

Introduction

Foreword

All prices are quoted in U.S. dollars and are subject to change without notice. Prices include packaging, but exclude freight, tax and insurance (where applicable).

All freight is shipped F.O.B. 1001 Wesemann Drive, West Dundee, IL 60118. Renishaw automatically ships and insures items via United Parcel Service unless the customer specifies otherwise.

Renishaw's terms of business are thirty (30) days net.

Renishaw's return policy for unused items returned by customers is as follows:

A notice requesting goods to be returned must occur within 30 days of shipment. A Return Goods Authorization number (RGA) will be issued by Renishaw's Customer Service department and is required prior to goods being returned. Goods must then be returned within 30 days of issue date. The RGA number must be noted on all paperwork and labels for return. Shipment to Renishaw without an RGA number may be refused.

Goods returned for reasons other than quality issues will be subject to a restocking fee of \$75 or 20% of the net price, whichever is greater. After 60 days, no product will be accepted for return.

Returned product will be inspected and credit will be issued, except where an item is damaged, incomplete, or not in the original packaging. Specials, or non-standard assembled products, are non-returnable.

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COMPLETE METALWORKING SOLUTIONS

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The Renishaw mission

Renishaw will design, manufacture and supply metrology systems of the highest quality and reliability to enable customers worldwide to carry out dimensional measurements to traceable standards.

Our product offerings will enhance quality and productivity, and we will strive for total customer satisfaction through superior customer service.

Our aim is to provide leading edge technology by encouraging innovation to address our customers' needs.

We are committed to sustained growth through continued investment in product development and manufacturing methods.

Renishaw wishes to be recognized collectively and individually as leaders and contributors in our field and our community.

We wish to achieve our aims in a way that is caring, open and honest.

Renishaw is an environmentally conscious and responsible company. We will strive to ensure that all aspects of the business have the least harmful effect on the environment.

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Section 10 – Alpha-numeric price list

Coordinate measuring machine probes



Coordinate measuring machine probes

Fixed and manual probe heads

PH1

A small swivel head, adjustable in both the A and B axes, with limited overtravel protection. The probe is offset from the mounting shank Z axis.

Number of probe sockets:	1
Probe status indication:	1 LED
Cable connection:	5 pin DIN 180° socket
Overtravel break load:	Adjustable from 20 gf (0.7 ozf) to locked solid
A-axis indexing:	Swivel of 115° locked with hexagonal key (3 mm A/F)
B-axis indexing:	15° steps through 360°
Weight:	125 g (4.5 oz)
Mounting options:	Shank to suit your CMM

Part number: A-1049-1795

Price: \$1,848



PH6

A compact, vertical probe head for a single probe, with a choice of integral cables (see below).

Number of probe sockets:	1
Probe status indication:	1 LED
Cable connection:	Integral cable
Mounting options:	Shank to suit your CMM

Part number: A-1046-5097 (coiled 12-28 in, 5 pin DIN)	Price: \$500
Part number: A-1046-5098 (coiled 18-50 in, 5 pin DIN)	Price: \$500
Part number: A-1046-5099 (coiled 30-95 in, 5 pin DIN)	Price: \$500
Part number: A-1046-5094 (plain 177 in, 5 pin DIN)	Price: \$500
Part number: A-1046-5096 (coiled 23-72 in, 7 pin amph)	Price: \$500



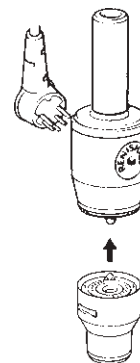
PH6A

The PH6A is designed for use with autojoint probes and allows you to change probes or add extensions without having to requalify the probe. **Special order only.**

Number of probe sockets:	1
Probe status indication:	1 LED
Cable connection:	5 pin DIN 180° socket
Mounting options:	Shank to suit your CMM

Part number: A-1051-0012

Price: \$752



PH6M

A fixed head with autojoint connection for probes and adaptors. For use with TP7M, SP600M, and SP25M.

Number of probe sockets:	1 autojoint
Probe status indication:	1 LED
Cable connection:	Micro 'D' connector
Mounting options:	Shank to suit your CMM

Part number: A-1074-0020

Price: \$1,776



MH8

A manually indexable probe head with repeatable indexing, eliminating the need to requalify the stylus tip position after orientation. The MH8 can be used with the TP6 probe directly or with the TP20 probe with up to 50 mm extension. An easy upgrade, as there is no need for special software, cabling, or electronics.

2 σ positional repeatability:	1.5 μ m
Probe status indication:	1 LED
Cable connection:	5 pin DIN type connector
A-axis indexing:	0° to 90° in 15° steps = 7 positions
B-axis indexing:	\pm 180° in 15° steps = 24 positions
Total number of positions:	168
Maximum support capability:	TP6 mounted directly TP20 with PEL1 50 mm extension
Probe mounting:	M8 bush
Mounting options:	Shank to suit your CMM

Part number: A-1332-0002

Price: \$3,546

MIH

A manually indexable head, repeatable in 720 positions over two axes with LCD display, the MIH is designed for use with the autojoint TP6A touch probe and long extensions for large components. TP2, TP6, TP20 touch probes can be used with the addition of the PAA1 or PAA2 extensions.

2 σ positional repeatability:	1 μ m
Probe status indication:	1 LED
Cable connection:	5 pin DIN 180° socket
A-axis indexing:	105° to 0° in 7.5° steps = 15 positions
B-axis indexing:	\pm 180° in 7.5° steps = 48 positions
Probe mounting:	Autojoint
Mounting options:	Shank to suit your CMM

Part number: A-1070-0003

Price: \$7,098



Coordinate measuring machine probes

MH20

The MH20 is an ultra-compact manually adjustable probe head offering maximum flexibility in probe orientation. The full range of TP20 probe modules can be used via its integral probe mounting. The MH20 is incompatible with the MCR20.

Probe mounting:	TP20 kinematic mount
Head mounting:	MS/T range of shanks
Suitable interfaces:	PI4-2, PI200-3 or PI7-3
Number of probe sockets:	1
Probe status indication:	1 LED
Cable connection:	5 pin DIN 180° socket
A-axis indexing:	Non-indexing swivel $\pm 93^\circ$
B-axis indexing:	Non-indexing swivel $\pm 300^\circ$
Maximum extension bar:	EM2 extension module – 75 mm (2.95 in)



MH20 head with low force module

Part number: A-4043-0000 **Price:** \$4,284

MH20 head with standard force module

Part number: A-4043-0100 **Price:** \$4,284

MH20 head with medium force module

Part number: A-4043-0200 **Price:** \$4,284

MH20 head with extended force module

Part number: A-4043-0300 **Price:** \$4,284

MH20i

The MH20i offers the significant advantage of repeatable indexing positions, vastly improving productivity for multi-orientation measurement applications. The MH20i is incompatible with the MCR20.

Probe mounting:	TP20 kinematic mount
Head mounting:	MS range of shanks
Suitable interfaces:	PI4-2, PI200-3 or PI7-3
Number of probe sockets:	1
Probe status indication:	1 LED
Cable connection:	5 pin DIN 180° socket
A-axis indexing:	0° to 90° in 15° repeatable steps
B-axis indexing:	180° in 15° repeatable steps
Repeatability of position:	1.5 µm (0.00006 in) with TP20 and 10 mm stylus 2.5 µm (0.0001 in) with EM2 extension module and 10 mm stylus
Maximum extension bar:	EM2 extension module – 75 mm (2.95 in)

MH20i head with low force module

Part number: A-4099-0000 **Price:** \$4,986

MH20i head with standard force module

Part number: A-4099-0100 **Price:** \$4,986

MH20i head with medium force module

Part number: A-4099-0200 **Price:** \$4,986

MH20i head with extended force module

Part number: A-4099-0300 **Price:** \$4,986



Coordinate measuring machine probes

RTP20

Renishaw's new RTP20 compact head for DCC coordinate measuring machines (CMMs) offers low-cost 'motorized' head functionality and integral TP20 touch-trigger probe.

The new RTP probe head allows the integral probe to be moved to 168 repeatable positions in 15° increments using both A and B axes, allowing a one-time qualification for a stylus tip position. This eliminates the need for costly time-consuming requalification routines, ensuring fast throughput for part inspection. Users can therefore easily access features to be measured and optimize system performance by ensuring the probe is applied to the surface at the best angle to achieve accurate measurements.

Probe mounting:	TP20 kinematic mount
Head mounting:	MS range of shanks
Suitable interfaces:	PI4-2, PI200-3 or PI7-3
Number of probe sockets:	1
Probe status indication:	1 LED
Cable connection:	5 pin DIN 180° socket
A-axis indexing:	0° to 90° in 15° repeatable steps
B-axis indexing:	180° in 15° repeatable steps
Repeatability of position:	1.5 µm (0.00006 in) with TP20 and 10 mm stylus 2.5 µm (0.0001 in) with EM2 extension module and 10 mm stylus
Maximum extension bar:	EM2 extension module – 75 mm (2.95 in)



RTP20 rack kit

- Includes:
- RTP20 head
 - Shank (various types)
 - Pole
 - Pole adaptor (various types)
 - MCR20 rack
 - 2 × TP20 modules (standard, medium, extended or low)
 - 2 × M2 stylus spanners
 - 2 × M4 stylus spanners
 - Cleaning kit

Part number: A-5400-#### (see next page) **Price:** \$7,200

(Additional charge for 6-way module \$78 per module)

RTP20 non-rack kit

- Includes:
- RTP20 head
 - Shank (various types)
 - Pole
 - Pole adaptor (various types)
 - 1 × TP20 module (standard, medium, extended or low)
 - 2 × M2 stylus spanners
 - 2 × M4 stylus spanners
 - Cleaning kit

Part number: A-5400-8### (see next page) **Price:** \$6,300

(Additional charge for 6-way module \$78 per module)

RTP20 part numbers

Non-rack kit

A-5400-8###

This number represents the TP20 module required:

- 1 = Low force module
- 2 = Standard force module
- 3 = Medium force module
- 4 = Extended force module
- 5 = 6-way module
- 6 = EM1 module
- 7 = EM2 module

These numbers represent the shank required:

- 01 = MS1 shank
- 02 = MS2 shank
- 03 = MS3 shank
- 04 = MS4 shank
- 05 = MS5 shank
- 06 = MS6 shank
- 07 = MS7 shank
- 08 = MS8 shank
- 09 = MS9 shank
- 10 = MS10 shank
- 11 = MS11 shank
- 12 = MS12 shank
- 13 = MS13 shank
- 14 = MS14 shank
- 15 = MS15 shank
- 16 = MS7(S) shank
- 17 = MS17 shank
- 18 = MS1(S) shank
- 19 = no shank

PLUS the pole adaptor required:

- +0 = M8 pole adaptor
- +20 = M6 pole adaptor
- +40 = 5/16 pole adaptor
- +60 = 3/8 pole adaptor
- +80 = M10 pole adaptor

Example

RTP20 with:

- No rack (8)
- Standard force module (2)
- MS3 shank + M6 pole adaptor (03 + 20 = 23)

= **A-5400-8223**

Rack kit

A-5400-####

This number represents the first TP20 module required:

- 1 = Low force module
- 2 = Standard force module
- 3 = Medium force module
- 4 = Extended force module
- 5 = 6-way module
- 6 = EM1 module
- 7 = EM2 module

This number represents the second TP20 module required:

- 1 = Low force module
- 2 = Standard force module
- 3 = Medium force module
- 4 = Extended force module
- 5 = 6-way module
- 6 = EM1 module
- 7 = EM2 module

These numbers represent the shank required:

- 01 = MS1 shank
- 02 = MS2 shank
- 03 = MS3 shank
- 04 = MS4 shank
- 05 = MS5 shank
- 06 = MS6 shank
- 07 = MS7 shank
- 08 = MS8 shank
- 09 = MS9 shank
- 10 = MS10 shank
- 11 = MS11 shank
- 12 = MS12 shank
- 13 = MS13 shank
- 14 = MS14 shank
- 15 = MS15 shank
- 16 = MS7(S) shank
- 17 = MS17 shank
- 18 = MS1(S) shank
- 19 = no shank

PLUS the pole adaptor required:

- +0 = M8 pole adaptor
- +20 = M6 pole adaptor
- +40 = 5/16 pole adaptor
- +60 = 3/8 pole adaptor
- +80 = M10 pole adaptor

Example

RTP20 with:

- Rack
- Low force module (1)
- Standard force module (2)
- MS1(S) shank + M10 pole adaptor (18 + 80 = 98)

= **A-5400-1298**

See pages 1-44 to 1-46 for information on the shank type for your machine.

Please call Customer Service on 847-286-9953 for part number assistance.

Motorized probe heads

PH10T PLUS

The new PH10T PLUS motorized probe head allows complete, rapid, and repeatable inspection of most complex components with minimum human intervention. Full orientation of your TP2, TP6, TP20 or TP200 probe between any of 720 positions, under manual or program control, turns your 3 axis CMM into a 5 axis machine.

2 σ positional repeatability:	0.4 μ m
Cycle time (90° move):	3.5 seconds
Total angular movement:	A axis 105° to 0° in 7.5° steps = 15 positions B axis \pm 180° in 7.5° steps = 48 positions
Total number of positions :	720
Maximum extension bar length:	300 mm using PEL4 extension*
Head mounting:	Shank to suit your CMM
Probe mounting facility:	M8 thread
Probe head control:	PHC10-3 PLUS (purchased separately)
Dimensions:	Length 102 mm excluding AM1, width 62 mm
Weight:	645 g

Part number: A-5863-2000

Price: \$20,209

PH10M PLUS

The PH10M PLUS motorized probe head has been developed for the new generation of contact and non-contact scanning probes. It has three times the torque of PH10 PLUS, allowing probe extension bars up to 300 mm long to be used.

The PH10M PLUS has an autojoint mounting.

2 σ positional repeatability:	0.4 μ m
Cycle time (90° move):	3.5 seconds
Total angular movement:	A axis: 105° to 0° in 7.5° steps = 15 positions B axis: \pm 180° in 7.5° steps = 48 positions
Total number of positions:	720
Maximum extension bar length:	300 mm using PAA3 extension*
Head mounting:	Shank to suit your CMM
Probe mounting facility:	Autojoint
Probe head control:	PHC10-3 PLUS (purchased separately)
Dimensions:	Length 102 mm excluding AM1, width 62 mm
Weight:	645 g

Part number: A-5863-1000

Price: \$22,920

* On all the PH10 PLUS series of probe heads, it is possible to extend beyond 300 mm using our range of CF extensions.



PH10MQ PLUS

The PH10MQ PLUS can be mounted vertically inside the CMM's quill for a greater working envelope by increasing the Z axis travel. The specification of the PH10MQ PLUS is identical to that of the PH10M PLUS, with the following exceptions:

Head mounting: Direct to quill
Dimensions: Length 73 mm, width 80 mm
Weight: 730 g

Part number: A-5863-3000

Price: \$22,920

PH10M-iQ PLUS

PH10M-iQ PLUS functions identically to a traditional PH10M PLUS but with the addition of inferred qualification technology. Inferred qualification increases throughput by removing the need to qualify each head position that is used in a measurement program.

PH10M-iQ PLUS works with all PH10M compatible probes, but only touch-trigger probe configurations can utilize inferred qualification. Scanning probes can be used in traditional PH10M qualification mode but cannot use inferred qualification.

Part Number: A-1025-1800

Price: \$25,897



Coordinate measuring machine probes

Motorized probe head accessories

AM1/AM2

The AM1 adjustment module is designed for use with the PH10T and PH10M probe heads. The AM2 is designed for the PH10MQ probe heads. Each module provides quick and accurate angular alignment of the motorized probe head with the CMM's axes and/or the autochange rack. The quick release mechanism allows the head to be removed for storage and replaced without further alignment.

	AM1	AM2
Size:	60 mm × 15.5 mm	80 mm × 10 mm
Adjustment:	±2° in pitch and roll* ±4.5° in yaw	±1° in pitch and roll ±1° in yaw
Overtravel:	±3.5° in pitch and roll	0
Mounting:	Mounts to quill using shank	Mounts direct to quill

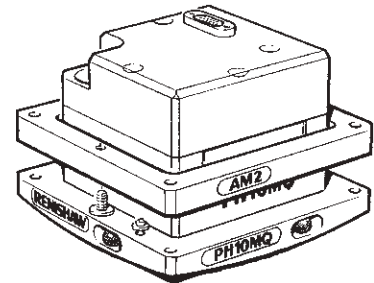
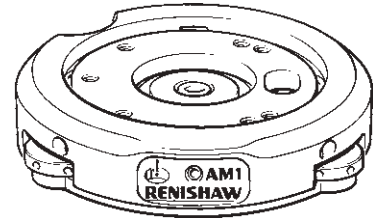
* Up to ±5.5° in pitch and roll is possible, but at the expense of overtravel.

Part number: A-1026-0320 (AM1)

Price: \$817

Part number: A-1036-0080 (AM2)

Price: \$817



PHC10-3 PLUS

The PHC10-3 PLUS head control receives instructions and processes signals to rotate the angles of the PH10 PLUS series probe heads. The PHC10-3 PLUS is compatible with all PH10 PLUS heads. It has its own internal power supply.

Data transmission:	RS232 or USB
Input connectors:	15 way 'D' probe
Output connectors:	7 pin DIN or 9 pin D type
Maximum cable length:	50 m (164 ft)
Hand control:	HCU1 (purchased separately)

Part number: A-5863-0100

Price: \$3,107



PHC10-3 PLUS with internal PI200-3

This variant of the PHC10-3 PLUS controller includes a prefitted PI200-3 interface card in a single 1U case.

Part number: A-5863-0200

Price: \$3,928

HCU2

The HCU2 hand control unit enables the probe head to be used in a manual mode or during a teach cycle. An LCD dot matrix display provides information and status of the PHC10-3 system.

Part number: A-5882-0010

Price: \$802



MCUlite-2 joystick

Part number: A-5331-0015 **Price:** \$724

MCU5 joystick kit

Part number: A-5121-0003 **Price:** \$2,171

MCU5-2 joystick kit

Part number: A-5734-0100 **Price:** \$2,171

MCU-W wireless joystick kit (no batteries)

Part number: A-5121-0077 **Price:** \$3,749

MCU-W2 wireless joystick kit (no batteries)

Part number: A-5734-0200 **Price:** \$3,749

MCU-W battery (2 pack)

Part number: A-5381-0095 **Price:** \$385

MCU-W 1 battery

Part number: A-5381-0036 **Price:** \$202

PL163

5 meter cable for MCU.

Part number: A-1016-8098 **Price:** \$186

PL164

10 meter cable for MCU.

Part number: A-1016-8099 **Price:** \$287

PL171

20 meter cable for MCU.

Part number: A-1016-8100 **Price:** \$483

12U retrofit cabinet

Part number: A-5567-1000 **Price:** \$2,620



Coordinate measuring machine probes

PH20

PH20 is another innovative measurement product from Renishaw that transforms coordinate measuring machine (CMM) performance. For the first time, 5-axis technology developed for the multi-award winning REVO® measurement system is available for touch-trigger applications on all sizes of CMM.

PH20's unique 'head touches' allow measurement points to be taken by moving only the head rather than the CMM structure. Using only the rapid rotary motion of the head, points can be taken faster, and with improved accuracy and repeatability. Furthermore, 5-axis motion eliminates time spent indexing the head. Together these speed increases typically result in a three-fold improvement in throughput over conventional systems.

PH20's infinite positioning capability guarantees optimal feature access, minimizing stylus changes. Five-axis simultaneous motion allows larger parts to be measured on the CMM by minimizing the space required around the part for head rotation.

Users of the PH20 probe head will immediately have access to the range of proven TP20 probe modules, providing a wide selection of trigger forces, directional sensing options and extensions to meet application requirements*. The detachable modules provide crash protection and can be automatically changed using the MCR20 change rack.

* Excepting the extended force module

PH20 features and benefits

- Incorporates 5-axis measurement technology, minimizing CMM motion and the associated CMM dynamic errors.
- Infinite positioning and 5-axis motion reduces non-productive transitions between features.
- Infinite positioning and 5-axis motion aid access to difficult features.
- Rapid calibration with all positions inferred means more time measuring.
- Maximum reach up to 200 mm with maintained effective working length.
- Standard M2 styli for convenience.



Hardware integration

- The UCC controller is fundamental to the PH20 system.
- The UCC controller features routines particular to 5-axis motion and head-touch measurement.
- MCUlite-2 is the multi-function hand control unit required for the system.
- PH20 can fit to any machine, either directly to the quill or via a shank using a range of mounting adaptors.
- The PH20 is compatible with the existing range of TP20 modules, excepting the extended force module.
- MCR20NI is the recommended rack for stylus changing, but it is possible to use an MCR20.
- No air supply is needed.

Software integration

- The Renishaw UCCserver™ software application will provide the interface for PH20 control.
- UCCserver is based on I++DME command protocol.
- PH20 is fully integrated with Renishaw's MODUSTM application software.

Specification summary		PH20	
Weight (excluding module and cables)		810 g (28.6 oz)	
Temperature range	Operating	15 °C to 35 °C (59 °F to 95 °F)	
	Storage	-25 °C to 70 °C (-13 °F to 158 °F)	
Maximum movement speed		3 revs/s (1281 mm/s with standard module and 10 mm stylus)	
Maximum head touch speed		50 mm/s	
Rotation angles	A axis	-115° to 115°	
	B axis	∞	
Angular resolution		0.4 μRadians	
Bearings		Mechanical	
Change rack system		TCR20 or MCR20 with TDA block	
Joystick		MCU <i>lite</i> -2, MCU5 or MCU-W	
ISO 10360-5 (2001) typical performance			
standard force module with 12 × 4 mm stylus on a CMM with ISO 10360-2 (2002) specification of 0.48+ L/1000*	Size	CMM TOUCH	HEAD TOUCH
	Form	0.0006 mm (0.00002 in)	0.0002 mm (0.00001 in)
	Location	0.0026 mm (0.00010 in)	0.0024 mm (0.00009 in)
		0.0013 mm (0.00005 in)	0.0009 mm (0.00003 in)

* specified with a TP7

PH20 head

Includes: PH20 head with standard force module
 TP20

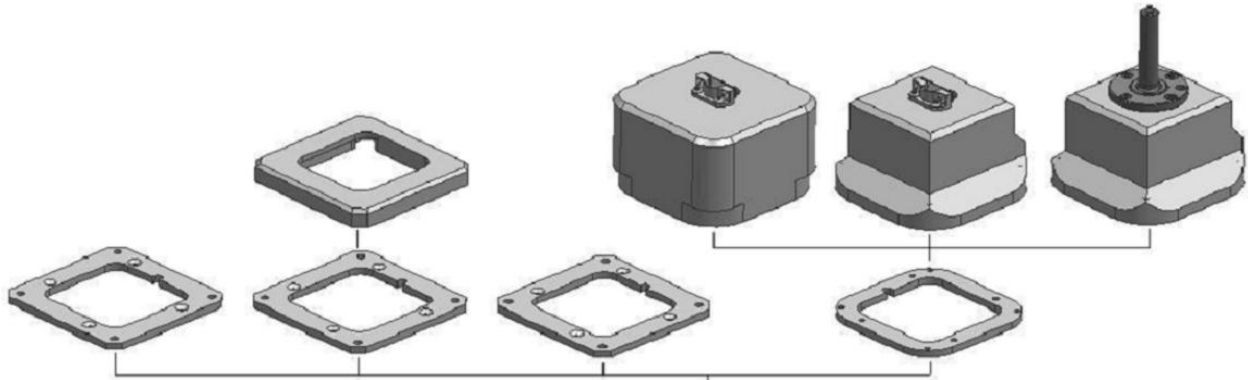
Part number: A-5669-0001

Price: \$17,179



Coordinate measuring machine probes

PH20 shanks



PH20 shank adaptor

Part number: A-3007-1715 Price: \$201

PH20 small quill adaptor

60 mm × 60 mm.

Part number: A-3007-1716 Price: \$201

PH20 large quill adaptor

80 mm × 80 mm.

Part number: A-3007-1717 Price: \$201

PH20 PH10MQ quill adaptor

Part number: A-3007-1720 Price: \$35

PH20 calibration stylus

Part number: A-5004-2182 Price: \$43

PH20 calibration sphere

Part number: A-1034-0026 Price: \$545

Rack for PH20

TCR20

Part number: A-1371-1001 Price: \$2,237



NOTE: See CMM probe shanks starting on page 1-44.

REVO-2

The 5-axis REVO-2 system incorporating the REVO-2 head provides fast, ultra-high accuracy positioning.

REVO-2 system overview

The system comprises the following elements:

- REVO-2 head
- RSP2 2D tip sensing probe and associated stylus holders and accessories
- RSP3 3D probe and associated accessories
- **UCC** universal CMM controller
- REVO-2 PCI interface card (for **UCC**)
- **SPA** servo power amplifier
- Air filter unit

REVO-2 – ‘tip sensing’ probe technology

- Enclosed laser directed onto a reflector at the stylus tip.
- The stylus touches the part and bends.
- The reflector is displaced.
- The altered return path of the laser is sensed by a PSD.
- The exact tip position is known because the reflector and the stylus ball are close together.
- Stylus wear is minimized by using a low scanning force.

REVO-2 features and benefits

- Incorporates **Renscan5™** 5-axis scanning technology minimizing CMM motion and the associated CMM dynamic errors
- Increased measuring speed, up to 500 mm/s, resulting in increased measurement throughput
- Data collection rates up to 6,000 points per second
- Infinite positioning and 5-axis motion reduces non-productive transitions between features
- Stylus wear minimized by extremely low scanning forces
- Infinite positioning and 5-axis motion aid access to difficult features
- Rapid calibration with all positions inferred means more time measuring
- Maximum reach up to 500 mm with maintained effective working length
- Standard M2 styli for convenience
- Probe and stylus changing capability allowing flexibility and future probing technology compatibility



Hardware integration

- The **UCC** is fundamental to the REVO-2 system
- The **UCC** controller features **Renscan5™** scanning routines particular to 5-axis motion and scanning
- **SPA** is a servo power amplifier used to drive the head and CMM
- MCU is the multi-function hand control unit required for the system

Software integration

- The Renishaw **UCCserver™** software application will provide the interface for REVO® control
- **UCCserver™** is based on I++DME command protocol

Coordinate measuring machine probes

Specification summary		REVO-2			
Operating temperature		14 °C to 30 °C (57 °F to 86 °F)			
Storage temperature		-10 °C to 70 °C (14 °F to 158 °F)			
Weight (excluding probe and cables)		1.75 kg			
Dimensions	Height (overall)	239 mm (9.41 in)			
	B axis	86 mm (3.40 in) square			
	A axis swept diameter	118 mm (4.65 in)			
Air specification	Incoming supply to filter specification (ref: ISO 8537.1)	Particle size	Class 4	15 µm	Line pressure of 6 bar to 6.5 bar
		Dirt concentration	Class 4	8 mg/m ³	
		Dewpoint	Class 4	3 °C	
		Oil	Class 4	5 mg/m ³	
	After filtration air specification (ref: ISO 8537.1)	Particle size	Class 2	1 µm	Pressure 5 bar
		Dirt concentration	Class 2	1 mg/m ³	
		Dewpoint	Class 3	-20 °C	
		Oil	Class 2	0.1 mg/m ³	
Movement speed		3 revolutions per second			
Rotation angles	A axis	-5° to 120°			
	B axis	Continuous			
Angular resolution		0.08 arc second			
Bearings		Air			
Change rack system		Allowing both probe changing and stylus holder changing			

REVO-2 head kit

Includes: REVO-2®
RSP2
RSH250
45 mm diameter datum ball

Part number: A-5518-1095 **Price:** \$46,993

REVO-2 head only

Part number: A-5759-0001 **Price:** \$44,492

REVO® RSP2 V2 probe

Part number: A-3060-0028 **Price:** \$4,838

REVO® RSH250 stylus holder kit

Part number: A-3060-0021 **Price:** \$1,162

REVO® RSH350 stylus holder kit

Part number: A-3060-0022 **Price:** \$1,258

REVO® RSH500 stylus holder kit

Part number: A-3060-0023 **Price:** \$1,354

REVO® RSH175 stylus holder kit

Part number: A-3060-0024 **Price:** \$1,165

REVO® RSH450 stylus holder kit

Part number: A-3060-0026 **Price:** \$1,306

RSP3-1 REVO® probe kit

Includes: RSP3-1
PSH3-1

Part number: A-3060-0331 **Price:** \$6,773

RSP3-2 REVO® probe kit

Includes: RSP3-2
RSH3-2

Part number: A-3060-0332 **Price:** \$6,773

RSP3-3 REVO® probe kit

Includes: RSP3-3
 RSH3-3

Part number: A-3060-0333 **Price:** \$6,773

RSP3-4 REVO® probe kit

Includes: RSP3-4
 RSH3-4

Part number: A-3060-0334 **Price:** \$7,934

RSH3-1

Includes: PA25 - RSH3

Part number: A-3061-2521 **Price:** \$208

RSH3-2

Includes: PA25 - RSH3

Part number: A-3061-2522 **Price:** \$314

RSH3-3

Includes: PA25 - RSH3

Part number: A-3061-2523 **Price:** \$383

RSH3-4

Includes: PA25 - RSH3

Part number: A-3061-2524 **Price:** \$507

RSP3-6 probe kit

Includes: Probe
 Portspacer

Part number: A-6084-0001 **Price:** \$10,643

REVO® RSH3-6C-500 (500 mm crank)

Part number: A-6084-0015 **Price:** \$968

REVO® RSH3-6C-600 (600 mm crank)

Part number: A-6084-0016 **Price:** \$1,016

REVO® RSH3-6-600 (600 mm straight)

Part number: A-6084-0006 **Price:** \$1,016

REVO® RSH3-6-700 (700 mm straight)

Part number: A-6084-0007 **Price:** \$1,064

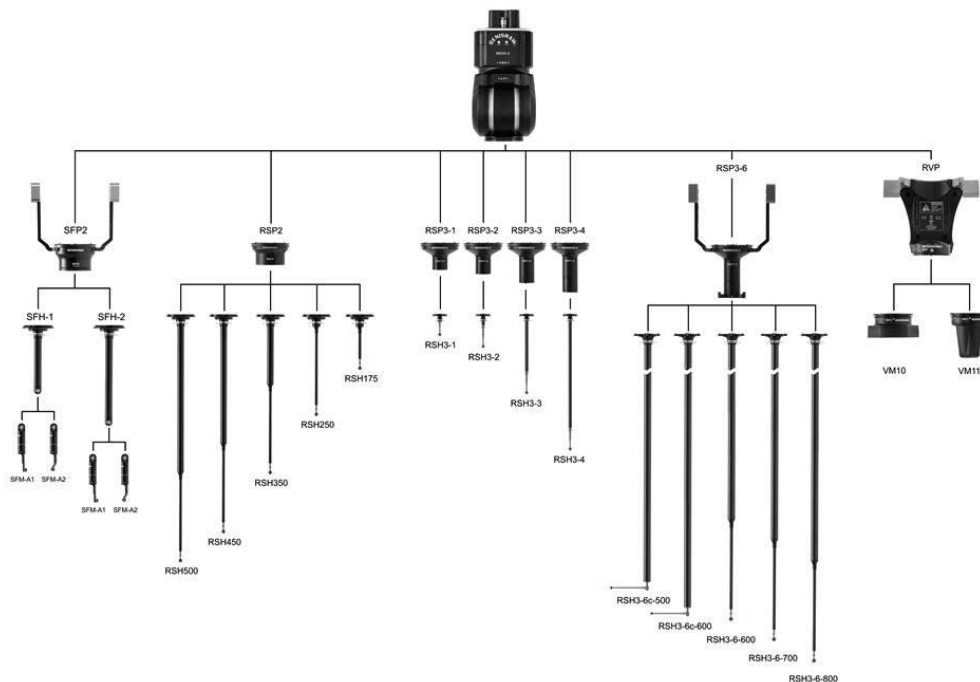
REVO® RSH3-6-800 (800 mm straight)

Part number: A-6084-0008 **Price:** \$1,161

REVO® to REVO-2 upgrade kit

Includes: REVO-2
 UCCS5 and PSU
 SPA3
 Blanking plate

Part number: A-1032-0025 **Price:** \$29,250



Coordinate measuring machine probes

RVP vision probe for REVO-2

The REVO vision probe (RVP) provides non-contact vision measurement on an infinitely positioning, 5-axis platform. Now, tactile scanning measurement, surface finish analysis and non-contact inspection can all be performed on one CMM.

The RVP system is a breakthrough in technology in the world of non-contact CMM inspection. The combination of non-contact vision measurement and a 5-axis, infinitely positioning platform makes the RVP system truly unique.

RVP further expands the range of applications for the REVO-2 system with a non-contact edge detecting sensor automatically interchangeable with all other REVO probe options. As a result, the system provides the optimum tool to measure multiple features, and a wider variety of parts can be inspected.

System components

The RVP system comprises a vision probe body, a number of vision modules, rack ports and a calibration artefact. The image capture and processing components of the system are held inside the vision probe body and include an industry standard, robust, CMOS sensor for reliable image capture. The vision modules allow a range of features with different sizes and shapes to be inspected. All vision modules contain integral LED lighting to achieve a sharp contrast between holes and part material. Background feature enhancement is also available using backlighting combined with bespoke part fixturing.

Benefits

Added part inspection capability

Small features and delicate or flexible parts that cannot be measured using tactile probes can now be inspected on a 5-axis non-contact measurement platform.

Added value multi-sensor system

A machine equipped with REVO-2 can be used for a large range of inspection applications including scanning measurement, surface finish analysis and now, non-contact inspection.

High speed data collection

5-axis motion between part features and real time image processing dramatically increase data collection rates.



Innovations

5-axis movement, infinite positioning

RVP benefits from REVO's infinite positioning and 5-axis movement, which ensure accurate and unrestricted placement in front of features at any angle.

Automatically interchangeable sensors

The RVP non-contact probe is automatically interchangeable with all other probe options available for REVO-2, and data from multiple sensors is automatically referenced to a common datum.

3D surface reconstruction

5-axis motion and infinite positioning provide access to the data required for 3D surface reconstruction.

Probe specification	RVP
Weight	551 g
Dimensions	158 mm × 131 mm × 134 mm
Rack port compatibility	VPCP (heated)
Sensor type	1/1.8" CMOS sensor
Head compatibility	REVO-2
Operating temperature	+10 °C to +40 °C
Software compatibility	UCCsuite 5.0 onwards MODUS™ 1.7 onwards
Integration	I++ DME protocol

Module specification

VM10

VM11



	VM10	VM11
Weight	153 g	145 g
Dimensions	86 mm × 39 mm	75 mm × 67 mm
Rack port compatibility	VMCP (heated)	VMCP (heated)
Measurement range	1 mm diameter or greater	0.5 mm diameter or greater
Field of view	50 mm × 40 mm	12.5 × 10 mm
Stand-off	80 mm	120 mm
Depth of field	5 mm	5 mm
Resolution	40 µm	20 µm
LED illumination	24 LEDs	10 LEDs
Backlight compatibility	Yes	Yes

RVP probe

Part number: A-5378-0080 **Price:** \$27,090

VM10 vision module

Part number: A-5378-0082 **Price:** \$5,805

VM11 vision module

Part number: A-5378-0087 **Price:** \$7,256

VPCP vision probe change port

Part number: A-5378-0081 **Price:** \$1,838

VMCP vision module change port

Part number: A-5378-0083 **Price:** \$1,838

VA10 calibration artefact

Part number: A-5378-0085 **Price:** \$1,258

Coordinate measuring machine probes

RVP kits

RVP combo kit

- Includes: RVP probe
VPCP vision probe change port
VM10 vision module
VM11 vision module
VMCP vision module change port
VA10 calibration artefact

Part number: A-5378-9504 **Price:** \$46,924

RVP VM10 kit

- Includes: RVP probe
VPCP vision probe change port
VM10 vision module
VMCP vision module change port
VA10 calibration artefact

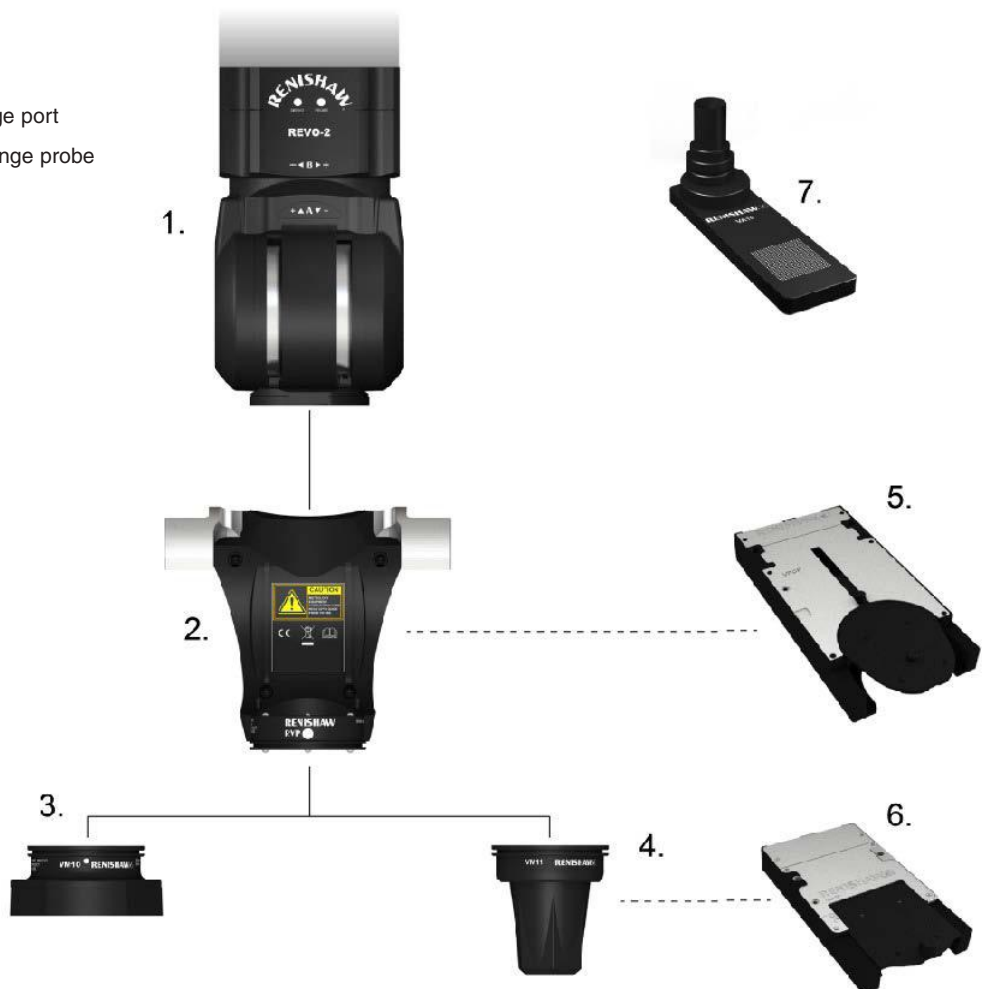
Part number: A-5378-9505 **Price:** \$37,829

RVP VM11 kit

- Includes: RVP probe
VPCP vision probe change port
VM11 vision module
VMCP vision module change port
VA10 calibration artefact

Part number: A-5378-9506 **Price:** \$39,281

1. REVO-2 head
2. RVP probe
3. VM10 vision module
4. VM11 vision module
5. VPCP vision probe change port
6. VMCP vision module change probe
7. VA10 calibration artefact



SFP2 surface finish probe

Enhanced access and inspection capability for integrated surface finish measurement.

The SFP2 probe increases the surface finish measurement ability of the REVO® system, which offers multi-sensor capability providing touch-trigger, high-speed tactile scanning and non-contact vision measurement on a single CMM.

Powered by 5-axis measurement technology, the SFP2's automated surface finish inspection offers significant time savings, reduced part handling and greater return on CMM investment.

The SFP2 system consists of a probe and a range of modules and is automatically interchangeable with all other probe options available for REVO, providing the flexibility to easily select the optimum tool to inspect a wide range of features, all on one CMM platform. Data from multiple sensors is automatically referenced to a common datum.

The surface finish system is managed by the same I++ DME compliant interface as the REVO system, and full user functionality is provided by Renishaw's MODUS™ metrology software.

Key benefits

Unrivalled feature access

SFP2 benefits from REVO's infinite positioning and 5-axis movement, and features an integral motorized C axis. The SFM variants offer a range of tip arrangements which, combined with the knuckle joint between module and holder, provide access to the features most difficult to reach.

Operator independent data collection

CMM programs can now include automated and operator-independent surface finish measurement. All results, including surface finish data, are recorded and stored in a single location for easy retrieval.

Greater return on investment in CMMs

Integrated surface finish and dimensional inspection can remove the need for dedicated surface measurement equipment, reducing factory footprint, part handling and associated costs.



Coordinate measuring machine probes

Specification summary		SFP2 surface finish probe			
SFM-A1 and SFM-A2 modules	Surface finish range	0.05 μm – 6.3 μm Ra			
	Surface finish accuracy (of nominal Rs)	\pm (5% +15 nm)			
	Surface forces	Skid: 0.2 N	Stylus tip: 0.005 N		
	Encoder resolution	1 nm			
	Measurement range	1.0 mm			
	Measurement speed	Up to 1 mm/s			
	SFM range of adjustment	$\pm 90^\circ$ at the knuckle joint			
SFP2 probe	C-axis positioning accuracy	$\pm 0.25^\circ$			
	C-axis rotation speed	Up to 90°/sec			
	Rotational capability	A axis (from REVO-2)	+120° / –110°		
		B axis (from REVO-2)	Infinite positioning		
		C axis	$\pm 180^\circ$		
	Mounting (probe and holder)	Magnetized coupling			
	Probe head	REVO-2 only			
	Change rack	MRS2 recommended for full capability			
	Software compatibility	UCCsuite 5.2 onwards MODUS 1.8 onwards			
	Weight	SFP2 probe	SFH1 holder	SFM-A1 module	SFM-A2 module
330 g		33 g	12 g	12 g	
Operating temperature range	+10 °C to +40 °C				
Storage temperature range	–25 °C to +70 °C				
Operating humidity	0% to 80% (non-condensing)				
System features	Calibration and verification artefacts	SFA1	3.0 μm Ra sinusoid		
		SFA2	0.5 μm Ra sinusoid		
		SFA3	0.4 μm Ra sawtooth		
		TFP	Uses LF TP20 module; PICS interface to SPA3 amplifier		
Outputs	MODUS basic	Ra, Rms(Rq)			
	MODUS standard surface texture	Rt, R3z, Rz, Rz1max, RzDIN, RzJIS, Rseg Rp, Rv Rpm, Rvm, Rc, Rsm			
	MODUS advanced surface texture	Rk, Rpk, Rvk, Rmr, Rmr1, Rmr2, Rpq, Rvq, Rmq, Rvoid, Rvdd, Rvddl, Rcvx, Rcvxl			
Sampling rate	4 kHz				

REVO® SFP2 base kit

Part number: A-5764-0005-KIT Price: \$27,471

REVO® SFP2 probe

Part number: A-5764-0010 Price: \$23,780

REVO® SFM-A1 (Straight, Type A Skid)

Part number: A-5764-0020 Price: \$8,941

REVO® SFM-A2 (Crank, Type A Skid)

Part number: A-5764-0021 Price: \$8,941

REVO® SFM-B1 (SM Straight, Type B Skid)

Part number: A-5764-0025 Price: \$10,283

REVO® SFM-C2 (Straight, Type C Skid)

Part number: A-5764-0031 Price: \$12,965

REVO® SFM-D1 (90°, Type D Skid)

Part number: A-5764-0035 Price: \$10,283

Single artefact kit (SFA1 and 1 AF holder)

Part number: A-5764-0072 Price: \$2,397

REVO® SFH-1 module holder

Part number: A-5764-0080 Price: \$1,332

REVO® SFH-2 module holder

Part number: A-5764-0081 Price: \$1,522

REVO® SFA1 3.0 sin artefact

Part number: A-5764-0060 Price: \$1,807

REVO® SFA2 0.5 sin artefact

Part number: A-5764-0061 Price: \$1,807

REVO® SFA3 0.4 ST artefact

Part number: A-5764-0062 Price: \$1,807

REVO® OFA optical flat artefact

Part number: A-5764-3142 Price: \$3,710

Triple artefact kit (SFA1, 2, 3 and 3 AF holder)

Part number: A-5764-0073 Price: \$6,106

REVO® single AF holder (SFAH-1, tools)

Part number: A-5764-0070 Price: \$590

REVO® triple AF holder (SFAH-2, tools)

Part number: A-5764-0071 Price: \$685

REVO® SF2 TFP probe kit (LF, PL24, styli)

Part number: A-5764-0063 Price: \$4,280

REVO® SF2 MST – module setting tool

Part number: A-5764-0091 Price: \$190

REVO® SF2 system storage box

Part number: A-5764-0090 Price: \$333

REVO® RCP TC-3 high force rack port

Part number: A-3061-0320 Price: \$1,807

MRS MPS1 port spacing tool

Part number: A-6084-0017 Price: \$63



Coordinate measuring machine probes

Touch probes

TP1S/TP1SM

A robust and reliable probe which is especially suited for manual CMMs. It is available in two versions with differing plug socket orientations:

TP1S cable connects vertically
TP1SM cable connects horizontally

Sense directions:	$\pm X, \pm Y, +Z$
2σ unidirectional repeatability:	0.5 μm
Pre-travel variation:	$\pm 2.0 \mu\text{m}$
Stylus force range:	10 g to 50 g
Stylus overtravel:	XY plane $\pm 19.5^\circ$ +Z axis 8.5 mm @ 15 g 5.0 mm @ 50 g
Suitable interfaces:	PI4-2, PI7-3, or PI200-3
Stylus thread size:	M3
Mounting option:	Shank to suit your CMM
Test conditions:	31 mm stylus @ 8 mm/s with trigger force of 15 g

Part number: A-1041-7540 (TP1S)
Part number: A-1041-7541 (TP1SM)

Price: \$3,474
Price: \$3,474



TP20/TP20 NI modular probes

The TP20 is a 5-way or 6-way kinematic touch-trigger probe. Its two piece design comprises a probe body and detachable stylus module(s) which gives the ability to change stylus configurations either manually or automatically without requalification of the stylus tips. It affords significant time savings in inspection routines.

A direct replacement for the industry standard Renishaw TP2 probe, the TP20 probe system brings a range of new benefits to manual and DCC CMM applications, and can easily be retrofitted to existing TP2 installations.

The TP20 can be used on a wide range of Renishaw's manual or motorized probe heads, either by direct mounting using the standard M8 thread or, alternatively, by using a PAA# adaptor to connect to an autojoint.

The system components are:

- TP20/TP20 NI probe body
- TP20 stylus module – seven module variants allow for optimization of performance to suit the application
- MCR20 module changing rack – automatic operation

The TP20 probe system may be used with Renishaw's PI 4-2, PI 7-2 or PI 200 probe interfaces.

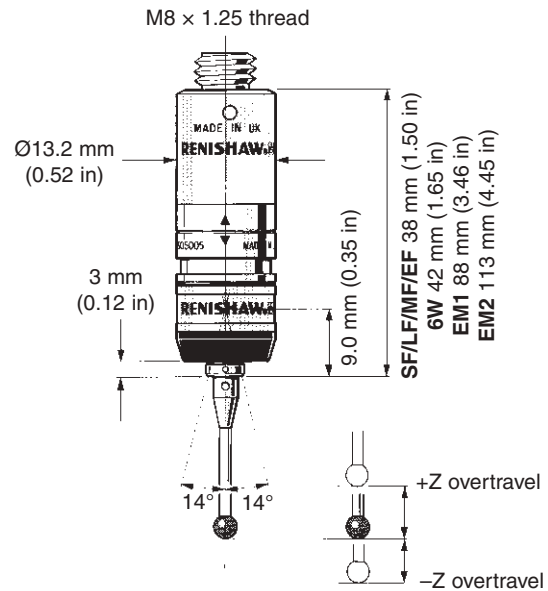
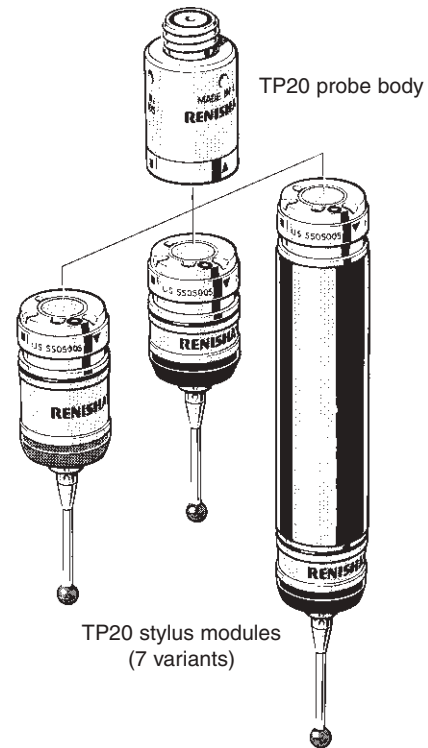
TP20 probe body

The TP20 probe body houses one half of the highly repeatable magnetic kinematic coupling that attaches the stylus module and body. The body also contains a magnetic proximity switch to inhibit triggering of the probe during automatic module changing with MCR20.

Note: If the probe is operated close to magnetized parts/clamping etc, the probe trigger may become inhibited. Countermeasures include the use of long styli, stylus extensions or body orientation to increase the distance to the magnetic source. Alternatively, use the TP20 NI probe body.

TP20 NI probe body

The TP20 NI probe differs from the TP20 body in that it is not affected by magnetic fields. However the probe trigger must be inhibited through software during change cycles using the MCR20.



+Z overtravel

SF/EM1/EM2	4.0 mm (0.16 in)
LF	3.1 mm (0.12 in)
MF	3.7 mm (0.15 in)
EF	2.4 mm (0.09 in)
6W	4.5 mm (0.177 in)

-Z overtravel

6W	1.5 mm (0.06 in)
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Coordinate measuring machine probes

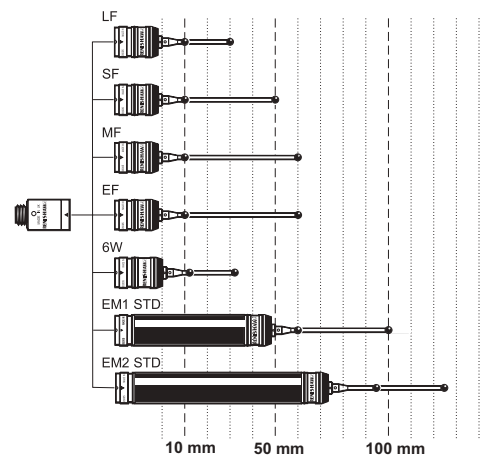
Specification summary		TP20	TP20 NI
Principal application		DCC and manual CMMs suitable for most applications	DCC and manual CMMs where operation is within a magnetic field
Sense directions	All modules except 6W 6W	$\pm X, \pm Y, +Z$ $\pm X, \pm Y, \pm Z$	$\pm X, \pm Y, +Z$ $\pm X, \pm Y, \pm Z$
Pre-travel variation	LF SF/EM1/EM2 MF EF 6W	$\pm 0.6 \mu\text{m}$ (± 0.000023 in) $\pm 0.8 \mu\text{m}$ (± 0.000032 in) $\pm 1.0 \mu\text{m}$ (± 0.000039 in) $\pm 2.0 \mu\text{m}$ (± 0.000079 in) $\pm 1.5 \mu\text{m}$ (± 0.000058 in)	$\pm 0.6 \mu\text{m}$ (± 0.000023 in) $\pm 0.8 \mu\text{m}$ (± 0.000032 in) $\pm 1.0 \mu\text{m}$ (± 0.000039 in) $\pm 2.0 \mu\text{m}$ (± 0.000079 in) $\pm 1.5 \mu\text{m}$ (± 0.000058 in)
Repeatability of stylus change (max)	With SCR200 Manual	$\pm 0.5 \mu\text{m}$ (± 0.000020 in) $\pm 1.0 \mu\text{m}$ (± 0.000040 in)	$\pm 0.5 \mu\text{m}$ (± 0.000020 in) $\pm 1.0 \mu\text{m}$ (± 0.000040 in)
Stylus range		M2	M2
Probe mounting method		M8 thread	M8 thread
Suitable interface		PI 4-2, PI 7-2, PI 200	PI 4-2, PI 7-2, PI 200
Stylus module changing rack (automatic)		MCR20	MCR20
Stylus module storage rack (manual)		MSR1	MSR1



Module type and test stylus length	Trigger force		Overtravel force			Overtravel displacement			Unidirectional repeatability 2σ at stylus tip	2D (XY) form error
	XY	Z	XY	+Z	-Z	XY	+Z	-Z		
SF (black cap) 10 mm	0.08 N	0.75 N	0.2-0.3 N	3.5 N	-	$\pm 14^\circ$	4.0 mm (0.16 in)	-	0.35 μm (0.000014 in)	$\pm 0.8 \mu\text{m}$ (± 0.000032 in)
LF (green cap) 10 mm	0.055 N	0.65 N	0.09 N	1.15 N	-	$\pm 14^\circ$	3.1 mm (0.12 in)	-	0.35 μm (0.000014 in)	$\pm 0.6 \mu\text{m}$ (± 0.000024 in)
MF (grey cap) 25 mm	0.1 N	1.9 N	0.2-0.4 N	7.0 N	-	$\pm 14^\circ$	3.7 mm (0.15 in)	-	0.50 μm (0.000020 in)	$\pm 1.0 \mu\text{m}$ (± 0.000039 in)
EF (brown cap) 50 mm	0.1 N	3.2 N	0.2-0.5 N	10.0 N	-	$\pm 14^\circ$	2.4 mm (0.09 in)	-	0.65 μm (0.000026 in)	$\pm 2.0 \mu\text{m}$ (± 0.000079 in)
6W (blue cap) 10 mm	0.14 N	1.6 N	0.25 N	2.5 N	9.0 N	$\pm 14^\circ$	4.5 mm (0.18 in)	1.5 mm (0.059 in)	0.80 μm (0.000032 in)	$\pm 1.5 \mu\text{m}$ (± 0.000059 in)
EM1 10 mm	0.08 N	0.75 N	0.2-0.3 N	3.5 N	-	$\pm 14^\circ$	4.0 mm (0.16 in)	-	0.35 μm (0.000014 in)	$\pm 0.8 \mu\text{m}$ (± 0.000032 in)
EM2 10 mm	0.08 N	0.75 N	0.2-0.3 N	3.5 N	-	$\pm 14^\circ$	4.0 mm (0.16 in)	-	0.35 μm (0.000014 in)	$\pm 0.8 \mu\text{m}$ (± 0.000032 in)

The above data applies for test conditions as follows:

- Stylus length as stated above
- Stylus velocity 480 mm/min (1.57 ft/min)



TP20 probe kits

TP20 probe kit 1

Includes two standard force modules.

Part number: A-1371-0290 **Price:** \$4,059

TP20 probe kit 2

Includes one standard force and one medium force module.

Part number: A-1371-0291 **Price:** \$4,059

TP20 probe kit 3

Includes one standard force and one extended force module.

Part number: A-1371-0292 **Price:** \$4,059

TP20 probe kit 4

Includes two medium force modules.

Part number: A-1371-0293 **Price:** \$4,059

TP20 probe kit 5

Includes one medium force and one extended force module.

Part number: A-1371-0294 **Price:** \$4,059

TP20 probe kit 6

Includes two extended force modules.

Part number: A-1371-0295 **Price:** \$4,059

TP20 probe kit 7

Includes one standard force and one 6-way module.

Part number: A-1371-0418 **Price:** \$4,397

TP20 non-inhibit (NI) probe kits

TP20 non-inhibit probe kit 1

Includes two standard force modules.

Part number: A-1371-0640 **Price:** \$4,059

TP20 non-inhibit probe kit 2

Includes one standard force and one medium force module.

Part number: A-1371-0641 **Price:** \$4,059

TP20 non-inhibit probe kit 3

Includes one standard force and one extended force module.

Part number: A-1371-0642 **Price:** \$4,059

TP20 non-inhibit probe kit 4

Includes two medium force modules.

Part number: A-1371-0643 **Price:** \$4,059

TP20 non-inhibit probe kit 5

Includes one medium force and one extended force module.

Part number: A-1371-0644 **Price:** \$4,059

TP20 non-inhibit probe kit 6

Includes two extended force modules.

Part number: A-1371-0645 **Price:** \$4,059

Coordinate measuring machine probes

TP20 accessories

TP20 probe modules

Standard force probe module

Part number: A-1371-0270 **Price:** \$1,015

Medium force probe module

Part number: A-1371-0271 **Price:** \$1,015

Extended force probe module

Part number: A-1371-0272 **Price:** \$1,015

Low force module

This module has a lower trigger force for use on components where a low probing force is needed.

Part number: A-1371-0392 **Price:** \$1,015

6-way probe module

Part number: A-1371-0419 **Price:** \$1,353

EM1 module only kit

This module is based on the standard force module with an integral 50 mm carbon fiber extension piece.

Part number: A-1371-0430 **Price:** \$1,229

EM2 module only kit

This module is based on the standard force module with an integral 75 mm carbon fiber extension piece.

Part number: A-1371-0431 **Price:** \$1,269

EM1/EM2 kit

Includes: TP20 EM1 standard module assembly
TP20 EM2 standard module assembly
Test certificate
EM1/EM2 user's information

Part number: A-1371-0432 **Price:** \$2,255

Cleaning kit

Part number: A-1085-0016 **Price:** \$19

MCR20

The MCR20 module changing rack provides rapid automatic changing of probe modules without the need to requalify. Rack function is completely passive and does not require any electrical connections.

Installation and set-up of the system is achieved with minimal operator skill as no special software or communications are required. The rack base and docking port assembly incorporate hinged overtravel mechanisms to assist crash protection. The kits include two probe modules, a mounting kit, a location plate, and a PS2R stylus.

Mounting fixture:	Single stud
Number of ports:	6
Repeatability of module change:	Automatic $\leq 1 \mu\text{m}$ Manual $\leq 2 \mu\text{m}$



MCR20 probe module change rack kits

MCR20 module change rack kit 1

Includes two standard force modules.

Part number: A-1371-0261 **Price:** \$5,513

MCR20 probe module change rack kit 2

Includes one standard force and one medium force module.

Part number: A-1371-0262 **Price:** \$5,513

MCR20 probe module change rack kit 3

Includes one standard force and one extended force module.

Part number: A-1371-0263 **Price:** \$5,513

MCR20 probe module change rack kit 4

Includes two medium force modules.

Part number: A-1371-0264 **Price:** \$5,513

MCR20 probe module change rack kit 5

Includes one medium force and one extended force module.

Part number: A-1371-0265 **Price:** \$5,513

MCR20 probe module change rack kit 6

Includes two extended force modules.

Part number: A-1371-0266 **Price:** \$5,513

MCR20 location plate

Part number: M-1085-0301 **Price:** \$10

Coordinate measuring machine probes

TP2 5-way

TP2 5-way is the industry-standard probe for most CMM applications. Its compact dimensions are ideal for probing into restricted component features.

Sense directions:	5-way ($\pm X$, $\pm Y$, $+Z$)
2σ unidirectional repeatability:	0.35 μm
Pre-travel variation:	$\pm 0.80 \mu\text{m}$
Stylus force range:	7 g to 15 g
Stylus overtravel:	XY plane $\pm 14^\circ$ +Z axis 4.5 mm @ 7 g 3.0 mm @ 15 g
Mounting options:	M8 thread
Stylus thread size:	M2
Suitable interface:	PI4-2, PI7-3 or PI200-3
Test conditions:	10 mm stylus @ 8 mm/s with trigger force of 7 g to 8 g

Part number: A-1042-1890

Price: \$3,814



TP6/TP6A

The TP6 combines the robust characteristics of the TP1(S) with the repeatability of the TP2. It can be used on manual or DCC CMMs along with Renishaw's vast range of heads and extensions. The TP6A incorporates an autojoint for use with the Renishaw autochange system, or for manual probe changing. The TP6A allows for fast probe exchange without redatuming.

Sense directions:	$\pm X$, $\pm Y$, $+Z$
2σ unidirectional repeatability:	0.35 μm
Pre-travel variation:	$\pm 1.0 \mu\text{m}$
Stylus force range:	10 g to 30 g
Stylus overtravel:	XY plane $\pm 22^\circ$ +Z axis 6.5 mm @ 12 g 3.0 mm @ 30 g
Mounting options:	TP6 M8 thread TP6A Autojoint
Stylus thread size:	M3
Test stylus length:	21 mm
Suitable interface:	PI4-2, PI7-3, PI200-3
Test conditions:	21 mm stylus @ 8 mm/s with trigger force of 11 g to 13 g

Part number: A-1039-0001 (TP6)

Price: \$3,689

Part number: A-1039-0028 (TP6A)

Price: \$3,814



TP7M

The TP7M is designed to maintain a high level of accurate and reliable performance across a wide range of conditions. The TP7M must be used with either the PH10M probe head or a PH6M fixed head.

Sense directions:	±X, ±Y, ±Z	
2σ unidirectional repeatability:	High sensitivity	0.25 μm
	Mid sensitivity	0.25 μm
Pre-travel variation:	High sensitivity	±0.25 μm
	Mid sensitivity	±0.50 μm
Trigger force:	XY plane	2 g
	Z axis	15 g
Overtravel force:	XY plane	50 g
	Z axis	300 g
Stylus overtravel:	XY plane	16°
	+Z axis	5 mm
	-Z axis	5 mm
Max. extension on PH10M:	200 mm	
Mounting options:	Autojoint	
Stylus thread size:	M4	
Test stylus length:	50 mm	
Suitable interface:	PI7-3 only	
Test conditions:	50 mm stylus @ 8 mm/s	



TP7M probe kit

Part number: A-1073-0121

Price: \$5,625

TP7M EP

The TP7M EP (enhanced performance) is capable of achieving a 3D accuracy of < 0.6 μm tested to ISO 10360 Part 2.

TP7M EP probe kit

Part number: A-1073-0261

Price: \$6,973

TP200/TP200B modular probes

The TP200 and TP200B are electronic probes using strain gage technology which gives higher accuracy than kinematic touch-trigger probes. They combine outstanding metrology performance with superior functionality to produce a highly versatile DCC CMM probing system with excellent productivity.

The TP200 system components are:

- TP200 probe body – the standard model
- TP200B probe body – a variant model with increased vibration tolerance
- TP200 stylus module – choice of fixed overtravel forces: 'SF' (standard force) or 'LF' (low force)
- PI 200 probe interface
- SCR200 stylus changing rack



TP200 probe body

The TP200 probe incorporates micro strain gage transducers delivering excellent repeatability and accurate 3D form measurement even with long styli. The sensor technology gives sub-micron triggering performance and eliminates the lobing characteristics encountered with standard probes. The solid state ASIC electronics within the probe ensure reliable operation over millions of trigger points.

TP200B probe body

The TP200B probe uses the same technology as TP200 but has been designed to have a higher tolerance to vibration. This helps to overcome the problem of 'air' trigger generation which can arise from vibrations transmitted through the CMM or when using longer styli with faster positioning speeds. Please note that we do not recommend the use of TP200B with the LF module or cranked/star styli.

Measuring performance			TP200	TP200B
Principal application			DCC CMM where high accuracy measurement is required	As TP200 but where 'air' * trigger events occur
Sense directions			6-way ($\pm X, \pm Y, \pm Z$)	6 way ($\pm X, \pm Y, \pm Z$)
Unidirectional repeatability (2σ μm)	Trigger level 1		0.4 μm (0.000016 in)	0.4 μm (0.000016 in)
	Trigger level 2		0.5 μm (0.000020 in)	0.5 μm (0.000020 in)
XY (2D) form measurement deviation	Trigger level 1		± 0.8 μm (0.000032 in)	± 1.0 μm (0.000040 in)
	Trigger level 2		± 0.9 μm (0.000036 in)	± 1.2 μm (0.000047 in)
XYZ (3D) form measurement deviation	Trigger level 1		± 1.0 μm (0.000040 in)	± 2.5 μm (0.000100 in)
	Trigger level 2		± 1.4 μm (0.000056 in)	± 4.0 μm (0.000160 in)
Repeatability of stylus change	With SCR200		± 0.5 μm (0.000020 in) max	± 0.5 μm (0.000020 in) max
	Manual		± 1.0 μm (0.000040 in) max	± 1.0 μm (0.000040 in) max
Trigger force	XY plane	All modules	0.02 N	0.02 N
	Z axis	All modules	0.07 N	0.07 N
Overtravel force (@ 0.5 mm displacement)	XY plane	SF/EO module	0.2 N – 0.4 N	0.2 N – 0.4 N
		LF module	0.1 N – 0.15 N	0.1 N – 0.15 N
	Z axis	SF/EO module	4.9 N	4.9 N
		LF module	1.6 N	1.6 N
Weight (probe sensor + module)			22 g (0.8 oz)	22 g (0.8 oz)
Max. extension (if on PH10 series head)			300 g (11.8 oz)	300 g (11.8 oz)
Max. recommended stylus length (M2 stylus range)	SF/EO module	LF module	50 mm (1.97 in) steel – 100 mm (3.94 in) GF	50 mm (1.97 in) steel – 100 mm (3.94 in) GF
			20 mm (0.79 in) steel – 50 mm (1.97 in) GF	20 mm (0.79 in) steel – 50 mm (1.97 in) GF
Probe mounting method			M8 thread	M8 thread
Suitable interface			PI200	PI200
Stylus module changing rack (automatic)			SCR200	SCR200
Stylus module storage rack (manual)			MSR1	MSR1

The above data applies for test conditions as follows:

Stylus length 50 mm (1.97 in)
Stylus velocity 480 mm/min (1.57 ft/min)

* Air trigger (or false trigger). The TP200B reduces triggers that may be caused by vibrations.

TP200/TP200B probe kits

TP200 probe with standard force module

Part number: A-1207-0001 **Price:** \$4,731

TP200 probe with low force module

Part number: A-1207-0002 **Price:** \$4,731

TP200B probe with standard force module

Part number: A-1207-0055 **Price:** \$4,731

TP200 accessories

Standard force stylus module

Part number: A-1207-0010 **Price:** \$710

Low force stylus module

Part number: A-1207-0011 **Price:** \$710

TP200 probe cleaning kit

Part number: A-1085-0016 **Price:** \$19

GF stylus kit *

Part number: A-5003-2310 **Price:** \$710

*See Stylus section for kit contents.

Coordinate measuring machine probes

SCR200

The SCR200 stylus changing rack provides rapid, automatic changing of styli without the need to requalify probe tips. Installation and set-up of the system are achieved with minimal operator skill, as no special CMM cabling, software or communications are required. The SCR200 is powered and serviced entirely by the PI200-3 interface and is fully crashed protected.

Mounting:	Horizontal or vertical
Mounting fixture:	Single stud
Number of ports:	6
Module location and retention:	Magnetic
Repeatability of stylus change (2σ) at 50 mm:	Automatic: 1 μ m Manual: 2 μ m
Change cycle:	< 2 seconds



SCR200 kit

Includes: 3 stylus changing modules
Mounting kit
PS2R stylus
Location plate

Part number: A-1207-0030 (standard force modules) **Price:** \$9,105
Part number: A-1207-0070 (low force modules) **Price:** \$9,105

SCR200 stylus changing rack only

Part number: A-1085-0370 **Price:** \$7,181

SCR200 datum stylus (PS35R)

Part number: A-5000-7812 **Price:** \$147

SCR200 cables

Part number: A-1016-7630 (PL63S – 5 m) **Price:** \$109
Part number: A-1016-7631 (PL64S – 10 m) **Price:** \$125
Part number: A-1016-7632 (PL65S – 20 m) **Price:** \$163

SCR200 mounting kit

Part number: A-1085-0005 **Price:** \$20

SCR200 location plate

Part number: M-1085-0301 **Price:** \$10

Special probing systems

SP25

The SP25M is actually two sensors in one! – enabling the user to SCAN for form measurement or reverse engineering and TOUCH-TRIGGER PROBE (TTP) for geometry.

Highly accurate scanning performance with (M3) stylus lengths from 20 mm to 200 mm together with the ability to carry Renishaw's TP20 range of touch-trigger probe modules mean that the SP25M system provides unmatched flexibility to optimize a measurement solution to suit the application.

The probe is just 25 mm in diameter, compatible with Renishaw's PH10M/MQ, PH6M and PHS1 probe heads, and can also be mounted using a multiwired extension bar. Together these combinations permit excellent reach and access to part features.

Physical measurement range: ±0.5 mm deflection in all directions in all orientations

Physical overtravel range: X,Y ±2.0 mm
 +Z 1.7 mm
 -Z 1.2 mm

Resolution: Capable of < 0.1 µm

Spring rate: 0.6 N/mm to 0.2 N/mm – dependent on stylus length

Dimensions: Ø25 mm × length dependent on module used

Mass: SP25M body	65 g
SM25-1 scan module	35 g (includes SH25-1, but excludes stylus)
SM25-2 scan module	40 g (includes SH25-2, but excludes stylus)
SM25-3 scan module	49 g (includes SH25-3, but excludes stylus)
TM25-20 TTP module	40 g (includes TP20 standard module, but excludes stylus)

Mounting: Multiwired autojoint connection

- compatible with PH10M PLUS, PH10MQ PLUS, and PH6M
- may be mounted to autojoint extension bars

Signal outputs: Non-linear and non-orthogonal analog outputs – rate, gain and resolution are not fixed

Interface: AC3 card



SP25M special SCAN/TTP full combination kit

The full scanning system plus the capability to use TP20 modules – this kit includes all the equipment in these separate kits and is supplied as one complete kit:

- 1 × A-2237-1001 SP25M scanning probe kit #1 (includes SM25-1 kit)
- 1 × A-2237-1102 SM25-2 scanning module kit
- 1 × A-2237-1103 SM25-3 scanning module kit
- 1 × A-2237-1200 TM25-20 TTP module adaptor ONLY (to directly carry any TP20 module)

Part number: A-2237-1015

Price: \$18,786

Coordinate measuring machine probes

SP25M scanning probe kit #1 (entry level kit)

Includes: 1 × SP25M probe body
1 × SM25-1 scanning module kit (see below)

Part number: A-2237-1001 **Price:** \$10,854

SP25M scanning probe kit #2 (entry level kit)

Includes: 1 × SP25M probe body
1 × SM25-2 scanning module kit (see below)

Part number: A-2237-1002 **Price:** \$10,854

SP25M scanning probe kit #3 (entry level kit)

Includes: 1 × SP25M probe body
1 × SM25-3 scanning module kit (see below)

Part number: A-2237-1003 **Price:** \$10,854

SP25M scanning probe kit #4 (entry level kit)

Includes: 1 × SP25M probe body
1 × SM25-4 scanning module kit (see below)

Part number: A-2237-1004 **Price:** \$12,768

SM25-1 scanning module kit

Includes: 1 × SM25-1
2 × SH25-1

Part number: A-2237-1101 **Price:** \$4,991

SM25-2 scanning module kit

Includes: 1 × SM25-2
2 × SH25-2

Part number: A-2237-1102 **Price:** \$4,991

SM25-3 scanning module kit

Includes: 1 × SM25-3
2 × SH25-3

Part number: A-2237-1103 **Price:** \$4,991



SM25-4 full module kit

Includes: 1 × SM25-4
 2 × SH25-4
 full stylus kit containing:
 1 × M3 stylus D5R L21 EWL21 d2.5SS
 1 × M3 stylus D5R L50 EWL50 d2.5CE
 1 × M3 stylus D10R L200 EWL200 d4C/F
 1 × M3 stylus D10R L150 EWL150 d4C/F
 1 × M3 stylus D10R L100 EWL100 d4C/F
 1 × M3 stylus D10R L75 EWL75 d4C/F
 2 × M2-M3 stylus tools

Part number: A-2237-1104 **Price:** \$8,124

SM25-4 entry level module kit

Includes: 1 × SM25-4
 1 × SH25-4
 basic stylus kit containing:
 1 × M3 stylus D5R L21 EWL21 d2.5SS
 1 × M3 stylus D10R L100 EWL100 d4C/F
 2 × M2-M3 stylus tools

Part number: A-2237-1108 **Price:** \$6,373

SM25-4 basic module kit

Includes: 1 × SM25-4
 2 × SH25-4
 basic stylus kit containing:
 1 × M3 stylus D5R L21 EWL21 d2.5SS
 1 × M3 stylus D10R L100 EWL100 d4C/F
 2 × M2-M3 stylus tools

Part number: A-2237-1109 **Price:** \$6,895

SM25-5 scanning module kit

Includes: 1 × SM25-5
 2 × SH25-5

Part number: A-2237-1105 **Price:** \$6,302

TM25-20 TTP module adaptor only

Part number: A-2237-1200 **Price:** \$3,553

TM25-20 TTP module adaptor kit #1

Includes: 1 × TM25-20
 2 × TP20 standard modules

Part number: A-2237-1201 **Price:** \$4,991

SM25-1 scanning module only

Part number: A-2237-1111 **Price:** \$4,643

SM25-2 scanning module only

Part number: A-2237-1112 **Price:** \$4,643

SM25-3 scanning module only

Part number: A-2237-1113 **Price:** \$4,643

SM25-4 scanning module only

Part number: A-2237-1114 **Price:** \$5,431

SM25-5 scanning module only

Part number: A-2237-1115 **Price:** \$6,002

SH25-1 stylus holder only

Part number: A-2237-1301 **Price:** \$208

SH25-2 stylus holder only

Part number: A-2237-1302 **Price:** \$314

SH25-3 stylus holder only

Part number: A-2237-1303 **Price:** \$383

SH25-4 stylus holder only

Part number: A-2237-1304 **Price:** \$507

SH25-5 stylus holder only

Part number: A-2237-1305 **Price:** \$270

AC3 interface card

Part number: A-2237-1601 **Price:** \$3,483

Coordinate measuring machine probes

FCR25

The full potential of the SP25M system may be realized when the flexible change rack option is incorporated. Based on the versatile FCR25 triple-port rack unit, which allows any of the SP25M system elements to be rapidly exchanged in any of the ports, this is undoubtedly the most adaptable rack system yet from Renishaw. The FCR25 mounts directly to Renishaw's MRS modular rack system. Alternatively, compact 3-port and 6-port 'standalone' racks are available which incorporate FCR25.



FCR25 flexible change rack unit

Triple-port unit for MRS system.

Includes: 1 × FCR25
3 × PA25-SH
3 × PA25-20

Note: Requires an MRS kit for CMM mounting.

Part number: A-2237-1401 **Price:** \$2,670



FCR25 TC

Thermally controlled FCR25 for use with SM25 modules only.

Part number: A-2237-1408 **Price:** \$3,030

FCR25-L3 3-port standalone change rack unit

Includes: 1 × FCR25 with integral leg for table mounting
3 × PA25-SH
3 × PA25-20

Part number: A-2237-1403 **Price:** \$3,947



FCR25-L6 6-port standalone change rack unit

Includes: 2 × FCR25 with integral leg for table mounting
3 × PA25-SH
3 × PA25-20

Part number: A-2237-1406 **Price:** \$6,616



FCR25 port adaptor insert kit

Includes: 3 × PA25-SH
3 × PA25-20

Part number: A-2237-1415 **Price:** \$383

SP80

The SP80 is a quill-mounted scanning probe that uses digital scale and readhead technology, plus Renishaw's innovative isolated optical metrology principles, to provide exceptional scanning performance, even with long styli.

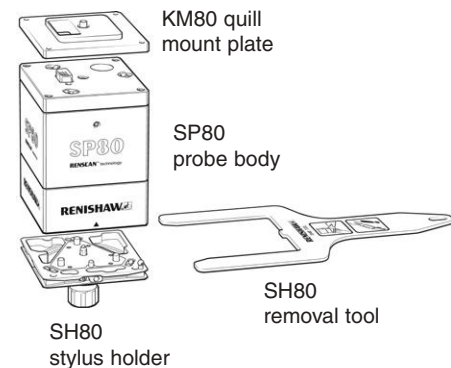
It is able to reach deep into parts by carrying styli up to 500 mm long and 500 g mass, including star configurations which do not require counterbalancing. Renishaw's M5 styli products are designed to complement SP80 and ensure maximum performance.

Detachable stylus holders (SH80) permit rapid and repeatable interchange between stylus configurations, thus eliminating recalibration, maximizing productivity and permitting optimum solutions to match the application.

A simple and robust passive design, with no internal motors to generate heat or reliability issues, avoids unnecessary system complexity.

The SP80 probe body houses the sensor mechanism comprising a 'box' spring motion system and the isolated metrology system featuring high accuracy digital scale and readheads.

Longer stylus lengths may be carried subject to operating conditions (consult Renishaw for application assistance).



SP80 probe kit 1

Includes: SP80 probe body
SH80 stylus holder
KM80 quill mount plate
PL157 probe cable
60 mm long stylus
Tools

Part number: A-2238-0700 **Price:** \$17,644

SP80 probe kit 2

Includes: SP80 probe kit 1
SCP80 stylus change port (3 off)
MRS kit 2 (600 mm rail length – see page 1-57)

Part number: A-2238-0732 **Price:** \$21,738

SP80 probe kit 3

Includes: SP80 probe kit 1
SCP80 stylus change port (4 off)
MRS kit 2 (600 mm rail length – see page 1-57)

Part number: A-2238-0733 **Price:** \$22,103

SP80 probe kit 4

Includes: SP80 probe kit 1
SCP80 stylus change port (5 off)
MRS kit 3 (1000 mm rail length – see page 1-57)

Part number: A-2238-0734 **Price:** \$22,537

SP80 probe kit 5

Includes: SP80 probe kit 2
SH80 stylus holder (3 off)

Part number: A-2238-0735 **Price:** \$23,098

SP80 probe kit 6

Includes: SP80 probe kit 3
SH80 stylus holder (4 off)

Part number: A-2238-0736 **Price:** \$24,015

SP80 probe kit 7

Includes: SP80 probe kit 4
SH80 stylus holder (5 off)

Part number: A-2238-0737 **Price:** \$24,951

Coordinate measuring machine probes

SP80H

The SP80H is a horizontal quill-mounted version of the SP80 probe that uses the same digital scale and readhead technology as the SP80 probe.

The SP80H is intended for use on horizontal arm machines and uses the standard SH80 stylus holder and KM80 quill mount. It uses the SCP80V for automated stylus changing.

It is able to carry Renishaw's range of M5 threaded styli up to 500 mm long. Stylus configurations up to 300 g unbalanced are possible.



SP80H probe kit 1

- Includes:
- SP80H probe body
 - SH80 stylus holder
 - SH80K stylus holder
 - KM80 quill mount plate
 - SH80 removal tool
 - PL157 probe cable
 - 60 mm long stylus
 - Tools

Part number: A-2238-0419 **Price:** \$17,644

Other probe kits similarly configured to the SP80 probe kits are available upon request. Please contact Renishaw for details.

SCP80 stylus change port

Individual ports for rapid interchange between SH80s. The SCP80 mounts to Renishaw's modular rack system (MRS) – see page 1-55.

Part number: A-2238-0706 **Price:** \$1,127

SCP80V rack port

The SCP80V is a rack port designed for use with SP80H to allow automatic changing of the SCP80 stylus holders on horizontal arm machines. It may also be used for changing stylus holders that have long styli protruding from the rear of a horizontally mounted port.

Part number: A-2238-0726 **Price:** \$1,212

SH80 stylus holder

Rapidly interchangeable onto the probe body via a magnetic kinematic joint, the SH80 features a 5-way stylus cube which can be rotated to align styli as desired.

Part number: A-2238-0705 **Price:** \$567

SH80K stylus holder

The SH80K is a stylus holder that allows you to power off the SP80 and SP80H probes and turn them back on without needing to re-home the probe.

Part number: A-2238-0430 **Price:** \$609

SH80 removal tool

The SH80 removal tool is used to manually remove the SH80 or SH80K stylus holder from the SP80 or SP80H.

Part number: M-2238-0443 **Price:** \$61

KM80 quill mount plate

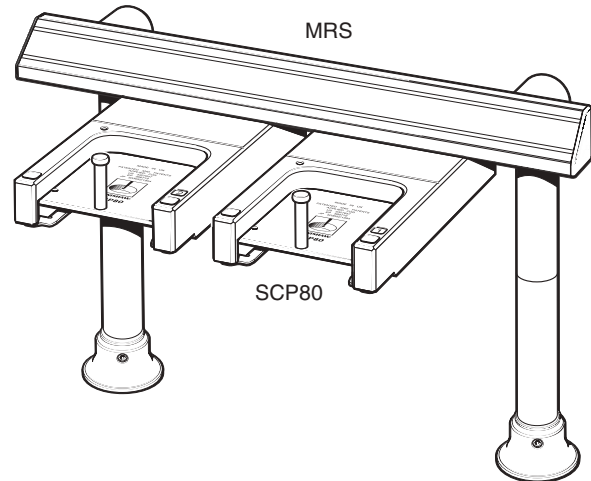
The standard mounting plate between the CMM quill (80 mm square) and the SP80 probe body. Provides easy and repeatable removal/replacement of the probe. Alternative CMM quill mountings are available (see KM6080 and SM80 below).

Part number: A-2238-0703 **Price:** \$189

KM6080 quill mount plate

As KM80 but used to mount SP80 onto a 60 mm square CMM quill.

Part number: A-2238-0020 **Price:** \$189



SM80 shank mount plate

As KM80 but with a shank mount to the CMM (non-preferred method).

Part number: A-2238-0704 **Price:** \$944

IU80 interpolator unit

Required for all OEM controller installations (as opposed to Renishaw's UCC controller installations which require use of the UCC/SP80 daughter card).

Part number: A-2238-0720 **Price:** \$907

CC6 counter card

Required where this function is not performed by the CMM controller/PC.

Part number: A-4068-0400 **Price:** \$1,634

Cables

PL156

IU80 to OEM controller (supplied unterminated).

Part number: A-1016-7129 **Price:** \$104

PL157

SP80 probe cable (included with all SP80 kits).

Part number: A-1016-7132 **Price:** \$125

PL158

IU80 to CC6.

Part number: A-1016-7133 **Price:** \$264

Coordinate measuring machine probes

SP600M

The SP600M is an autojointed, multiwired analog scanning probe which enables a CMM to gather large amounts of data very rapidly for inspection or digitizing purposes. Low spring forces allow scanning of finely detailed parts. The probe can be used with a PH10M or PH6M probe head and is compatible with the Renishaw autochange system.

Measurement range:	±1 mm (0.04 in) X, Y, and Z
Return to zero:	< 5 µm (0.0002 in) from 0.5 mm deflection
Resolution:	0.1 µm (0.000004 in) with optional AC2 interface 0.5 µm (0.00002 in) with optional AC1 interface
Spring rate:	120 gf/mm nominal
Outputs (X,Y,Z):	Analog proportional voltage output scaling: 4 V to 8.5 V/mm
Interface:	AC1 or AC2 analog converter PC card (optional)
Mounting:	Multi-wired autojoint
Dimension:	Length 107.5 mm, diameter 50 mm
Weight:	216 g

Part number: A-2098-0105 **Price:** \$11,543

AC1 analog converter PC card

Part number: A-2098-1000 **Price:** \$2,425

AC2 analog converter PC card

Part number: A-2172-0001 **Price:** \$2,820

Stylus module – SH600 standard

Part number: A-2098-0284 **Price:** \$480

Stylus module – SH600 extended

Part number: A-2098-1036 **Price:** \$653

SP600Q

The SP600Q is a quill-mounted version of the SP600M probe. It can therefore be connected directly to the quill of a CMM and an external cable carries the probe signal to the interface card. The specification for the SP600Q is identical to the SP600M, with the following exceptions:

Mounting:	Direct in quill
Dimensions:	Length 99 mm, diameter 60 mm
Weight:	299 g

SP600Q kit

Part number: A-2098-0890 **Price:** \$11,543

SCR600 stylus changing rack

The SCR600 is a passive stylus change rack for use with the SP600M and requires no electrical connections. It houses up to four stylus modules per rack. The rack kit includes two stylus changing modules and additional modules can be purchased separately.

Part number: A-2098-0255 **Price:** \$5,356



Gram gage

The gram gage allows you to adjust, reset and check probe trigger force settings on all standard Renishaw CMM touch-trigger probes. Setting the optimum trigger force using the gram gage maximizes probe performance. It can be used to set trigger force settings over a range of 3 to 30 grams.

Overall length: 95 mm
 Needle length: 41 mm
 Depth: 27 mm
 Width: 43 mm
 Range: 4 to 35 gram range with 1 gram graduations

Probe	Stylus length (mm)	Optimum trigger force (grams) *
TP1	31	15
TP2-5W	10	7 to 8
TP2-6W	10	7 to 8
TP6	21	11 to 13
TP6A	21	11 to 13

* This is the optimum trigger force recommended by Renishaw. Higher trigger forces may be required for longer styli.

Part number: P-GA01-0001

Price: \$374



Coordinate measuring machine probes

CMM probe shanks

Shanks are used to mount the probe head to the quill of the CMM. The shanks listed below are suitable for all Renishaw manual and motorized heads, as well as the TP1 and MIP probes.

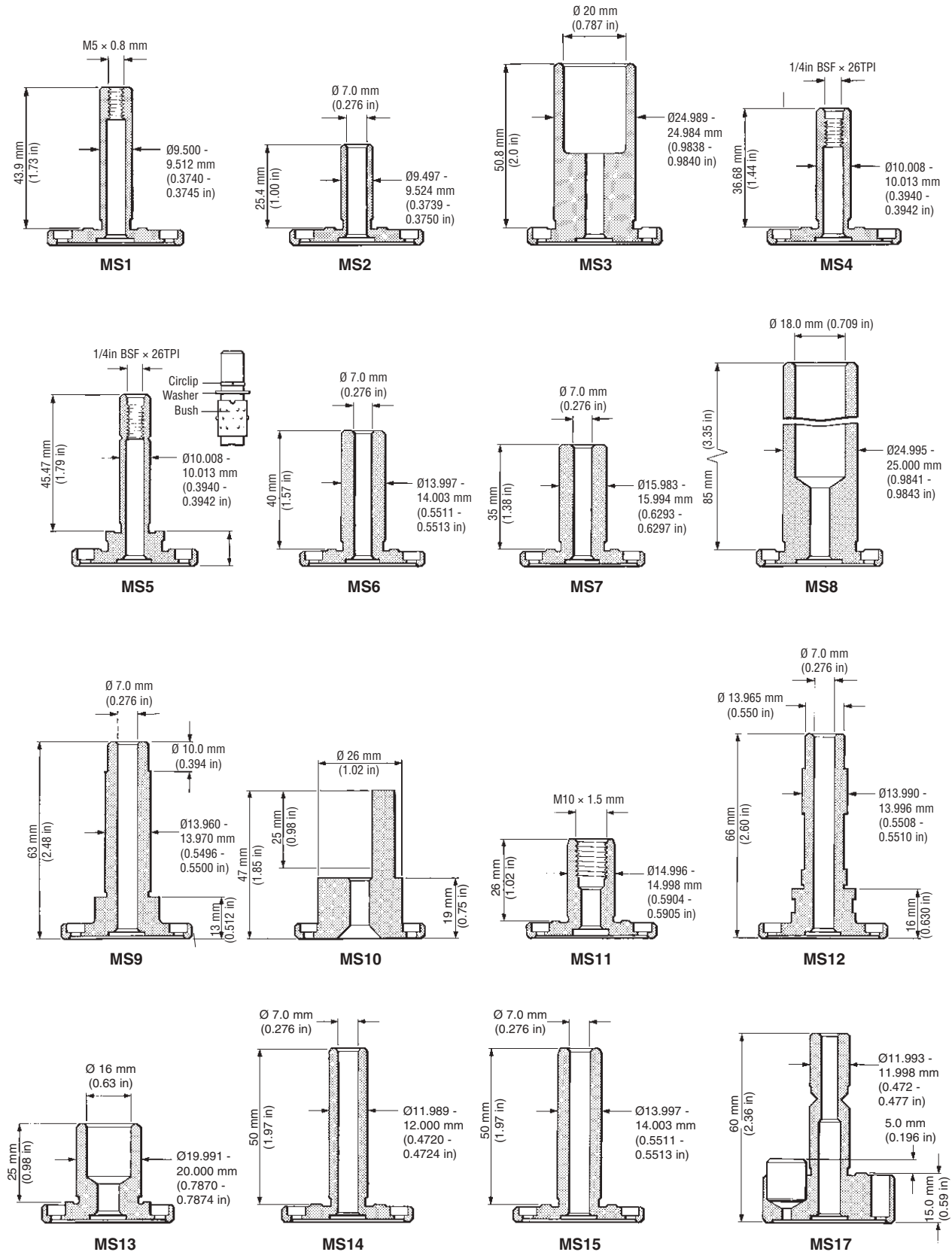
Note: The PH6 requires a different shank and has a separate listing (see page 1-46).

The correct shank must be chosen to suit the mounting facility of your coordinate measuring machine.

Shanks are included in the price of Renishaw heads and TP1 and MIP probes, but must be specified when placing an order. See the drawings on the following pages for the exact dimensions of each shank.

Shank	Used on the following machines	Part number	Price
MS1	Brown & Sharpe, Bridgeport, Elm Systems, Fanamation, Giddings & Lewis, I.T.P., Poli, Portage Machine, Tesa, Zett-Mess	M-1041-2146	\$158
MS1(S)	New Carl Zeiss	A-1041-7114	\$158
MS2	Boice, Carl Zeiss, Federal Products, Helmhel, Kemco, Metrologic, MFO, Mora, Numerex, Real Meca, Starrett, Tokyo-Boeki, Tri-mesures, TSK, and Wenzel	M-1041-1650	\$158
MS3	LK Tool (meter 4), Ferranti, Tarus, W & A, Eley & Warren	M-1041-1656	\$158
MS5	Ferranti	M-1041-1652	\$158
MS6	C.E. Johannson (old specification)	M-1041-1653	\$158
MS7	Renault (Seiv), Tri-Measures	M-1041-1654	\$158
MS7(S)	Starrett (new specification)	M-1041-7132	\$202
MS8	Olivetti	M-1041-1657	\$158
MS9	MTI Corporation (UK)	M-1041-4843	\$158
MS10	MTI Corporation	M-1041-7507	\$158
MS11	Crown Windley	M-1041-1088	\$158
MS12	MTI Corporation (new specification)	M-1041-7068	\$158
MS13	DEA Corp	M-1041-5348	\$158
MS14	CTA, Real Meca	M-1041-5981	\$158
MS15	C.E. Johannson (new specification)	M-1041-2153	\$158
MS17	Stiefelmayer	A-1041-7113	\$225

Standard base diameter 41.35 mm – 41.45 mm (1.630 in – 1.632 in)



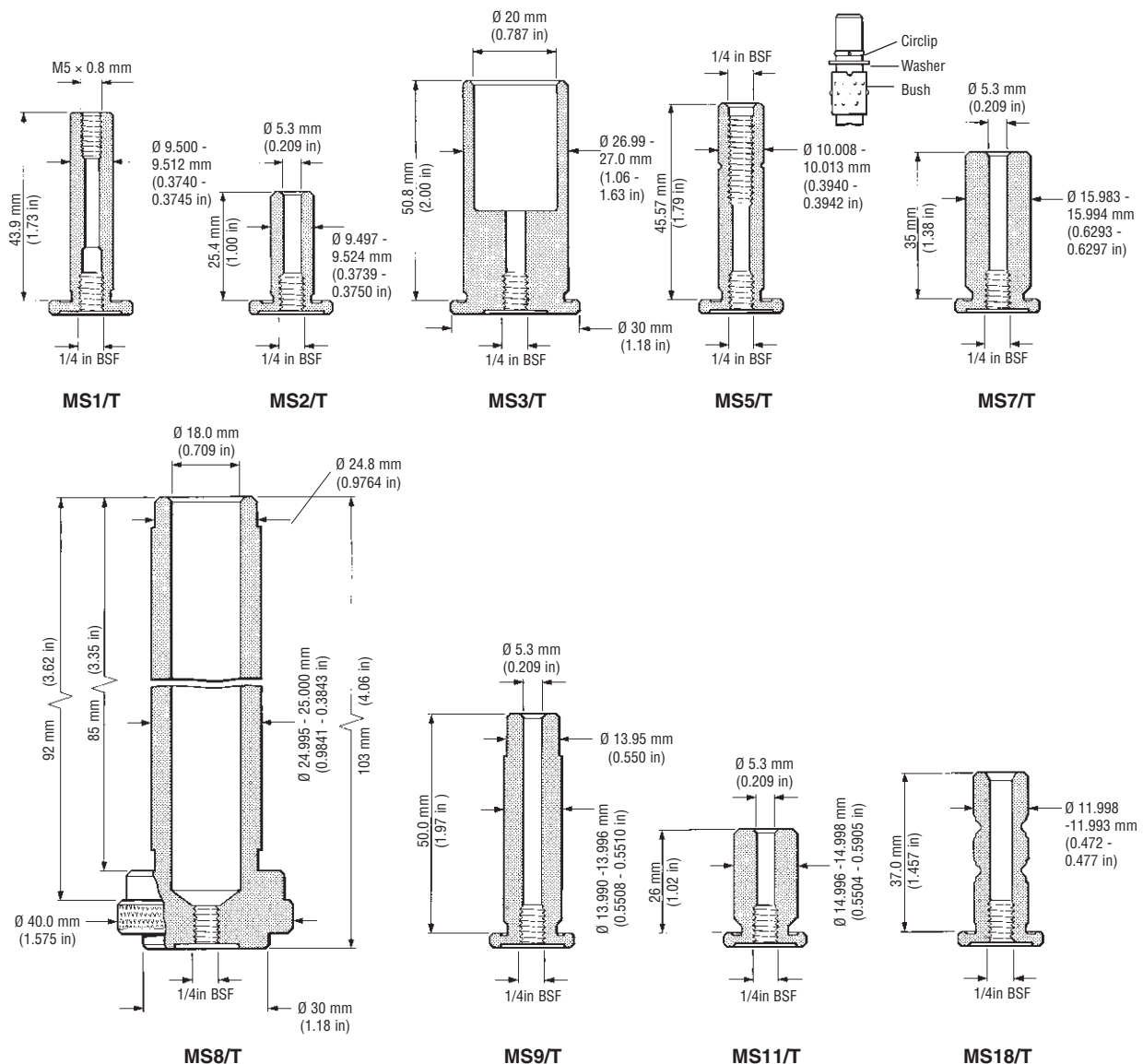
Coordinate measuring machine probes

PH6 shanks

Shank Used on the following machines

Shank	Used on the following machines	Part number	Price
MS1/T	Brown & Sharpe, Bridgeport, Elm Systems, Fanamation, Giddings & Lewis, Poli, Portage Machine	M-1046-1121	\$225
MS2/T	Federal Products, Helmel, Kemco, Mora, Numerex, Starrett, Tokyo-Boeki, Wenzel	M-1046-1120	\$158
MS3/T	Eley, Ferranti, LK Tool (meter 4), Tarus, W & A, Warren	M-1046-1126	\$158
MS4/T	LK Tool (micro)	M-1046-1128	\$158
MS5/T	Ferranti	M-1046-1122	\$158
MS6/T	C.E. Johannson	M-1046-1123	\$158
MS7/T	Renault	M-1046-1124	\$158
MS8/T	Olivetti	M-1046-1802	\$158
MS9/T	MTI Corporation (UK)	M-1046-4545	\$158
MS11/T	Crown & Windley	M-1046-2661	\$158
MS18/T	Mora	M-1046-7107	\$158

Standard base diameter 18.9 mm – 19.1 mm (0.74 in – 0.75 in) unless stated



CMM cables

Manual probe head cables

Cable	Type	Overall length	Machine connector	Part number	Price
PL1(T)	Coiled	315 mm – 730 mm (12.4 in – 28.7 in)	5 pin mold – 5 pin DIN	A-1016-0004	\$102
PL2(T)	Coiled	465 mm – 1290 mm (18.3 in – 50.8 in)	5 pin mold – 5 pin DIN	A-1016-0006	\$102
PL3(T)	Coiled	765 mm – 2415 mm (30.1 in – 95.1 in)	5 pin mold – 5 pin DIN	A-1016-0012	\$102
PL4(T)	Plain	4510 mm (177.6 in)	5 pin mold – 5 pin DIN	A-1016-0001	\$102
PL14	Coiled	595 mm – 1830 mm (23.4 in – 72 in)	5 pin mold – 7 pin AMPHENOL	A-1016-0003	\$113
PL17(T)	Coiled	200 mm – 400 mm (7.9 in – 15.8 in)	5 pin mold – 14 pin LEMO	A-1023-7024	\$255
PL18(T)	Coiled	500 mm – 1300 mm (19.7 in – 51.2 in)	5 pin mold – 14 pin LEMO	A-1023-7025	\$255
PL27(T)	Coiled	203 mm (8 in)	5 pin mold – 5 pin mold	A-1016-6370	\$60
PL27(T)	Plain	152 mm (6 in)	5 pin mold – 5 pin mold	A-1016-6440	\$60

Motorized probe head cables

Cable	Type	Overall length	Machine connector	Part number	Price
PL5(U)	Coiled	0.4 m – 0.8 m (16 in – 31 in)	PH9/10 to machine cable	A-1016-7672	\$284
PL6(U)	Coiled	0.8 m – 1.6 m (31 in – 63 in)	PH9/10 to machine cable	A-1016-7673	\$284
PL12(U)	Plain	0.1 m (4 in)	PH9/10 to machine cable	A-1016-7674	\$249
PL13(U)	Coiled	0.1 m – 0.2 m (4 in – 8 in)	PH9/10 to machine cable	A-1016-7675	\$249
PL33(U)	Plain	3 m (118 in)	PH9/10 to machine cable	A-1023-7056	\$326
PL93(U)	Plain	0.1 m (4 in)	PH10MQ to PLM6/7/8/9S	A-1016-7676	\$284

Machine cables

Cable	Type	Overall length	Machine connector	Part number	Price
PLM6(T)	Plain	6 m (19 ft)	PH10 cable to PHC10-3 controller (chassis)	A-1016-7564	\$163
PLM7(T)	Plain	4 m (13 ft)	PH10 cable to PHC10-3 controller (chassis)	A-1016-7563	\$163
PLM8(U)	Plain	6 m (19 ft)	PH10 cable to PHC10-3 controller (socket)	A-1016-7677	\$163
PLM9(U)	Plain	4 m (13 ft)	PH10 cable to PHC10-3 controller (socket)	A-1016-7678	\$163

Output cables

Cable	Type	Overall length	Machine connector	Part number	Price
PL7	Plain	3 m (118 in)	5 pin DIN to 5 pin DIN	A-1029-0166	\$60
PL15	Plain	4.5 m (177 in)	5 pin DIN, interface to CMM	A-1004-0110	\$71
PL26(T)	Plain	0.6 m (23 in)	PI200-3 to PHC9 (7 pin)	A-1057-0132	\$102
PL37	Plain	0.5 m (19 in)	7 pin DIN to 7 pin DIN	A-1054-0003	\$60

Multiwired cables

Cable	Type	Overall length	Description	Part number	Price
PL38V	Plain	25 m (82 ft)	Multiwired cable	A-1016-7625	\$900
PL42V	Plain	15 m (49 ft)	Multiwired cable	A-1016-7624	\$723
PL44V	Plain	8 m (26 ft)	Multiwired cable	A-1016-7627	\$580
PL45V	Plain	1.8 m (5.9 ft)	Multiwired cable	A-1016-7629	\$391
PL46V	Plain	3.7 m (12 ft)	Multiwired cable	A-1016-7628	\$462
PL56V	Plain	12 m (39.3 ft)	Multiwired cable	A-1016-7626	\$652
PL75V	Plain	1 m (3.2 ft)	IS1-2 extension cable	A-1016-7644	\$179

Coordinate measuring machine probes

Adaptor/extension cables

Cable	Type	Overall length	Description	Part number	Price
PL9	Plain	0.6 m (23 in)	Machine cable to probe interface cable	A-1029-0182	\$60
PL10	Plain	0.1 m (4 in)	Machine cable to probe/head cable (5 pin)	A-1029-0111	\$89
PL22	Plain	0.3 m (12 in)	Probe head cable adaptor (PL1S, 2S, 3S, 4S to PI4-2, PI200-3 input)	A-1057-0131	\$60
PL23(T)		0.5 m (19 in)	PI4-2, PI200-3 adaptor cable (machine cable to PHC9 extension cable PL82V to video interface)	A-1057-0133	\$89
PL97(S)	Plain	0.1 m (4 in)	SCR200 Y adaptor cable	A-1016-7660	\$237

PICS interconnection cables

Cable	Overall length	Description	Part number	Price
PL24	5 m (16 in)	PI200-3 or PI7-3 to CMM	A-1016-0121	\$158
PL25(T)	0.3 m (11 in)	PI200-3 or PI7-3 to PHC10-3/ACC2-2	A-1016-0120	\$158
PL70(V)	0.5 m (19 in)	PI200-3 and PI7-3 interfaces	A-1016-7634	\$379
PL72	2 m (6.5 in)	PI200-3 or PI7-3 to PHC10-3/ACC2-2	A-1016-7637	\$158
PL76(S)	0.7 m (2.25 in)	T cable	A-1016-7643	\$179

Extensions

The extensions and knuckle joint are the primary means of adding flexibility to fixed heads. Extensions provide penetration into deep features, while the knuckle joint allows inspection of angular features. The knuckle joint allows 360° in the B axis and ±100° in the A axis.

Extension bars

Number	Description	Material	Length	Diameter	Part number	Price
PEL1	M8 thread to M8 thread	Aluminum	50 mm (1.97 in)	13 mm	A-1047-3484	\$297
PEL2	M8 thread to M8 thread	Aluminum	100 mm (3.94 in)	18 mm – 13 mm	A-1047-3485	\$362
PEL3	M8 thread to M8 thread	Aluminum	200 mm (7.87 in)	18 mm – 13 mm	A-1047-3486	\$380
PEL4	M8 thread to M8 thread	Aluminum	300 mm (11.81 in)	13 mm	A-1047-3487	\$480
PECF1*	M8 thread to M8 thread	Carbon fiber	50 mm (1.97 in)	13 mm	A-1047-7065	\$598
PECF2*	M8 thread to M8 thread	Carbon fiber	100 mm (3.94 in)	13 mm	A-1047-7064	\$645
PECF3*	M8 thread to M8 thread	Carbon fiber	200 mm (7.87 in)	13 mm	A-1047-7066	\$715

* These products are special order only. Please call Customer Service for details.

Knuckle joint

Number	Description	Part number	Price
PK1	Knuckle joint	A-1014-1720	\$633

Autojoint extension bars

Number	Description	Material	Length	Diameter	Part number	Price
PAA1	Autojoint to M8 thread	Steel	30 mm (1.18 in)	25 mm – 18 mm	A-1051-0417	\$370
PAA2	Autojoint to M8 thread	Aluminum	140 mm (5.51 in)	25 mm – 13 mm	A-1051-0418	\$472
PAA3	Autojoint to M8 thread	Aluminum	300 mm (11.81 in)	25 mm – 13 mm	A-1051-0419	\$574
PAACF2*	Autojoint to M8 thread	Carbon fiber	140 mm (5.51 in)	25 mm – 13 mm	A-1051-0488	\$1,028
PAACF3*	Autojoint to M8 thread	Carbon fiber	300 mm (11.81 in)	25 mm – 13 mm	A-1051-0493	\$1,078
PAACF*	Autojoint to M8 thread	Carbon fiber	400 mm (15.74 in)	25 mm – 14 mm	A-1051-0513	\$1,722
PAACF*	Autojoint to M8 thread	Carbon fiber	450 mm (17.72 in)	25 mm – 14 mm	A-1051-0394	\$1,794
PEM1	Autojoint to autojoint	Steel/aluminum	50 mm (1.97 in)	25 mm	A-1076-0070	\$1,018
PEM2	Autojoint to autojoint	Steel/aluminum	100 mm (3.94 in)	25 mm	A-1076-0071	\$1,255
PEM3	Autojoint to autojoint	Steel/aluminum	200 mm (7.87 in)	25 mm	A-1076-0072	\$1,492
PEM4	Autojoint to autojoint	Steel/aluminum	150 mm (5.91 in)	25 mm (90°)	A-1076-0073	\$1,551
PEMCF1*	Autojoint to autojoint	Carbon fiber	50 mm (1.97 in)	25 mm	A-1051-0490	\$801
PEMCF2*	Autojoint to autojoint	Carbon fiber	100 mm (3.94 in)	25 mm	A-1051-0443	\$1,267
PEMCF3*	Autojoint to autojoint	Carbon fiber	200 mm (7.87 in)	25 mm	A-1051-0491	\$1,506
PEMCF*	Autojoint to autojoint	Carbon fiber	150 mm (5.91 in)	25 mm	A-1051-1132	\$1,440

* These products are special order only. Please call Customer Service for details.

Coordinate measuring machine probes

Interfaces

PI7-3

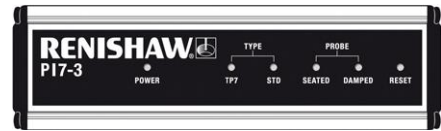
The PI7-3 interface is a dual-purpose probe interface designed to process signals from the TP7M high-accuracy probe and standard touch-trigger probes (TP2, TP20, TP6, and TP6A). Special auto-selecting electronics within the interface allow the automatic use and exchange of all of these probes without any setting changes to the interface.

The PI7-3 performs all the functions of the PI4 and PI9 interfaces, but has additional features such as probe damping, probe inhibit, and emergency stop. This interface can be either free-standing or rack-mounted.

Application:	TP7, TP2, TP6, TP6A, TP20, MH20, and MH20i
Power supply:	85 V – 135 V, 50/60 Hz 170 V – 270 V, 50/60 Hz
Dimensions:	Height 88 mm (3.46 in) Width 146 mm (5.75 in) Depth 208.5 mm (8.21 in)
Input:	9 way 'D' type socket
TP7M input:	15 way double density 'D' type socket or 9 pin 'D' type socket
Compatibility:	Output TTL(PICS)/SSR 5 pin DIN socket (PICS-9 pin 'D' type plug)
Cables	Contact Renishaw

Part number: A-5726-0100

Price: \$1,170



PI200-3

The PI200-3 interface can be interconnected within the majority of Renishaw's manual and motorized probing installations with no additional CMM communications or control signalling required. Optimum performance will be obtained on installations utilizing probe damping or halt signal facilities. Probe signalling between TP200 and PI200-3 must be direct and uninterrupted. Probe signal interfacing may be present within some CMM cabling arrangements. Call Renishaw for further details.

Application: TP1, MIP, TP2, TP20, TP6, TP6A, TP200, MH20, and MH20i
 Power supply: 85 V – 264 V, 47 Hz – 66 Hz
 Dimensions: Height 88 mm (3.46 in)
 Width 146 mm (5.75 in)
 Depth 183 mm (7.19 in)
 Input: 9 way 'D' type socket
 Compatibility: Output PICS/SSR

Part number: A-5707-0100

Price: \$817



IS1-2

The IS1-2 interface selector is a fully-automatic system for use on CMM installations requiring multiple sensor types (i.e. video, laser, analog, etc.). The unit functions by identifying which probe has been fitted to the probe head and switches the probe signal/power lines to the appropriate interface. The unit is configurable by inserting different programming modules.

Applications: TP7M, SP600M, TP2, TP20, TP6, TP200, SP25M, TP800
 Power supply: 85 V – 264 V, 47 Hz – 66 Hz
 Dimensions: Height 88 mm (3.46 in)
 Width 164 mm (5.75 in)
 Depth 208 mm (8.21 in)
 Input: 15 way double density 'D' type socket
 Output: 15 way double density 'D' type plug and
 9 way 'D' type plug (PICS)
 Cables: Contact Renishaw

Part number: A-1327-0100

Price: \$2,960

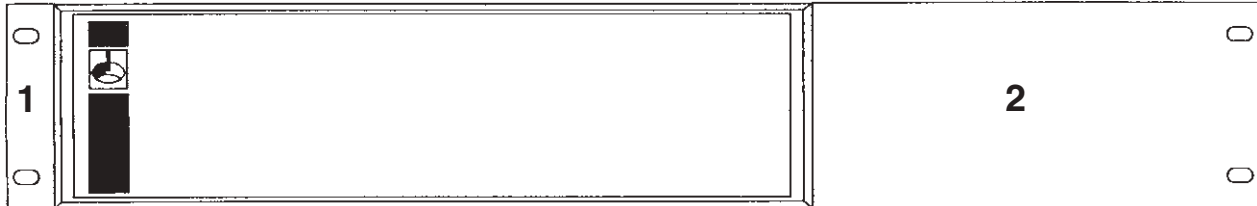


Coordinate measuring machine probes

Mounting brackets

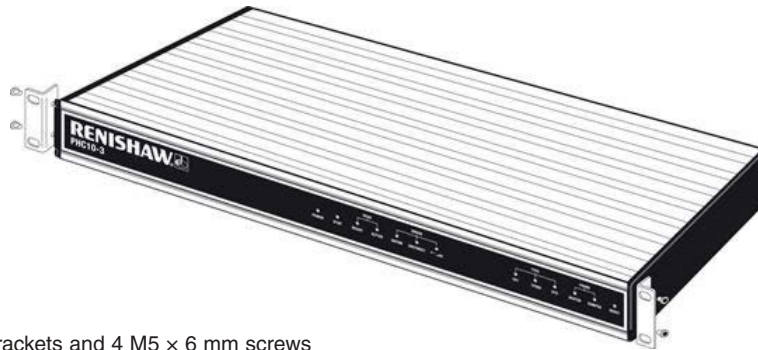
Renishaw controllers and interfaces are supplied in various different types of enclosures. Consult the drawings below to determine your bracket requirements based upon the combination of products you are installing.

PHC9 / PHC50 / PHC10-2 / ACC2-2



- | | | |
|---------------------------|---------------------------------|--------------------|
| 1. Rack mount bracket kit | Part number: A-1018-0124 | Price: \$24 |
| 2. 1/3 blanking panel kit | Part number: A-1018-0123 | Price: \$31 |

PHC10-3 PLUS cabinet mounting



Mounting kit containing 2 brackets and 4 M5 x 6 mm screws

Part number: A-1018-0189 **Price:** \$35

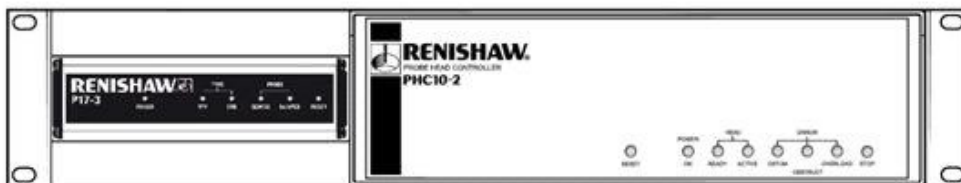
PI7-3 alone / PI200-3



1/3 mounting panel kit containing 1U x 1/3 blanking plate and 2 M6 x 5 mm screws (2 kits required)

Part number: A-1018-0179 **Price:** \$23

PI7-3 next to PHC10-2



Mounting kit containing PI7-3 to PHC10-2 conversion bracket

Part number: A-1018-0173 **Price:** \$48

Autochange system

Renishaw's autochange equipment is the world's first integrated CMM probe exchange system. Mounted within the CMM's working envelope, autochange facilitates fast, automatic probe exchange without the need for redatuming. In addition, it provides covered storage for probes and extension bars.

ACR1 autochange rack with adjustable base

The ACR1 is designed to accept the SP600 and SP25M as well as all other Renishaw autojoint probes and extension bars (must be used in conjunction with the horizontal mounting kit – see below). The rack is supplied with eight long ports for maximum support. Where a probe greater than Ø25 mm is required, the rack can be configured by the user by swapping a long port for a short port (see below).

Number of stations: 8
 Dimensions: 460 mm × 109 mm × 81 mm

This system can be mounted either horizontally or vertically.

Part number: A-1051-1300 **Price:** \$19,931

Note: Adjustable base, legs and cable sold separately (see page 1-54).



Horizontal mounting kit

Includes: 1 × adjustable rack base
 2 × 200 mm legs
 2 × screws

Part number: A-1051-0441 **Price:** \$385

Vertical mounting kit

Includes: 1 × support plate
 8 × support pins (short)
 8 × support pins (long)

Part number: A-1051-1308 **Price:** \$91

ACC2-2 autochange controller

Data transmission: Serial (RS232)
 User-definable parameters: Baud rate 300–19200
 Voltage range: 85 V–135 V, 170 V–275 V, 50/60 Hz automatic selection
 Dimensions: Height 88 mm (3.46 in)
 Width 290 mm (11.42 in)
 Depth 220 mm (8.66 in)

Part number: A-1520-0101 **Price:** \$3,100



Coordinate measuring machine probes

ACR1 autochange system accessories

Adjustable rack base

Part number: A-1051-0440 **Price:** \$330

Leg (100 mm)

Part number: M-1051-0147 **Price:** \$14

Leg (200 mm)

Part number: M-1051-0148 **Price:** \$25

Port replacement kits

All kits contain four ports.

Short port replacement kit

Part number: A-5036-0049 **Price:** \$285

Long port replacement kit

Part number: A-1051-7077 **Price:** \$275

Mixed port replacement kit

Contains two short and two long ports.

Part number: A-1051-7076 **Price:** \$275

ACR1 autochange system cables

PL19 5 m cable

Part number: A-1051-0199 **Price:** \$222

PL20 10 m cable

Part number: A-1051-0045 **Price:** \$369

PL21 15 m cable

Part number: A-1051-0102 **Price:** \$483

PL40 30 m cable

Part number: A-1054-0002 **Price:** \$942

ACR3 autochange rack

The ACR3 forms part of the modular rack system (MRS) and is an autochange rack for probes and extension bars that incorporate the Renishaw autojoint. The ACR3 is a four-port mechanical design that traverses the MRS rail. Driven by the motion of the CMM, it locks and unlocks the autojoint between the probe and the probe head.

ACR3 4-port rack

Part number: A-5036-0005

Price: \$10,044

Note: For 8-port applications, two 4-port racks can be connected together. The 8-port configuration requires the use of either the MRS kit 2 or MRS kit 3 (see below).

MRS kits

Include: MRS rail (see below)
 MRS feet (2)
 125 mm legs (4)
 Step back adaptors (2)

The MRS rail is available in 400 mm, 600 mm and 1000 mm lengths.

MRS kit 1

400 mm long rail.

Part number: A-4192-0001

Price: \$1,262

MRS kit 2

600 mm long rail.

Part number: A-4192-0002

Price: \$1,353

MRS kit 3

1000 mm long rail.

Part number: A-4192-0003

Price: \$1,467

Note: The MRS kits are compatible with FCR25, SCP600 and ACR3.

MRS rails

Part number: A-4192-0050 (400 mm)

Price: \$215

Part number: A-4192-0051 (600 mm)

Price: \$282

Part number: A-4192-0052 (1000 mm)

Price: \$394

ACR3 components

SCP600

Stylus change port for SP600.

Part number: A-2098-0933

Price: \$1,467



Coordinate measuring machine probes

MRS legs

One per kit.

Part number: A-4192-0061 (62.5 mm) **Price:** \$90

Part number: A-4192-0053 (125 mm) **Price:** \$107

MRS heavy duty leg kit

Ø60 mm × 350 mm long. One per kit.

Part number: A-4192-0020 **Price:** \$381

MRS adjustable foot plate

Two per kit.

Part number: A-4192-0702 **Price:** \$394

MRS leg and foot adaptor

One per kit.

Part number: A-4192-0055 **Price:** \$158

MRS fixed foot

One per kit.

Part number: A-4192-0056 **Price:** \$158

MRS step back adaptor

One per kit.

Part number: A-4192-0058 **Price:** \$158

M8 T nut *

Part number: P-NU18-0005 **Price:** \$14

* no discounts

MRS spacer kit

Two per kit.

Part number: A-4192-0014 **Price:** \$81

MRS2 kits

The MRS2 is a highly versatile storage solution for Renishaw probe and stylus configurations. It has been designed for users who are increasingly using their CMMs for multi sensor measurement, and therefore need to store greater varieties of probes and styli on racks within a limited machine working volume.

MRS2 is built entirely from extruded aluminum and is available in a variety of interchangeable rail and leg kits that can be configured according to the need of the individual. Leg and rail kits are sold separately to allow maximum flexibility. Rails can be tiered, using the front and back spacer kits, to offer up to three meters of rail space.

MRS2 leg kits

- Includes: 2 × leg extrusions
4 × 40 mm brackets
6 × square end caps
2 × extrusion clamp plate kits

Not included: Rail, front spacer, and back spacer.

Part number: A-6007-1020 (H = 200 mm)	Price: \$733
Part number: A-6007-1040 (H = 400 mm)	Price: \$828
Part number: A-6007-1060 (H = 600 mm)	Price: \$1,108
Part number: A-6007-1080 (H = 800 mm)	Price: \$1,203

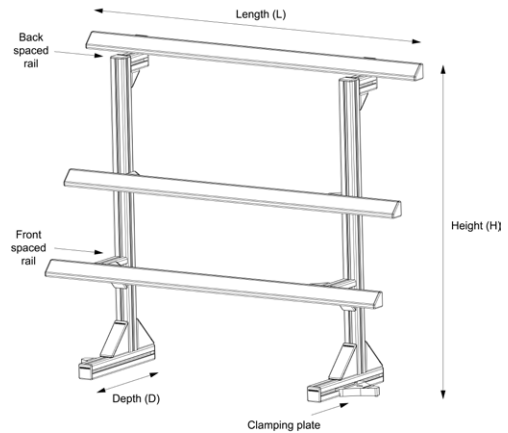


MRS2 rail kits

- Includes: 1 × rail
2 × triangular end caps
2 × 40 mm brackets

Not included: Leg, front spacer, and back spacer.

Part number: A-6007-2040 (L = 400 mm)	Price: \$225
Part number: A-6007-2060 (L = 600 mm)	Price: \$282
Part number: A-6007-2100 (L = 1000 mm)	Price: \$376



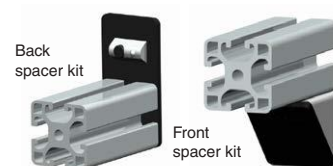
MRS2 spacer kits

Part number: A-6007-3010 (front spacer kit)	Price: \$161
Part number: A-6007-4008 (back spacer kit)	Price: \$161

MRS2 accessories

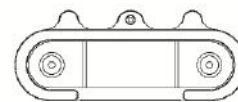
MRS2 spirit level

Part number: A-6007-0630	Price: \$28
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MRS2 extrusion clamp plate kit

Part number: A-6007-0620 (1 per kit)	Price: \$189
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MRS2 end caps and brackets

Part number: A-6007-0710 (4 × triangular end caps)	Price: \$46
Part number: A-6007-0720 (6 × square end caps)	Price: \$67
Part number: A-6007-0740 (4 × 40 mm bracket end caps)	Price: \$46
Part number: A-6007-0780 (4 × 80 mm bracket end caps)	Price: \$75
Part number: A-6007-0810 (10 × D-nuts and bolts)	Price: \$75



Coordinate measuring machine probes

Manual autojoint probe stand

Renishaw's manual autojoint probe stand (MAPS) is a low-cost storage rack capable of holding up to six combinations of probes, extension bars, and accessories. The stand can be mounted directly on the table of a CMM using the appropriate socket head bolt (maximum size M10, 3/8 in) which is passed through the center of the base.

Standard autochange rack legs (100 mm and 200 mm long) are compatible with this stand and can be stacked to accommodate longer probe extensions with longer stylus extensions. As an alternative to the support pillar, a wall mounting bracket is available to enable the stand to be mounted to a cabinet, wall or any other vertical surface.

Height: 285 mm
Depth: 80 mm
Width: 235 mm

Part number: A-1071-0001

Price: \$233



MSR1 rack

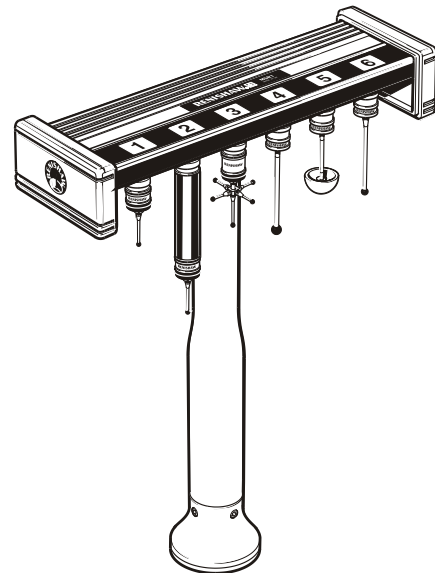
The MSR1 rack is intended for use on either manual or DCC CMMs to hold pre-qualified stylus assemblies fitted to TP20 or TP200 probe modules. The rack provides convenient storage and protects the kinematic coupling mechanism from contamination.

Overall height: 285 mm
Depth (inc wall bracket): 86 mm
Width: 236 mm

MSR1 with leg and base (wall mount kit included)

Part number: A-1371-0347

Price: \$423



Datum sphere

The Renishaw universal datum sphere enhances the performance of manual and fully automated CMMs. It allows for quick and easy adjustment to set ball stem over a wide range of probe datuming angles. This enables datuming above, centrally and below the ball. Each datum sphere is supplied with its own certificate, giving ball diameter and roundness. All sphere measurements are performed on equipment traceable to UK (NPL) standards.

Specifications:	Hard-wearing tungsten carbide sphere (ball) available in five sizes
Metric:	Ø12 mm, Ø19 mm and Ø25 mm
Inch:	Ø3/4 in and Ø1 in
Sphericity:	to within 0.1 µm (0.000004 in)
Diametric tolerance:	±1 µm (0.00004 in)

Datum sphere kit

Includes: 1 datum ball (selected by size)
Pivot pillar
Base
C spanner
Ball certificate
Storage box

Description	Part number	Price
Ø12 mm ball	A-1034-0028	\$545
Ø19 mm ball	A-1034-0027	\$545
Ø25 mm ball	A-1034-0026	\$545
Ø¾ in ball	A-1034-0031	\$545
Ø1 in ball	A-1034-0035	\$545

Datum sphere fixing studs

A fixing stud is required with each kit to attach the pillar to the table surface. Select one from the list below.

Description	Manufacturer	Part number	Price
M6 × 1		A-1034-0352	\$27
M8 × 1.25	MTI	A-1034-0351	\$27
M10 × 1.5	B&S, LK Tool & Sheffield	A-1034-0350	\$27
5/16–18 UNC		A-1034-0354	\$27
3/8–16 UNC	Carl Zeiss, Fanamation, LK Tool, & L.S. Starrett	A-1034-0353	\$27

Datum sphere accessories (M6 thread – stem is attached to the ball)

Description	Part number	Price
Ø12 mm datum ball	A-1034-0005	\$335
Ø19 mm datum ball	A-1034-0023	\$335
Ø25 mm datum ball	A-1034-0002	\$335
Ø¾ in datum ball	A-1034-0032	\$335
Ø1 in datum ball	A-1034-0036	\$335
2 way adaptor	A-1034-0356	\$82
3 way adaptor *	A-1034-0357	\$186
Pillar extension 75 mm (2.96 in) long	A-1034-0355	\$82

* Special order



Coordinate measuring machine probes

Mahogany boxes

Probe head boxes

Description	Part number	Price
PH1 probe head, cable, TK6 box	A-1015-7725	\$105
PH6 probe head, TP2 probe, stylus, TK6 box	A-1015-7731	\$105
PH5 or PH5-1 probe head, cable, TK6 box	A-1015-7727	\$105
PH10M probe head kit box	A-1015-7698	\$113
PH6A probe head kit box	A-1015-7674	\$207
TP1 probe and stylus box (PC10)	A-1015-7686	\$142
MIH and accessories box	A-1015-7765	\$118
TP200 probe and stylus box	A-1015-7869	\$141

Extension bar boxes

Description	Part number	Price
PEL extension bars (PC19)	A-1015-7694	\$118
PEM extension bars	A-1015-7761	\$137

Probe extension kits

Kit EKL **Part number:** A-1047-7005 **Price:** \$1,041

Description	Quantity	Part number
Lightweight extension bar (50 mm) PEL1	1	A-1047-3484
Lightweight extension bar (100 mm) PEL2	1	A-1047-3485
Lightweight extension bar (200 mm) PEL3	1	A-1047-3486
Double-ended spanner	1	A-1047-3932
Box	1	A-1015-7694

PEM Kit **Part number:** A-1076-0100 **Price:** \$3,462

Description	Quantity	Part number
Multiwire extension bar (50 mm) PEM1	1	A-1076-0070
Multiwire extension bar (100 mm) PEM2	1	A-1076-0071
Multiwire extension bar (200 mm) PEM3	1	A-1076-0072
Joint key	1	A-1051-0040
Box	1	A-1015-7761

Stylus tools

S1 C spanner (for use with TP20 probe body)

Part number: A-1042-1486 Price: \$20

S3 hex key 1.5 mm A/F

Part number: P-TL01-0150 Price: \$4

S4 hex key 3.0 mm straight arm

Part number: P-TL01-0300 Price: \$4

S5 wrench 2 mm A/F

Part number: P-TL01-0200 Price: \$4

S6 hex key 2.5 mm A/F

Part number: P-TL01-0250 Price: \$4

S7 stylus tool (for use with M2 and M3 styli)

Part number: M-5000-3540 Price: \$9

S9 double-ended spanner

Part number: A-1047-3932 Price: \$15

S10 joint key (for use with autojoint)

Part number: A-1051-0040 Price: \$18

S12 hex key 0.9 mm A/F

Part number: P-TL01-0089 Price: \$4

S20 torque tool (for use with M2 carbon fiber stylus)

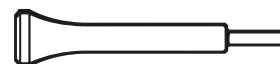
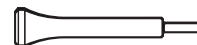
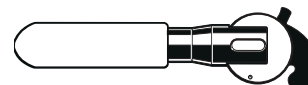
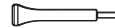
Part number: A-5003-2300 Price: \$48

M4 stylus tool (for use with M4 and M5 styli)

Part number: M-5000-3707 Price: \$12

Stylus tool (for use with adaptor M-5000-9301)

Part number: M-5000-9304 Price: \$15



Coordinate measuring machine probes

Tool kits

TK1 tool kit

The TK1 tool kit is included with the MP1, MP3, MP4, MP7, MP8, MP9, MP10, MP11, MP12, MP14 and LP2 probes.

Includes: Stylus tool Ø1.98 mm
Hex key 1.5 mm A/F
Hex key 2.0 mm A/F
Hex key 2.5 mm A/F
Hex key 3.0 mm A/F
Hex key 4.0 mm A/F

Part number: A-2053-7531

Price: \$38

TK3 tool kit

The TK3 tool kit is included with the M6-3 probe.

Includes: Stylus tool Ø1.98 mm
Hex key 1.5 mm A/F
Hex key 2.0 mm A/F
Hex key 2.5 mm A/F
Hex key 3.0 mm A/F
Hex key 4.0 mm A/F
Hex key 5.0 mm A/F

Part number: A-2027-7046

Price: \$38

TK4 tool kit

Includes: S7 stylus tool (2)
Hex key 1.5 mm A/F
Hex key 2.5 mm A/F

Part number: A-1041-7041

Price: \$24

TK5 tool kit

Includes: S7 stylus tool (2)
S8 spanner
C spanner
Double-ended spanner
Hex key 1.5mm A/F

Part number: A-1042-7030

Price: \$62

TK6 tool kit

Includes: Hex key 2.0 mm A/F
Hex key 2.5 mm A/F
Hex key 3.0 mm A/F

Part number: A-1042-7031

Price: \$7

TK7 tool kit

Includes: Joint key
S7 stylus tools (2)
Hex key 1.5 mm A/F

Part number: A-1039-0041

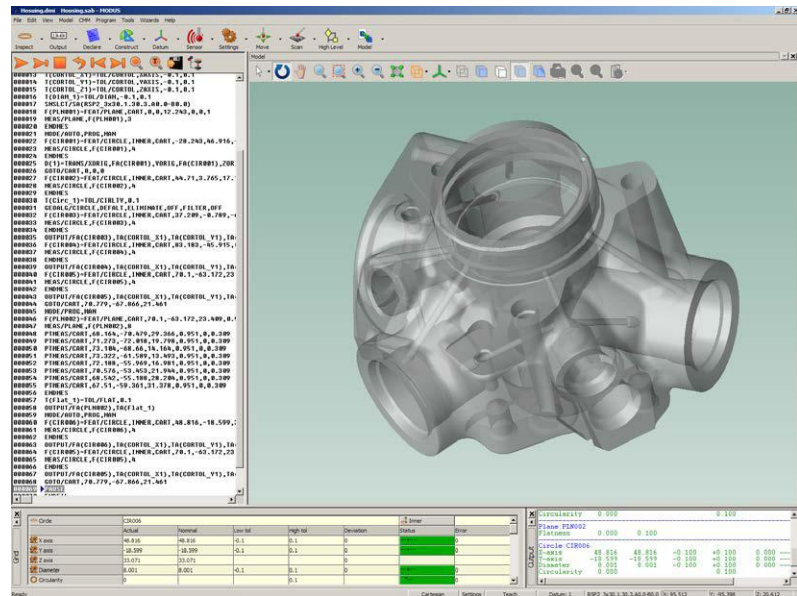
Price: \$28

CMM metrology software

MODUST™

Renishaw's new MODUST™ software provides a powerful platform for 3-axis and 5-axis measurement. A configurable user interface allows native DMIS programs to be developed online or offline, drawing geometry, embedded dimensions and tolerance data from CAD, with full simulation and collision detection. The software includes certified algorithms for feature measurement, feature construction and part alignment.

- Full support for I++ DME compliant metrology controllers, including Renishaw's UCC range of universal CMM controllers
- Full compatibility with REVO® and PH20
- CAD-driven online / offline programming
- Full motion simulation and collision detection, including 5-axis moves
- Native DMIS support
- Certified mathematical algorithms
- Powerful text and graphical reporting
- Flexible output of results data including certified Q-DAS



Coordinate measuring machine probes
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MODUST™

MODUST™ – 3-axis and 5-axis touch-trigger

Part number: A-5639-0001 Price: \$8,800

MODUST™ – 3-axis scanning

Part number: A-5639-0003 Price: \$12,800

MODUST™ – 5-axis scanning

Part number: A-5639-0005 Price: \$20,800

MODUST™ Offline*

MODUST™ – Offline 3-axis and 5-axis touch-trigger

Part number: A-5639-0101 Price: \$4,400

MODUST™ – Offline 3-axis scanning

Part number: A-5639-0103 Price: \$6,400

MODUST™ – Offline 5-axis scanning

Part number: A-5639-0105 Price: \$10,400

Offline – Graphical reporting

Part number: A-5639-0007 Price: \$1,600

Options

Renishaw offers multiple application-specific analysis packages including Modus Gear, Modus Spline and Modus Airfoil. These are chargeable modules added to a base package of Modus 3-axis or 5-axis. Please contact Renishaw for details.

* The online version of MODUST™ can also be run offline without the need to purchase MODUST™ Offline. Only purchase MODUST™ Offline if you require a dedicated offline seat of MODUST™.

Coordinate measuring machine probes

CAD integration options

In addition to the native IGES and STEP support, MODUS™ offers a wide range of CAD options including VDA-FS, STEP, CATIA® (v5 and v4), Unigraphics®, Parasolid®, Pro/E® and SolidWorks®. For a complete list and pricing of CAD import / export options please contact Renishaw sales.

Software maintenance agreements

Every new purchase of MODUS™ comes with one year's free software updates, maintenance and support. After the first year, one-year maintenance agreements can be purchased for MODUS™ and its software options. Please contact Renishaw sales for details.

MODUS™ training at Renishaw Inc

Charge per student.

4 days

Part number: A-5639-1701 **Price:** \$3,000

3 days

Part number: A-5639-1700 **Price:** \$2,250

2 days

Part number: A-5639-1702 **Price:** \$1,500

1 day

Part number: A-5639-1703 **Price:** \$750

Onsite MODUS™ training

Up to four people, all inclusive of expenses.

4 days

Part number: RI-5639-1701 **Price:** \$9,625

3 days

Part number: RI-5639-1700 **Price:** \$7,700

2 days

Part number: RI-5639-1702 **Price:** \$5,775

1 day

Part number: RI-5639-1703 **Price:** \$3,850

MODUS™ training block

Part number: A-5639-2500 **Price:** \$680

Renishaw services

Renishaw has set up a series of part numbers which should be referenced when ordering Renishaw services. These part numbers will appear on your invoice.

Part number	Description	Price
RI-6002-0001	CMM hourly labor	\$150/hour
RI-6002-0002	CMM hourly travel	\$75/hour
RI-6002-0003	CMM expenses	as incurred
RI-6002-0004	CMM in-house training	\$750/day

Coordinate measuring machine probes

Coordinate measuring
machine probes

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Machine tool probes



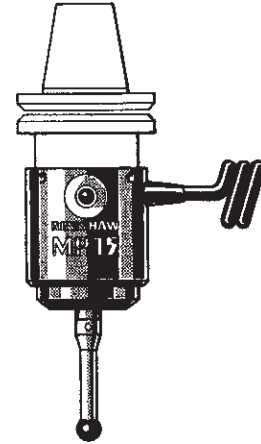
Machine tool probes

Inspection probes for machining centers

MP15

The MP15 probe is used on small CNC machines with limited Z travel and manual tool changing.

The probe is mounted in the machine spindle with the signal transmission cable connected to the machine control. With the MP15, the illuminated LED switches off every time the probe stylus contacts the workpiece.



MP15 hard-wired probe kit

Part number: A-2116-1802

Price: \$2,214

MP15/MP11 adaptor

Part number: M-2116-1356

Price: \$236

HSI interface

Part number: A-5500-1000

Price: \$207

OMP40-2

The OMP40-2 is an ultra-compact optical transmission part probing system. Measuring just 40 mm diameter and 50 mm in length, the OMP40-2 is suitable for all machining and mill-turn centers. Utilizing a revised state-of-the-art modulated optical transmission method, the system offers the highest level of resistance to light interference when used with the OMI-2/OMI-2T. The OMP40-2 probe is also backwards compatible with existing OMM/MI12 and OMI receivers, enabling current MP7, MP8, MP9 and MP10 system users to benefit from its innovative features.

Sense directions	±X, ±Y, +Z
Stylus overtravel	X and Y: ±12.5°
	Z: 6 mm (0.23 in)
Stylus trigger force	X and Y: 50 gf – 90 gf
	Z: 585 gf
Unidirectional repeatability	1.0 µm (0.00004 in)

OMP40-2 retrofit kit

Includes: OMP40-2 probe
OMM-2
Receiver mounting bracket
OSI interface
50 mm and 100 mm ceramic styli
Sealtite kit
Renishaw Inspection Plus software
Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: OMP40-NS-S (Available at fixed price)
Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

OMP40-2 hardware only kit

Includes: OMP40-2 probe
OMM-2
Receiver mounting bracket
OSI interface
50 mm and 100 mm ceramic styli
Sealtite kit

Part number: OMP40-NS-KIT **Price:** \$6,407



OMP40-2 probe kit

Includes: OMP40-2
½ AA battery (2)
Tool kit

Legacy

Part number: A-4071-0001 **Price:** \$3,984

Modulated

Part number: A-4071-2001 **Price:** \$3,984

OMP40-2 upgrade kit

Current users of MP7, MP8, MP9 or MP10 optical transmission probes may upgrade to OMP40-2. A complete working system (probe module plus transmission system) must be exchanged.

Includes: OMP40-2 probe system

Part number: RI-4071-0001 **Price:** \$1,992

OMP40-2 accessories and replacement parts

½ AA battery (2 pack)

Part number: P-BT03-0007 **Price:** \$45

OMP60/RMP60 style shank adaptor

Part number: A-4071-0031 **Price:** \$179

Machine tool probes

OMP40-2 continued

OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033

OMI-2 optical receiver/interface

With 8 m cable.

Part number: A-5191-0049 **Price:** \$1,657

OMI-2 optical receiver/interface

With 15 m cable.

Part number: A-5191-0050 **Price:** \$1,743

OMI-2T optical receiver/interface

With 8 m cable.

Part number: A-5439-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

With 15 m cable.

Part number: A-5439-0050 **Price:** \$1,743

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$975

Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 meter long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

OMP400

OMP400 is an ultra-compact optical transmission probe using strain gage technology. Measuring just 40 mm diameter x 50 mm in length, OMP400 is suitable for all machining and mill-turn centers requiring uncompromised 3D metrology performance. Utilizing a revised state-of-the-art modulated optical transmission method, the system offers the highest level of resistance to light interference when used with OMI-2. The OMP400 probe is also backwards compatible with existing OMM/MI12 and OMI receivers, enabling current MP7, MP8, MP9 and MP10 system users to benefit from its innovative features.

Sense directions	±X, ±Y, +Z
Stylus overtravel	X and Y: ±18°
	Z: 11 mm (0.43 in)
Stylus trigger force	X and Y: 6 gf
	Z: 260 gf
Unidirectional repeatability	0.25 µm (0.00001 in)

OMP400 retrofit kit

Includes: OMP400 probe
 OMM-2
 Receiver mounting bracket
 OSI interface
 50 mm and 100 mm carbon fiber styli
 Sealtitle kit
 Renishaw Inspection Plus software
 Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: OMP400-NS-S (Available at fixed price)
 Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

OMP400 hardware only kit

Includes: OMP400 probe
 OMM-2
 Receiver mounting bracket
 OSI interface
 50 mm and 100 mm carbon fiber styli
 Sealtitle kit

Part number: OMP400-NS-KIT **Price:** \$7,271

OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033



OMP400 probe kit

Includes: OMP400 probe
 ½ AA battery (2)
 Tool kit

Legacy

Part number: A-5069-0001 **Price:** \$4,781

Modulated

Part number: A-5069-2001 **Price:** \$4,781

OMP400 upgrade kit

Current users of MP700 optical transmission probes may upgrade to OMP400. A complete working system (probe module plus transmission system) must be exchanged.

Includes: OMP400 probe

Part number: RI-5069-0001 **Price:** \$2,390

Note: A new shank is required. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Machine tool probes

OMP400 continued

OMI-2 optical receiver/interface

With 8 m cable.

Part number: A-5191-0049 **Price:** \$1,657

OMI-2 optical receiver/interface

With 15 m cable.

Part number: A-5191-0050 **Price:** \$1,743

OMI-2T optical receiver/interface

With 8 m cable.

Part number: A-5439-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

With 15 m cable.

Part number: A-5439-0050 **Price:** \$1,743

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$975

Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

To obtain optimal metrology performance, the following carbon fiber styli are recommended. Refer to the Styli section for more details.

Stylus	Part number	Price
6 × 50 mm CF	A-5003-7306	\$128
6 × 100 mm CF	A-5003-6510	\$145
6 × 150 mm CF	A-5003-6511	\$274
6 × 200 mm CF	A-5003-6512	\$289

OMP60

OMP60 is an optical transmission probing system suitable for medium to large machining and mill-turn centers. Utilizing a revised state-of-the-art modulated optical transmission method, the system offers the highest level of resistance to light interference. The OMP60 probe is also backwards compatible with existing OMM/MI12 and OMI receivers. OMP60 also supports all methods of probe activation – shank switch, spin and M code – enabling current MP7, MP8, MP9 and MP10 users to benefit from some of its innovative features.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 18^\circ$
	Z: 11 mm (0.43 in)
Stylus trigger force	X and Y: 75 gf – 140 gf
	Z: 530 gf
Unidirectional repeatability	1.0 μm (0.00004 in)

OMP60 retrofit kit

Includes: OMP60 probe
 OMM-2
 Receiver mounting bracket
 OSI interface
 50 mm and 100 mm ceramic styli
 Sealtite kit
 Renishaw Inspection Plus software
 Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: OMP60-NS-S (Available at fixed price)
 Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

OMP60 hardware only kit

Includes: OMP60 probe
 OMM-2
 Receiver mounting bracket
 OSI interface
 50 mm and 100 mm ceramic styli
 Sealtite kit

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: OMP60-NS-KIT **Price:** \$6,407



OMP60 probe kit

Includes: OMP60 probe
 AA battery (2)
 Tool kit

Legacy

Part number: A-4038-0001 **Price:** \$3,984

Modulated

Part number: A-4038-2001 **Price:** \$3,984

OMP60 upgrade kit

Current users of MP7, MP8, MP9 or MP10 optical transmission probes may upgrade to OMP60. A complete working system (probe module plus transmission system) must be exchanged.

Includes: OMP60 probe system

Part number: RI-4038-0001 **Price:** \$1,992

Machine tool probes

OMP60 continued

OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033

OMI-2 optical receiver/interface

With 8 m cable.

Part number: A-5191-0049 **Price:** \$1,657

OMI-2 optical receiver/interface

With 15 m cable.

Part number: A-5191-0050 **Price:** \$1,743

OMI-2T optical receiver/interface

With 8 m cable.

Part number: A-5439-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

With 15 m cable.

Part number: A-5439-0050 **Price:** \$1,743

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$975

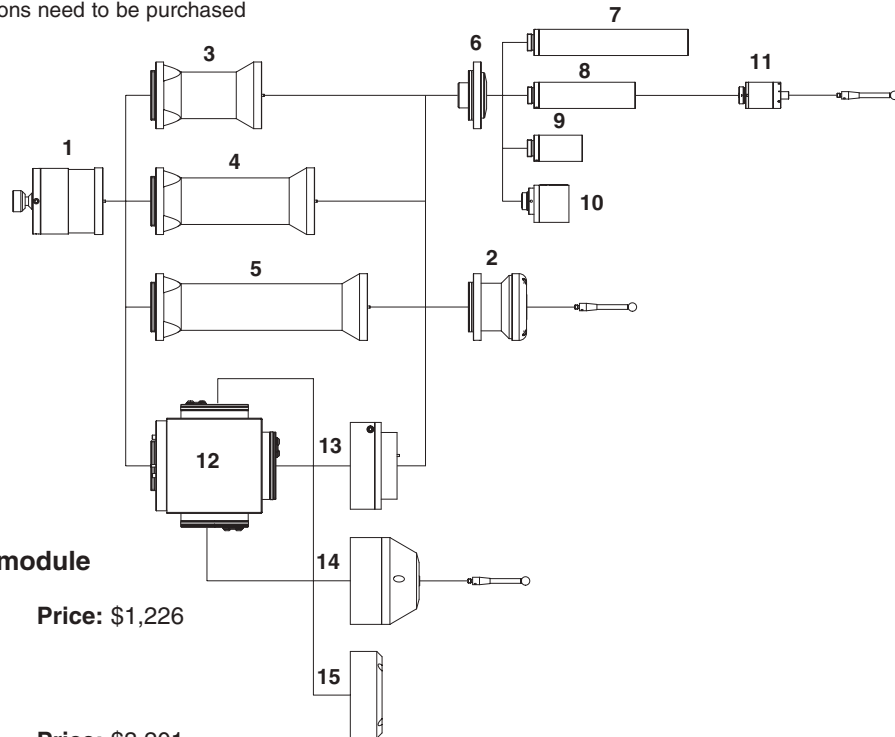
Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

OMP60M

OMP60M is a modular version of the OMP60. The OMP60M, probe module, adaptors and extensions need to be purchased separately.



1 – OMP60M transmission module

Part number: A-4038-1003 Price: \$1,226

2 – OMP60M probe module

Part number: A-4038-1002 Price: \$3,201

3 – OMP60M 100 mm extension

Part number: A-4038-1010 Price: \$647

4 – OMP60M 150 mm extension

Part number: A-4038-1027 Price: \$839

5 – OMP60M 200 mm extension

Part number: A-4038-1028 Price: \$872

6 – OMP60M LP2 adaptor

Part number: A-4038-0212 Price: \$647

7 – LPE3 150 mm extension

Part number: A-2063-7003 Price: \$299

8 – LPE2 100 mm extension

Part number: A-2063-7002 Price: \$299

9 – LPE1 50 mm extension

Part number: A-2063-7001 Price: \$299

10 – MA4 90° adaptor

Part number: A-2063-7600 Price: \$486

11 – LP2 probe assembly

Part number: A-2063-6098 Price: \$3,102

12 – OMP60M 3-way adaptor

Part number: A-4113-0784 Price: \$1,307

13 – OMP60M probe module adaptor

Part number: A-4113-0771 Price: \$741

14 – MP3 probe

Part number: A-2053-5358 Price: \$3,245

15 – Shorting cover

Part number: A-2053-6468 Price: \$144

OMP60M upgrade kit

Current users of MP7, MP8, MP9 or MP10 optical transmission probes may upgrade to OMP60M. A complete working probe must be exchanged.

Includes: OMP60M module
OMP60M probe module

Part number: RI-4038-1003 Price: \$2,537

Machine tool probes

OMP600

OMP600 is the latest generation optical transmission probe using strain gage technology and suitable for medium to large machining and mill-turn centers. Utilizing a revised state-of-the-art modulated optical transmission method, the system offers the highest resistance to light interference.

The OMP600 probe is also backwards compatible with existing OMM/MI12 and OMI receivers. OMP600 also supports all methods of probe activation – shank switch, spin and M code – enabling current MP700 users to benefit from some of its innovations.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 15^\circ$
	Z: 11 mm (0.43 in)
Stylus trigger force	X and Y: 15 gf
	Z: 178 gf
Unidirectional repeatability	0.25 μm (0.00001 in)



OMP600 retrofit kit

Includes: OMP600 probe
OMM-2/OSI
Receiver mounting bracket
50mm and 100 mm carbon fiber styli
Sealtite kit
Renishaw Inspection Plus software
Installation and application support

A shank (tool holder) is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: OMP600-NS-S (Available at fixed price)
Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

OMP600 hardware only kit

Includes: OMP600 probe
OMM-2/OSI
Receiver mounting bracket
50 mm and 100 mm carbon fiber styli
Sealtite kit

Part number: OMP600-NS-KIT **Price:** \$7,271

OMP600 probe kit

Includes: OMP600 probe
AA battery (2)
Tool kit

Legacy

Part number: A-5180-0001 **Price:** \$4,781

Modulated

Part number: A-5180-2001 **Price:** \$4,781

OMP600 upgrade kit

Current users of MP700 optical transmission probes may upgrade to OMP600. A complete working system (probe module plus transmission system) must be exchanged.

Includes: OMP600 probe

Part number: RI-5180-0001 **Price:** \$2,390

OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033

OMI-2 optical receiver/interface

With 8 m cable.

Part number: A-5191-0049 **Price:** \$1,657

OMI-2 optical receiver/interface

With 15 m cable.

Part number: A-5191-0050 **Price:** \$1,743

OMI-2T optical receiver/interface

With 8 m cable.

Part number: A-5439-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

With 15 m cable.

Part number: A-5439-0050 **Price:** \$1,743

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$957

Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

To obtain optimal metrology performance, the following carbon fiber styli are recommended. Refer to the Styli section for more details.

Stylus	Part number	Price
6 × 50 mm CF	A-5003-7306	\$128
6 × 100 mm CF	A-5003-6510	\$145
6 × 150 mm CF	A-5003-6511	\$274
6 × 200 mm CF	A-5003-6512	\$289

Machine tool probes

RMP40

RMP40 is an ultra-compact radio transmission part probe, ideal for use on small to medium machine tools. RMP40 features an integrated probe module delivering exceptional robustness and generous overtravel. RMP40 complies with FCC regulations and operates in the 2.4 GHz range. RMP40 delivers interference-free transmission through the use of FHSS (frequency hopping spread spectrum).

RMP40 supports two methods of probe activation:

Radio-on The probe is turned on via an RF signal produced by the RMI-Q and initiated by an M code. The probe is turned off via an RF signal or the internal timer.

Spin-on The probe is turned on via an internal centrifugal switch. The probe is turned off via the centrifugal switch or the internal timer.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 12.5^\circ$
	Z: 6 mm (0.24 in)
Stylus trigger force	X and Y: 50 gf – 90 gf
	Z: 585 gf
Unidirectional repeatability	1.0 μm (0.00004 in)



RMP40 retrofit kit

Includes: RMP40 probe and transmission system
RMI-Q radio machine interface
Receiver mounting bracket
50 mm and 100 mm ceramic styli
Sealtite kit
Renishaw Inspection Plus software
Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: RMP40-NS-S (Available at fixed price)
Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

RMP40 hardware only kit

Includes: RMP40 probe and transmission system
RMI-Q radio machine interface
Receiver mounting bracket
50 mm and 100 mm ceramic styli
Sealtite kit

Part number: RMP40-NS-KIT **Price:** \$8,459

RMP40 probe kit

Includes: RMP40 probe
 $\frac{1}{2}$ AA battery (2)
Tool kit

Part number: A-5480-0001 **Price:** \$5,363

RMI-Q radio machine interface

Part number: A-5687-0050 **Price:** \$2,681

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

Sealtite conduit

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

RMP60

RMP60 is a radio transmission part probing system ideal for use on all machine tools. RMP60 features an integrated probe module delivering exceptional robustness and generous overtravel. RMP60 complies with FCC regulations and operates in the 2.4 GHz range. RMP60 delivers interference-free transmission through the use of FHSS (frequency hopping spread spectrum).

RMP60 supports three methods of probe activation:

- Radio-on** The probe is turned on via an RF signal produced by the RMI-Q and initiated by an M code. The probe is turned off via an RF signal or the internal timer.
- Spin-on** The probe is turned on via an internal centrifugal switch. The probe is turned off via the centrifugal switch or the internal timer.
- Switch-on** The probe is turned on and off via a switch incorporated into the shank, activated when the probe is loaded into the spindle.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 18^\circ$
	Z: 11 mm (0.43 in)
Stylus trigger force	X and Y: 75 gf – 140 gf
	Z: 530 gf
Unidirectional repeatability	1.0 μm (0.00004 in)

RMP60 retrofit kit

- Includes: RMP60 probe and transmission system
RMI-Q radio machine interface
Receiver mounting bracket
50 mm and 100 mm ceramic styli
Sealtite kit
Renishaw Inspection Plus software
Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: RMP60-NS-S (Available at fixed price)
Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

RMP60 hardware only kit

- Includes: RMP60 probe and transmission system
RMI-Q radio machine interface
Receiver mounting bracket
50 mm and 100 mm ceramic styli
Sealtite kit

Part number: RMP60-NS-KIT **Price:** \$8,459



RMP60 probe kit

- Includes: RMP60 probe
AA battery (2)
Tool kit

Part number: A-5742-0001 **Price:** \$5,363

RMI-Q radio machine interface

Part number: A-5687-0050 **Price:** \$2,681

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

Sealtite conduit

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

RMP60 upgrade kit

Current users of MP14, MP16 or MP18 radio probes may upgrade to RMP60. A complete working system (MP3 probe, transmission system, MI14 or MI16 interface and RMM antennas) must be exchanged.

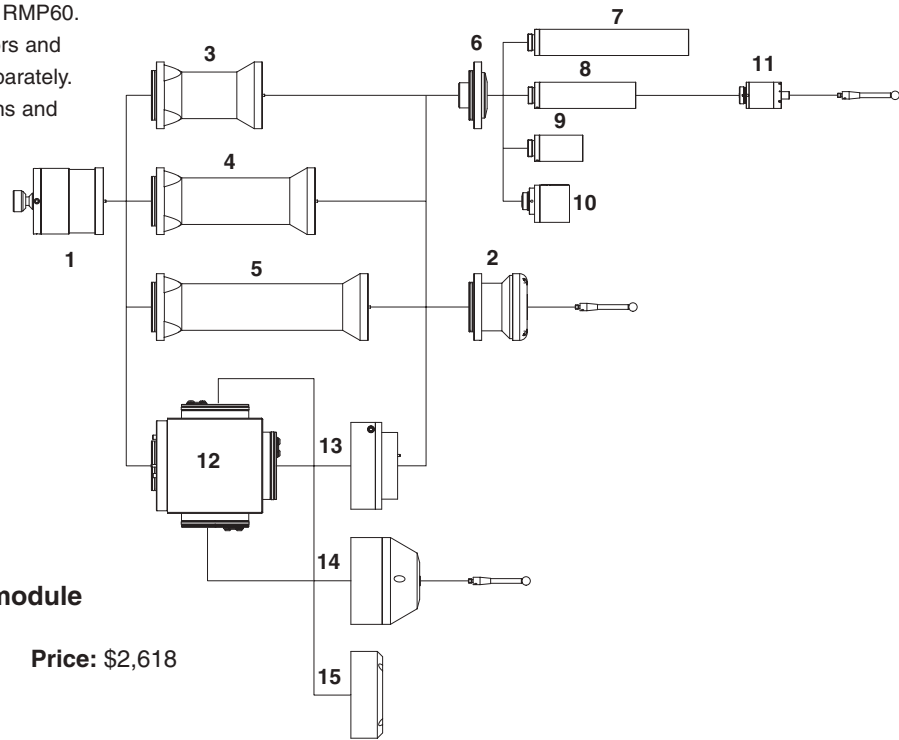
- Includes: RMP60 probe
RMI-Q radio machine interface
Receiver mounting bracket
Sealtite kit

Part number: RI-5742-0001 **Price:** \$5,447

Machine tool probes

RMP60M

RMP60M is a modular version of the RMP60. The RMP60M, probe module, adaptors and extensions need to be purchased separately. RMP60 complies with FCC regulations and operates in the 2.4 GHz range.



1 – RMP60M transmission module

Part number: A-5742-1003 Price: \$2,618

2 – RMP60M probe module

Part number: A-4038-1002 Price: \$3,201

3 – RMP60M 100 mm extension

Part number: A-4038-1010 Price: \$647

4 – RMP60M 150 mm extension

Part number: A-4038-1027 Price: \$839

5 – RMP60M 200 mm extension

Part number: A-4038-1028 Price: \$872

6 – RMP60M LP2 adaptor

Part number: A-4038-0212 Price: \$647

7 – LPE3 150 mm extension

Part number: A-2063-7003 Price: \$299

8 – LPE2 100 mm extension

Part number: A-2063-7002 Price: \$299

9 – LPE1 50 mm extension

Part number: A-2063-7001 Price: \$299

10 – MA4 90° adaptor

Part number: A-2063-7600 Price: \$486

11 – LP2 probe assembly

Part number: A-2063-6098 Price: \$3,102

12 – RMP60M 3-way adaptor

Part number: A-4113-0784 Price: \$1,307

13 – RMP60M probe module adaptor

Part number: A-4113-0771 Price: \$741

14 – MP3 probe

Part number: A-2053-5358 Price: \$3,245

15 – Shorting cover

Part number: A-2053-6468 Price: \$144

RMP60M upgrade kit

Current users of MP14, MP16 or MP18 radio probes may upgrade to RMP60M. A complete working system (probe, MI14 or MI16 interface and RMM antennas) must be exchanged.

Includes: RMP60M module
RMP60M probe module
RMI radio machine interface
Receiver mounting bracket
Sealtite kit

Part number: RI-5742-1003 Price: \$5,992

RMP600

RMP600 is a radio transmission probe using strain gage technology. Measuring only 63 mm in diameter and 76 mm in length, with an omni-directional transmission distance of 15 m, it is ideal for use on all machine tools. RMP600 features an integrated probe module delivering exceptional robustness and generous overtravel. It delivers interference-free transmission through the use of FHSS (frequency hopping spread spectrum). RMP600 complies with FCC regulations and operates in the 2.4 GHz range.

RMP600 supports three methods of probe activation:

- Radio-on** The probe is turned on via an RF signal produced by the RMI-Q and initiated by an M code. The probe is turned off via an RF signal or the internal timer.
- Spin-on** The probe is turned on via an internal centrifugal switch. The probe is turned off via the centrifugal switch or the internal timer.
- Switch-on** The probe is turned on and off via a switch incorporated into the shank, activated when the probe is loaded into the spindle.

Sense directions	±X, ±Y, +Z
Stylus overtravel	X and Y: ±15°
	Z: 11 mm (0.43 in)
Stylus trigger force	X and Y: 20 gf
	Z: 193 gf
Unidirectional repeatability	0.25 µm (0.00001 in)

RMP600 retrofit kit

- Includes: RMP600 probe
RMI-Q radio machine interface
Receiver mounting bracket
50 mm and 100 mm carbon fiber styli
Sealtite kit
Renishaw Inspection Plus software
Installation and application support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: RMP600-NS-S (Available at fixed price)
Call for details

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

RMP600 hardware only kit

- Includes: RMP600 probe
RMI-Q radio machine interface
Receiver mounting bracket
50 mm and 100 mm carbon fiber styli
Sealtite kit

Part number: RMP600-NS-KIT **Price:** \$10,496



RMP600 probe kit

- Includes: RMP600 probe
AA battery (2)
Tool kit

Part number: A-5312-0001 **Price:** \$7,333

RMI-Q radio machine interface

Part number: A-5687-0050 **Price:** \$2,681

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

Sealtite conduit

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

RMP600 upgrade kit

Current users of MP14, MP16 or MP18 radio probes may upgrade to RMP600. A complete working system (MP3 probe, transmission system, MI14 or MI16 interface and RMM antennas) must be exchanged.

- Includes: RMP600 probe
RMI-Q radio machine interface
Receiver mounting bracket
Sealtite kit

Part number: RI-5312-0001 **Price:** \$6,746

Machine tool probes

Shanks and Toolholders

Shanks for OMP60, MP11, OMP600, RMP60 and RMP600 (spin-on, optical-on, radio-on) systems

Part number	Description	Price
M-2045-0068	CAT30	\$385
M-2045-0069	CAT40	\$385
M-2045-0138	CAT45	\$857
M-2045-0071	CAT50	\$385
M-2045-0292	CAT60	\$1,781
M-2045-0077	BT30	\$385
M-2045-0027	BT40	\$385
M-2045-0038	BT45	\$857
M-2045-0073	BT50	\$385
M-2045-0186	HSK A40	\$726
M-2045-0187	HSK A50	\$865
M-2045-0188	HSK A63	\$929
M-2045-0189	HSK A80	\$1,125
M-2045-0190	HSK A100	\$1,128
A-2045-0243	½ in straight shank	\$228
A-2030-0252	1 in straight shank	\$228
A-2030-0211	25 mm straight shank	\$228
M-2045-0313	CAPTO C4	\$786
M-2045-0346	CAPTO C5	\$1,042
M-2045-0310	CAPTO C6	\$708
M-2045-0311	CAPTO C8	\$1,751
M-2045-0335	KM63	\$1,454
M-2045-1831591	KM63Y (Mazak)	\$1,648

Calibration masters

Calibration tools

Part number	Description	Price
M-2253-0954	CAT40	\$451
M-2253-0955	CAT50	\$565
M-2253-1562	BT30	\$730
M-2253-1263	BT40	\$451
M-2253-1262	BT50	\$565

Shanks for OMP40-2, OMP400 and RMP40

Part number	Description	Price
M-4071-0050	CAT30	\$433
M-4071-0058	CAT40	\$385
M-4071-0072	CAT50	\$385
M-4071-0049	BT30	\$445
M-4071-0057	BT40	\$385
M-4071-0071	BT50	\$385
M-4071-0048	ISO30 DIN69871	\$433
M-4071-0069	ISO40 DIN69871	\$414
M-4071-0044	HSK E25	\$505
M-4071-0055	HSK E32	\$505
M-4071-0054	HSK E40	\$505
M-4071-0045	HSK A32	\$505
M-4071-0046	HSK A40	\$505
M-4071-0047	HSK A50	\$680
M-4071-0129	HSK A63	\$595
M-4071-0141	CAPTO C4	\$829
M-4071-0066	CAPTO C5	\$861
M-4071-0067	CAPTO C6	\$861
M-4071-0065	KM63	\$861

OMP400 and RMP40 shank kits

CAT40 shank kit

Includes: CAT40 shank
OMP60/RMP60 shank adaptor

Part number: M-4071-0058-RI **Price:** \$564

BT40 shank kit

Includes: BT40 shank
OMP60/RMP60 shank adaptor

Part number: M-4071-0057-RI **Price:** \$564

Shanks for OLP40 and RLP40

Part number	Description	Price
A-5625-1003	25 mm straight shank	\$228
A-5625-1004	½ in straight shank	\$228
A-5625-1007	1 in straight shank	\$228

Tool setting probes for machining centers

NC4 tool setter

NC4 is a non-contact tool setter and our most compact design. NC4 is available in fixed or separate configurations. NC4F (fixed) is available in four different sizes. NC4S (separate) systems are user-configurable operating between 500 mm and 5 m.

Repeatability	±1.0 µm (0.00004 in)	
Minimum tool diameter	Measurement	0.03 mm (0.0012 in)
	Breakage	0.03 mm (0.0012 in)

NC4 fixed system retrofit kits

Include: NC4 fixed unit with 12.5 m cable
NCi-6 interface
Air regulator kit
Ø22 mm OD steel braided conduit
Mounting plate
Tool setting software
Installation and application support

Part number: NC4-F300-S *
Part number: NC4-F230-S *
Part number: NC4-F145-S *
Part number: NC4-F115-S *

NC4 separate system retrofit kits

Include: NC4 separate unit with 12.5 m cable
NCi-6 interface
Air regulator kit
Ø17 mm OD steel braided conduit
Tool setting software
Installation and application support

Part number: NC4-S800-S *
Part number: NC4-S1500-S *
Part number: NC4-S2000-S *
Part number: NC4-S3000-S *
Part number: NC4-S5000-S *

Note: When ordering a separate system retrofit kit, the customer must select an NC4 based on its operating range. In addition, the customer must select tool setting software based on the control type. Brackets and an adjusting method (see following page) are also needed for NC4 separate systems. These are not included with NC4 separate systems and must be ordered additionally. Mounting brackets for various machines are continually developed. Contact Renishaw for the latest list of compatibility. Bracket installation is **not** included with the standard separate system retrofit price, this service can be quoted upon request.

* Available at a fixed price. Call for details.

NC4 fixed kits



NC4 F300/240 with NCi-6 kit

Separation 240 mm

Part number: NC4-F300-kit **Price:** \$5,094

NC4 F230/170 with NCi-6 kit

Separation 170 mm

Part number: NC4-F230-kit **Price:** \$5,094

NC4 F145/85 with NCi-6 kit

Separation 85 mm

Part number: NC4-F145-kit **Price:** \$5,094

NC4 F115/55 with NCi-6 kit

Separation 55 mm

Part number: NC4-F115-kit **Price:** \$5,094

NC4 separate kits



NC4 S800 with NCi-6 kit

Separation 500 mm – 800 mm

Part number: A-4114-5060 **Price:** \$4,972

NC4 S1500 with NCi-6 kit

Separation 800 mm – 1500 mm

Part number: A-4114-5065 **Price:** \$4,972

NC4 S2000 with NCi-6 kit

Separation 1500 mm – 2000 mm

Part number: A-4114-5070 **Price:** \$4,972

NC4 S3000 with NCi-6 kit

Separation 2000 mm – 3000 mm

Part number: A-4114-5075 **Price:** \$4,972

NC4 S5000 with NCi-6 kit

Separation 3000 mm – 5000 mm

Part number: A-4114-5080 **Price:** \$4,972

Machine tool probes

NC4 tool kit

Part number: A-4114-4110 Price: \$45

NC4 air regulator kit

Part number: A-2253-5120 Price: \$464

NC4 air filter service kit

Part number: P-FI01-S002 Price: \$154

NCi-6 interface

Part number: A-6516-2000 Price: \$237

NC4 access panel 0.2

Part number: A-4114-0082 Price: \$23

NC4 access panel 0.4

Part number: A-4114-0084 Price: \$23

NC4 access panel 0.6

Part number: A-4114-0086 Price: \$23

NC4 set-up tool

Part number: A-4114-8000 Price: \$358

Steel sheath conduit 22 mm OD x 1 m

For NC4 fixed cable protection.

Part number: P-HO01-0011 Price: \$24

Steel sheath conduit 17 mm OD x 1 m

For NC4 separate cable protection.

Part number: P-HO01-0008 Price: \$24

NC4F 90-degree cable exit kit

Part number: P-CA61-0068 Price: \$23

Part number: P-CA61-0069 Price: \$23

NC4F air blast nozzle and bracket

Part number: A-5450-0480 Price: \$319

Solenoid kit

Part number: A-5450-0490 Price: \$890



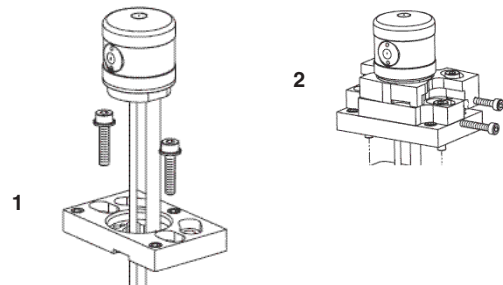
NC4S mounting hardware options

1. NC4 spacer plate – separate

Part number: A-4114-4400 Price: \$95

2. NC4 adjuster pack – separate

Part number: A-4114-3100 Price: \$239



OTS

The OTS is a new optical transmission tool setter for vertical and horizontal machining centers. Modeled on the TS27R, OTS can set tool length and diameter of rotating tools and perform broken tool detection. OTS is available in two configurations – OTS ½ AA and OTS AA. OTS can be used with the OMI-2, OMI-2T or OMM-2/OSI interface. OMI-2T or OMM-2/OSI must be used if OTS is to be paired with another optical transmission probe.

Sense directions	±X, ±Y, +Z
Stylus overtravel	X and Y: ±10°
	Z: 5.5 mm (0.21 in)
Stylus trigger force	130 gf – 240 gf
Unidirectional repeatability	1.0 µm (0.00004 in)

OTS retrofit kit

Includes: OTS ½ AA or OTS AA probe
OMM-2
Receiver mounting bracket
OSI interface
Sealtite kit
Renishaw tool setting software
Installation and application support

Part number: OTS-S (½ AA configuration)

Part number: OTSAA-S (AA configuration)

Available at fixed price – call for details.

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

OTS hardware only kit

Includes: OTS ½ AA probe or OTS AA probe
OMM-2
Receiver mounting bracket
OSI interface
Sealtite kit

Part number: OTS-KIT (½ AA) **Price:** \$4,596

Part number: OTSAA-KIT (AA) **Price:** \$4,596

OTS ½ AA probe kit

Includes: OTS probe
½ AA battery (2)
Tool kit

Part number: A-5401-2001 **Price:** \$2,379

OTS AA probe kit

Includes: OTS probe
AA battery (2)
Tool kit

Part number: A-5514-2001 **Price:** \$2,379



OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033

OMI-2 optical receiver/interface

With 8 m cable.

Part number: A-5191-0049 **Price:** \$1,657

OMI-2 optical receiver/interface

With 15 m cable.

Part number: A-5191-0050 **Price:** \$1,743

OMI-2T optical receiver/interface

With 8 m cable.

Part number: A-5439-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

With 15 m cable.

Part number: A-5439-0050 **Price:** \$1,743

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$975

Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

Machine tool probes

RTS

The RTS is a radio transmission tool setter for vertical and horizontal machining centers. Modeled after the OTS, RTS can set tool length and diameter of rotating tools and perform broken tool detection. RTS uses AA batteries (identical to RMP60). RTS can be used with either the RMI or the RMI-Q. The RMI-Q must be used if RTS is to be paired with another radio transmission probe.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 10^\circ$
	Z: 5.5 mm (0.21 in)
Stylus trigger force	130 gf – 240 gf
Unidirectional repeatability	1.0 μm (0.00004 in)



RTS retrofit kit

Includes: RTS AA probe
RMI-Q
Receiver mounting bracket
Sealtite kit
Renishaw tool setting software
Installation and application support

Part number: RTSAA-S

Available at fixed price – call for details.

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

RTS hardware only kit

Includes: RTS AA probe
RMI-Q
Receiver mounting bracket
Sealtite kit

Part number: RTSAA-KIT **Price:** \$6,010

RTS AA probe kit

Includes: RTS probe
AA battery (2)
Tool kit

Part number: A-5646-0001 **Price:** \$3,092

RMI-Q radio machine interface

Part number: A-5687-0050 **Price:** \$2,681

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

Sealtite conduit

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

TS27R

The TS27R is a tool setter for vertical machining centers that enables the user to set both tool length and diameter of rotating tools, and to carry out broken tool detection.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 10^\circ$
	Z: 5.5 mm (0.21 in)
Stylus trigger force	130 gf – 240 gf
Unidirectional repeatability	1.0 μm (0.00004 in)



TS27R retrofit kit

Includes: TS27R probe
HSI interface
Sealtite kit
Renishaw toolsetting software
Installation and application support

Part number: TS27R-S

Available at fixed price – call for details.

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

TS27R hardware only kit

Includes: TS27R probe
HSI interface
Sealtite kit

Part number: TS27R-KIT **Price:** \$1,481

TS27R probe, stylus, and holder kit

Part number: A-2008-0368 **Price:** \$1,190

HSI interface

Part number: A-5500-1000 **Price:** \$207

OTS, RTS or TS27R replacement parts and accessories

Tungsten carbide stylus (0.5 in disk)

Part number: A-2008-0382 **Price:** \$111

Ceramic stylus (19 mm square)

Part number: A-2008-0384 **Price:** \$260

Retrofit stylus kit

Includes: Break protection
Tether
Screws

Part number: A-5003-5171 **Price:** \$35

Break protect link

Part number: A-5003-0661 **Price:** \$25

Stylus holder with 4 set screws

Part number: A-2008-0389 **Price:** \$25

Stylus holder set screws

Part number: P-SC13-0403 **Price:** \$2

Crank for horizontal machining centers

Part number: A-2008-0448 **Price:** \$120

100 mm riser

Part number: M-2008-0866-RI-KIT **Price:** \$135

TS27 stylus (0.5 in disk)

For TS27 probes shipped prior to July 1995.

Part number: M-5003-1033 (steel) **Price:** \$111

Part number: M-2008-0197 (ceramic) **Price:** \$244

TS34

TS34 is a hard-wired tool setter for vertical and horizontal machining centers that enables users to set both length and diameter of rotating tools and perform broken tool detection.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 9^\circ$
	Z: 4 mm (0.157 in)
Stylus trigger force	X and Y: 65 gf – 142 gf
	Z: 550 gf
Unidirectional repeatability	1.0 μm (0.00004 in)

TS34 probe, stylus and holder kit

Rear exit

Part number: A-2197-2100 **Price:** \$3,524

Side exit

Part number: A-2197-3000 **Price:** \$3,524

HSI interface

Part number: A-5500-1000 **Price:** \$207



Primo™ LTS

The Primo LTS (length tool setter) is a hard wired single-axis tool setter which provides users with the ability to set tool length, check for tool wear and tool breakage, and to compensate for machine thermal growth. The LTS is used in conjunction with LTS application software which is available to download free of charge.

Sense directions	+Z
Stylus overtravel	Z: 7.5 mm (0.29 in)
Stylus trigger force	3N / 306 gf
Repeatability	0.75 µm (0.00003 in)



Primo LTS kit

Includes: Primo LTS
Ø26 mm contact pad

Part number: A-5475-0001 **Price:** \$983

Primo LTS with adaptor block

Includes: Primo LTS
Ø26 mm contact pad
Adaptor

Part number: A-5475-0002 **Price:** \$1,063

Primo LTS replacement parts and accessories

LTS tool kit

Includes: Ferrules (× 3)
1.5 mm hex key (× 1)

Part number: A-5475-0060 **Price:** \$24

LTS installation kit

Includes: M5 cap head screws (× 4)
Air pipe fitting (× 1)
Air flow regulator (× 1)
5 m × Ø6 mm air pipe

Part number: A-5475-0401 **Price:** \$94

LTS Ø26 mm contact pad kit

Includes: Ø26 mm (Ø1.02 in) contact pad (tungsten carbide)
Tool kit

Part number: A-5475-0402 **Price:** \$205

LTS air pipe

Part number: A-5475-0403 **Price:** \$63

LTS adaptor block (for T-slot mounting)

Part number: A-5475-0404 **Price:** \$82

LTS riser block 50 mm

Part number: A-5475-0405 **Price:** \$183

LTS riser block 100 mm

Part number: A-5475-0406 **Price:** \$290

LTS conduit bulkhead kit

Part number: A-5475-0407 **Price:** \$159

LTS conduit extension kit 2 m

Part number: A-5475-0408 **Price:** \$159

LTS conduit extension kit 5 m

Part number: A-5475-0409 **Price:** \$256

Solenoid kit

Part number: A-5299-2933 **Price:** \$469

TRS2

TRS2 is a cost-effective laser-based solution for high-speed broken tool detection. Working with the reflective properties of a rotating tool, TRS2 can detect broken tools at a distance of between 300 mm and 2 m, but optimized for use between 300 mm and 1 m. Toolwise™ Electronics makes TRS2 especially effective with tiny, easily broken tools down to 0.019 in (0.5 mm) diameter. TRS2 is suitable for solid profile tools including drills, taps, reamers and end mills.



TRS2 hardware kit

- Includes:
- TRS2 laser system with integral interface
 - Tool kit
 - Air regulator kit
 - Sealtite kit
 - Basic mounting bracket (shown)
 - Renishaw TRS2 broken tool detection software

Part number: TRS2-KIT **Price:** \$2,756

TRS2 probe only

- Includes: TRS2 laser system with integral interface

Part number: A-5450-0400 **Price:** \$2,103

TRS2 retrofit kit

- Includes:
- TRS2 laser system with integral interface
 - Tool kit
 - Air regulator kit
 - Sealtite kit
 - Basic mounting bracket (shown)
 - Renishaw TRS2 broken tool detection software
 - Installation and application support

Part number: TRS2-S

Available at fixed price – call for details.

Special pricing available for multiple systems.

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

TRS2 air regulator kit

Part number: A-2253-5120 **Price:** \$464

TRS2 air filter service kit

Part number: P-FI01-S002 **Price:** \$154

Sealtite conduit for TRS2

¼ in conduit, 5 ft long. Includes one fitting.

Part number: SEALTITE, 7455 **Price:** \$36

TRS2 replacement air cap

Part number: A-4178-0440 **Price:** \$30

Inspection probes for turning centers

OLP40

OLP40 is a compact optical transmission part probe, ideal for use on turning centers. OLP40's compact design features an integrated probe module delivering exceptional robustness and generous overtravel. Utilizing a revised state-of-the-art modulated optical transmission method, the system offers the highest level of resistance to light interference. The OLP40 probe is also backwards compatible with existing OMM/MI12 and OMI receivers. OLP40 supports two methods of probe activation – M code and spin-on.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 12.5^\circ$
	Z: 6 mm (0.24 in)
Stylus trigger force	X and Y: 50 gf – 90 gf
	Z: 585 gf
Unidirectional repeatability	1.0 μm (0.00004 in)



OLP40 retrofit kit

- Includes:
- OLP40 probe and transmission system
 - OMM-2
 - Receiver mounting bracket
 - OSI interface
 - 30 mm stainless steel stylus (x2)
 - Sealtite kit
 - Renishaw lathe inspection software
 - Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: OLP40-NS-S

Available at fixed price – call for details.

Note: The retrofit questionnaire at the end of this section must be filled out and returned to us before a retrofit order can be processed.

OLP40 hardware only kit

- Includes:
- OLP40 probe and transmission system
 - OMM-2
 - Receiver mounting bracket
 - OSI interface
 - 30 mm stainless steel stylus (x2)
 - Sealtite kit

Part number: OLP40-NS-KIT **Price:** \$6,341

OLP40 probe kit

- Includes:
- OLP40 probe
 - ½ AA battery (2)
 - Tool kit

Legacy

Part number: A-5625-0001 **Price:** \$3,984

Modulated

Part number: A-5625-2001 **Price:** \$3,984

Machine tool probes

OLP40 continued

OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033

OMI-2 optical receiver/interface

With 8 m cable.

Part number: A-5191-0049 **Price:** \$1,657

OMI-2 optical receiver/interface

With 15 m cable.

Part number: A-5191-0050 **Price:** \$1,743

OMI-2T optical receiver/interface

With 8 m cable.

Part number: A-5439-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

With 15 m cable.

Part number: A-5439-0050 **Price:** \$1,743

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$975

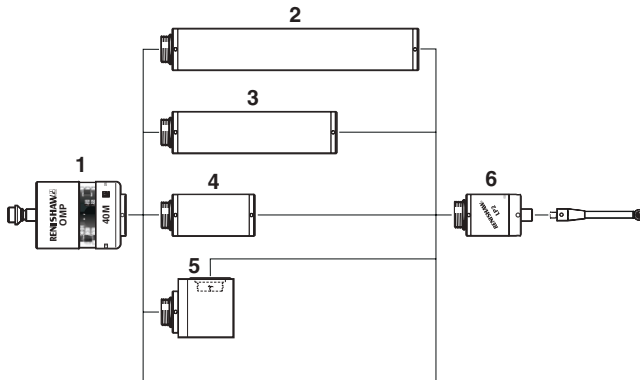
Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 meter long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

OMP40M

OMP40M is a modular version of the OLP40. The LP2 probe module, adaptors and extensions need to be purchased separately.



1 – OMP40M transmission module

Legacy

Part number: A-5626-0001 **Price:** \$1,383

Modulated

Part number: A-5626-2001 **Price:** \$1,383

2 – LPE3 extension 150 mm

Part number: A-2063-7003 **Price:** \$299

3 – LPE2 extension 100 mm

Part number: A-2063-7002 **Price:** \$299

4 – LPE1 extension 50 mm

Part number: A-2063-7001 **Price:** \$299

5 – MA4 90° adaptor

Part number: A-2063-7600 **Price:** \$486

6 – LP2 probe assembly

Part number: A-2063-6098 **Price:** \$3,102

OMP40M retrofit kit

Includes: OMP40M transmission system
LP2 probe
OMM-2
Receiver mounting bracket
OSI interface
30 mm stainless steel stylus (x 2)
Sealtite kit
Renishaw lathe inspection software
Installation and applications support

Part number: OMP40M-NS-S

Available at fixed price – call for details.

OMP40M hardware only kit

Includes: OMP40 transmission system
LP2 probe
OMM-2
Receiver mounting bracket
OSI interface
30 mm stainless steel stylus (x 2)
Sealtite kit

Part number: OMP40M-NS-KIT **Price:** \$6,842

A shank is not included in the above kits. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

OMM-2 optical receiver

Part number: A-5492-0051 **Price:** \$1,033

OMI-2 optical receiver/interface

Part number: A-5191-0049 **Price:** \$1,657

OMI-2T optical receiver/interface

Part number: A-5439-0049 **Price:** \$1,657

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

OSI interface

Part number: A-5492-2000 **Price:** \$975

Sealtite conduit for OMM-2, OMI-2 or OMI-2T

5/16 in conduit, 1 meter long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

Machine tool probes

RLP40

RLP40 is a compact radio transmission part probe, ideal for use on turning centers. RLP40's compact design features an integrated probe module delivering exceptional robustness and generous overtravel. RLP40 complies with FCC regulations and operates in the 2.4 GHz range. RLP40 delivers interference-free transmission through the use of FHSS (frequency hopping spread spectrum).

RLP40 supports two methods of probe activation:

- Radio-on** The probe is turned on via an RF signal produced by the RMI-Q and initiated by an M code. The probe is turned off via an RF signal or the internal timer.
- Spin-on** The probe is turned on via an internal centrifugal switch. The probe is turned off via the centrifugal switch or the internal timer.

Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 12.5^\circ$
	Z: 6 mm (0.24 in)
Stylus trigger force	X and Y: 50 gf – 90 gf
	Z: 585 gf
Unidirectional repeatability	1.0 μm (0.00004 in)



RLP40 retrofit kit

- Includes: RLP40 probe and transmission system
RMI-Q radio machine interface
Receiver mounting bracket
30 mm stainless steel stylus (x 2)
Sealtite kit
Renishaw lathe inspection software
Installation and applications support

A shank is not included in this kit. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

Part number: RLP40-NS-S

Available at fixed price – call for details.

Note: The retrofit questionnaire at the end of this section must be filled out and returned to Renishaw before a retrofit order can be processed.

RLP40 hardware only kit

- Includes: RLP40 probe and transmission system
RMI-Q radio machine interface
Receiver mounting bracket
30 mm stainless steel stylus (x 2)
Sealtite kit

Part number: RLP40-NS-KIT **Price:** \$7,849

RLP40 probe kit

- Includes: RLP40 probe
 $\frac{1}{2}$ AA battery (2)
Tool kit

Part number: A-5627-0001 **Price:** \$4,819

RMI-Q radio machine interface

Part number: A-5687-0050 **Price:** \$2,681

Receiver mounting bracket

Part number: A-2033-0830 **Price:** \$125

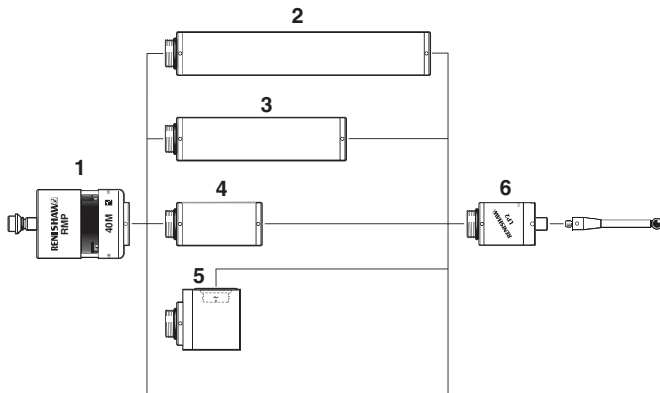
Sealtite conduit

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 **Price:** \$36

RMP40M

RMP40M is a modular version of the RLP40. The LP2 probe module, adaptors and extensions need to be purchased separately.



1 – RMP40M transmission module

Part number: A-5628-0001 Price: \$2,095

2 – LPE3 extension 150 mm

Part number: A-2063-7003 Price: \$299

3 – LPE2 extension 100 mm

Part number: A-2063-7002 Price: \$299

4 – LPE1 extension 50 mm

Part number: A-2063-7001 Price: \$299

5 – MA4 90° adaptor

Part number: A-2063-7600 Price: \$486

6 – LP2 probe assembly

Part number: A-2063-6098 Price: \$3,102

RMP40M retrofit kit

Includes: RMP40M transmission system
 LP2 probe
 RMI-Q radio machine interface
 Receiver mounting bracket
 30 mm stainless steel stylus (x 2)
 Sealrite kit
 Renishaw lathe inspection software
 Installation and applications support

Part number: RMP40M-NS-S

Available at fixed price – call for details.

RMP40M hardware only kit

Includes: RMP40 transmission system
 LP2 probe
 RMI-Q radio machine interface
 Receiver mounting bracket
 30 mm stainless steel stylus (x 2)
 Sealrite kit

Part number: RMP40M-NS-KIT Price: \$8,227

A shank is not included in the above kits. See section entitled Shanks and Toolholders on page 2-16 for price and part number information.

RMI-Q radio machine interface

Part number: A-5687-0050 Price: \$2,681

Receiver mounting bracket

Part number: A-2033-0830 Price: \$125

Sealrite conduit

5/16 in conduit, 1 m long. Includes one fitting.

Part number: A-4113-0306 Price: \$36

Machine tool probes

LP2

The LP2 probe is used on CNC lathes for workpiece inspection and tool setting. It is also used in special applications where its small body makes it suitable for gaging workpiece features with restricted access.

The LP2 is universal and can be fitted to optical, inductive, hard-wired and radio transmission systems. An array of sockets and adaptors is available to support these applications. Please contact Renishaw for further details.



Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 12.5^\circ$
	Z: 6.5 mm (0.25 in)
Stylus trigger force	X and Y: 50 gf – 90 gf
	Z: 585 gf
Unidirectional repeatability	1.0 μm (0.00004 in)

Includes: LP2 probe
2 C spanners
TK1 tool kit

Part number: A-2063-6098

Price: \$3,102

LP2H

The LP2H probe is used on CNC lathes for workpiece inspection and tool setting. It is designed for heavier duty applications where machine vibration or heavy stylus arrangements may cause unexpected triggers.



Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 12.5^\circ$
	Z: 5 mm (0.20 in)
Stylus trigger force	X and Y: 200 gf – 400 gf
	Z: 3000 gf
Unidirectional repeatability	2.0 μm (0.00008 in)

Includes: LP2H probe
2 C spanners
TK1 tool kit

Part number: A-2064-0002

Price: \$3,102

LP2DD

The LP2DD probe is based on the LP2 design, but incorporates a revised diaphragm assembly. This probe is recommended for grinding machines and other installations where dust-filled coolant is abundant.



Sense directions	$\pm X, \pm Y, +Z$
Stylus overtravel	X and Y: $\pm 15^\circ$
	Z: 6.5 mm (0.25 in)
Stylus trigger force	X and Y: 50 gf – 90 gf
	Z: 585 gf
Unidirectional repeatability	1.0 μm (0.00004 in)

Includes: LP2DD probe
2 C spanners
TK1 tool kit

Part number: A-2063-8020

Price: \$3,102

LP2/LP2DD replacement parts

LP2DD diaphragm replacement kit

An outer diaphragm replacement kit for the LP2DD.

Includes: Diaphragm
O ring

Part number: A-2063-8030 **Price:** \$42

Chip deflector

This deflector is recommended if the LP2DD is subjected to continual exposure to hot chips.

Part number: M-2063-8003 **Price:** \$142

C spanner

A C spanner is required for fitting an LP2 to your machine.

Part number: A-2063-7587 **Price:** \$18

LP2 service kit (DK2)

Includes: Front cap
Metal eyelid
Spring
O ring

Part number: A-2063-7542 **Price:** \$80

TK1 tool kit

Includes: Stylus tool
1.5 mm A/F hex key
2.0 mm A/F hex key
2.5 mm A/F hex key
3.0 mm A/F hex key
4.0 mm A/F hex key

Part number: A-2053-7531 **Price:** \$38

Machine tool probes

LP2 accessories

FS1 adjustable female socket

Provides $\pm 4^\circ$ of angular rotation about the center line of the LP2. Supplied with 500 mm long cable, protective cover and adjusting screws.

Part number: A-2063-6697 **Price:** \$142

FS2 fixed female socket

Designed for rigid mounting of an LP2. Supplied with 500 mm long cable and protective cover.

Part number: A-2063-5431 **Price:** \$142

FS3 single axis adjustable holder

The socket pivots on two balls, this provides $\pm 4^\circ$ of pitch adjustment about the center line of the LP2. Supplied with 500 mm long cable, protective cover and adjusting screws.

Part number: A-2063-5308 **Price:** \$249

MA4 90° adaptor

Part number: A-2063-7600 **Price:** \$486

HSI interface

Part number: A-5500-1000 **Price:** \$207

LPE1 extension

A 50 mm long extension which can be fitted between the LP2 and holder.

Part number: A-2063-7001 **Price:** \$299

LPE2 extension

100 mm long.

Part number: A-2063-7002 **Price:** \$299

LPE3 extension

150 mm long

Part number: A-2063-7003 **Price:** \$299

LP2 straight shanks

LP2 straight shanks are fitted with FS2 socket assemblies to accommodate the LP2 probe. An HSI interface is also required.

LP2 0.75 in straight shank with FS2 and cable assembly

Part number: A-2063-8326 **Price:** \$1,281

LP2 1 in straight shank with FS2 and cable assembly

Part number: A-2063-8328 **Price:** \$1,281

LP2 22 mm straight shank with FS2 and cable assembly

Part number: A-2063-8366 **Price:** \$1,281

MP250

MP250 is the next generation compact probe. Measuring just 25 mm in diameter and 40 mm in length, MP250 is identical in size to the popular LP2. MP250 uses RENGAGE™ strain gage sensing technology and delivers superior metrology performance. MP250 is aimed at the tool cutter grinder and special CNC lathe markets. MP250 is supported via hard-wired only and must be used with the HSI interface and FS sockets designed specifically for the MP250. MP250 is not suitable for use with inductive, optical or radio transmission.

Sense directions	±X, ±Y, +Z
Stylus overtravel	X and Y: ±15°
	Z: 6.5 mm (0.25 in)
Stylus trigger force	X and Y: 11 gf
	Z: 220 gf
Unidirectional repeatability	0.25 µm (0.00001 in)

MP250 probe kit

Includes: MP250 probe
 Tool kit

Part number: A-5500-1600 **Price:** \$4,630

MP250 accessories

FS10 adjustable female socket for MP250

Part number: A-5500-1710 **Price:** \$237

FS20 fixed female socket for MP250

Part number: A-5500-1810 **Price:** \$237

HSI-C interface for MP250

Part number: A-6527-1000 **Price:** \$241



Machine tool probes

Tool setting for turning centers

High precision removable arm (HPRA)

The HPRA is a 'plug-in', cost effective, precision tool setting system for use on CNC lathes. When needed, the arm is manually introduced to the machine envelope and held in place through the use of the machine resident HPRA base. The arm is locked in position through the duration of the tool setting cycle. After use, the arm is removed and stored on the HPRA storage stand.

Unidirectional repeatability

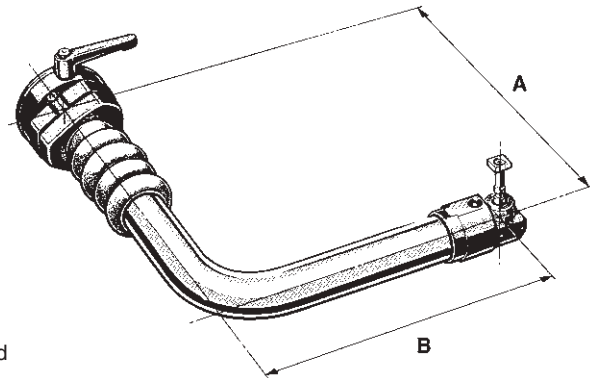
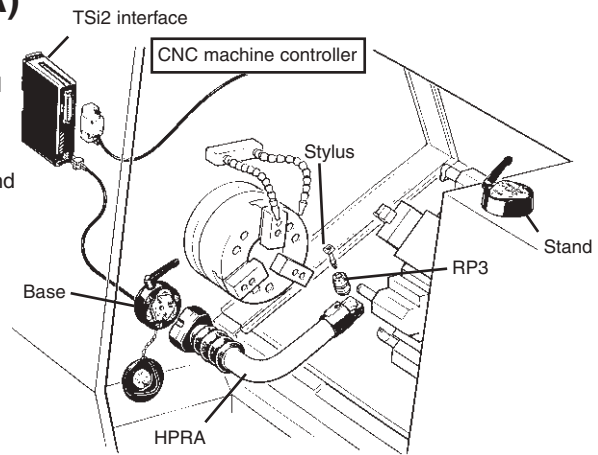
max 2σ value: 5.0 μm (0.0002 in) for arms supporting 6 in to 15 in chucks
 8.0 μm (0.0003 in) for arms supporting 18 in to 24 in chucks

Max arm dimensions: A=580 mm B=450 mm

Min arm dimensions: A=250 mm B=211 mm

HPRA is available to fit most common chuck sizes from 6 in to 24 in. Each HPRA standard kit (see below) is supplied complete with:

- RP3 probe (A-2197-0049)
- 90° probe holder
- TSi2 interface (A-2176-0010)
- HPRA storage stand (A-2176-0019)



Standard kits

Part number: See below

Price: \$3,706*

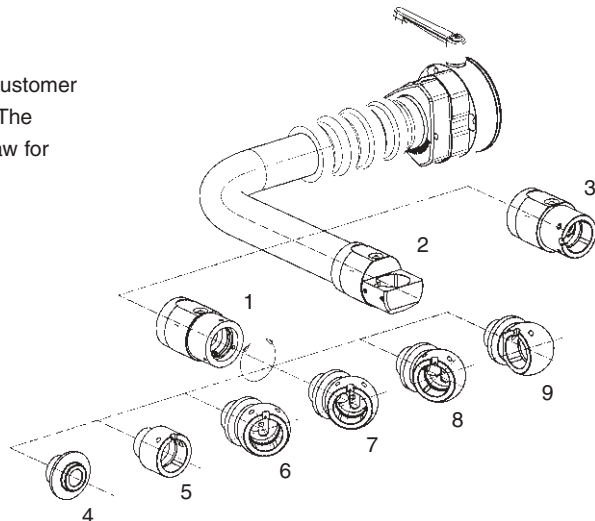
* A stylus assembly and base (rear exit or side exit) are not included and must be ordered separately.

Part description	Part number	A-dimension	B-dimension
HPRA 6 in chuck with RP3 kit	A-2176-0883	250	211
HPRA 8 in chuck with RP3 kit	A-2176-0884	280	241
HPRA 10 in chuck with RP3 kit	A-2176-0885	325	290
HPRA 12 in chuck with RP3 kit	A-2176-0886	355	290
HPRA 15 in chuck with RP3 kit	A-2176-0887	455	335
HPRA 18 in chuck with RP3 kit	A-2176-0888	510	375
HPRA 24 in chuck with RP3 kit	A-2176-0889	580	450

Custom kits

The HPRA can also be designed for specific applications. The customer must specify arm length, probe holder, stylus configuration etc. The items below depict some of the options. Please contact Renishaw for pricing.

- | | | |
|---|-------------|--------------------|
| 1 | A-2176-0268 | PCB/LED housing |
| 2 | A-2176-0018 | 90° holder fixed |
| 3 | A-2176-0257 | I/L holder fixed |
| 4 | A-2048-0523 | LP2 adaptor |
| 5 | A-2176-1291 | I/L adj RP3 holder |
| 6 | A-2176-1290 | 30° adj RP3 holder |
| 7 | A-2176-0269 | 45° adj RP3 holder |
| 8 | A-2176-1289 | 60° adj RP3 holder |
| 9 | A-2176-1288 | 90° adj RP3 holder |



HPRA bases

The HPRA base is designed to provide a repeatable location for fixing the HPRA arm during tool setting cycles. The base is designed to stay resident within the machine and is supplied with a cover to protect the unit from coolant and debris when the arm is not in use. HPRA bases are available in rear and side exit configurations and are supplied with 3 meters of cable.

HPRA rear exit base

Part number: A-2176-0025

Price: \$784

HPRA side exit base

Part number: A-2176-0187

Price: \$784

HPRA storage stand

Part number: A-2176-0019

Price: \$311

HPRA/HPPA/HPMA stylus kits

There are six primary configurations of styli to support HPRA. Each is designed to be compatible with standard sizes of block tooling ranging from 5/8 in to 2 in. Each stylus kit is supplied complete with:

- 15 × 15 × 4 stylus assembly
- Break stem
- Stylus extension/adaptor

Part number: A-2197-0157 (16 mm tooling)

Price: \$116

Part number: A-2197-0158 (20 mm tooling)

Price: \$116

Part number: A-2197-0159 (25 mm tooling)

Price: \$116

Part number: A-2197-0160 (32 mm tooling)

Price: \$116

Part number: A-2197-0161 (40 mm tooling)

Price: \$116

Part number: A-2197-0162 (50 mm tooling)

Price: \$116

HPRA/HPPA/HPMA break stems and tool kits

Part number: M-2197-0156 (16 mm and 20 mm tooling)

Price: \$25

Part number: M-2197-0150 (25 mm to 50 mm tooling)

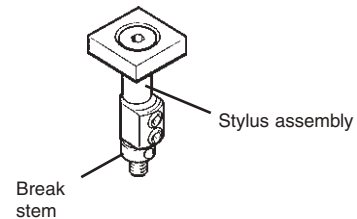
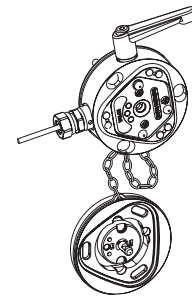
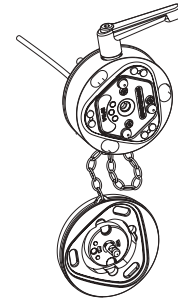
Price: \$25

Part number: A-2176-0639 (16 mm to 20 mm tooling)

Price: \$27

Part number: A-2176-0636 (25 mm to 50 mm tooling)

Price: \$27



Machine tool probes

High precision pull-down arm (HPPA)

High precision motorized arm (HPMA)

The HPPA is a manual 'pull-down / push-up' tool setting system for use on CNC lathes. The HPMA is an 'automatic' servo driven system. Both products are designed to permanently reside in the machine envelope.

When needed, the HPPA is manually 'pulled-down' into position. After use, the arm is 'pushed-up' away from the cutting volume. HPMA requires the use of CNC M codes to drive the arm to its active and stowed positions.

All HPPA and HPMA systems are supplied with an enclosure to protect the probe and stylus assembly when not in use. HPPA and HPMA hubs are available in both R/E (rear exit) and S/E (side exit) configurations. S/E hubs are supplied with a fixed 5 m cable. **R/E hubs are supplied with a bulkhead connector and require the purchase of a separate cable.**



Specifications

Unidirectional repeatability

max 2σ value in machine XZ axis: 5.0 μm (0.0002 in) for arms supporting 6 in to 15 in chucks
8.0 μm (0.0003 in) for arms supporting 18 in to 24 in chucks

HPPA max arm dimensions: A=555 mm B=458 mm

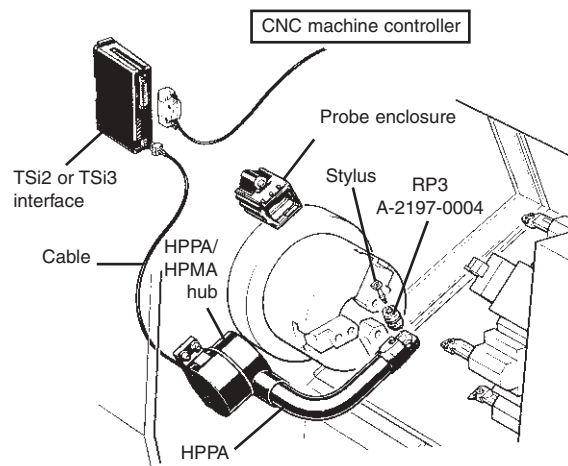
HPPA min arm dimensions: A=250 mm B=219 mm

HPMA max arm dimensions: A=555 mm B=458 mm

HPMA min arm dimensions: A=250 mm B=219 mm

HPPA and HPMA are available to fit most common chuck sizes from 6 in to 24 in. Each 'standard' kit (see below) is supplied complete with:

- Arm
- HPPA or HPMA hub
- RP3 probe (A-2197-0049)
- 25 mm tooling stylus for HPMA only (A-2197-0159)
- 90° probe holder
- TSi2 interface for HPPA (A-2176-0010)
- TSi3 interface for HPMA (A-2181-0465)
- Probe enclosure (A-2275-0098)
- Cable (supplied with S/E systems only, **purchase separately for R/E systems**)



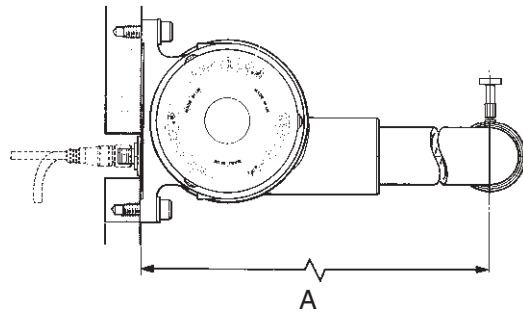
HPPA standard kits

Part number: See below

Price: \$4,380*

* A stylus assembly is not included and must be ordered separately. In addition HPPA and HPMA R/E systems require the separate purchase of a cable.

Part description	Part number	A-dimension	B-dimension
HPPA 6 in R/E with RP3 kit	A-2275-0181	250	219
HPPA 8 in R/E with RP3 kit	A-2275-0182	286	249
HPPA 10 in R/E with RP3 kit	A-2275-0183	335	298
HPPA 12 in R/E with RP3 kit	A-2275-0184	368	298
HPPA 15 in R/E with RP3 kit	A-2275-0185	400	343
HPPA 18 in R/E with RP3 kit	A-2275-0186	469	383
HPPA 24 in R/E with RP3 kit	A-2275-0187	555	458
HPPA 6 in S/E with RP3 kit	A-2275-0188	250	219
HPPA 8 in S/E with RP3 kit	A-2275-0189	286	249
HPPA 10 in S/E with RP3 kit	A-2275-0190	335	298
HPPA 12 in S/E with RP3 kit	A-2275-0191	368	298
HPPA 15 in S/E with RP3 kit	A-2275-0192	400	343
HPPA 18 in S/E with RP3 kit	A-2275-0193	469	383
HPPA 24 in S/E with RP3 kit	A-2275-0194	555	458



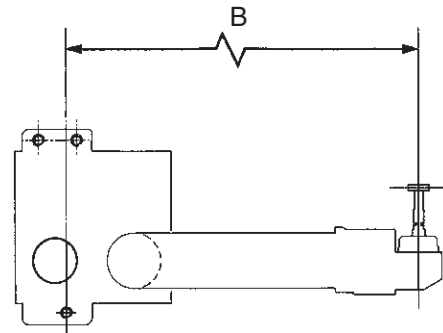
HPMA standard kits

Part number: See below

Price: \$4,942**

** Includes A-2197-0159 25 mm tooling stylus.

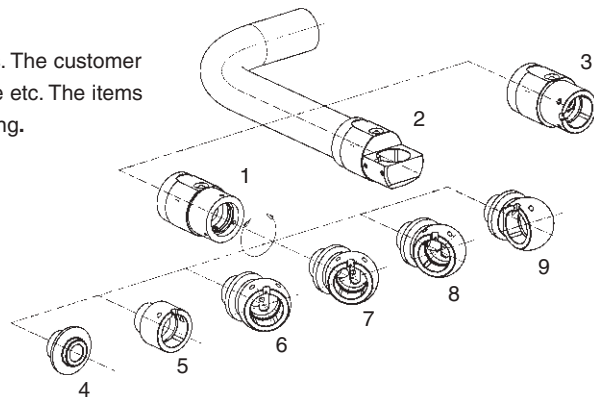
Part description	Part number	A-dimension	B-dimension
HPMA 6 in R/E with RP3 kit	A-2181-0645	250	219
HPMA 8 in R/E with RP3 kit	A-2181-0646	286	249
HPMA 10 in R/E with RP3 kit	A-2181-0647	335	298
HPMA 12 in R/E with RP3 kit	A-2181-0648	368	298
HPMA 15 in R/E with RP3 kit	A-2181-0649	400	343
HPMA 18 in R/E with RP3 kit	A-2181-0650	469	383
HPMA 24 in R/E with RP3 kit	A-2181-0651	555	458
HPMA 6 in S/E with RP3 kit	A-2181-0652	250	219
HPMA 8 in S/E with RP3 kit	A-2181-0653	286	249
HPMA 10 in S/E with RP3 kit	A-2181-0654	355	298
HPMA 12 in S/E with RP3 kit	A-2181-0655	368	298
HPMA 15 in S/E with RP3 kit	A-2181-0656	400	343
HPMA 18 in S/E with RP3 kit	A-2181-0657	469	383
HPMA 24 in S/E with RP3 kit	A-2181-0658	555	458



Custom kits

The HPPA and HPMA can also be designed for specific applications. The customer must specify arm length, probe holder, stylus configuration, hub type etc. The items below depict some of the options. Please contact Renishaw for pricing.

1	A-2176-0268	PCB/LED housing
2	A-2176-0018	90° holder fixed
3	A-2176-0257	I/L holder fixed
4	A-2048-0523	LP2 adaptor
5	A-2176-1291	I/L adj RP3 holder
6	A-2176-1290	30° adj RP3 holder
7	A-2176-0269	45° adj RP3 holder
8	A-2176-1289	60° adj RP3 holder
9	A-2176-1288	90° adj RP3 holder



Machine tool probes

HPPA cables

The HPPA R/E systems require the use of one of the cables below:

Part number: P-CA82-1010 (2 meters)	Price: \$34
Part number: P-CA82-1009 (5 meters)	Price: \$54
Part number: P-CA82-1011 (10 meters)	Price: \$76

HPMA cables

The HPMA R/E systems require the use of one of the cables below:

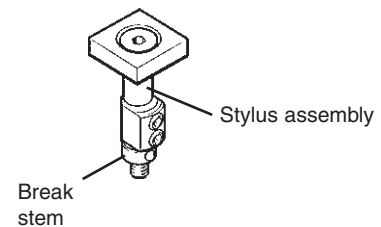
Part number: A-2181-1080 (2 meters)	Price: \$105
Part number: A-2181-1085 (5 meters)	Price: \$131
Part number: A-2181-1090 (10 meters)	Price: \$178

HPRA/HPPA/HPMA stylus kits

There are six primary configurations of styli to support HPPA and HPMA. Each is designed to be compatible with standard sizes of block tooling ranging from 5/8 in to 2 in. Each stylus kit is supplied complete with:

- 15 × 15 × 4 stylus assembly
- Break stem
- Stylus extension/adaptor

Part number: A-2197-0157 (16 mm tooling)	Price: \$116
Part number: A-2197-0158 (20 mm tooling)	Price: \$116
Part number: A-2197-0159 (25 mm tooling)	Price: \$116
Part number: A-2197-0160 (32 mm tooling)	Price: \$116
Part number: A-2197-0161 (40 mm tooling)	Price: \$116
Part number: A-2197-0162 (50 mm tooling)	Price: \$116



HPRA/HPPA/HPMA M4 break stems and tool kits

Part number: M-2197-0156 (16 mm and 20 mm tooling)	Price: \$25
Part number: M-2197-0150 (25 mm to 50 mm tooling)	Price: \$25
Part number: M-2048-2093 (Mori Seiki)	Price: \$25
Part number: A-2176-0639 (16 mm to 20 mm tooling)	Price: \$27
Part number: A-2176-0636 (25 mm to 50 mm tooling)	Price: \$27



Legacy HPA stylus kits

TS20 replacement stylus kit

Includes stylus 10 × 10 × 4, break protect link, adaptor and screw.

Part number: A-2008-0601 (25 mm tooling)	Price: \$116
Part number: A-2008-0602 (32 mm tooling)	Price: \$116
Part number: A-2008-0603 (40 mm tooling)	Price: \$116

TS20 break protect link

Part number: M-2008-0333 (25 mm tooling)	Price: \$25
Part number: M-2008-0604 (32 mm tooling)	Price: \$25
Part number: M-2008-0605 (40 mm tooling)	Price: \$25

RP1, RP2 and RP3 tool setting probes

The RP1, RP2 and RP3 probes are suitable for OEM installation into purpose-built holders, or for use with Renishaw's automatic or manual tool setting arms.

RP1 – Tool setting/inspection probe and tool kit

For use on OEM installation into purpose-built holders.

Part number: A-2154-0007 **Price:** \$1,540

RP1 DD – RP1 double diaphragm version and tool kit

For use on OEM installation into purpose-built holders.

Part number: A-2154-0008 **Price:** \$1,540

RP2 – Probe for tool setting arm (TSA) only

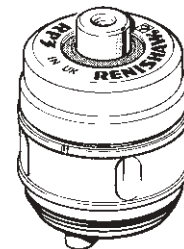
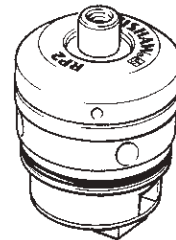
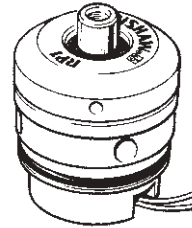
Part number: A-2116-0149 **Price:** \$1,540

RP2DD – RP2 double diaphragm version for TSA only

Part number: A-2116-0150 **Price:** \$1,540

RP3 – Probe for HPRA, HPPA and HPMA arms

Part number: A-2197-0049 **Price:** \$1,540



Machine tool probes

Interfaces

OSI interface

The OSI interface is required for use with Renishaw optical probes using Modulated transmission. The OSI works exclusively with the OMM-2 receiver.

Part number: A-5492-2000

Price: \$975



HSI interface

The HSI interface is required for use with Renishaw's LP2 variants TS27R/TS34 probes. The HSI converts signals received from the probe into an acceptable form for the CNC machine control. The HSI has solid state relay output.

Part number: A-5500-1000

Price: \$207



HSI-C interface

The HSI-C processes signals from RENGAGE or standard hard-wired probes and converts them into voltage-free solid-state relay (SSR) outputs, which are then transmitted to the CNC machine controller.

Part number: A-6527-1000

Price: \$241



NCi-6 interface

The NCi-6 interface is required for use with Renishaw non-contact tool setting systems. The interface converts probe signals into an acceptable form for the CNC machine control. This interface has solid state relay outputs.

Part number: A-6516-2000

Price: \$237



Receivers and interfaces

OMI-2 and OMI-2T are optical receivers that transmit signals between the probe and CNC control. All systems offer visual indicators of probe status, start signal status, battery condition and error condition.

OMI-2

OMI-2 offers increased resistance to light interference and is exclusively compatible with Renishaw optical transmission systems operating in Modulated transmission mode (OMP60, OMP40, OMP400 or OLP40).

Part number: A-5191-0049 (8 m cable) **Price:** \$1,657

Part number: A-5191-0050 (15 m cable) **Price:** \$1,743

OMI-2T

OMI-2T is identical to the OMI-2 and is the exclusive interface supporting the twin probe system. OMI-2T is capable of communicating with multiple optical probes. CNC must have supporting M codes. This interface should be used when combining an OTS with an OMP60, OMP40 or OMP400.

Part number: A-5439-0049 (8 m cable) **Price:** \$1,657

Part number: A-5439-0050 (15 m cable) **Price:** \$1,743

OMM-2 optical machine module

The OMM-2 receiver is required for use with Renishaw optical probes using Modulated transmission. The OMM-2 works exclusively with the OSI. OMM-2 is capable of communicating with multiple optical probes.

Part number: A-5492-0051 (25 m cable) **Price:** \$1,033



Machine tool probes

RMI-Q radio machine interface

RMI-Q is identical to RMI and is the exclusive interface supporting multiple (up to four) probe systems. RMI-Q is capable of communicating with multiple radio probes. CNC must have supporting M codes. This interface should be used when combining an RTS with an RMP40, RMP60 or RMP600.



Part number: A-5687-0049 (8 m cable) **Price:** \$2,681

Part number: A-5687-0050 (15 m cable) **Price:** \$2,681

RMI-Q accessories

RMI-Q 30 m replacement cable

Part number: A-5687-0303 **Price:** \$396

RMI-Q 50 m replacement cable

Part number: A-5687-0304 **Price:** \$539

RMI-Q antenna cover

Part number: A-5687-0305 **Price:** \$125

Lathe tool setting arm interfaces

There are two primary configurations of interfaces supporting lathe arms. The TSi2 and TSi3 deliver OCT (active high) output for probe status and arm positions, while the TSi2-C and TSi3-C interfaces deliver solid state relay (SSR) outputs for probe status and arm positions. The TSi2 and TSi2-C support the HPRA and HPPA lathe arms. The TSi3 and TSi3-C support the HPMA lathe arm.

TSi2

Part number: A-2176-0010

Price: \$194

TSi2-C

Part number: A-2176-1152

Price: \$194

TSi3

Part number: A-2181-0465

Price: \$237

TSi3-C

Part number: A-2181-2239

Price: \$237



Machine tool probes

Machine tool software

Macro based programming

Renishaw probing and tool setting software is a set of macros that control probing motion and data manipulation for a number of routines with input of a few parameters. Some capabilities may vary by specific software package and individual controller. All software is supplied on USB with electronic user's guide.

Inspection Plus software for machining centers

Available measurement cycles include:

- X or Y or Z single surface measure
- Any angle web/pocket
- 3 or 4 point bore/boss
- Internal/external corner
- 4th or 5th axis measure
- Feature to feature measure

Description	Part number	Price
Brother 32A (June 2002 and above)	A-4012-0908	\$1,127
Brother 32B	A-4012-1028	\$1,127
DMG Mori (Fanuc/Meldas)	A-4012-0936	\$1,127
Fagor 8065/8070	A-4016-0071	\$1,127
Fanuc 0-31	A-4012-0516	\$1,127
Haas	A-4012-0880	\$1,127
Mazak Fusion	A-4013-0023	\$1,127
Mazak Smooth/Matrix	A-4013-0112	\$1,127
Mitsubishi Meldas	A-4012-0516	\$1,127
Okuma OSP	A-4016-1035	\$1,127
Siemens 810D/840D (Ver 5 and above)	A-4014-0356	\$1,127
Toshiba Tosnuc (888M/999M)	A-4012-0949	\$1,127
Yasnac I80, MX3, J50, J300	A-4014-0070	\$1,127

Inspection Plus software for machining centers using strain gage probes

Available measurement cycles include:

- X or Y or Z single surface measure
- XYZ vector measure
- Any angle web/pocket
- 3 or 4 point bore/boss
- Internation/external corner
- 4th or 5th axis measure
- Feature to feature measure

Description	Part number	Price
Haas	A-4012-0890	\$1,127
Mazak Fusion	A-4013-0040	\$1,127
Yasnac I80, MX3, J50, J300	A-4014-0104	\$1,127

See data sheet H-2000-2298 for more details on Renishaw macro software (including support for SupaTouch, GoProbe and Set and Inspect).

Tool setting software for machining centers

Renishaw tool setting software allows you to set tool length and diameter offsets for single point and multiple point tools, perform in-cycle broken tool detection and manual or automatic (programmed) positioning.

Contact tool setting

Description	Part number	Price
Brother 32A (June 2002 and above)/32B	A-4012-1007	\$451
DMG Mori (Fanuc/Meldas)	A-4012-1555	\$451
Fadal	A-4016-0043	\$451
Fagor 8065/8070	A-4016-0078	\$451
Fanuc 0-31	A-4012-0584	\$451
Haas	A-4012-0886	\$451
Mazak 640M, M32, M+	A-4013-0036	\$451
Mazak Smooth/Matrix	A-4013-0133	\$451
Mitsubishi Meldas	A-4012-0584	\$451
Okuma OSP	A-4016-1039	\$451
Okuma OSP (HMC)	A-4016-1071	\$451
Siemens 810/840D (Ver 5 and above)	A-4014-0396	\$451
Yasnac J50, J300, I80/MX3	A-4014-0018	\$451

Non-contact tool setting

Description	Part number	Price
Brother 32A (June 2002 and above)	A-4012-0904	\$677
Brother 32B	A-4012-1035	\$677
DMG Mori (Fanuc/Meldas)	A-4012-0953	\$677
Fadal	A-4016-0061	\$677
Fanuc 0-31	A-4012-0820	\$677
Haas	A-4012-0895	\$677
Mazak Fusion	A-4013-0062	\$677
Mazak Smooth/Matrix	A-4013-0119	\$677
Mitsubishi Meldas	A-4012-0820	\$677
Okuma OSP	A-4016-1021	\$677
Siemens 810/840D (Ver 5 and above)	A-4014-0401	\$677
Yasnac MX3, I80, J50, J300	A-4014-0020	\$677

Special non-contact tool setting

Description	Part number	Price
Mazak angle beam Fusion	A-4013-0088	\$677
Mazak E-Series Matrix	A-4013-0123	\$677
Mazak E-Series Fusion	A-4013-0092	\$677
Yasnac angle beam	A-4014-0025	\$677

Machine tool probes

Inspection software for turning centers

Renishaw's Inspection software for turning centers offers macros for:

- single-point (radial) measurement
- two-point (diameter) measurement
- rib/groove measurement
- single Z-surface measurement

It can update tool offsets and work offsets. It has an upper tolerance band which can be set for no offset correction. On completion of each measurement cycle it is possible to print out the results.

Description	Part number	Price
Fanuc 0-31	A-4012-0541	\$902
Haas	A-4012-0874	\$902
Haas Y axis	A-4012-1309	\$902
Mazak (QTN) Fusion 640T	A-4013-0071	\$902
Mazak (QTN) Smooth/Matrix	A-4013-1309	\$902
Siemens 810D/840D	A-4014-0137	\$902
Yasnac LX3	A-4014-0011	\$902

Inspection software for multi-axis turning centers

- horizontal and vertical head orientations
- X, Y and Z single surface measure
- bore/boss
- web/pocket
- C-axis find

Description	Part number	Price
DMG Mori MT/NT (Fanuc)	A-4012-0834	\$1,127
DMG Mori Y axis (Fanuc)	A-4012-1301	\$1,127
Doosan MX (Fanuc)	A-4012-1016	\$1,127
Doosan SMX (Fanuc)	A-4012-1511	\$1,127
Fanuc/Meldas Y axis	A-4012-1092	\$1,127
Mazak E-series Fusion	A-4013-0083	\$1,127
Mazak Mark IV and E-series Matrix	A-4013-0106	\$1,127
Nakamura Super NX (Fanuc)	A-4012-1074	\$1,127

Tool setting software for turning centers

The Renishaw tool setting software for turning centers sets tool length and/or diameter for static and powered tools. It has manual or automatic (programmed) positioning capability.

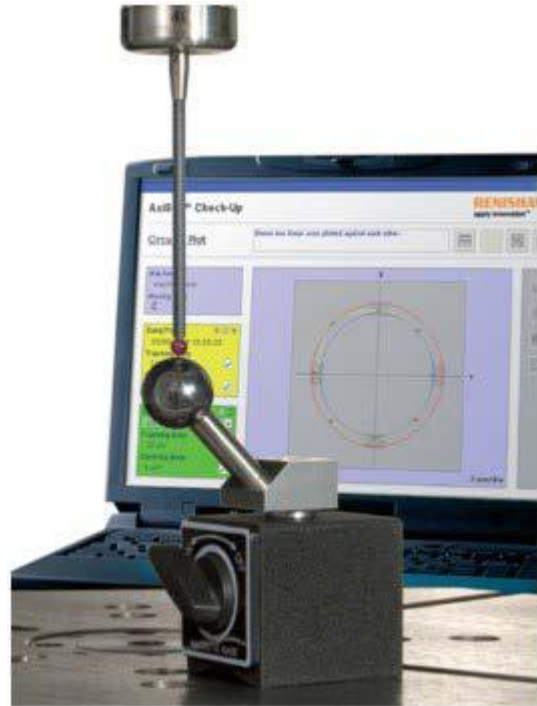
Description	Part number	Price
Fanuc 0-31	A-4012-0528	\$451
Fanuc (2/3 axis/driven tools)	A-4012-0779	\$451
Haas	A-4012-0877	\$451
Mitsubishi Meldas	A-4013-0254	\$451
Mitsubishi Meldas (3 axis)	A-4013-0250	\$451
Siemens 810D/828D/840D)	A-4014-0130	\$451

AxiSet™ Check-Up

Compatible with common formats of 5-axis machines, AxiSet™ Check-Up provides machine users with a fast and accurate method for determining rotary axis pivot points. The system is comprised of macro software, dedicated calibration artifact and PC-based data analysis software. Performance analysis is reported graphically via Microsoft® Excel®, compared against user-defined tolerances and stored for historical comparison.

The solutions defined below are compatible with 5-axis table-table machines. New solutions are being developed. Contact Renishaw for the latest list of compatibility. Each solution includes:

- CNC specific macro
- Artifact with magnetic base
- PC-based data analysis software



AxiSet™ Check-Up Mazak Variaxis

Part number: A-5642-1000 **Price:** \$2,620

AxiSet™ Check-Up Fanuc (Table-Table)

Part number: A-5642-1100 **Price:** \$2,620

AxiSet™ Check-Up Mori Seiki NMV NMH

Part number: A-5642-1400 **Price:** \$2,620

AxiSet™ Check-Up Siemens (Table-Table)

Part number: A-5642-1500 **Price:** \$2,620

AxiSet™ Check-Up Mazak Mark IV

Part number: A-5642-1005 **Price:** \$2,620

AxiSet™ Check-Up Mazak eV/eH

Part number: A-5642-1009 **Price:** \$2,620

AxiSet™ Check-Up Hurco Winmax (Table-Table)

Part number: A-5642-1105 **Price:** \$2,620

AxiSet™ Check-Up Haas

Part number: A-5642-1600 **Price:** \$2,620

AxiSet™ Check-Up Mori Seiki NT

Part number: A-5642-1405 **Price:** \$2,620

AxiSet™ Check-Up Siemens (Head-Head)

Part number: A-5642-1515 **Price:** \$2,620

Machine tool probes

Off-line programming

Productivity+™ is a software module designed to simplify the process of integrating probing cycles into the CNC machining program.

Productivity+™:

- Imports the native CAD model
- Creates and edits probing programs
- Allows simulation of inspection routines in a virtual environment
- Requires no detailed knowledge of macro codes
- Is compatible with many popular controls
- Multi-axis machining center support
- Perpetual software maintenance



Productivity+™ Active Editor Pro

Part number: A-4007-1400

Price: \$5,232

Productivity+™ post processors

Productivity+™ is supplied with one post processor per purchased seat (select from the list below).

Control	Part number	Price
Brother	A-4007-5900	\$1,571
Fanuc Macro B	A-4007-5100	\$1,571
Haas	A-4007-5200	\$1,571
Heidenhain i530	A-4007-6000	\$1,571
Heidenhain 426/430	A-4007-6900	\$1,571
Heidenhain 6xx	A-4007-7200	\$1,571
Hitachi Seicos	A-4007-5300	\$1,571
Hurco Winmax	A-4007-6800	\$1,571
Makino	A-4007-5400	\$1,571
Mazak	A-4007-5500	\$1,571
Mazak Integrex	A-4007-7100	\$1,571
Mitsubishi Meldas	A-4007-5600	\$1,571
Mori Seiki	A-4007-6600	\$1,571
Okuma	A-4007-6300	\$1,571
Siemens 840D/810D	A-4007-6700	\$1,571
Yasnac	A-4007-5700	\$1,571

Productivity+™ CAD importers

Productivity+™ comes with three CAD importers as standard: IGES, STEP and Parasolid®. Other CAD importers are available (select from the list below).

CAD system	Part number	Price
Pro-E	A-5226-0007	\$1,571
CATIA	A-5226-0008	\$1,571
UG/NX	A-5226-0009	\$1,571
ACIS	A-5226-0010	\$1,048
SolidWorks®	A-5226-0011	\$1,571
Inventor™	A-5226-0012	\$1,571
All of the above	A-5226-0020	\$2,095

Productivity+™ Active Editor Pro 90-day trial

Part number: A-4007-8999

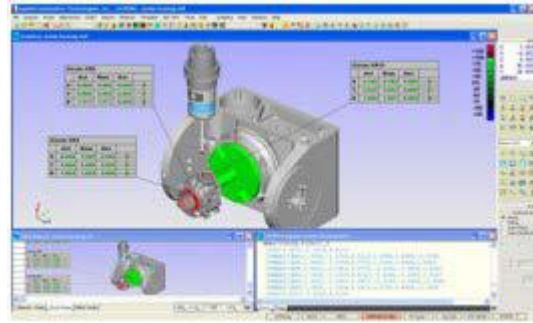
Price: FOC

Renishaw Capps-NC

Renishaw Capps-NC is a comprehensive part verification software package for machine tools, designed to give confidence to the user that the part produced conforms to the CAD model.

Capps-NC can reduce set-up time and fixturing cost while creating automated closed loop manufacturing. A reduction of additional repair and scraps will increase product quality.

- Generate measurement programs from the CAD model, offline, in a virtual PC environment.
- Using the comprehensive probe builder, various shanks, Renishaw probes and styli can be modeled.
- Generate probe paths for 3-axis machines measuring 2D and 3D prismatic features and 3D free-form surfaces.
- Collision avoidance automatically detects obstructions and generates avoidance paths.
- Supports a variety of CNCs and machine communication protocols (RS232, Ethernet, FOCAS, Mnet, TNCDirect, Siemens OPC, MTConnect).
- Uses industry-standard DMIS code to generate machine motion, construction, dimensioning and tolerance instructions.
- Generate comprehensive measurement reports with full GD&T.
- Using the optional 4th/5th axis module, Capps-NC supports a variety of multi-axis machine configurations.
- Using the optional tool and work offset module, tool compensation commands and work offset shifts can be incorporated into the post processed output.
- Intuitive part alignment tools to achieve perfect part set-up conditions before the cutting process. Tools such as Best Fit and Iterative Part Alignment.
- Adapt G-code cutting and trimming programs to any actual part shape and orientation for 5-axis motion code with NC-Fit.
- First year maintenance and support included.



Capps-NC Advanced

Capps-NC Advanced is a single software license designed for the user who intends to program inspection cycles and capture measurement results **on a single PC**.

Includes: Complete Capps-NC license
 Machine interface option
 CAD importers (IGES and STEP)
 One-year Capps-NC maintenance and support

Capps-NC Advanced – 3-axis machine

Part number: A-5722-CPNC-ADV-3A **Price:** \$16,500

Capps-NC Advanced – 4-axis machine

Part number: A-5722-CPNC-ADV-4A **Price:** \$19,500

Capps-NC Advanced – 5-axis machine

Part number: A-5722-CPNC-ADV-5A **Price:** \$22,500

Capps-NC Advanced – Mill Turn machine

Part number: A-5722-CPNC-ADV-MT **Price:** \$23,500

Capps-NC Advanced each additional axis control

Part number: A-5722-CPNC-ADV-AX **Price:** \$3,500

Capps-NC Advanced additional turret control

Part number: A-5722-CPNC-ADV-TUR **Price:** \$3,500

Work offset programming and feedback

Part number: A-5722-CPNC-ADV-WO **Price:** \$4,950

Tool offset programming and feedback

Part number: A-5722-CPNC-ADV-TO **Price:** \$4,950

Machine tool probes

Capps-NC programming station

Capps-NC programming – 3-axis machine

Part number: A-5722-CPNC-PS-3A Price: \$10,500

Capps-NC programming – 4-axis machine

Part number: A-5722-CPNC-PS-4A Price: \$12,500

Capps-NC programming – 5-axis machine

Part number: A-5722-CPNC-PS-5A Price: \$14,500

Capps-NC programming – Mill Turn machine

Part number: A-5722-CPNC-PS-MT Price: \$15,000

Capps-NC programming each additional axis control

Part number: A-5722-CPNC-PS-AX Price: \$2,045

Capps-NC programming additional turret control

Part number: A-5722-CPNC-PS-TUR Price: \$2,045

Work offset programming and feedback

Part number: A-5722-CPNC-PS-WO Price: \$2,250

Tool offset programming and feedback

Part number: A-5722-CPNC-PS-TO Price: \$2,250

Capps-NC execution module

Capps-NC execution module – 3-axis machine

Part number: A-5722-CPNC-EM-3A Price: \$8,950

Capps-NC execution module – 4-axis machine

Part number: A-5722-CPNC-EM-4A Price: \$10,450

Capps-NC execution module – 5-axis machine

Part number: A-5722-CPNC-EM-5A Price: \$12,500

Capps-NC execution module – Mill Turn machine

Part number: A-5722-CPNC-EM-MT Price: \$13,500

Capps-NC execution module each additional axis control

Part number: A-5722-CPNC-EM-AX Price: \$1,950

Capps-NC execution module additional turret control

Part number: A-5722-CPNC-EM-TUR Price: \$2,450

Work offset execution module and feedback

Part number: A-5722-CPNC-EM-WO Price: \$2,950

Tool offset execution module and feedback

Part number: A-5722-CPNC-EM-TO Price: \$2,950

Capps-NC additional NC options

Additional machine interface options

Part number: A-5722-A46-CPNC-OP-INT **Price:** \$1,950

2nd spindle or turret interface capability for mill turns

Part number: A-5722-A418-CPNC-OP_DT **Price:** \$3,250

License Manager

Includes: 3 nodes of connection

Part number: A-5722-A418-CPNC-LM **Price:** \$4,950

Execution modules configured for License Manager discount from configured price

Part number: A-5722-A420-CPNC-LMCEM **Price:** Call for details

AAT NC-fit for NC part program correction

Part number: A-5722-A420-CPNC-NCF **Price:** \$12,500

Capps-NC Direct CAD translators

Catia4 direct import

Part number: A-5722-C1-CAD-C4 **Price:** \$4,551

Catia5 direct import

Part number: A-5722-C2-CAD-C5 **Price:** \$4,551

Pro-E direct import

Part number: A-5722-C3-CAD-PE **Price:** \$4,551

Unigraphics import

Part number: A-5722-C4-CAD-UG **Price:** \$4,551

Parasolid import

Part number: A-5722-C5-CAD-PS **Price:** \$1,728

SolidWorks import

Part number: A-5722-C6-CAD-SW **Price:** \$1,728

VDA import

Part number: A-5722-C7-CAD-VDA **Price:** \$1,095

Machine tool probes

Capps-NC maintenance

SMA rate on software

Part number: A11-SMA-NC **Price:** Call for details

Each skipped year

Part number: A-5722-SMAE-NC **Price:** Call for details

Probe retrofit questionnaire

Customer information (location of installation)



Important! This document consists of four pages. Please be sure to read all information before returning.

Address of installation:

Company name _____ Contact name _____

Street _____

City _____ State _____ Zip _____

Telephone _____ Fax _____ E-mail _____

Product being purchased _____

Machine information

Machine make _____ Control make _____

Machine model _____ Control model _____

Machine type (i.e. VMC, HMC, lathe, gantry etc.) _____

Tool holder type/size (i.e. CAT50, BT40, HSK A80, VDI, other) _____

Axis/Axis travels: X _____ Y _____ Z _____ B _____ Other _____

Is the machine still in warranty? Yes No Serial # _____

Is the machine installed? Yes No If no, when will installation be complete? _____

Spindle orientation: Yes No

Pallet shuttle: Yes No If Yes, indexer or full 4th axis

Is there currently a probe system on the machine (i.e. tool post, part probe, tool eye)? Yes No

If yes, please explain _____

Is a safety briefing required to work at location of installation? Yes No

Note: If a non-disclosure form is required to enter the facility, please provide at least two weeks prior to the scheduled visit.

Application information _____

Machine tool probes

Note: The machine must be operational at the time of installation. A pull stud is required for spindle-mounted probes, but is not provided by Renishaw. A calibration device is not supplied.

The following options must be installed and activated (turned on) by your OEM, machine distributor or control manufacturer prior to Renishaw's arrival.

Required control features/options

Indicate which options are installed on your control.

Fanuc/Yasnac/Mitsubishi/Mazak

G31 skip	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
G31 high speed skip	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
G31 multi-skip	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
Custom macro	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Haas

Promac	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
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Connector type/pin location of skip signal _____

- 24 V dc required to power probe interface
- M codes may be required – see the following information pages for details

Note: Controls not listed may have similar features/options. Contact Renishaw regarding support for other controls.

IMPORTANT

This questionnaire is intended for information purposes for installation only and shall in no event constitute a binding contract with Renishaw.

Please note – The issuer of the purchase order is responsible for all information provided to Renishaw. Please make sure that the information is as accurate and current as possible, as this will expedite the installation. If additional time or hardware is required, due to incorrect information, additional costs may be billed to you.

The installation timeframe is 2 to 3 weeks. Please keep in mind that your installation is not considered for scheduling until this form is completed and returned to us. At that time, the form will be reviewed and you will be contacted as to the acceptability of the retrofit and dates available for installation.

I have read and understood the preceding information.



Important – this document consists of four pages. Please be sure to read all information before returning.

Signed _____ Date _____

Purchase order issued to Renishaw by:

Company name _____ Contact name _____

Street _____

City _____ State _____ Zip _____

Telephone _____ Fax _____

Additional retrofit customer information

Machine tool software requirements

Machining center:	Inspection Plus	46.5 Kb	117 m
	Tool setting	9 Kb	23 m
	NC4 tool setting	15 Kb	38 m
Lathe software:	Inspection	11 Kb	28 m
	Tool setting	6 Kb	15 m

Program number requirements

Renishaw program numbers range from 9002 through 9100, and 9700 through 9900.

Macro variables required	#100–#149 (only used while macro is running)
	#500–#565 (some variables in this range required and must be dedicated)

Training

Training will be provided after installation on the use and application of Renishaw probing cycles. Training will **not** include the incorporation of probe cycles into the customer's current manufacturing programs. Any special applications or additional software training which requires additional time or visits to the original scheduled installation/training will be charged at Renishaw Inc standard service rates.

Note: Please indicate any additional training requirements on your purchase order.

Part probe system details

OMP40/OMP60/RMP60	Turn on (via optical or RF) / Turn off (via optical or RF) or time out	Installation time: Up to 8 hours Training time: Up to 6 hours
	Turn on methods	Auto start (OMP40/OMP60) sends a start signal every second until a probe command is received. This method can only be used if the probe is stored outside the machine enclosure when not in use. Machine start (OMP40/OMP60/RMP60) requires that an M code be available for use to issue the start command. Spin start (OMP60/RMP60) uses an internal switch. The probe will turn on after being spun at 650 RPM for 1 second.
	Turn off methods	Time out (OMP40/OMP60/RMP60). A timer automatically switches the power off 12, 33 or 134 seconds (selectable) after turn on. Each time the probe is triggered, the timer is reset to the selected value. Optical off (OMP40/OMP60) / RF off (RMP60) requires that an M code be available to initiate the turn off sequence.
	OMP400	Optical (flash) on/optical off or time out (optical transmission) Installation time Up to 8 hours Training time Up to 6 hours
	Turn on method	Machine start (optical on) requires that an M code be available for use to issue the start command. Auto start cannot be used with the strain gage probes.
	Turn off methods	Time out. A timer automatically switches the power off 33 or 134 seconds (selectable) after turn on. Each time the probe is triggered, the timer is reset to 33 or 134 seconds. Optical off. Requires the use of an M code as stated for machine start above.
RMP40M OLP40M	Turn on (via optical or RF) / Turn off (via optical or RF) or time out	Installation time Up to 8 hours Training time Up to 6 hours
	Turn on method	Machine start requires that an M code be available for use to issue the start command. Auto start cannot be used with these probes (for lathe applications).
	Turn off method	Optical off. Requires the use of an M code as stated for machine start above.

Machine tool probes

Tool setting probe details

TS27R	Hard-wired	Installation time Training time	Up to 6 hours Up to 6 hours
OTS	<p>Machine start requires that an M code be available for use to issue the start command. Auto start cannot be used with these probes.</p> <p>These probes are fixed either to a T slot in the machine bed, or can be mounted on a riser if required to allow tools to reach the stylus. A riser is not provided by Renishaw unless specified on the quotation. The TS27R is wired to the probe interface via a tough cable conduit. The TS27R cannot be mounted on pallets or rotary tables.</p>		
NC4 or TRS2	Hard-wired	Fixed installation time Training time	Up to 8 hours Up to 6 hours
	Fixed system	<p>The probe is fixed either to a T slot in the machine bed, or can be mounted on a riser if required to allow tools to reach the laser beam. A riser is not provided by Renishaw unless specified on the quotation. The NC4 is wired to the probe interface via a tough cable conduit. The NC4 cannot be mounted on pallets or rotary tables.</p>	
		Separate installation time Training time	Up to 12 hours * Up to 6 hours
	Separate system	<p>The probe transmitter and receiver are mounted to brackets which attach to the machine. Brackets and their installation are not provided by Renishaw unless specifically stated in the quotation. Brackets not provided by Renishaw must be mounted prior to the arrival of a Renishaw engineer. The brackets should allow for complete machine motion (pallet shuttles, rotary tables, axis travels etc), laser beam alignment and expected system performance.</p> <p>* Depending on bracket mounting requirements, additional time may be required.</p>	
	Fixed or separate	<p>The NC4 must be mounted in such a way that the tool can access the laser beam and move in all three axes (X, Y, Z) with respect to the beam. For basic functionality (length, diameter, basic broken tool), no M code is required. For additional features (missing/ broken insert, profile checking, rapid broken tool check) a level M code pair is required.</p>	
HPRA	Hard-wired	<p>The HPRA must be mounted to a bracket which attaches to the machine. The brackets and their installation are not provided by Renishaw unless specifically stated in the quotation. Brackets not provided by Renishaw must be mounted prior to the arrival of a Renishaw engineer. The brackets should allow for complete machine and expected system performance.</p>	

Dual probe installations (part and tool probe on same machine)

Requires either two independent probe inputs (multi-channel skip) or an M code driven relay. The M code driven relay must be installed and available prior to the probe installation.

Example M51 – part probe (selected) M61 – tool setter (selected)

M51 energize relay (coil latches and stays energized) program continues
M61 de-energize relay (coil resets) program continues

M code for flash (optical) on and off

M71 pulse (momentarily energize relay) program continues

Example: Pulse M code M71 (flash on and flash off)

Gaging systems



EQUATOR™

the versatile gauge™

The Renishaw Equator™ is a versatile alternative to custom gaging, offering inspection of an unprecedented variety of manufactured parts.

Fast, repeatable and versatile

The Equator™ system consists of a highly repeatable, “parallel kinematic” structure machine coupled with a high-power, multi-axis universal controller and digital servo power amplifier. The resultant system is capable of high-speed, comparative gaging for inspection of high-volume manufactured parts, directly on the shop floor. Additionally, the optimized ratio of working envelope (300 mm × 300 mm × 300 mm*) to machine footprint (~ 570 mm × 500 mm), means Equator™ can be set to work in even the most crowded of factory spaces. The lightweight machine, weighing just 55 lbs, requires just single phase power and needs no costly air supply.

Re-configuration of the gaging system to cater for part design changes, or to measure new parts, is possible in a fraction of the time it would take with conventional custom gaging. An operator can switch between parts in seconds, perfect for flexible manufacturing processes or for accepting parts from multiple machines.

Easy to use

The included intuitive MODUST™ Organizer operator front-end software requires little or no training, while on the programmable system the comprehensive MODUST™ Equator™ programming software allows engineers to rapidly create gaging routines for any part – simple or complex, prismatic or free-form – using industry-standard DMIS programming.

Thermally “stable” – for shop floor use

Re-mastering is as swift as measuring a production part and immediately compensates both the machine and the part being measured for temperature variations typical of a shop floor environment.



Integrated stylus changing

Further versatility is offered by the included Equator™-specific stylus changing rack, allowing automated in-cycle changing of SM25 stylus modules. The SM25 modules couple to the industry-standard SP25 CMM probe, allowing Equator™ users to swap the stylus configurations without re-qualifying each time. Up to six stylus combinations can be loaded into the rack at any time. These can be used on a single complex part or with multiple parts of varying geometries.

Traceability to calibrated CMMs

Master parts do not need to be expensive custom parts like a traditional gage; take a production part and measure it on a CMM to establish feature variation from CAD or drawing nominals. The results from any CMM can be configured to be used directly within the Equator™ software.

Effectively, the calibrated absolute accuracy of the CMM can be “extended” onto the shop floor to provide calibrated traceability to Equator™ measurements. With the calibration file loaded into the Equator™ software, measurements made in the Equator™ system can be referred back to the CAD or drawing nominals. This allows true process control with SPC packages.

* 300 mm Z measurement range available with module change to SM25-3, measuring external features only on an extended height Equator only. Z axis stroke is 150 mm.

Machine kit

Includes: Equator™ 300 machine
Equator™ 6-port rack
SP25M scanning probe kit
Calibration accessory kit
Joystick (or 'E-stop' button)
Cables



Controller kit

Includes: Equator™ controller
Intuitive "front-end" software package

Equator™ tiles

Renishaw fixture plates (various options available).

Regular height Equator™ combination kits

Operator's version

Description	Part number	Price
Equator™ machine with 6-port rack and joystick, controller with Organizer software and M6 threaded fixture plate	A-EQ33-1J10	\$30,505
Equator™ machine with 6-port rack and joystick, controller with Organizer software and ¼ in R&R threaded fixture plate	A-EQ33-1J40	\$30,882
Equator™ machine with 6-port rack and stop button, controller with Organizer software and M6 threaded fixture plate	A-EQ33-1S10	\$31,581
Equator™ machine with 6-port rack and stop button, controller with Organizer software and ¼ in R&R threaded fixture plate	A-EQ33-1S40	\$30,457

Programmer's version

Description	Part number	Price
Equator™ machine with 6-port rack and joystick, controller with Organizer and MODUS™ programming software and M6 threaded fixture plate	A-EQ33-2J10	\$34,084
Equator™ machine with 6-port rack and joystick, controller with Organizer and MODUS™ software and ¼ in R&R threaded fixture plate	A-EQ33-2J40	\$34,347

Extended height Equator™ combination kits

Operator's version

Description	Part number	Price
Extended height Equator™ machine with 6-port rack and joystick with Organizer software and ¼ in R&R threaded fixture plate	A-EH33-1J40	\$32,268

Programmer's version

Description	Part number	Price
Extended height Equator™ machine with 6-port rack and joystick with Organizer and MODUS™ software and ¼ in R&R threaded fixture plate	A-EH33-2J40	\$35,733

Gaging systems

New Renishaw Equator™ 500

Intelligent process control for larger parts with all the benefits of the proven Equator 300 gaging system

The new larger Equator 500 system now enables the gaging of larger parts, with a working volume of 500 mm in diameter and up to 400 mm in height.

Both Equator 300 and 500 gaging systems are accurate between a range of 5 °C and 50 °C at any rate of temperature change, and are capable of scanning speeds in excess of 200 mm/s.

Every system is compatible with simple-to-use Organizer operator software, EZ-IO software for automation, and IPC (intelligent process control) software for updating tool offsets on CNC machine tools.

Larger measuring volume

The Equator 500 has a gaging volume of 500 mm diameter in the X/Y plane and 250 mm in Z when used with the SM25-2 scanning module. This can be expanded to 400 mm in Z with the SM25-3 scanning module, which allows styli up to 200 mm in length to reach many more features. The base of Equator 500 supports workpiece and fixturing with a total weight limit of 100 kg.

Typical applications include the manufacture of car and truck transmission and engine casings, drive-train parts like conrods and differential housings, suspension castings, pressed parts, valves and pumps.

Accuracy with rapid temperature changes, now over a 45 °C range

Climatic conditions can result in variable daily and seasonal temperature cycles. For example, early in the morning a cold machine shop can increase in temperature due to both external conditions and machinery heating up. The system has been proven to cope with this by re-mastering, meaning that accurate gaging can start as soon as the first part has been produced and continue regardless of how conditions change.



Automatic update of tool offsets directly from Equator 300 and 500 systems

The Equator range is compatible with new IPC software which allows constant monitoring and automatic adjustment of a machining operation, keeping part dimensions close to nominal and well within process control limits. This correction of process drift improves part quality and manufacturing capability, and reduces scrap. The proximity of the Equator gage to the CNC process allows adjustment at the point of manufacture, avoiding time delays or reliance on finished part (tailgate) inspection. An Equator gaging system can be connected to one or multiple CNC machine tool controllers.



Gaging systems

Replacement equipment

Stop button

Part number: A-5504-0255

Price: \$395



Joystick kit

Part number: A-5504-0258

Price: \$730



Joystick cable only

Part number: A-5358-5016

Price: \$210

Button interface

Part number: A-6088-0010

Price: \$875



Autochange rack (6 ports)

Part number: A-5504-0250

Price: \$2,435

Rack port inserts for 6 off SH25

Part number: A-2237-1414

Price: \$163

Rack set-up tool

Part number: A-2237-0682

Price: \$50

Rack port clip for autochange rack alignment

6 required.

Part number: M-5358-2589

Price: \$3

MODUS™ Equator™ dongle

Part number: A-5639-3000

Price: \$4,200



Power cables

Part number: P-EQ33-MAINS

Price: \$16

Fixturing plate (M6)

Part number: PCR-13300300-12-6

Price: \$550

Fixturing plate (1/4-20 in)

Part number: PCR-501212-50-20

Price: \$578

Fixturing plate (M4)

Part number: PCR-13300300-10-4

Price: \$620

Fixturing plate (M8)

Part number: PCR-13300300-15-8

Price: \$550



Fixturing plate (single ¼-20 hole)

Part number: R-PEC-13300300-6 **Price:** \$260

Fixturing plate spacer (50 mm)

Part number: A-5504-0203 **Price:** \$695

Fixturing plate spacer (150 mm)

Part number: A-5504-0207 **Price:** \$695



Optional equipment

Digital I/O box (normally open)

With Automation software.

Part number: A-5923-0050 **Price:** \$5,200

Additional I/O box only (normally open)

Part number: A-5923-0259 **Price:** \$1,155

Full 5-sphere calibration artefact only

Part number: A-5504-0252 **Price:** \$440

Extended calibration artefact stem

Part number: A-5504-0274 **Price:** \$105

Gage checker

Part number: A-5925-0200 **Price:** \$875

Cleaning kit

Part number: A-5504-0955 **Price:** \$88

Equator enclosure

Equator enclosure kit

Includes top, base and monitor bracket.

Part number: A-5504-0210 **Price:** \$4,340

Equator enclosure top unit

Part number: A-5504-0211 **Price:** \$2,287

Equator enclosure base unit

Part number: A-5504-0212 **Price:** \$1,906

Equator enclosure monitor bracket

Part number: P-PCO1-0045 **Price:** \$154

MCU docking port for wired joystick

Part number: A-1333-0026 **Price:** \$87



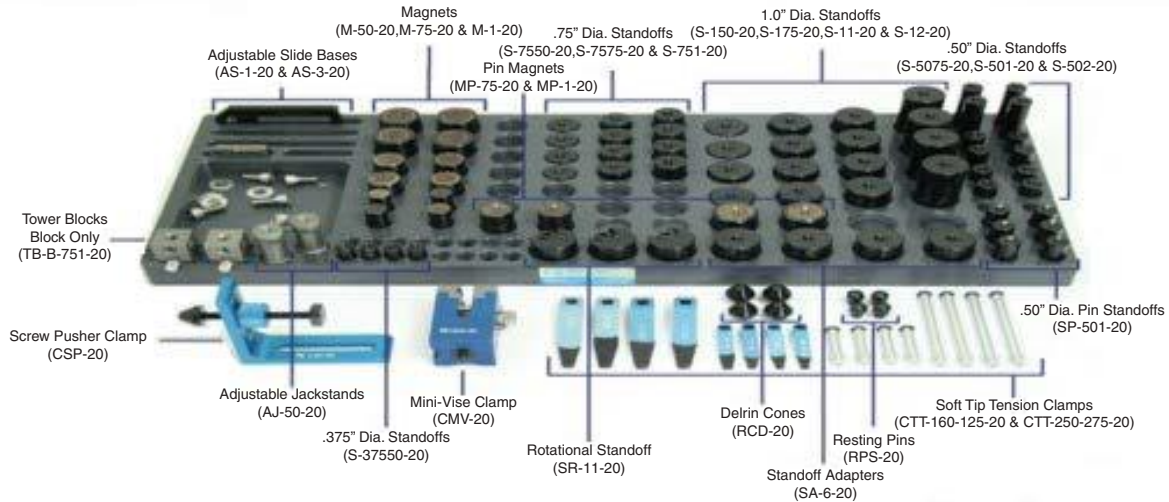
Gaging systems

Fixturing components

R&R component kit FSC-MCR-20 (1/4-20 in)

Part number: FSC-MCR-20

Price: \$2,615



R&R component kit FSC-MCA-20 (1/4-20 in)

Part number: FSC-MCA-20

Price: \$972

R&R component kit FSC-CA-20 (1/4-20 in)

Part number: FSC-CA-20

Price: \$744

Equator probe kit

Equator SP25-2 scanning kit with single calibration sphere

Part number: A-5504-0205

Price: \$4,335



Equator stylus kits

Equator basic stylus kit

Part number: A-5504-0281

Price: \$780

Equator intermediate stylus kit

Part number: A-5504-0282

Price: \$1,455

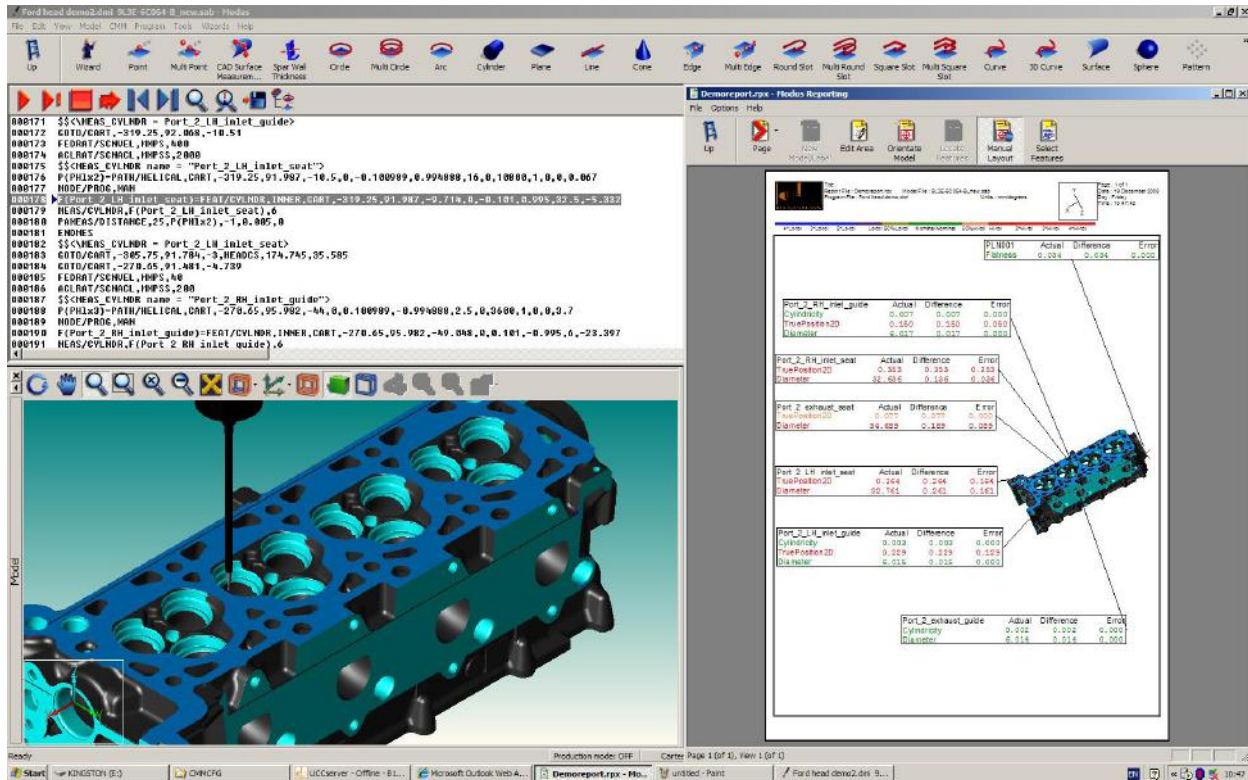
Equator advanced stylus kit

Part number: A-5504-0283

Price: \$2,851



Equator™ MODUS™ software training



On site training (maximum 4 students)

Description	Part number	Price
Equator™ MODUS™ scanning training (US travel) – 4 days	CS-TRA-ONSI-11-4DAY	\$9,625
Equator™ MODUS™ advanced training (US travel) – 2 days	CS-TRA-ONSI-11-2DAY	\$5,775

Training at Renishaw Inc*

Description	Part number	Price
Equator™ MODUS™ scanning training (US) – 4 days	CS-TRA-INHO-4DAY	\$3,000
Equator™ MODUS™ advanced training (US) – 2 days	CS-TRA-INHO-2DAY	\$1,500

* per student

Equator training block

Part number: A-5504-0209 **Price:** \$675

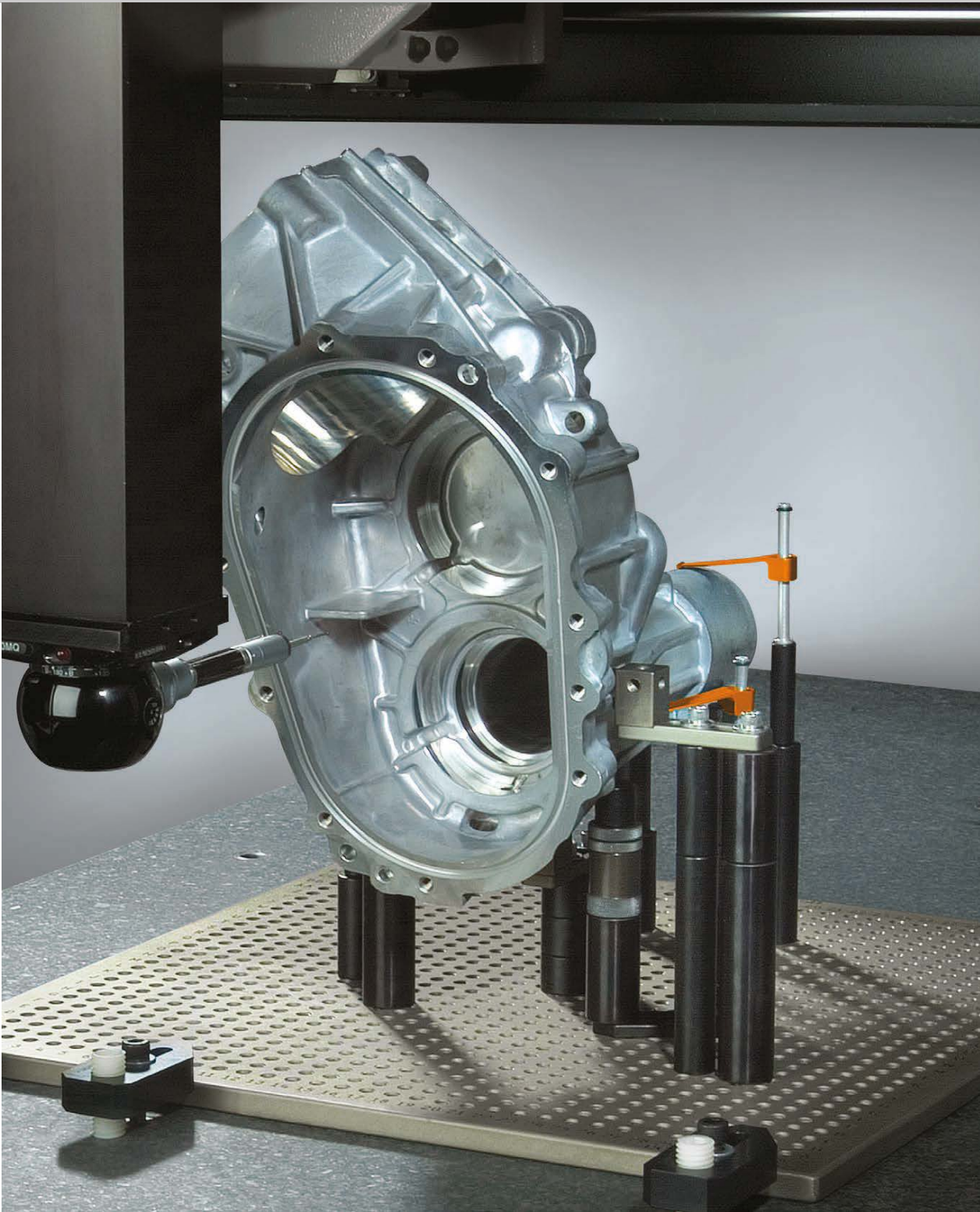
Equator 2nd year extended warranty

Now available.

Part number: Please ask your Renishaw representative **Price:** POA



Fixtures



CMM fixtures

CMM fixtures

CMM base plate options

Part number	Thread	Height	Width	Depth	Spacing	Price
M4 plates						
R-PC-13150150-10-4	M4	13 mm	150 mm	150 mm	10 mm OC	\$369
R-PC-13300300-10-4	M4	13 mm	300 mm	300 mm	10 mm OC	\$761
M6 plates						
R-PC-13300300-12-6	M6	13 mm	300 mm	300 mm	12.5 mm OC	\$651
R-PC-13450450-12-6	M6	13 mm	450 mm	450 mm	12.5 mm OC	\$1,096
R-PC-19600600-12-6	M6	19 mm	600 mm	600 mm	12.5 mm OC	\$1,996
R-PC-19750750-12-6*	M6	19 mm	750 mm	750 mm	12.5 mm OC	\$2,595
R-PC-197501000-12-6*	M6	19 mm	750 mm	1000 mm	12.5 mm OC	\$3,100
R-PC-199001200-12-6*	M6	19 mm	900 mm	1200 mm	12.5 mm OC	\$4,800
M8 plates						
R-PC-13300300-15-8	M8	13 mm	300 mm	300 mm	15 mm OC	\$626
R-PC-13450450-15-8	M8	13 mm	450 mm	450 mm	15 mm OC	\$1,021
R-PC-19600600-15-8	M8	19 mm	600 mm	600 mm	15 mm OC	\$1,781
R-PC-19750750-15-8*	M8	19 mm	750 mm	750 mm	15 mm OC	\$2,450
R-PC-197501020-15-8*	M8	19 mm	750 mm	1020 mm	15 mm OC	\$2,995
R-PC-199001200-15-8*	M8	19 mm	900 mm	1200 mm	15 mm OC	\$4,495

*Mounting holes may also be added and longer lead times may apply to larger plates.



M4 kits: clamping

The M4 CMM clamping kits can be used to hold brass, titanium, aluminum, plastic and other nonferrous parts.

A kit includes a base plate with M4 threaded holes 10 mm on center (choose from plate sizes listed below) and a set of components (A) along with plate clamps for mounting to the CMM.



Kit part number	Base plate size	Set	Price
R-KC-C1A-4	13 mm × 150 mm × 150 mm	A	\$1,298
R-KC-C2A-4	13 mm × 300 mm × 300 mm	A	\$1,690

Component set A

Part number: R-FSC-CA-4 **Price:** \$929

Includes:

Qty	Part number	Description
3	R-S-610-4	6 mm dia. × 10 mm standoff
3	R-S-625-4	6 mm dia. × 25 mm standoff
3	R-S-95-4	9 mm dia. × 5 mm standoff
3	R-S-910-4	9 mm dia. × 10 mm standoff
3	R-S-925-4	9 mm dia. × 25 mm standoff
2	R-S-950-4	9 mm dia. × 50 mm standoff
3	R-S-1210-4	12 mm dia. × 10 mm standoff
3	R-S-1225-4	12 mm dia. × 25 mm standoff
2	R-S-1250-4	12 mm dia. × 50 mm standoff
2	R-SP-610-4	6 mm dia. × 10 mm pin standoff
2	R-SP-910-4	9 mm dia. × 10 mm pin standoff
2	R-CT-40-25-4	40 mm tension clamp with 25 mm post
3	R-CW-25-25-4	25 mm wire clamp with 25 mm post
2	R-CW-50-50-4	50 mm wire clamp with 50 mm post
4	R-RPA-4	Aluminum resting pin
1	R-AJ-9-4	9 mm dia. adjustable jackstand
1	R-AS-30-4	30 mm long adjustable slide
1	R-AS-45-4	40 mm long adjustable slide
1	R-TB-1619-4	Tower block with base 16 mm × 19 mm
1	R-TC-300190-4	300 mm × 190 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm box (not shown)

Total: 46 pc

CMM fixtures

M6 kits: clamping

The M6 CMM clamping kits can be used to hold brass, titanium, aluminum, plastic and other nonferrous parts.

A kit includes a base plate with M6 threaded holes 12.5 mm on center (choose from plate sizes listed below) and a set of components (A, B or C) along with plate clamps for mounting to the CMM.



Kit part number	Base plate size	Set	Price
R-KC-C1A-6	13 mm × 300 mm × 300 mm	A	\$1,456
R-KC-C2A-6	13 mm × 450 mm × 450 mm	A	\$1,901
R-KC-C3A-6	19 mm × 600 mm × 600 mm	A	\$2,801
R-KC-C4A-6	19 mm × 750 mm × 750 mm	A	\$3,400
R-KC-C5A-6	19 mm × 750 mm × 1000 mm	A	\$3,905
R-KC-C6A-6	19 mm × 900 mm × 1200 mm	A	\$5,605

Component set A

Part number: R-FSC-CA-6 **Price:** \$805

Includes:

Qty	Part number	Description
3	R-S-1320-6	13 mm dia. × 20 mm standoff
3	R-S-1325-6	13 mm dia. × 25 mm standoff
3	R-S-1350-6	13 mm dia. × 50 mm standoff
3	R-S-1920-6	19 mm dia. × 20 mm standoff
3	R-S-1925-6	19 mm dia. × 25 mm standoff
3	R-S-1950-6	19 mm dia. × 50 mm standoff
3	R-S-2520-6	25 mm dia. × 20 mm standoff
3	R-S-2525-6	25 mm dia. × 25 mm standoff
3	R-S-2550-6	25 mm dia. × 50 mm standoff
2	R-SP-1325-6	13 mm dia. × 25 mm pin standoff
2	R-CT-40-30-6	40 mm tension clamp with 30 mm post
4	R-CT-64-70-6	64 mm tension clamp with 70 mm post
4	R-RCD-6	Delrin® resting cone
1	R-AJ-13-6	13 mm dia. adjustable jackstand
1	R-AS-45-6	45 mm long adjustable slide
1	R-AS-70-6	70 mm long adjustable slide
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 44 pc

Kit part number	Base plate size	Set	Price
R-KC-C1B-6	13 mm × 300 mm × 300 mm	B	\$2,705
R-KC-C2B-6	13 mm × 450 mm × 450 mm	B	\$3,150
R-KC-C3B-6	19 mm × 600 mm × 600 mm	B	\$4,050
R-KC-C4B-6	19 mm × 750 mm × 750 mm	B	\$4,649
R-KC-C5B-6	19 mm × 750 mm × 1000 mm	B	\$5,154
R-KC-C6B-6	19 mm × 900 mm × 1200 mm	B	\$6,854

Component set B

Part number: R-FSC-CB-6 **Price:** \$2,054

Includes:

Qty	Part number	Description
3	R-S-910-6	9 mm dia. × 10 mm standoff
6	R-S-1320-6	13 mm dia. × 20 mm standoff
6	R-S-1325-6	13 mm dia. × 25 mm standoff
6	R-S-1350-6	13 mm dia. × 50 mm standoff
3	R-S-1910-6	19 mm dia. × 10 mm standoff
6	R-S-1920-6	19 mm dia. × 20 mm standoff
6	R-S-1925-6	19 mm dia. × 25 mm standoff
6	R-S-1950-6	19 mm dia. × 50 mm standoff
4	R-S-19100-6	19 mm dia. × 100 mm standoff
6	R-S-2520-6	25 mm dia. × 20 mm standoff
6	R-S-2525-6	25 mm dia. × 25 mm standoff
6	R-S-2550-6	25 mm dia. × 50 mm standoff
4	R-S-25100-6	25 mm dia. × 100 mm standoff
4	R-SP-1325-6	13 mm dia. × 25 mm pin standoff
6	R-CT-40-30-6	40 mm tension clamp with 30 mm post
12	R-CT-64-70-6	64 mm tension clamp with 70 mm post
4	R-RCD-6	Delrin® resting cone
4	R-RPS-6	Steel resting pin
2	R-AJ-13-6	13 mm dia. adjustable jackstand
2	R-AJ-25-6	25 mm dia. adjustable jackstand
2	R-AS-45-6	45 mm dia. long adjustable slide
2	R-AS-70-6	70 mm long adjustable slide
2	R-TB-2025-6	Tower block with base 20 mm × 30 mm
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 110 pc

CMM fixtures

Kit part number	Base plate size	Set	Price
R-KC-C1C-6	13 mm × 300 mm × 300 mm	C	\$4,196
R-KC-C2C-6	13 mm × 450 mm × 450 mm	C	\$4,641
R-KC-C3C-6	19 mm × 600 mm × 600 mm	C	\$5,541
R-KC-C4C-6	19 mm × 750 mm × 750 mm	C	\$6,140
R-KC-C5C-6	19 mm × 750 mm × 1000 mm	C	\$6,645
R-KC-C6C-6	19 mm × 900 mm × 1200 mm	C	\$8,345

Component set C

Part number: R-FSC-CC-6 **Price:** \$3,545

Includes:

Qty	Part number	Description
6	R-S-910-6	9 mm dia. × 10 mm standoff
4	R-S-1310-6	13 mm dia. × 10 mm standoff
8	R-S-1320-6	13 mm dia. × 20 mm standoff
8	R-S-1325-6	13 mm dia. × 25 mm standoff
8	R-S-1350-6	13 mm dia. × 50 mm standoff
4	R-S-1910-6	19 mm dia. × 10 mm standoff
8	R-S-1920-6	19 mm dia. × 20 mm standoff
8	R-S-1925-6	19 mm dia. × 25 mm standoff
8	R-S-1950-6	19 mm dia. × 50 mm standoff
6	R-S-19100-6	19 mm dia. × 100 mm standoff
8	R-S-2520-6	25 mm dia. × 20 mm standoff
8	R-S-2525-6	25 mm dia. × 25 mm standoff
8	R-S-2550-6	25 mm dia. × 50 mm standoff
6	R-S-25100-6	25 mm dia. × 100 mm standoff
4	R-SP-1325-6	13 mm dia. × 25 mm pin standoff
2	R-SP-1925-6	19 mm dia. × 25 mm pin standoff
6	R-CT-40-30-6	40 mm tension clamp with 30 mm post
12	R-CT-64-70-6	64 mm tension clamp with 70 mm post
3	R-CT-95-83-6	95 mm tension clamp with 83 mm post
3	R-CT-100P-83-6	100 mm tension clamp plunger with 83 mm post
1	R-CTB-25-6	25 mm tension clamp bracket
6	R-RCD-6	Delrin® resting cone
6	R-RPS-6	Steel resting pin
1	R-APJ-6	Adjustable pivot joint
4	R-AJ-13-6	13 mm dia. adjustable jackstand
3	R-AJ-25-6	25 mm dia. adjustable jackstand
3	R-AS-45-6	45 mm long adjustable slide
4	R-AS-70-6	70 mm long adjustable slide
2	R-TB-2025-6	Tower block with base 20 mm × 30 mm
1	R-T-25300-6	25 mm × 300 mm tower
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 163 pc

M6 kits: magnetic and clamping

The M6 CMM magnetic and clamping kits can be used to hold steel, aluminum, plastic and other nonferrous parts.

A kit includes a base plate with M6 threaded holes 12.5 mm on center (choose from plate sizes listed below) and a set of components (A, B or C) along with plate clamps for mounting to the CMM.



Kit part number	Base plate size	Set	Price
R-KC-MC1A-6	13 mm × 300 mm × 300 mm	A	\$1,684
R-KC-MC2A-6	13 mm × 450 mm × 450 mm	A	\$2,129
R-KC-MC3A-6	19 mm × 600 mm × 600 mm	A	\$3,029
R-KC-MC4A-6	19 mm × 750 mm × 750 mm	A	\$3,628
R-KC-MC5A-6	19 mm × 750 mm × 1000 mm	A	\$4,133
R-KC-MC6A-6	19 mm × 900 mm × 1200 mm	A	\$5,833

Component set A

Part number: R-FSC-MCA-6 **Price:** \$1,033

Includes:

Qty	Part number	Description
3	R-M-13-6	13 mm dia. × 25 mm magnet
3	R-M-19-6	19 mm dia. × 25 mm magnet
3	R-M-25-6	25 mm dia. × 25 mm magnet
3	R-S-1320-6	13 mm dia. × 20 mm standoff
3	R-S-1235-6	13 mm dia. × 25 mm standoff
3	R-S-1350-6	13 mm dia. × 50 mm standoff
3	R-S-1920-6	19 mm dia. × 20 mm standoff
3	R-S-1925-6	19 mm dia. × 25 mm standoff
3	R-S-1950-6	19 mm dia. × 50 mm standoff
3	R-S-2520-6	25 mm dia. × 20 mm standoff
3	R-S-2525-6	25 mm dia. × 25 mm standoff
3	R-S-2550-6	25 mm dia. × 50 mm standoff
4	R-CT-64-70-6	64 mm tension clamp with 70 mm post
4	R-RCD-6	Delrin® resting cone
1	R-AJ-13-6	13 mm dia. adjustable jackstand
1	R-AS-45-6	45 mm long adjustable slide
1	R-AS-70-6	70 mm long adjustable slide
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 49 pc

CMM fixtures

Kit part number	Base plate size	Set	Price
R-KC-MC1B-6	13 mm × 300 mm × 300 mm	B	\$2,984
R-KC-MC2B-6	13 mm × 450 mm × 450 mm	B	\$3,429
R-KC-MC3B-6	19 mm × 600 mm × 600 mm	B	\$4,329
R-KC-MC4B-6	19 mm × 750 mm × 750 mm	B	\$4,928
R-KC-MC5B-6	19 mm × 750 mm × 1000 mm	B	\$5,433
R-KC-MC6B-6	19 mm × 900 mm × 1200 mm	B	\$7,133

Component set B

Part number: R-FSC-MCB-6 **Price:** \$2,333

Includes:

Qty	Part number	Description
4	R-M-13-6	13 mm dia. × 25 mm magnet
4	R-M-19-6	19 mm dia. × 25 mm magnet
4	R-M-25-6	25 mm dia. × 25 mm magnet
2	R-MP-13-6	13 mm dia. 25 mm pin magnet
3	R-S-1910-6	9 mm dia. × 10 mm standoff
6	R-S-1320-6	13 mm dia. × 20 mm standoff
6	R-S-1325-6	13 mm dia. × 25 mm standoff
6	R-S-1350-6	13 mm dia. × 50 mm standoff
3	R-S-1910-6	19 mm dia. × 10 mm standoff
6	R-S-1920-6	19 mm dia. × 50 mm standoff
6	R-S-1925-6	19 mm dia. × 25 mm standoff
6	R-S-1950-6	19 mm dia. × 50 mm standoff
3	R-S-19100-6	19 mm dia. × 100 mm standoff
6	R-S-2520-6	25 mm dia. × 20 mm standoff
6	R-S-2525-6	25 mm dia. × 25 mm standoff
6	R-S-2550-6	25 mm dia. × 50 mm standoff
3	R-S-25100-6	25 mm dia. × 100 mm standoff
4	R-CT-40-30-6	40 mm tension clamp with 30 mm post
8	R-CT-64-70-6	64 mm tension clamp with 70 mm post
4	R-RCD-6	Delrin® resting cone
4	R-RPS-6	Steel resting pin
2	R-AJ-13-6	13 mm dia. adjustable jackstand
2	R-AJ-25-6	25 mm dia. adjustable jackstand
2	R-AS-45-6	45 mm long adjustable slide
2	R-AS-70-6	70 mm long adjustable slide
2	R-TB-2025-6	Tower block with base 20 mm × 30 mm
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 112 pc

Kit part number	Base plate size	Set	Price
R-KC-MC1C-6	13 mm × 300 mm × 300 mm	C	\$4,478
R-KC-MC2C-6	13 mm × 450 mm × 450 mm	C	\$4,923
R-KC-MC3C-6	19 mm × 600 mm × 600 mm	C	\$5,823
R-KC-MC4C-6	19 mm × 750 mm × 750 mm	C	\$6,422
R-KC-MC5C-6	19 mm × 750 mm × 1000 mm	C	\$6,927
R-KC-MC6C-6	19 mm × 900 mm × 1200 mm	C	\$8,627

Component set C

Part number: R-FSC-MCC-6 **Price:** \$3,827

Includes:

Qty	Part number	Description
6	R-M-13-6	13 mm dia. × 25 mm magnet
6	R-M-19-6	19 mm dia. × 25 mm magnet
6	R-M-25-6	25 mm dia. × 25 mm magnet
2	R-MP-13-6	13 mm dia. × 25 mm pin magnet
2	R-MP-19-6	19 mm dia. × 25 mm pin magnet
4	R-S-910-6	9 mm dia. × 10 mm standoff
4	R-S-1310-6	13 mm dia. × 10 mm standoff
8	R-S-1320-6	13 mm dia. × 20 mm standoff
8	R-S-1325-6	13 mm dia. × 25 mm standoff
8	R-S-1350-6	13 mm dia. × 50 mm standoff
4	R-S-1910-6	19 mm dia. × 10 mm standoff
8	R-S-1920-6	19 mm dia. × 20 mm standoff
8	R-S-1925-6	19 mm dia. × 25 mm standoff
8	R-S-1950-6	19 mm dia. × 50 mm standoff
6	R-S-19100-6	19 mm dia. × 100 mm standoff
8	R-S-2520-6	25 mm dia. × 20 mm standoff
8	R-S-2525-6	25 mm dia. × 25 mm standoff
8	R-S-2550-6	25 mm dia. × 50 mm standoff
6	R-S-25100-6	25 mm dia. × 100 mm standoff
4	R-CT-40-30-6	40 mm tension clamp with 30 mm post
8	R-CT-64-70-6	64 mm tension clamp with 70 mm post
2	R-CT-95-83-6	95 mm tension clamp with 83 mm post
1	R-CTB-25-6	25 mm tension clamp bracket
6	R-RCD-6	Delrin® resting cone
6	R-RPS-6	Steel resting pin
1	R-APJ-6	Adjustable pivot joint
3	R-AJ-13-6	13 mm dia. adjustable jackstand
3	R-AJ-25-6	25 mm dia. adjustable jackstand
3	R-AS-45-6	45 mm long adjustable slide
3	R-AS-70-6	70 mm long adjustable slide
2	R-TB-2025-6	Tower block with base 20 mm × 30 mm
1	R-T 25300-6	25 mm × 300 mm tower
2	R-TC-500200	500 mm × 200 mm × 25 mm component tray
2	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 165 pc

CMM fixtures

M8 kits: clamping

The M8 CMM clamping kits can be used to hold aluminum, plastic and other nonferrous parts.

A kit includes a base plate with M8 threaded holes 15 mm on center (choose from plate sizes listed below) and a set of components (A, B or C) along with plate clamps for mounting to the CMM.



Kit part number	Base plate size	Set	Price
R-KC-C1A-8	13 mm × 300 mm × 300 mm	A	\$1,415
R-KC-C2A-8	13 mm × 450 mm × 450 mm	A	\$1,810
R-KC-C3A-8	19 mm × 600 mm × 600 mm	A	\$2,570
R-KC-C4A-8	19 mm × 750 mm × 750 mm	A	\$3,239
R-KC-C5A-8	19 mm × 750 mm × 1020 mm	A	\$3,784
R-KC-C6A-8	19 mm × 900 mm × 1200 mm	A	\$5,284

Component set A

Part number: R-FSC-CA-8

Price: \$789

Includes:

Qty	Part number	Description
3	R-S-1320-8	13 mm dia. × 20 mm standoff
3	R-S-1325-8	13 mm dia. × 25 mm standoff
3	R-S-1350-8	13 mm dia. × 50 mm standoff
3	R-S-1920-8	19 mm dia. × 20 mm standoff
3	R-S-1925-8	19 mm dia. × 25 mm standoff
3	R-S-1950-8	19 mm dia. × 50 mm standoff
3	R-S-2520-8	25 mm dia. × 20 mm standoff
3	R-S-2525-8	25 mm dia. × 25 mm standoff
3	R-S-2550-8	25 mm dia. × 50 mm standoff
2	R-SP-1325-8	13 mm dia. × 25 mm pin standoff
2	R-CT-40-30-8	40 mm tension clamp with 30 mm post
4	R-CT-64-70-8	64 mm tension clamp with 70 mm post
4	R-RCD-8	Delrin® resting cone
1	R-AJ-19-8	19 mm dia. adjustable jackstand
1	R-AS-70-8	70 mm long adjustable slide
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 43 pc

Kit part number	Base plate size	Set	Price
R-KC-C1B-8	13 mm × 300 mm × 300 mm	B	\$2,779
R-KC-C2B-8	13 mm × 450 mm × 450 mm	B	\$3,174
R-KC-C3B-8	19 mm × 600 mm × 600 mm	B	\$3,934
R-KC-C4B-8	19 mm × 750 mm × 750 mm	B	\$4,603
R-KC-C5B-8	19 mm × 750 mm × 1020 mm	B	\$5,148
R-KC-C6B-8	19 mm × 900 mm × 1200 mm	B	\$6,648

Component set B

Part number: R-FSC-CB-8 **Price:** \$2,153

Includes:

Qty	Part number	Description
3	R-S-1315-8	13 mm dia. × 15 mm standoff
6	R-S-1320-8	13 mm dia. × 20 mm standoff
6	R-S-1325-8	13 mm dia. × 25 mm standoff
6	R-S-1350-8	13 mm dia. × 50 mm standoff
3	R-S-1915-8	19 mm dia. × 15 mm standoff
6	R-S-1920-8	19 mm dia. × 20 mm standoff
6	R-S-1925-8	19 mm dia. × 25 mm standoff
6	R-S-1950-8	19 mm dia. × 50 mm standoff
4	R-S-19100-8	19 mm dia. × 100 mm standoff
6	R-S-2520-8	25 mm dia. × 20 mm standoff
6	R-S-2525-8	25 mm dia. × 25 mm standoff
6	R-S-2550-8	25 mm dia. × 50 mm standoff
4	R-S-25100-8	25 mm dia. × 100 mm standoff
4	R-SP-1325-8	13 mm dia. × 25 mm pin standoff
6	R-CT-40-30-8	40 mm tension clamp with 30 mm post
12	R-CT-64-70-8	64 mm tension clamp with 70 mm post
4	R-RCD-8	Delrin® resting cone
4	R-RSC-8	Steel resting cone
2	R-AJ-19-8	19 mm dia. adjustable jackstand
2	R-AJ-25-8	25 mm dia. adjustable jackstand
1	R-AS-45-8	45 mm long adjustable slide
3	R-AS-70-8	70 mm long adjustable slide
2	R-TB-2530-8	Tower block with base
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 110 pc

CMM fixtures

Kit part number	Base plate size	Set	Price
R-KC-C1C-8	13 mm × 300 mm × 300 mm	C	\$4,160
R-KC-C2C-8	13 mm × 450 mm × 450 mm	C	\$4,555
R-KC-C3C-8	19 mm × 600 mm × 600 mm	C	\$5,315
R-KC-C4C-8	19 mm × 750 mm × 750 mm	C	\$5,984
R-KC-C5C-8	19 mm × 750 mm × 1020 mm	C	\$6,529
R-KC-C6C-8	19 mm × 900 mm × 1200 mm	C	\$8,029

Component set C

Part number: R-FSC-CC-8 **Price:** \$3,534

Includes:

Qty	Part number	Description
4	R-S-1315-8	13 mm dia. × 15 mm standoff
8	R-S-1320-8	13 mm dia. × 20 mm standoff
8	R-S-1325-8	13 mm dia. × 25 mm standoff
8	R-S-1350-8	13 mm dia. × 50 mm standoff
4	R-S-1915-8	19 mm dia. × 15 mm standoff
8	R-S-1920-8	19 mm dia. × 20 mm standoff
8	R-S-1925-8	19 mm dia. × 25 mm standoff
8	R-S-1950-8	19 mm dia. × 50 mm standoff
6	R-S-19100-8	19 mm dia. × 100 mm standoff
8	R-S-2520-8	25 mm dia. × 20 mm standoff
8	R-S-2525-8	25 mm dia. × 25 mm standoff
8	R-S-2550-8	25 mm dia. × 50 mm standoff
6	R-S-25100-8	25 mm dia. × 100 mm standoff
6	R-SP-1325-8	13 mm dia. × 25 mm pin standoff
6	R-CT-40-30-8	40 mm tension clamp with 30 mm post
12	R-CT-64-70-8	64 mm tension clamp with 70 mm post
3	R-CT-95-83-8	95 mm tension clamp with 83 mm post
3	R-CT-100P-83-8	100 mm tension clamp plunger with 83 mm post
1	R-CTB-25-8	25 mm tension clamp bracket
4	R-RCD-8	Delrin® resting cone
4	R-RCS-8	Steel resting cone
1	R-APJ-8	Adjustable pivot joint
4	R-AJ-19-8	19 mm dia. adjustable jackstand
3	R-AJ-25-8	25 mm dia. adjustable jackstand
3	R-AS-45-8	45 mm long adjustable slide
4	R-AS-70-8	70 mm long adjustable slide
2	R-TB-2530-8	Tower block with base
1	R-TB-25300-8	25 mm × 300 mm tower
2	R-TC-500200	500 mm × 200 mm × 25 mm component tray
2	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 153 pc

M8 kits: magnetic and clamping

The M8 CMM magnetic and clamping kits can be used to hold steel, aluminum, plastic and other nonferrous parts.

A kit includes a base plate with M8 threaded holes 15 mm on center (choose from plate sizes listed below) and a set of components (A, B or C) along with plate clamps for mounting to the CMM.



Kit part number	Base plate size	Set	Price
R-KC-MC1A-8	13 mm × 300 mm × 300 mm	A	\$1,618
R-KC-MC2A-8	13 mm × 450 mm × 450 mm	A	\$2,013
R-KC-MC3A-8	19 mm × 600 mm × 600 mm	A	\$2,773
R-KC-MC4A-8	19 mm × 750 mm × 750 mm	A	\$3,442
R-KC-MC5A-8	19 mm × 750 mm × 1020 mm	A	\$3,987
R-KC-MC6A-8	19 mm × 900 mm × 1200 mm	A	\$5,487

Component set A

Part number: R-FSC-MCA-8 Price: \$992

Includes:

Qty	Part number	Description
3	R-M-13-8	13 mm dia. × 25 mm magnet
3	R-M-19-8	19 mm dia. × 25 mm magnet
3	R-M-25-8	25 mm dia. × 25 mm magnet
3	R-S-1320-8	13 mm dia. × 20 mm standoff
3	R-S-1325-8	13 mm dia. × 25 mm standoff
3	R-S-1350-8	13 mm dia. × 50 mm standoff
3	R-S-1920-8	19 mm dia. × 20 mm standoff
3	R-S-1925-8	19 mm dia. × 25 mm standoff
3	R-S-1950-8	19 mm dia. × 50 mm standoff
3	R-S-2520-8	25 mm dia. × 20 mm standoff
3	R-S-2525-8	25 mm dia. × 25 mm standoff
3	R-S-2550-8	25 mm dia. × 50 mm standoff
3	R-CT-64-70-8	64 mm tension clamp with 70 mm post
4	R-RCD-8	Delrin® resting cone
1	R-AJ-19-8	19 mm dia. adjustable jackstand
1	R-AS-70-8	70 mm long adjustable slide
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 47 pc

CMM fixtures

Kit part number	Base plate size	Set	Price
R-KC-MC1B-8	13 mm × 300 mm × 300 mm	B	\$3,096
R-KC-MC2B-8	13 mm × 450 mm × 450 mm	B	\$3,491
R-KC-MC3B-8	19 mm × 600 mm × 600 mm	B	\$4,251
R-KC-MC4B-8	19 mm × 750 mm × 750 mm	B	\$4,920
R-KC-MC5B-8	19 mm × 750 mm × 1020 mm	B	\$5,465
R-KC-MC6B-8	19 mm × 900 mm × 1200 mm	B	\$6,965

Component set B

Part number: R-FSC-MCB-8 **Price:** \$2,470

Includes:

Qty	Part number	Description
4	R-M-13-8	13 mm dia. × 25 mm magnet
4	R-M-19-8	19 mm dia. × 25 mm magnet
4	R-M-25-8	25 mm dia. × 25 mm magnet
2	R-MP-13-8	13 mm dia. × 25 mm pin magnet
3	R-S-1315-8	13 mm dia. × 15 mm standoff
6	R-S-1320-8	13 mm dia. × 20 mm standoff
6	R-S-1325-8	13 mm dia. × 25 mm standoff
6	R-S-1350-8	13 mm dia. × 50 mm standoff
3	R-S-1915-8	19 mm dia. × 15 mm standoff
6	R-S-1920-8	19 mm dia. × 20 mm standoff
6	R-S-1925-8	19 mm dia. × 25 mm standoff
6	R-S-1950-8	19 mm dia. × 50 mm standoff
4	R-S-19100-8	19 mm dia. × 100 mm standoff
6	R-S-2520-8	25 mm dia. × 20 mm standoff
6	R-S-2525-8	25 mm dia. × 25 mm standoff
6	R-S-2550-8	25 mm dia. × 50 mm standoff
4	R-S-25100-8	25 mm dia. × 100 mm standoff
4	R-CT-40-30-8	40 mm tension clamp with 30 mm post
8	R-CT-64-70-8	64 mm tension clamp with 70 mm post
4	R-RCD-8	Delrin® resting cone
4	R-RCS-8	Steel resting cone
2	R-AJ-19-8	19 mm dia. adjustable jackstand
2	R-AJ-25-8	25 mm dia. adjustable jackstand
1	R-AS-45-8	45 mm long adjustable slide
3	R-AS-70-8	70 mm long adjustable slide
2	R-TB-2530-8	Tower block with base
1	R-TC-500200	500 mm × 200 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 114 pc

Kit part number	Base plate size	Set	Price
R-KC-MC1C-8	13 mm × 300 mm × 300 mm	C	\$4,476
R-KC-MC2C-8	13 mm × 450 mm × 450 mm	C	\$4,871
R-KC-MC3C-8	19 mm × 600 mm × 600 mm	C	\$5,631
R-KC-MC4C-8	19 mm × 750 mm × 750 mm	C	\$6,300
R-KC-MC5C-8	19 mm × 750 mm × 1020 mm	C	\$6,845
R-KC-MC6C-8	19 mm × 900 mm × 1200 mm	C	\$8,345

Component set C

Part number: R-FSC-MCC-8 **Price:** \$3,850

Includes:

Qty	Part number	Description
6	R-M-13-8	13 mm dia. × 25 mm magnet
6	R-M-19-8	19 mm dia. × 25 mm magnet
6	R-M-25-8	25 mm dia. × 25 mm magnet
2	R-MP-13-8	13 mm dia. × 25 mm pin magnet
2	R-MP-19-8	19 mm dia. × 25 mm pin magnet
3	R-S-1315-8	13 mm dia. × 15 mm standoff
8	R-S-1320-8	13 mm dia. × 20 mm standoff
8	R-S-1325-8	13 mm dia. × 25 mm standoff
8	R-S-1350-8	13 mm dia. × 50 mm standoff
3	R-S-1915-8	19 mm dia. × 15 mm standoff
8	R-S-1920-8	19 mm dia. × 20 mm standoff
8	R-S-1925-8	19 mm dia. × 25 mm standoff
8	R-S-1950-8	19 mm dia. × 50 mm standoff
6	R-S-19100-8	19 mm dia. × 100 mm standoff
8	R-S-2520-8	25 mm dia. × 20 mm standoff
8	R-S-2525-8	25 mm dia. × 25 mm standoff
8	R-S-2550-8	25 mm dia. × 50 mm standoff
6	R-S-25100-8	25 mm dia. × 100 mm standoff
4	R-CT-40-30-8	40 mm tension clamp with 30 mm post
8	R-CT-64-70-8	64 mm tension clamp with 70 mm post
2	R-CT-95-83-8	95 mm tension clamp with 83 mm post
1	R-CTB-25-8	25 mm tension clamp bracket
4	R-RCD-8	Delrin® resting cone
4	R-RCS-8	Steel resting cone
1	R-APJ-8	Adjustable pivot joint
3	R-AJ-19-8	19 mm dia. adjustable jackstand
3	R-AJ-25-8	25 mm dia. adjustable jackstand
3	R-AS-45-8	45 mm long adjustable slide
3	R-AS-70-8	70 mm long adjustable slide
2	R-TB-2530-8	Tower block with base
1	R-TB-25300-8	25 mm × 300 mm tower
2	R-TC-500200	500 mm × 200 mm × 25 mm component tray
2	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 155 pc

CMM fixtures

Adjustables

Adjustable jackstand

To allow variable heights of up to 22 mm and then lock them into position.

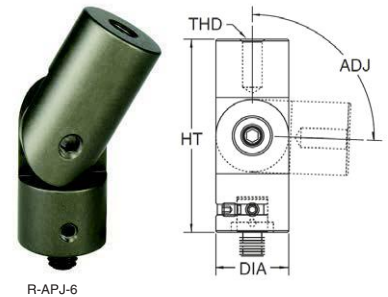
Part number	Thread	Diameter	Height	Adjustment	Price
R-AJ-9-4	M4	9 mm	19 mm	7 mm	\$45
R-AJ-13-6	M6	17 mm	42 mm	13 mm	\$40
R-AJ-25-6	M6	25 mm	42 mm	13 mm	\$55
R-AJ-19-8	M8	19 mm	37 mm	13 mm	\$45
R-AJ-25-8	M8	25 mm	42 mm	13 mm	\$56
R-AJS-35-8	M8	38 mm	65 mm	15 mm	\$88



Adjustable pivot joint

For positioning a component at any angle. Lock the rotating base into position and then set the angle of the pivot.

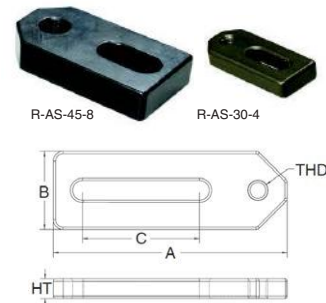
Part number	Thread	Diameter	Height	Adjustment	Price
R-APJ-6	M6	19 mm	50 mm	93°	\$74
R-APJ-8	M8	19 mm	50 mm	93°	\$77



Adjustable slide

To place components in between holes on the plate.

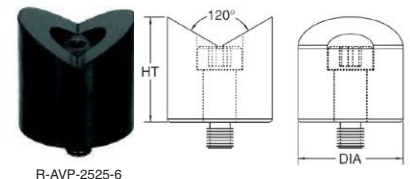
Part number	Thread	Height	A	B	C	Price
R-AS-30-4	M4	5 mm	30 mm	13 mm	9 mm	\$28
R-AS-45-4	M4	5 mm	45 mm	13 mm	24 mm	\$31
R-AS-45-6	M6	10 mm	44 mm	20 mm	13 mm	\$28
R-AS-70-6	M6	10 mm	72 mm	25 mm	34 mm	\$40
R-AS-45-8	M8	10 mm	44 mm	20 mm	13 mm	\$30
R-AS-70-8	M8	10 mm	72 mm	25 mm	34 mm	\$42



Adjustable V-post

For holding cylindrical or tubular parts without marring the part surface. Can be rotated and locked into position.

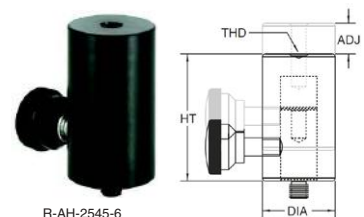
Part number	Thread	Diameter	Height	Adjustment	Price
R-AVP-2525-6	M6	25 mm	25 mm	360°	\$39
R-AVP-2525-8	M8	25 mm	25 mm	360°	\$39



Adjustable height stand

To allow variable heights without marring the part surface.

Part number	Thread	Diameter	Height	Adjustment	Price
R-AH-2545-6	M6	25 mm	45 mm	9 mm	\$55
R-AH-2545-8	M8	25 mm	45 mm	9 mm	\$55



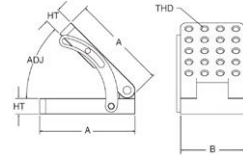
Adjustable angle plate

Ideal for holding components on an angle. The angle plate is adjustable to 180°.

Part number	Thread	Height	A	B	Adjustment	Price
R-PCA-135075-10-4	M4	13 mm	75 mm	50 mm	180°	\$178
R-PCA-135075-12-6	M6	13 mm	75 mm	50 mm	180°	\$178



R-PCA-135075-12-6



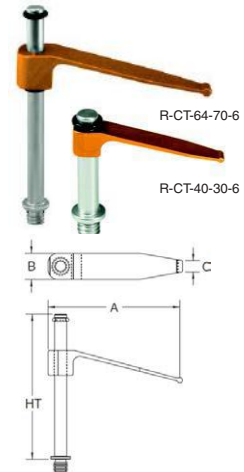
CMM fixtures

Clamps

Tension clamp

For quick and easy clamping.

Part number	Thread	Height	A	B	C	Price
R-CT-40-25-4	M4	25 mm	40 mm	7.6 mm	4 mm	\$21
R-CT-40-30-6	M6	30 mm	40 mm	7.6 mm	4 mm	\$23
R-CT-40-70-6	M6	68 mm	40 mm	7.6 mm	4 mm	\$25
R-CT-64-70-6	M6	68 mm	63.5 mm	13 mm	5 mm	\$26
R-CT-95-86-6	M6	83 mm	96 mm	19 mm	9 mm	\$45
R-CT-100P-83-6*	M6	83 mm	105 mm	19 mm	9 mm	\$57
R-CT-40-30-8	M8	30 mm	40 mm	7.6 mm	4 mm	\$25
R-CT-40-70-8	M8	68 mm	40 mm	7.6 mm	4 mm	\$27
R-CT-64-70-8	M8	68 mm	63.5 mm	13 mm	5 mm	\$28
R-CT-95-83-8	M8	83 mm	96 mm	19 mm	9 mm	\$45
R-CT-100P-83-8*	M8	83 mm	105 mm	19 mm	9 mm	\$57

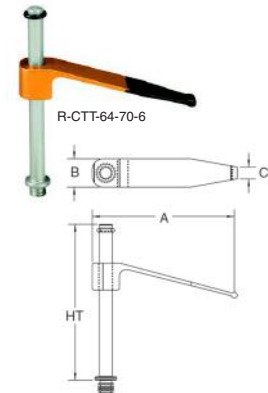


*Includes a plunger for reaching over the edge of a part to a more rigid surface or to reach over another support component.

Soft tip tension clamp

Rubber coated tips hold parts without scratching or marring the part surface.

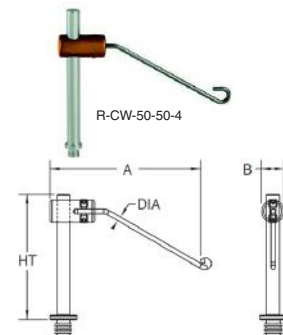
Part number	Thread	Height	A	B	C	Price
R-CTT-40-25-4	M4	25 mm	40 mm	7.6 mm	4 mm	\$24
R-CTT-40-30-6	M6	30 mm	40 mm	7.6 mm	4 mm	\$28
R-CTT-40-70-6	M6	68 mm	40 mm	7.6 mm	4 mm	\$30
R-CTT-64-70-6	M6	68 mm	63.5 mm	13 mm	5 mm	\$31
R-CTT-95-83-6	M6	83 mm	96 mm	19 mm	9 mm	\$50
R-CTT-40-30-8	M6	30 mm	40 mm	7.6 mm	4 mm	\$28
R-CTT-40-70-8	M8	68 mm	40 mm	7.6 mm	4 mm	\$30
R-CTT-64-70-8	M8	68 mm	63.5 mm	13 mm	5 mm	\$31
R-CTT-95-83-8	M8	83 mm	96 mm	19 mm	9 mm	\$50



Spring wire clamp

For light clamping of small parts, minimizing the contact area on a part and causing the least possible obstruction.

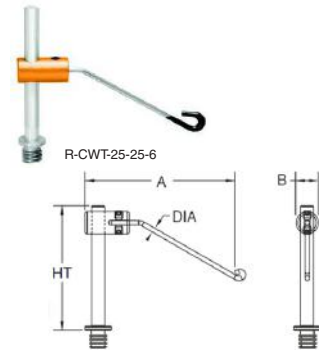
Part number	Thread	Height	A	B	C	Price
R-CW-25-25-4	M4	25 mm	36 mm	8 mm	1.5 mm	\$28
R-CW-50-50-4	M4	45 mm	55 mm	8 mm	1.5 mm	\$32
R-CW-25-25-6	M6	25 mm	36 mm	8 mm	1.5 mm	\$28
R-CW-50-50-6	M6	50 mm	55 mm	8 mm	1.5 mm	\$32



Soft tip spring wire clamp

With rubber coated tips for light clamping of small parts, minimizing the contact area on a part and for the least possible obstruction.

Part number	Thread	Height	A	B	C	Price
R-CWT-25-25-4	M4	25 mm	36 mm	8 mm	1.5 mm	\$30
R-CWT-50-50-4	M4	45 mm	55 mm	8 mm	1.5 mm	\$34
R-CWT-25-25-6	M6	25 mm	36 mm	8 mm	1.5 mm	\$28
R-CWT-50-50-6	M6	50 mm	55 mm	8 mm	1.5 mm	\$33

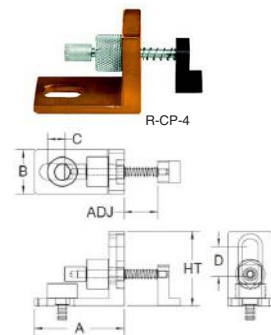


Pusher clamp

To push a part against standoffs or into corner (two interchangeable tips included).

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CP-4	M4	32 mm	38 mm	19 mm	8 mm	13 mm	10 mm	\$79
R-CP-6	M6	32 mm	38 mm	19 mm	8 mm	13 mm	10 mm	\$79

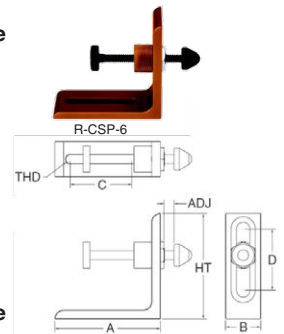
Included: socket head cap screw, thumb screw and washer.



Screw pusher clamp

For pushing and holding a part against stops.

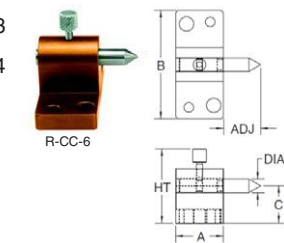
Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CSP-6	M6	76 mm	76 mm	25 mm	44 mm	44 mm	38 mm	\$81
R-CSP-8	M8	76 mm	76 mm	25 mm	44 mm	44 mm	38 mm	\$81



Centers

For holding cylindrical parts at each end on their inside diameters.

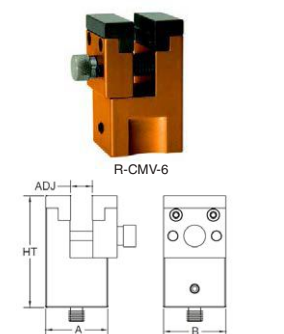
Part number	Thread	Diameter	Height	A	B	C	Adjustment	Price
R-CC-6	M4/M6	6 mm	38 mm	22 mm	51 mm	20 mm	16 mm	\$186
R-CC-13	M4/M6/M8	13 mm	50 mm	38 mm	64 mm	25 mm	38 mm	\$223
R-CC-25	M4/M6/M8	25 mm	69 mm	51 mm	76 mm	35 mm	50 mm	\$274



Mini vise

For clamping a small area of a part. Vises can be rotated 360° and then locked into a position.

Part number	Thread	Height	A	B	Adjustment	Price
R-CMV-4	M4	58 mm	32 mm	32 mm	11 mm	\$253
R-CMV-6	M4	58 mm	32 mm	32 mm	11 mm	\$253
R-CMV-8	M8	58 mm	32 mm	32 mm	11 mm	\$253

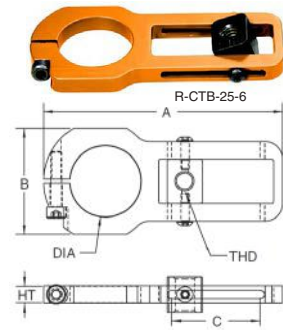


CMM fixtures

Tension clamp bracket

To hold tension clamp on an angle.

Part number	Thread	Diameter	Height	A	B	C	Price
R-CTB-25-6	M6	25.5 mm	6 mm	86 mm	38 mm	32 mm	\$62
R-CTB-25-8	M8	25.5 mm	6 mm	86 mm	38 mm	32 mm	\$63

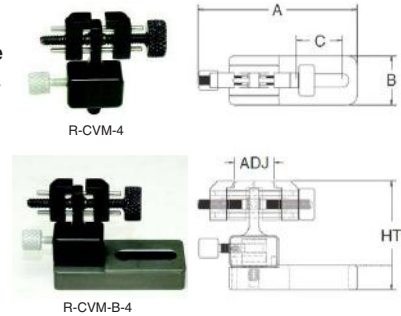


Micro vise clamp

Ideal for holding parts horizontally or vertically. Jaws have a V notch for holding cylindrical and tubular parts.

Part number	Thread	Height	A	B	C	Adjustment	Price
R-CVM-4	M4	28 mm	38 mm	10 mm	—	13 mm	\$117
R-CVM-B-4	M4	35 mm	51 mm	16 mm	15 mm	13 mm	\$147
R-CVM-6	M6	28 mm	38 mm	10 mm	—	13 mm	\$117
R-CVM-B-6	M6	38 mm	78 mm	20 mm	35 mm	13 mm	\$147

(with base)



Spring pusher standoff clamp

Designed for fixturing small parts in tight or compact space. Ideal for positioning parts and for profile clamping.

Part number	Thread	Diameter	Height	Price
R-CSPS-1210-4	M4	12 mm	10 mm	\$45
R-CSPS-1210-5	M5	12 mm	10 mm	\$46

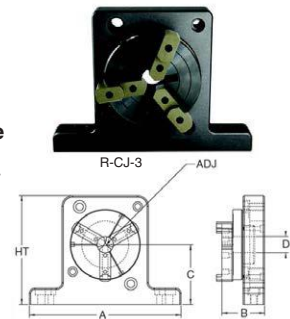


3-jaw clamp

For holding round parts at one end or in the middle, allowing the probe to move around the part without interference.

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CJ-3	M6/M8	127 mm	178 mm	50 mm	70 mm	19 mm	1.5 – 64.5 mm	\$374

Included: socket head cap screws.

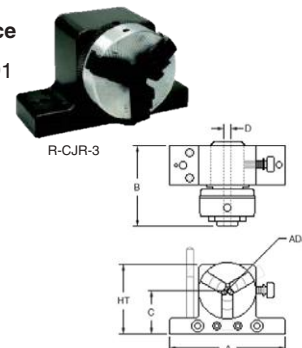


Rotating 3-jaw clamp

For clamping on inner and outer diameter of a part. The part is locked into position then rotated to a marked increment.

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CJR-3	M4/M6	60 mm	102 mm	70 mm	38 mm	6.4 mm	1 – 63 mm	\$291

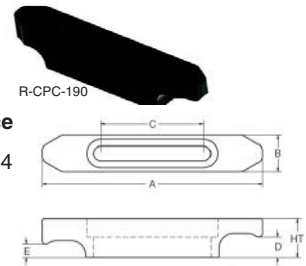
Included: socket head cap screws and chuck keys.



CMM plate clamp

Non-marking clamp for securing 13 mm and 19 mm thick plates to a CMM. Includes screws for M8, M10 and M12 inserts.

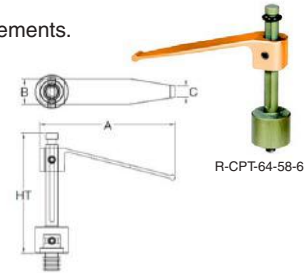
Part number	Thread	Height	A	B	C	D	E	Price
R-CPC-190	M8/M10/M12	34 mm	193 mm	32 mm	90 mm	6.4 mm	11.9 mm	\$54



Positional tension clamp

Allows locking the tension clamp rotational position to avoid probing interferences between measurements.

Part number	Thread	Height	A	B	C	Price
R-CPT-64-58-6	M6	58 mm	63.5 mm	13 mm	5 mm	\$63

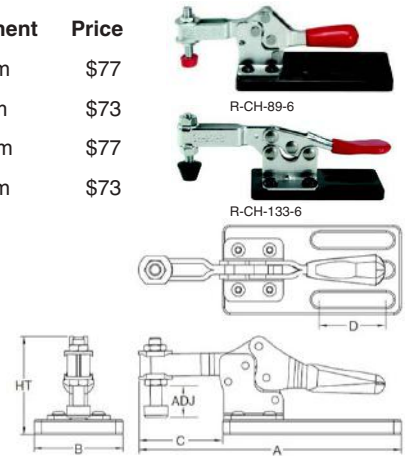


Hold down clamp

For additional clamping force.

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CH-89-6	M6	42 mm	125 mm	38 mm	35 mm	29 mm	13 mm	\$77
R-CH-133-6	M6	50 mm	139 mm	38 mm	49 mm	29 mm	8 mm	\$73
R-CH-89-8	M8	42 mm	124 mm	38 mm	35 mm	30 mm	13 mm	\$77
R-CH-133-8	M8	50 mm	138 mm	38 mm	49 mm	30 mm	8 mm	\$73

Included: socket head cap screws and washers.



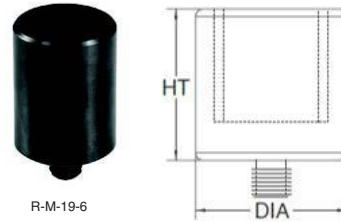
CMM fixtures

Magnets

Magnet

For holding steel or iron parts.

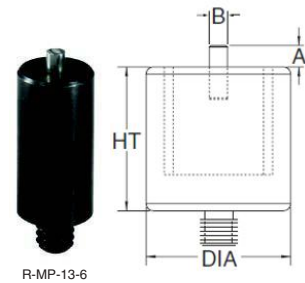
Part number	Thread	Diameter	Height	Price
R-M-6-4	M4	6 mm	25 mm	\$27
R-M-13-4	M4	13 mm	25 mm	\$44
R-M-13-6	M6	13 mm	25 mm	\$30
R-M-19-6	M6	19 mm	25 mm	\$33
R-M-25-6	M6	25 mm	25 mm	\$43
R-M-32-6	M6	32 mm	25 mm	\$53
R-M-13-8	M8	13 mm	25 mm	\$31
R-M-19-8	M8	19 mm	25 mm	\$34
R-M-25-8	M8	25 mm	25 mm	\$44
R-M-32-8	M8	32 mm	25 mm	\$56



Pin magnet

For holding and locating steel or iron parts.

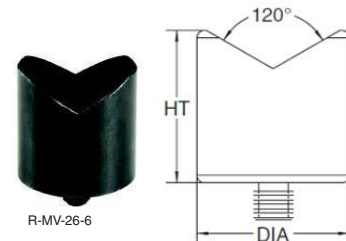
Part number	Thread	Diameter	Height	A	B	Price
R-MP-6-4	M4	6 mm	25 mm	3.8 mm	1.6 mm	\$59
R-MP-13-4	M4	13 mm	25 mm	3.8 mm	1.6 mm	\$67
R-MP-13-6	M6	13 mm	25 mm	3.8 mm	3 mm	\$59
R-MP-19-6	M6	19 mm	25 mm	3.8 mm	3 mm	\$70
R-MP-25-6	M6	25 mm	25 mm	3.8 mm	3 mm	\$74
R-MP-13-8	M8	13 mm	25 mm	3.8 mm	3 mm	\$65
R-MP-19-8	M8	19 mm	25 mm	3.8 mm	3 mm	\$76
R-MP-25-8	M8	25 mm	25 mm	3.8 mm	3 mm	\$80



V magnet

For holding cylindrical parts and bent tubing.

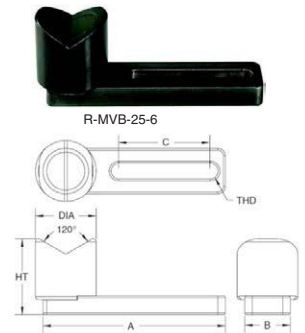
Part number	Thread	Diameter	Height	Price
R-MV-13-6	M6	13 mm	25 mm	\$65
R-MV-19-6	M6	19 mm	25 mm	\$78
R-MV-25-6	M6	25 mm	25 mm	\$84
R-MV-32-6	M6	32 mm	25 mm	\$103
R-MV-13-8	M8	13 mm	25 mm	\$77
R-MV-19-8	M8	19 mm	25 mm	\$87
R-MV-25-8	M8	25 mm	25 mm	\$91
R-MV-32-8	M8	32 mm	25 mm	\$115



V magnet with base

For holding steel or iron parts.

Part number	Thread	Diameter	Height	A	B	C	Price
R-MVB-13-6	M6	13 mm	32 mm	76 mm	19 mm	36 mm	\$116
R-MVB-19-6	M6	19 mm	32 mm	76 mm	19 mm	36 mm	\$118
R-MVB-25-6	M6	25 mm	32 mm	76 mm	19 mm	36 mm	\$121
R-MVB-32-6	M6	32 mm	32 mm	76 mm	19 mm	36 mm	\$142
R-MVB-19-8	M8	19 mm	32 mm	76 mm	19 mm	38 mm	\$134
R-MVB-25-8	M8	25 mm	32 mm	76 mm	19 mm	38 mm	\$138
R-MVB-32-8	M8	32 mm	32 mm	76 mm	19 mm	38 mm	\$167

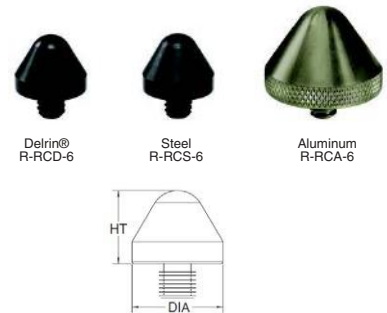


Miscellaneous

Cone

To rest a part on a rounded point for single-point contact.

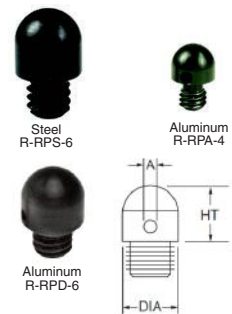
Part number	Thread	Diameter	Height	Material	Price
R-RCD-6	M6	16 mm	13 mm	Delrin®	\$9
R-RCS-6	M6	16 mm	13 mm	Steel	\$15
R-RCA-6	M6	25 mm	19 mm	Aluminum	\$26
R-RCD-8	M8	16 mm	13 mm	Delrin®	\$9
R-RCS-8	M8	16 mm	13 mm	Steel	\$11
R-RCA-8	M8	25 mm	19 mm	Aluminum	\$26
R-RCS-25-8	M8	25 mm	19 mm	Steel	\$28



Resting pin

To rest a part on a rounded point.

Part number	Thread	Diameter	Height	Material	A	Price
R-RPD-4	M4	6 mm	5 mm	Delrin®	1.9 mm	\$16
R-RPA-4	M4	6 mm	5 mm	Aluminum	1.9 mm	\$10
R-RPD-6	M6	9 mm	10 mm	Delrin®	1.9 mm	\$16
R-RPS-6	M6	9 mm	10 mm	Steel	1.9 mm	\$10



CMM fixtures

Screws and adaptors

Component replacement parts.

Thumb screw

Part number	Thread	Diameter	Height	Price
R-AATK-6	M6	12 mm	20 mm	\$2

Screws

Part number	Thread	Diameter	Height	Price
R-AATS-14	M3	6 mm	15 mm	\$6
R-AATS-20	M3	6 mm	20 mm	\$8
R-ATS-4	M4	13 mm	15 mm	\$8



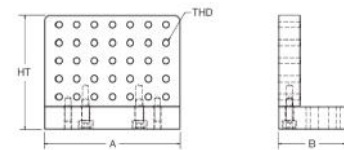
Adaptors

Part number	Thread	Diameter	Height	Price
R-AAS-4	M4	8 mm	15 mm	\$8
R-AAS-6	M6	8 mm	15 mm	\$8
R-AAS-8	M8	11 mm	17 mm	\$11

Vertical base plate

For holding components vertically.

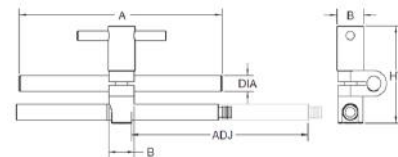
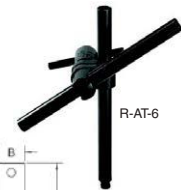
Part number	Thread	Height	A	B	Price
R-PCV-507540-10-4	M4	63.5 mm	75 mm	40 mm	\$138



Adjustable T-arm

To support a part on its side.

Part number	Thread	Diameter	Height	A	B	Adjustment	Price
R-AT-6	M6	7.8 mm	52 mm	100 mm	12.7 mm	89 mm	\$65



Standoffs

To elevate and locate a part.

M4 standoffs

Part number	Thread	Diameter	Height	Price
R-S-65-4*	M4	6 mm	5 mm	\$12
R-S-610-4*	M4	6 mm	10 mm	\$12
R-S-615-4	M4	6 mm	15 mm	\$16
R-S-620-4*	M4	6 mm	20 mm	\$15
R-S-625-4*	M4	6 mm	25 mm	\$14
R-S-95-4*	M4	9 mm	5 mm	\$12
R-S-910-4	M4	9 mm	10 mm	\$12
R-S-915-4	M4	9 mm	15 mm	\$17
R-S-920-4	M4	9 mm	20 mm	\$13
R-S-925-4	M4	9 mm	25 mm	\$13
R-S-950-4	M4	9 mm	50 mm	\$16
R-S-125-4*	M4	12 mm	5 mm	\$12
R-S-1210-4	M4	12 mm	10 mm	\$13
R-S-1215-4	M4	12 mm	15 mm	\$16
R-S-1220-4*	M4	12 mm	20 mm	\$15
R-S-1225-4	M4	12 mm	25 mm	\$14
R-S-1250-4	M4	12 mm	50 mm	\$17



R-S-2550-6

M6 standoffs

Part number	Thread	Diameter	Height	Price
R-S-610-6*	M6	6 mm	10 mm	\$12
R-S-625-6*	M6	6 mm	25 mm	\$13
R-S-95-6*	M6	9 mm	5 mm	\$12
R-S-910-6	M6	9 mm	10 mm	\$10
R-S-915-6	M6	9 mm	15 mm	\$16
R-S-920-6	M6	9 mm	20 mm	\$13
R-S-925-6	M6	9 mm	25 mm	\$13
R-S-1310-6	M6	13 mm	10 mm	\$11
R-S-1315-6	M6	13 mm	15 mm	\$12
R-S-1320-6	M6	13 mm	20 mm	\$11
R-S-1325-6	M6	13 mm	25 mm	\$11
R-S-1350-6	M6	13 mm	50 mm	\$13
R-S-13100-6	M6	13 mm	100 mm	\$20
R-S-13150-6	M6	13 mm	150 mm	\$21
R-S-1910-6	M6	19 mm	10 mm	\$12
R-S-1915-6	M6	19 mm	15 mm	\$13
R-S-1920-6	M6	19 mm	20 mm	\$12
R-S-1925-6	M6	19 mm	25 mm	\$12
R-S-1950-6	M6	19 mm	50 mm	\$15
R-S-19100-6	M6	19 mm	100 mm	\$16
R-S-19150-6	M6	19 mm	150 mm	\$22



R-S-920-4

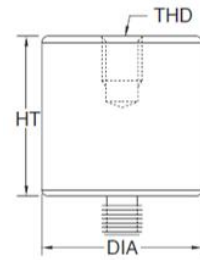


R-S-620-4

CMM fixtures

M6 standoffs continued

Part number	Thread	Diameter	Height	Price
R-S-2515-6	M6	25 mm	15 mm	\$18
R-S-2520-6	M6	25 mm	20 mm	\$14
R-S-2525-6	M6	25 mm	25 mm	\$15
R-S-2550-6	M6	25 mm	50 mm	\$16
R-S-25100-6	M6	25 mm	100 mm	\$18
R-S-25150-6	M6	25 mm	150 mm	\$25
R-S-3825-6	M6	38 mm	25 mm	\$28
R-S-3850-6	M6	38 mm	50 mm	\$30
R-S-38150-6	M6	38 mm	150 mm	\$43



M8 standoffs

Part number	Thread	Diameter	Height	Price
R-S-1315-8	M8	13 mm	15 mm	\$11
R-S-1320-8	M8	13 mm	20 mm	\$11
R-S-1325-8	M8	13 mm	25 mm	\$11
R-S-1350-8	M8	13 mm	50 mm	\$11
R-S-13100-8	M8	13 mm	100 mm	\$17
R-S-1915-8	M8	19 mm	15 mm	\$12
R-S-1920-8	M8	19 mm	20 mm	\$12
R-S-1925-8	M8	19 mm	25 mm	\$14
R-S-1950-8	M8	19 mm	50 mm	\$14
R-S-19100-8	M8	19 mm	100 mm	\$16
R-S-19150-8	M8	19 mm	150 mm	\$23
R-S-2520-8	M8	25 mm	20 mm	\$14
R-S-2525-8	M8	25 mm	25 mm	\$14
R-S-2550-8	M8	25 mm	50 mm	\$15
R-S-25100-8	M8	25 mm	100 mm	\$18
R-S-25150-8	M8	25 mm	150 mm	\$25
R-S-3825-8	M8	38 mm	25 mm	\$33
R-S-3850-8	M8	38 mm	50 mm	\$36
R-S-38150-8	M8	38 mm	150 mm	\$54

* Does not have a threaded top.

M4 standoffs are made of aluminum. M6 standoffs are made of steel.

Delrin® standoffs

To elevate and locate a part using a non-marring material.

Part number	Thread	Diameter	Height	Price
R-SD-610-4	M4	6 mm	10 mm	\$13
R-SD-910-4	M4	9 mm	10 mm	\$15
R-SD-1210-4	M4	12 mm	10 mm	\$16
R-SD-925-6	M6	9 mm	25 mm	\$15
R-SD-1325-6	M6	13 mm	25 mm	\$14
R-SD-1925-6	M6	19 mm	25 mm	\$15



Pin standoffs

To elevate and locate a part against a pin.

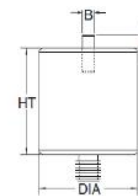
Part number	Thread	Diameter	Height	A	B	Price
R-SP-610-4	M4	6 mm	10 mm	3.8 mm	2 mm	\$14
R-SP-910-4	M4	9 mm	10 mm	3.8 mm	2 mm	\$14
R-SP-1210-4	M4	12 mm	10 mm	3.8 mm	2 mm	\$14
R-SP-610-6	M6	6 mm	10 mm	3.8 mm	2 mm	\$15
R-SP-910-6	M6	9 mm	10 mm	3.8 mm	2 mm	\$15
R-SP-1325-6	M6	13 mm	25 mm	3.8 mm	3 mm	\$15
R-SP-1925-6	M6	19 mm	25 mm	3.8 mm	3 mm	\$26
R-SP-1325-8	M8	13 mm	25 mm	3.8 mm	3 mm	\$16
R-SP-2525-8	M8	25 mm	25 mm	3.8 mm	3 mm	\$30



Delrin® pin standoffs

To elevate and locate a part against a pin using a non-marring material.

Part number	Thread	Diameter	Height	A	B	Price
R-SPD-910-4	M4	9 mm	10 mm	3.8 mm	2 mm	\$15
R-SPD-1325-6	M6	13 mm	25 mm	3.8 mm	3 mm	\$15



2-way spring-loaded pin

For locating within a hole or slot of a part.

Part number	Thread	Diameter	Height	A	B	Adjustment	Price
R-S-1350-2W-6	M6	13 mm	50 mm	2 mm	9 mm	12.5 mm	\$121
R-S-2550-2W-6	M6	25 mm	50 mm	7 mm	19 mm	12.5 mm	\$113
R-S-2550-2W-8	M8	25 mm	50 mm	7.1 mm	19 mm	12.5 mm	\$113

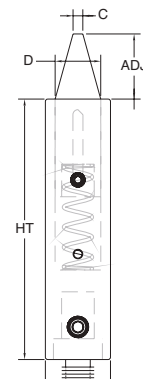


R-S-2550-2W-6 R-S-2550-4W-6

4-way spring-loaded pin

For locating within a hole or slot of a part.

Part number	Thread	Diameter	Height	A	B	Adjustment	Price
R-S-1350-4W-6	M6	13 mm	50 mm	2 mm	9 mm	12.5 mm	\$109
R-S-2550-4W-6	M6	25 mm	50 mm	7 mm	19 mm	12.5 mm	\$103
R-S-2550-4W-8	M8	25 mm	50 mm	7.1 mm	19 mm	12.5 mm	\$103



CMM fixtures

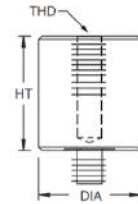
Standoff adaptor

For step clamps and calibration sphere.

Part number	Thread	Diameter	Height	A	Price
R-SA-6-4	M4	16 mm	15 mm	M6	\$15
R-SA-4-6	M6	9 mm	15 mm	M4	\$15
R-SA-8-6	M6	25 mm	25 mm	M8	\$17
R-SA-6-8	M8	25 mm	25 mm	M6	\$18



R-SA-6-8



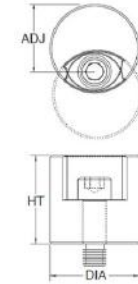
Rotator standoff

To secure parts against stops/supports.

Part number	Thread	Diameter	Height	Adjustment	Price
R-SR-2525-6	M6	25 mm	25 mm	19 mm	\$67



R-SR-2525-6



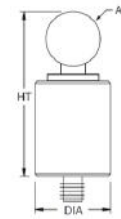
Tooling ball

For referencing CMM to co-ordinates to a program part.

Part number	Thread	Diameter	Height	A	Price
R-STB-13-6	M6	16 mm	41 mm	13 mm	\$72
R-STB-13-8	M8	19 mm	41 mm	13 mm	\$72



R-STB-13-6



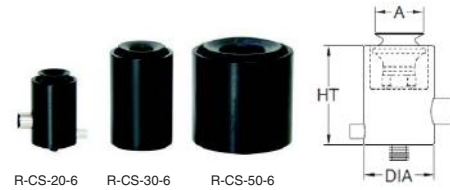
Suction cups

Suction cup

For holding contoured surfaces.

Part number	Thread	Diameter	Height	A	Price
R-CS-5-6	M6	19 mm	35 mm	5 mm	\$63
R-CS-10-6	M6	19 mm	45 mm	10 mm	\$62
R-CS-20-6	M6	31 mm	45 mm	20 mm	\$75
R-CS-30-6	M6	44 mm	65 mm	30 mm	\$88
R-CS-50-6	M6	70 mm	65 mm	50 mm	\$123

Requires R-CSH-MSC, available separately.



Exposed suction cup

For holding contoured surfaces.

Part number	Thread	Diameter	Height	A	Price
R-CES-10-6	M6	19 mm	42 mm	10 mm	\$49
R-CES-20-6	M6	31 mm	49 mm	20 mm	\$58
R-CES-30-6	M6	31 mm	57 mm	30 mm	\$68
R-CES-50-6	M6	31 mm	67 mm	50 mm	\$86

Requires R-CSH-MSC, available separately.



Suction V cup

For holding cylindrical tubes and shafts.

Part number	Thread	Diameter	Height	A	B	Price
R-CVS-5-6	M6	19 mm	35 mm	5 mm	90°	\$81
R-CVS-10-6	M6	19 mm	41 mm	10 mm	120°	\$79
R-CVS-20-6	M6	31 mm	51 mm	20 mm	120°	\$96
R-CVS-30-6	M6	44 mm	76 mm	30 mm	120°	\$124
R-CVS-50-6	M6	70 mm	89 mm	50 mm	120°	\$171

Requires R-CSH-MSC, available separately.



Vacuum pump

For suction cups with on/off valve, hose connector and quick disconnect.

Part number	Description	Price
R-CSVP	Vacuum pump assembly	\$218



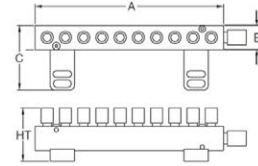
CMM fixtures

Manifold

6-port or 10-port manifold can be used vertically or horizontally on a base plate.

Part number	Description	Height	A	B	C	Price
R-CSM-6P	6-port manifold	52 mm	121 mm	25 mm	67 mm	\$197
R-CSM-10P	10-port manifold	52 mm	197 mm	25 mm	67 mm	\$267

Requires R-CSH-MP and R-CSH-MSC, available separately.



Vacuum hose

Hose for connecting manifold to vacuum pump and to suction cups.

Part number	Description	Price
R-CSH-MP	9.5 mm diameter hose to connect manifold to vacuum pump (sold per meter)	\$7
R-CSH-MSC	6.4mm diameter hose to connect manifold to suction cups (sold per meter)	\$13



Suction cup tray

For holding and organizing suction cups.

Part number	Thread	Height	Width	Depth	Price
R-TCS-300200	M6	25 mm	300 mm	200 mm	\$133



Towers

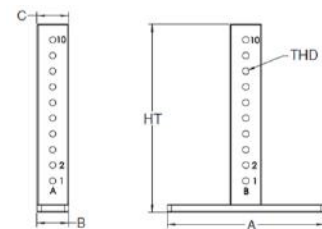
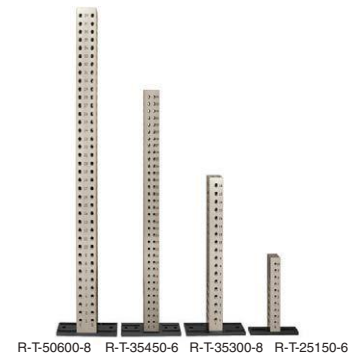
Tower

To hold a part vertically.

Part number	Thread	Height	A	B	C	Threaded rows	Price
R-T-25150-6	M6	150 mm	127 mm	25 mm	25 mm	1	\$166
R-T-25300-6	M6	300 mm	127 mm	25 mm	25 mm	1	\$211
R-T-35300-6	M6	300 mm	152 mm	51 mm	35 mm	2	\$315
R-T-35450-6	M6	450 mm	152 mm	51 mm	50 mm	2	\$381
R-T-50600-6	M6	600 mm	152 mm	51 mm	50 mm	2	\$613
R-T-50750-6	M6	760 mm	152 mm	51 mm	50 mm	2	\$732
R-T-25150-8	M8	150 mm	127 mm	25 mm	25 mm	1	\$166
R-T-25300-8	M8	300 mm	127 mm	25 mm	25 mm	1	\$217
R-T-35300-8	M8	300 mm	152 mm	51 mm	35 mm	2/1*	\$368
R-T-35450-8	M8	450 mm	152 mm	51 mm	35 mm	2/1*	\$433
R-T-50600-8	M8	600 mm	152 mm	51 mm	50 mm	2	\$650
R-T-50750-8	M8	760 mm	152 mm	51 mm	50 mm	2	\$759

Included: socket head cap screws.

* Two sides have two rows of holes; two sides have one row of holes in the center.

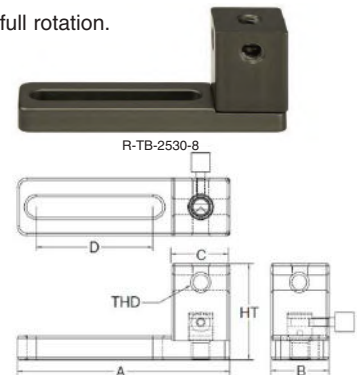


Tower block with base

For positioning a component vertically to the part set-up. Can be used without the base to allow full rotation.

Part number	Thread	Height	A	B	C	D	Price
R-TB-1619-4	M4	26 mm	41 mm	16 mm	16 mm	15 mm	\$66
R-TB-2025-6	M6	35 mm	70 mm	20 mm	20 mm	35 mm	\$70
R-TB-2530-8	M8	40 mm	89 mm	25 mm	25 mm	45 mm	\$91

Included: socket head cap screws.



CMM fixtures

Trays

Large component tray

For holding and organizing components.

Part number	Thread	Height	Depth	Width	Price
R-TC-560500	M6/M8	25 mm	560 mm	500 mm	\$338



R-TC-560500

Medium component tray

For holding and organizing components.

Part number	Thread	Height	Depth	Width	Price
R-TC-500200	M6/M8	25 mm	500 mm	200 mm	\$152

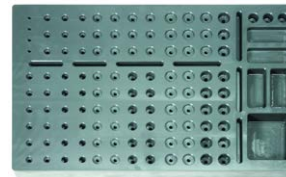


R-TC-500200

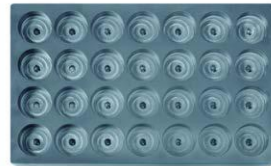
Small component tray

For holding and organizing components.

Part number	Thread	Height	Depth	Width	Price
R-TC-300190-4	M4	25 mm	300 mm	190 mm	\$138
R-TC-300190-6	M6	25 mm	300 mm	190 mm	\$148
R-TC-300200	M6/M8	25 mm	300 mm	200 mm	\$148



R-TC-300190-4

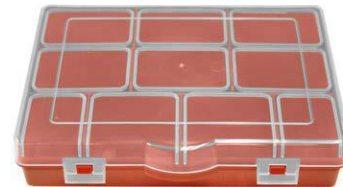


R-TC-300200

Component storage box

10-compartment box to hold and organize components.

Part number	Height	Depth	Width	Price
R-BC10	45 mm	203 mm	152 mm	\$15



R-BC10

QLC M4 vision kits

The QLC M4 vision kit is ideal for parts that fit within a 75 mm × 75 mm working volume.

A kit includes an acrylic base plate with M4 threaded holes 10 mm on center, a quick load corner and one set of components (A or B).

Note: Each QLC frame is specific to your machine. Please contact Renishaw to determine which frame you need and for pricing.



Plate sizes multi-hole set A

Part number	Base plate size	Price
R-QLC-PV1-A-4	13 mm × 150 mm × 150 mm	Call for price
R-QLC-PV2-A-4	13 mm × 200 mm × 200 mm	Call for price
R-QLC-PV3-A-4	13 mm × 250 mm × 150 mm	Call for price
R-QLC-PV4-A-4	13 mm × 250 mm × 250 mm	Call for price

Plate sizes multi-hole set B

Part number	Base plate size	Price
R-QLC-PV1-B-4	13 mm × 150 mm × 150 mm	Call for price
R-QLC-PV2-B-4	13 mm × 200 mm × 200 mm	Call for price
R-QLC-PV3-B-4	13 mm × 250 mm × 150 mm	Call for price
R-QLC-PV4-B-4	13 mm × 250 mm × 250 mm	Call for price

Component set A

Price: Call for price

Includes:

Qty	Part number	Description
3	R-S-610-4	6 mm dia. × 10 mm standoff
3	R-S-625-4	6 mm dia. × 25 mm standoff
3	R-S-95-4	9 mm dia. × 5 mm standoff
3	R-S-910-4	9 mm dia. × 10 mm standoff
3	R-S-920-4	9 mm dia. × 20 mm standoff
3	R-S-925-4	9 mm dia. × 25 mm standoff
3	R-S-1210-4	12 mm dia. × 10 mm standoff
3	R-S-1225-4	12 mm dia. × 25 mm standoff
2	R-SP-610-4	6 mm dia. × 10 mm pin standoff
2	R-SP-910-4	9 mm dia. × 10 mm pin standoff
2	R-CTT-40-25-4	40 mm tension clamp with coated soft tip with 25 mm post
2	R-CWT-25-25-4	25 mm wire clamp with coated soft tip with 25 mm post
2	R-CWT-50-50-4	50 mm wire clamp with coated soft tip with 50 mm post
1	R-CP-4	Pusher clamp
1	R-CVM-B-4	Micro-clamp vise with base
1	R-CSPS-1210-4	Spring pusher standoff clamp

Vision fixtures

Plate sizes multi-hole set A

Part number	Base plate size	Price
R-QLC-PV1-A-4	13 mm × 150 mm × 150 mm	Call for price
R-QLC-PV2-A-4	13 mm × 200 mm × 200 mm	Call for price
R-QLC-PV3-A-4	13 mm × 250 mm × 150 mm	Call for price
R-QLC-PV4-A-4	13 mm × 250 mm × 250 mm	Call for price

Plate sizes multi-hole set B

Part number	Base plate size	Price
R-QLC-PV1-B-4	13 mm × 150 mm × 150 mm	Call for price
R-QLC-PV2-B-4	13 mm × 200 mm × 200 mm	Call for price
R-QLC-PV3-B-4	13 mm × 250 mm × 150 mm	Call for price
R-QLC-PV4-B-4	13 mm × 250 mm × 250 mm	Call for price

Component set A

Price: Call for price

Includes:

Qty	Part number	Description
3	R-S-610-4	6 mm dia. × 10 mm standoff
3	R-S-625-4	6 mm dia. × 25 mm standoff
3	R-S-95-4	9 mm dia. × 5 mm standoff
3	R-S-910-4	9 mm dia. × 10 mm standoff
3	R-S-920-4	9 mm dia. × 20 mm standoff
3	R-S-925-4	9 mm dia. × 25 mm standoff
3	R-S-1210-4	12 mm dia. × 10 mm standoff
3	R-S-1225-4	12 mm dia. × 25 mm standoff
2	R-SP-610-4	6 mm dia. × 10 mm pin standoff
2	R-SP-910-4	9 mm dia. × 10 mm pin standoff
2	R-CTT-40-25-4	40 mm tension clamp with coated soft tip with 25 mm post
2	R-CWT-25-25-4	25 mm wire clamp with coated soft tip with 25 mm post
2	R-CWT-50-50-4	50 mm wire clamp with coated soft tip with 50 mm post
1	R-CP-4	Pusher clamp
1	R-CVM-B-4	Micro-clamp vise with base
1	R-CSPS-1210-4	Spring pusher standoff clamp
4	R-RPA-4	Aluminum resting pin
1	R-VC-5050-4	50 mm × 50 mm corner viewer
1	R-AJ-9-4	9 mm dia. adjustable jackstand
1	R-AS-30-4	30 mm long adjustable slide
1	R-ASA-45-4	45 mm long adjustable acrylic slide base
1	R-TB-1619-4	Tower block with base 16 mm × 19 mm
1	R-TC-300-190-4	300 mm × 190 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 48 pc

Plate sizes multi-window set A

Part number	Base plate size	Price
R-QLC-PVW1-A-4	13 mm × 200 mm × 200 mm	Call for price
R-QLC-PVW2-A-4	13 mm × 250 mm × 150 mm	Call for price
R-QLC-PVW3-A-4	13 mm × 250 mm × 250 mm	Call for price
R-QLC-PVW4-A-4	13 mm × 400 mm × 400 mm	Call for price

Plate sizes multi-window set B

Part number	Base plate size	Price
R-QLC-PVW1-B-4	13 mm × 200 mm × 200 mm	Call for price
R-QLC-PVW2-B-4	13 mm × 250 mm × 150 mm	Call for price
R-QLC-PVW3-B-4	13 mm × 250 mm × 250 mm	Call for price
R-QLC-PVW4-B-4	13 mm × 400 mm × 400 mm	Call for price

Component set B

Price: Call for price

Includes:

Qty	Part number	Description
3	R-S-65-4*	6 mm dia. × 5 mm standoff
6	R-S-610-4	6 mm dia. × 10 mm standoff
6	R-S-625-4	6 mm dia. × 25 mm standoff
3	R-S-95-4	9 mm dia. × 5 mm standoff
6	R-S-910-4	9 mm dia. × 10 mm standoff
6	R-S-920-4	9 mm dia. × 20 mm standoff
6	R-S-925-4	9 mm dia. × 25 mm standoff
6	R-S-1210-4	12 mm dia. × 10 mm standoff
6	R-S-1225-4	12 mm dia. × 25 mm standoff
4	R-SP-610-4	6 mm dia. × 10 mm pin standoff
4	R-SP-910-4	9 mm dia. × 10 mm pin standoff
4	R-CTT 40-25-4	40 mm tension clamp with coated soft tip with 25 mm post
4	R-CWT-25-25-4	25 mm wire clamp with coated soft tip with 25 mm post
4	R-CWT-50-50-4	50 mm wire clamp with coated soft tip with 50 mm post
1	R-CP-4	Pusher clamp
1	R-CVM-B-4	Micro-clamp vise with base
1	R-CSPS-1210-4	Spring pusher standoff clamp
4	R-RPA-4	Aluminum resting pin
1	R-VC-5050-4	50 mm × 50 mm corner viewer
2	R-AJ-9-4	9 mm dia. adjustable jackstand
2	R-AS-30-4	30 mm long adjustable slide
2	R-ASA-45-4	45 mm long adjustable acrylic slide base
1	R-TB-1619-4	Tower block with base 16 mm × 19 mm
1	R-TC-300190-4	300 mm × 190 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 85 pc

* Does not have a threaded top.

Vision fixtures

QLC M6 vision kits

The QLC M6 vision kit is a comprehensive kit for holding plastic, aluminum, rubber and other non-ferrous parts.

A kit includes an acrylic base plate with M6 threaded holes 12.5 mm on center, a quick load corner and one set of components (A).

Note: Each QLC frame is specific to your machine. Please contact Renishaw to determine which frame you need and for pricing.



Plate sizes multi-hole set A

Part number	Base plate size	Price
R-QLC-PV1-A-6	13 mm × 150 mm × 150 mm	Call for price
R-QLC-PV2-A-6	13 mm × 250 mm × 250 mm	Call for price

Component set A

Price: Call for price

Includes:

Qty	Part number	Description
3	R-S-610-6*	6 mm dia. × 10 mm standoff
3	R-S-625-6*	6 mm dia. × 25 mm standoff
3	R-S-95-6*	9 mm dia. × 5 mm standoff
3	R-S-910-6	9 mm dia. × 10 mm standoff
3	R-S-920-6	9 mm dia. × 20 mm standoff
3	R-S-925-6	9 mm dia. × 25 mm standoff
3	R-S-1310-6	13 mm dia. × 10 mm standoff
3	R-S-1320-6	13 mm dia. × 20 mm standoff
2	R-SP-610-6	6 mm dia. × 10 mm pin standoff
2	R-SP-910-6	9 mm dia. × 10 mm pin standoff
4	R-CTT-40-30-6	40 mm tension clamp with coated soft tip with 30 mm post
4	R-CWT-25-25-6	25 mm wire clamp with coated soft tip with 25 mm post
4	R-CWT-50-50-6	50 mm wire clamp with coated soft tip with 50 mm post
1	R-CP-6	Pusher clamp
1	R-CVM-B-6	Micro-clamp vise with base
1	R-CSPS-1925-6	19 mm dia. × 25 mm spring pusher standoff clamp
4	R-RPS-6	Steel resting pin
1	R-VC-7575-6	75 mm × 75 mm corner viewer
1	R-AJ-13-6	13 mm dia. adjustable jackstand
1	R-AS-45-6	45 mm long adjustable slide
1	R-ASA-45-6	45 mm long adjustable acrylic slide base
1	R-TB-2025-6	Tower block with base 20 mm × 30 mm
1	R-TC-300190-6	300 mm × 190 mm × 25 mm component tray
1	R-BC10	50 mm × 200 mm × 150 mm compartment box

Total: 54 pc

* Does not have a threaded top.

Plate sizes multi-window set A

Part number	Base plate size	Price
R-QLC1-PVW1-A-6	13 mm × 250 mm × 250 mm	Call for price
R-QLC1-PVW2-A-6	13 mm × 400 mm × 400 mm	Call for price

Plates

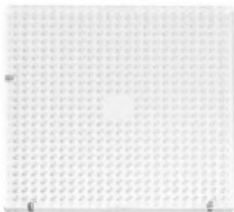
Vision plates

Acrylic base plates with dowel pins.



Part number	Thread	Height	Width	Depth	Windows	Hole spacing (OC*)	Price
M4 multi-hole plates							
R-PV-13150150-10-4	M4	13 mm	150 mm	150 mm	1	10 mm	\$333
R-PV-13200200-10-4	M4	13 mm	200 mm	200 mm	1	10 mm	\$438
R-PV-13250150-10-4	M4	13 mm	250 mm	150 mm	1	10 mm	\$428
R-PV-13250250-10-4	M4	13 mm	250 mm	250 mm	1	10 mm	\$518
M4 multi-window plates							
R-PV-W-13200200-10-4	M4	13 mm	200 mm	200 mm	5	10 mm	\$353
R-PV-W-13250150-10-4	M4	13 mm	250 mm	150 mm	3	10 mm	\$343
R-PV-W-13250250-10-4	M4	13 mm	250 mm	250 mm	5	10 mm	\$373
R-PV-W-13400400-10-4	M4	13 mm	400 mm	400 mm	7	10 mm	\$1,007
M6 multi-hole plates							
R-PV-13150150-12-6	M6	13 mm	150 mm	150 mm	1	12.5 mm	\$333
R-PV-13250250-12-6	M6	13 mm	250 mm	250 mm	1	12.5 mm	\$458
M6 multi-window plates							
R-PV-W-13250250-12-6	M6	13 mm	250 mm	250 mm	5	12.5 mm	\$343
R-PV-W-13400400-12-6	M6	13 mm	400 mm	400 mm	7	12.5 mm	\$1,002

*On center



Multi-hole plate R-PV-132000200-10-4



Multi-window plate R-PV-W-132000200-10-4

Vision fixtures

Adjustables

Adjustable jackstand

To allow variable heights of up to 22 mm and then lock them into position.

Part number	Thread	Diameter	Height	Adjustment	Price
R-AJ-9-4	M4	9 mm	19 mm	7 mm	\$45
R-AJ-13-6	M6	17 mm	42 mm	13 mm	\$40
R-AJ-25-6	M6	25 mm	42 mm	13 mm	\$55

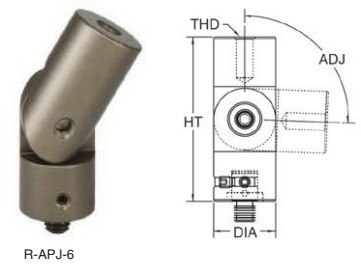


R-AJ-25-6

Adjustable pivot joint

For positioning a component at any angle. Lock the rotating base into position and then set the angle of the pivot.

Part number	Thread	Diameter	Height	Adjustment	Price
R-APJ-6	M6	19 mm	50 mm	93°	\$74

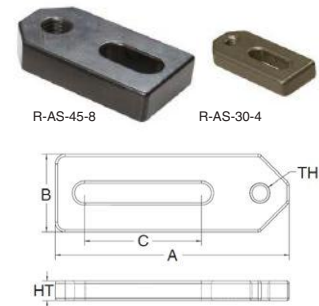


R-APJ-6

Adjustable slide

To place components in between holes on the plate.

Part number	Thread	Height	A	B	C	Price
R-AS-30-4	M4	5 mm	30 mm	13 mm	9 mm	\$28
R-AS-45-4	M4	5 mm	45 mm	13 mm	24 mm	\$30
R-ASA-45-4 (Acrylic)	M4	5 mm	45 mm	13 mm	24 mm	\$30
R-ASA-45-6 (Acrylic)	M6	10 mm	44 mm	20 mm	13 mm	\$33
R-AS-45-6	M6	10 mm	44 mm	20 mm <td 13 mm	\$28	
R-AS-70-6	M6	10 mm	72 mm	25 mm	34 mm	\$40



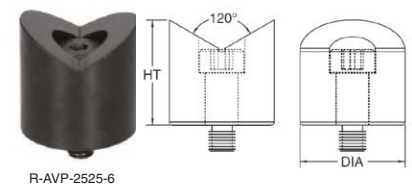
R-AS-45-8

R-AS-30-4

Adjustable V-post

For holding cylindrical or tubular parts without marring the part surface. Can be rotated and locked into position.

Part number	Thread	Diameter	Height	Adjustment	Price
A-AVP-2525-6	M6	25 mm	25 mm	360°	\$39

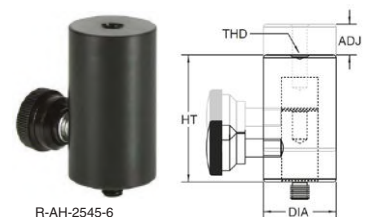


R-AVP-2525-6

Adjustable height stand

To allow variable heights without marring the part surface.

Part number	Thread	Diameter	Height	Adjustment	Price
R-AH-2545-6	M6	25 mm	45 mm	9 mm	\$55

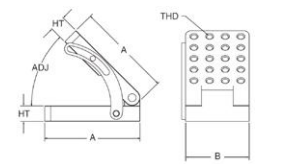


R-AH-2545-6

Adjustable angle plate

Ideal for holding components on an angle. The angle plate is adjustable to 180°.

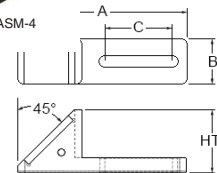
Part number	Thread	Height	A	B	Adjustment	Price
R-PCA-135075-10-4	M4	13 mm	75 mm	50 mm	180°	\$178
R-PCA-135075-12-6	M6	13 mm	75 mm	50 mm	180°	\$178



Adjustable slide mirror

To aid viewing and inspecting a part.

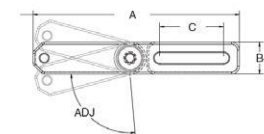
Part number	Thread	Height	A	B	C	Price
R-ASM-4	M4	29 mm	75 mm	20 mm	34 mm	\$97



Adjustable slide acrylic extension

Screw any component to the acrylic slide to extend the reach of the component.

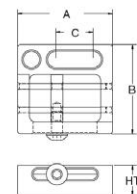
Part number	Thread	Height	A	B	C	Adjustment	Price
R-ASAE-4	M4	10 mm	82 mm	13 mm	25 mm	190°	\$87



Micro adjustable V

For cylindrical parts smaller than 6.5 mm in diameter.

Part number	Thread	Height	A	B	C	Price
R-AVM-4	M4	8 mm	25 mm	24 mm	10 mm	\$132



Vision fixtures

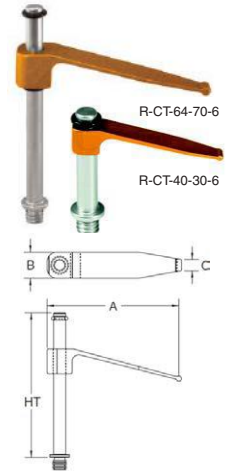
Clamps

Tension clamp

For quick and easy clamping.

Part number	Thread	Height	A	B	C	Price
R-CT-40-25-4	M4	25 mm	40 mm	7.6 mm	4 mm	\$21
R-CT-40-30-6	M6	30 mm	40 mm	7.6 mm	4 mm	\$23
R-CT-40-70-6	M6	68 mm	40 mm	7.6 mm	4 mm	\$25
R-CT-64-70-6	M6	68 mm	63.5 mm	13 mm	5 mm	\$26
R-CT-95-83-6	M6	83 mm	96 mm	19 mm	9 mm	\$45
R-CT-100P-83-6*	M6	83 mm	105 mm	19 mm	9 mm	\$57

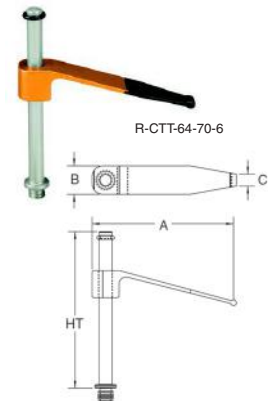
*Includes a plunger for reaching over the edge of a part to a more rigid surface or to reach over another support component.



Soft tip tension clamp

Rubber coated tips hold parts without scratching or marring the part surface.

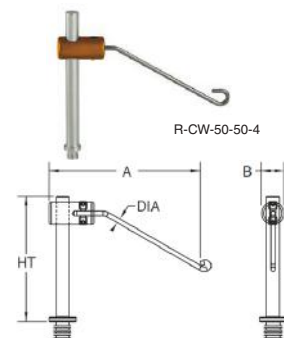
Part number	Thread	Height	A	B	C	Price
R-CTT-40-25-4	M4	25 mm	40 mm	7.6 mm	4 mm	\$24
R-CTT-40-30-6	M6	30 mm	40 mm	7.6 mm	4 mm	\$28
R-CTT-40-70-6	M6	68 mm	40 mm	7.6 mm	4 mm	\$30
R-CTT-64-70-6	M6	68 mm	63.5 mm	13 mm	5 mm	\$31
R-CTT-95-83-6	M6	83 mm	96 mm	19 mm	9 mm	\$50



Spring wire clamp

For light clamping of small parts, minimizing the contact area on a part and causing the least possible obstruction.

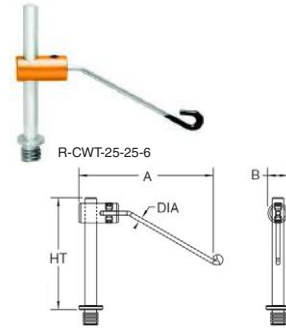
Part number	Thread	Height	A	B	C	Price
R-CW-25-25-4	M4	25 mm	36 mm	8 mm	1.5 mm	\$28
R-CW-50-50-4	M4	42 mm	55 mm	8 mm	1.5 mm	\$32
R-CW-25-25-6	M6	25 mm	36 mm	8 mm	1.5 mm	\$28
R-CW-50-50-6	M6	50 mm	55 mm	8 mm	1.5 mm	\$32



Soft tip spring wire clamp

With rubber coated tips for light clamping of small parts, minimizing the contact area on a part and for the least possible obstruction.

Part number	Thread	Height	A	B	C	Price
R-CWT-25-25-4	M4	25 mm	36 mm	8 mm	1.5 mm	\$30
R-CWT-50-50-4	M4	45 mm	55 mm	8 mm	1.5 mm	\$34
R-CWT-25-25-6	M6	25 mm	36 mm	8 mm	1.5 mm	\$28
R-CWT-50-50-6	M6	50 mm	55 mm	8 mm	1.5 mm	\$33

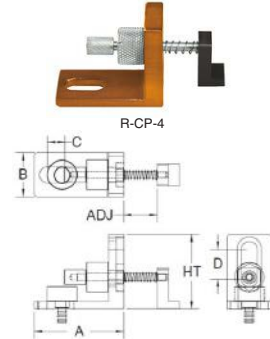


Pusher clamp

To push a part against standoffs or into corner (two interchangeable tips included).

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CP-4	M4	32 mm	38 mm	19 mm	8 mm	13 mm	10 mm	\$79
R-CP-6	M6	32 mm	38 mm	19 mm	8 mm	13 mm	10 mm	\$79

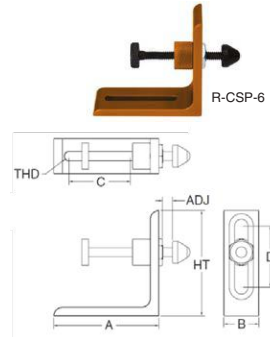
Included: socket head cap screw, thumb screw and washer.



Screw pusher clamp

For pushing and holding a part against stops.

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CSP-6	M6	76 mm	76 mm	25 mm	44 mm	44 mm	38 mm	\$81

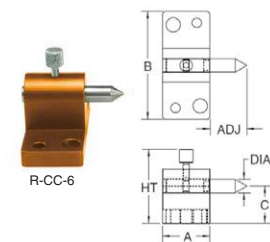


Centers

For holding cylindrical parts at each end on their inside diameters.

Part number	Thread	Diameter	Height	A	B	C	Adjustment	Price
R-CC-6	M4/M6	6 mm	38 mm	22 mm	51 mm	20 mm	16 mm	\$186
R-CC-13	M4/M6/M8	13 mm	50 mm	38 mm	64 mm	25 mm	38 mm	\$223
R-CC-25	M4/M6/M8	25 mm	69 mm	51 mm	76 mm	35 mm	50 mm	\$274

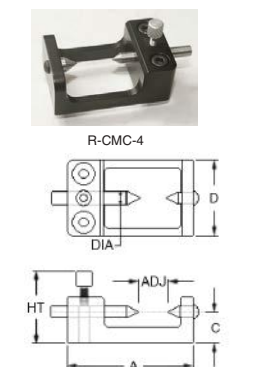
Included: both male and female centering options, and socket head cap screws.



Micro center

Has adjustability to hold cylindrical parts up to 26 mm in length and 25.5 mm in diameter.

Part number	Thread	Diameter	Height	A	B	C	D	Price
R-CMC-4	M4	4.8 mm	30 mm	51 mm	32 mm	12.5 mm	25.5 mm	\$147

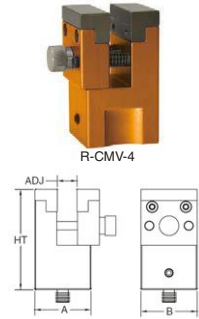


Vision fixtures

Mini vise

For clamping a small area of a part. Vises can be rotated 360° and then locked into a position.

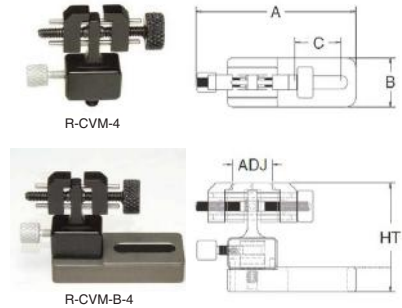
Part number	Thread	Height	A	B	Adjustment	Price
R-CMV-4	M4	58 mm	32 mm	32 mm	11 mm	\$253
R-CMV-6	M4	58 mm	32 mm	32 mm	11 mm	\$253



Micro vise clamp

Ideal for holding parts horizontally or vertically. Jaws have a V notch for holding cylindrical and tubular parts.

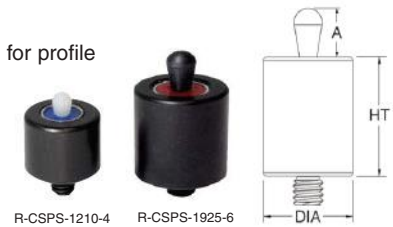
Part number	Thread	Height	A	B	C	Adjustment	Price
R-CVM-4	M4	28 mm	38 mm	10 mm	—	13 mm	\$117
R-CVM-B-4 (with base)	M4	35 mm	51 mm	16 mm	15 mm	13 mm	\$147
R-CVM-6	M6	28 mm	38 mm	10 mm	—	13 mm	\$117
R-CVM-B-6 (with base)	M6	38 mm	78 mm	20 mm	35 mm	13 mm	\$147



Spring pusher standoff clamp

Designed for fixturing small parts in tight or compact space. Ideal for positioning parts and for profile clamping.

Part number	Thread	Diameter	Height	A	Price
R-CSPS-1210-4	M4	12 mm	10 mm	4 mm	\$45
R-CSPS-1925-6	M6	19 mm	25 mm	10 mm	\$50

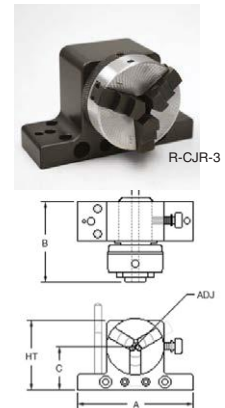


Rotating 3-jaw clamp

For clamping on inner and outer diameter of a part. The part is locked into position then rotated to a marked increment.

Part number	Thread	Height	A	B	C	D	Adjustment	Price
R-CJR-3	M4/M6	60 mm	102 mm	70 mm	38 mm	6.4 mm	1 – 63 mm	\$291

Included: socket head cap screws and chuck keys.

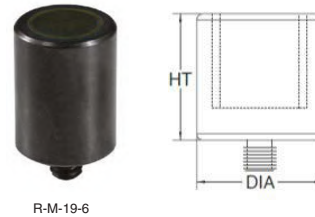


Magnets

Magnet

For holding steel or iron parts.

Part number	Thread	Diameter	Height	Price
R-M-6-4	M4	6 mm	25 mm	\$27
R-M-13-4	M4	13 mm	25 mm	\$44
R-M-13-6	M6	13 mm	25 mm	\$30
R-M-19-6	M6	19 mm	25 mm	\$33
R-M-25-6	M6	25 mm	25 mm	\$43
R-M-32-6	M6	32 mm	25 mm	\$53

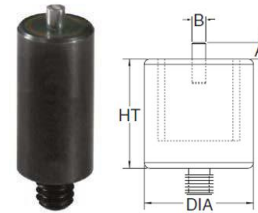


R-M-19-6

Pin magnet

For holding and locating steel or iron parts.

Part number	Thread	Diameter	Height	A	B	Price
R-MP-6-4	M4	6 mm	25 mm	3.8 mm	1.6 mm	\$59
R-MP-13-4	M4	13 mm	25 mm	3.8 mm	1.6 mm	\$67
R-MP-13-6	M6	13 mm	25 mm	3.8 mm	3 mm	\$59
R-MP-19-6	M6	19 mm	25 mm	3.8 mm	3 mm	\$70
R-MP-25-6	M6	25 mm	25 mm	3.8 mm	3 mm	\$74

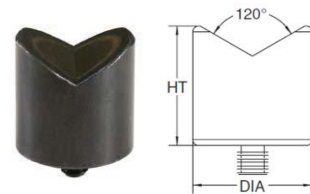


R-MP-13-6

V magnet

For holding cylindrical parts and bent tubing.

Part number	Thread	Diameter	Height	Price
R-MV-13-6	M6	13 mm	25 mm	\$65
R-MV-19-6	M6	19 mm	25 mm	\$78
R-MV-25-6	M6	25 mm	25 mm	\$84
R-MV-32-6	M6	32 mm	25 mm	\$103



R-MV-25-6

V magnet with base

For holding steel or iron parts.

Part number	Thread	Diameter	Height	A	B	C	Price
R-MVB-13-6	M6	13 mm	32 mm	76 mm	19 mm	36 mm	\$116
R-MVB-19-6	M6	19 mm	32 mm	76 mm	19 mm	36 mm	\$118
R-MVB-25-6	M6	25 mm	32 mm	76 mm	19 mm	36 mm	\$121
R-MVB-32-6	M6	32 mm	32 mm	76 mm	19 mm	36 mm	\$142

Included: socket head cap, thumb screws and washers.



R-MVB-25-6

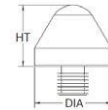
Vision fixtures

Miscellaneous

Cone

To rest a part on a rounded point for single-point contact.

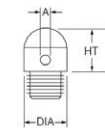
Part number	Thread	Diameter	Height	Material	Price
R-RCD-6	M6	16 mm	13 mm	Delrin®	\$9
R-RCS-6	M6	16 mm	13 mm	Steel	\$15
R-RCA-6	M6	25 mm	19 mm	Aluminum	\$26



Resting pin

To rest a part on a rounded point.

Part number	Thread	Diameter	Height	Material	A	Price
R-RPD-4	M4	6 mm	5 mm	Delrin®	1.9 mm	\$16
R-RPA-4	M4	6 mm	5 mm	Aluminum	1.9 mm	\$10
R-RPD-6	M6	9 mm	10 mm	Aluminum	1.9 mm	\$16
R-RPS-6	M6	9 mm	10 mm	Steel	1.9 mm	\$10



Screws and adaptors

Component replacement parts.

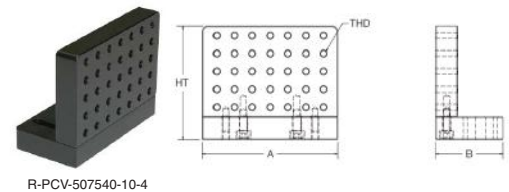
Part number	Thread	Diameter	Height	Price
Thumb screw				
R-AATK-6	M6	12 mm	20 mm	\$2
Screw				
R-AATS-14	M3	6 mm	15 mm	\$6
R-AATS-20	M3	6 mm	20 mm	\$8
R-ATS-4	M4	13 mm	15 mm	\$8
Adaptor				
R-AAS-4	M4	8 mm	15 mm	\$8
R-AAS-6	M6	8 mm	15 mm	\$8



Vertical base plate

For holding components vertically.

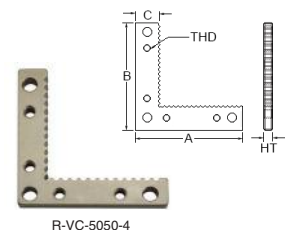
Part number	Thread	Height	A	B	Price
R-PCV-507540-10-4	M4	63.5 mm	75 mm	40 mm	\$138



Corner viewer

Allows the part to be located in a corner. The serrations allow backlighting along the sides of a part.

Part number	Thread	Height	A	B	C	Price
R-VC-5050-4	M4	5 mm	50 mm	50 mm	10 mm	\$48
R-VC-7575-6	M6	6 mm	83 mm	83 mm	19 mm	\$58



Standoffs

To elevate and locate a part.

M4 standoffs

Part number	Thread	Diameter	Height	Price
R-S-65-4*	M4	6 mm	5 mm	\$12
R-S-610-4*	M4	6 mm	10 mm	\$12
R-S-615-4	M4	6 mm	15 mm	\$16
R-S-620-4*	M4	6 mm	20 mm	\$15
R-S-625-4*	M4	6 mm	25 mm	\$14
R-S-95-4*	M4	9 mm	5 mm	\$12
R-S-910-4	M4	9 mm	10 mm	\$12
R-S-915-4	M4	9 mm	15 mm	\$17
R-S-920-4	M4	9 mm	20 mm	\$13
R-S-925-4	M4	9 mm	25 mm	\$13
R-S-950-4	M4	9 mm	50 mm	\$16
R-S-125-4*	M4	12 mm	5 mm	\$12
R-S-1210-4	M4	12 mm	10 mm	\$13
R-S-1215-4	M4	12 mm	15 mm	\$16
R-S-1220-4*	M4	12 mm	20 mm	\$15
R-S-1225-4	M4	12 mm	25 mm	\$14
R-S-1250-4	M4	12 mm	50 mm	\$17



R-S-2550-6

M6 standoffs

Part number	Thread	Diameter	Height	Price
R-S-610-6*	M6	6 mm	10 mm	\$12
R-S-625-6*	M6	6 mm	25 mm	\$13
R-S-95-6*	M6	9 mm	5 mm	\$12
R-S-910-6	M6	9 mm	10 mm	\$10
R-S-915-6	M6	9 mm	15 mm	\$16
R-S-920-6	M6	9 mm	20 mm	\$13
R-S-925-6	M6	9 mm	25 mm	\$13
R-S-1310-6	M6	13 mm	10 mm	\$11
R-S-1315-6	M6	13 mm	15 mm	\$12
R-S-1320-6	M6	13 mm	20 mm	\$11
R-S-1325-6	M6	13 mm	25 mm	\$11
R-S-1350-6	M6	13 mm	50 mm	\$13
R-S-13100-6	M6	13 mm	100 mm	\$20
R-S-13150-6	M6	13 mm	150 mm	\$21
R-S-1910-6	M6	19 mm	10 mm	\$12
R-S-1915-6	M6	19 mm	15 mm	\$13
R-S-1920-6	M6	19 mm	20 mm	\$12
R-S-1925-6	M6	19 mm	25 mm	\$12
R-S-1950-6	M6	19 mm	50 mm	\$15
R-S-19100-6	M6	19 mm	100 mm	\$16
R-S-19150-6	M6	19 mm	150 mm	\$22



R-S-920-4

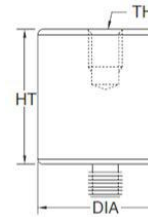


R-S-620-4*

Vision fixtures

M6 standoffs continued

Part number	Thread	Diameter	Height	Price
R-S-2515-6	M6	25 mm	15 mm	\$18
R-S-2520-6	M6	25 mm	20 mm	\$14
R-S-2525-6	M6	25 mm	25 mm	\$15
R-S-2550-6	M6	25 mm	50 mm	\$16
R-S-25100-6	M6	25 mm	100 mm	\$18
R-S-25150-6	M6	25 mm	150 mm	\$25
R-S-3825-6	M6	38 mm	25 mm	\$28
R-S-3850-6	M6	38 mm	50 mm	\$30
R-S-38150-6	M6	38 mm	150 mm	\$43



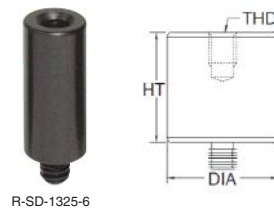
* Does not have a threaded top.

M4 standoffs are made of aluminum. M6 standoffs are made of steel.

Delrin® standoffs

To elevate and locate a part using a non-marring material.

Part number	Thread	Diameter	Height	Price
R-SD-610-4	M4	6 mm	10 mm	\$13
R-SD-910-4	M4	9 mm	10 mm	\$15
R-SD-1210-4	M4	12 mm	10 mm	\$16
R-SD-925-6	M6	9 mm	25 mm	\$15
R-SD-1325-6	M6	13 mm	25 mm	\$14
R-SD-1925-6	M6	19 mm	25 mm	\$15



Pin standoffs

To elevate and locate a part against a pin.

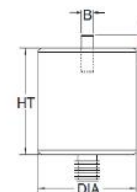
Part number	Thread	Diameter	Height	A	B	Price
R-SP-610-4	M4	6 mm	10 mm	3.8 mm	2 mm	\$14
R-SP-910-4	M4	9 mm	10 mm	3.8 mm	2 mm	\$14
R-SP-1210-4	M4	12 mm	10 mm	3.8 mm	2 mm	\$14
R-SP-610-6	M6	6 mm	10 mm	3.8 mm	2 mm	\$15
R-SP-910-6	M6	9 mm	10 mm	3.8 mm	2 mm	\$15
R-SP-1325-6	M6	13 mm	25 mm	3.8 mm	3 mm	\$15
R-SP-1925-6	M6	19 mm	25 mm	3.8 mm <td 3 mm	\$26	



Delrin® pin standoffs

To elevate and locate a part against a pin using a non-marring material.

Part number	Thread	Diameter	Height	A	B	Price
R-SPD-910-4	M4	9 mm	10 mm	3.8 mm	2 mm	\$15
R-SPD-1325-6	M6	13 mm	25 mm	3.8 mm	3 mm	\$15



2-way spring-loaded pin

For locating within a hole or slot of a part.

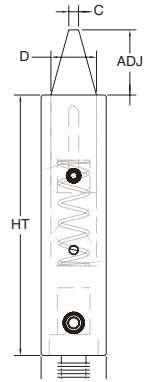
Part number	Thread	Diameter	Height	A	B	Adjustment	Price
R-S-1350-2W-6	M6	13 mm	50 mm	2 mm	9 mm	12.5 mm	\$121
R-S-2550-2W-6	M6	25 mm	50 mm	7 mm	19 mm	12.5 mm	\$113



4-way spring-loaded pin

For locating within a hole or slot of a part.

Part number	Thread	Diameter	Height	A	B	Adjustment	Price
R-S-1350-4W-6	M6	13 mm	50 mm	2 mm	9 mm	12.5 mm	\$109
R-S-2550-4W-6	M6	25 mm	50 mm	7 mm	19 mm	12.5 mm	\$103



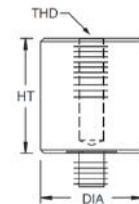
Standoff adaptor

For step clamps and calibration sphere.

Part number	Thread	Diameter	Height	A	Price
R-SA-6-4	M4	16 mm	15 mm	M6	\$15
R-SA-4-6	M6	9 mm	15 mm	M4	\$15
R-SA-8-6	M6	25 mm	25 mm	M8	\$17



R-SA-6-8



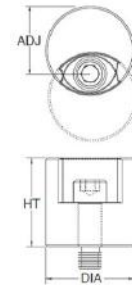
Rotator standoff

To secure parts against stops/supports.

Part number	Thread	Diameter	Height	Adjustment	Price
R-SR-2525-6	M6	25 mm	25 mm	19 mm	\$67



R-SR-2525-6



Vision fixtures

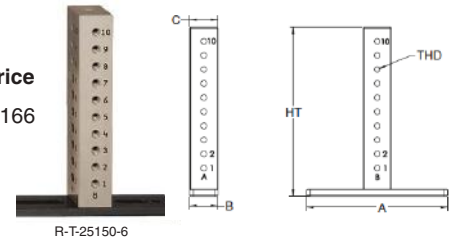
Towers

Tower

To hold a part vertically.

Part number	Thread	Height	A	B	C	Threaded rows	Price
R-T-25150-6	M6	150 mm	127 mm	25 mm	25 mm	1	\$166

Included: socket head cap screws.



Tower block with base

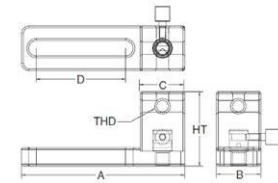
For positioning a component vertically to the part set-up. Can be used without the base to allow full rotation.

Part number	Thread	Height	A	B	C	D	Price
R-TB-1619-4	M4	26 mm	41 mm	16 mm	16 mm	15 mm	\$66
R-TB-2025-6	M6	35 mm	70 mm	20 mm	20 mm	35 mm	\$70

Included: socket head cap screws.



R-TB-2025-6



Trays

Medium component tray

For holding and organizing components.

Part number	Thread	Height	Depth	Width	Price
R-TC-500200	M6/M8	25 mm	500 mm	200 mm	\$152



R-TC-500200

Small component tray

For holding and organizing components.

Part number	Thread	Height	Depth	Width	Price
R-TC-300190-4	M4	25 mm	300 mm	190 mm	\$138
R-TC-300190-6	M6	25 mm	300 mm	190 mm	\$148



R-TC-300190-4

Component storage box

10-compartment box to hold and organize components.

Part number	Height	Depth	Width	Price
R-BC10	45 mm	203 mm	152 mm	\$15



R-BC10

Portable laser measurement and calibration

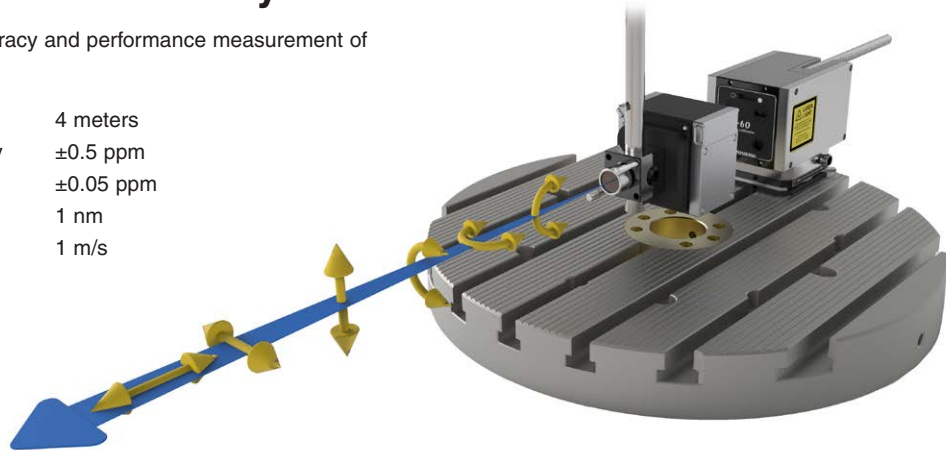


Portable laser measurement and calibration

XM multi-axis calibration systems

Used for comprehensive accuracy and performance measurement of any machine or system.

Linear measurement range	4 meters
Linear measurement accuracy	±0.5 ppm
Laser frequency accuracy	±0.05 ppm
Resolution	1 nm
Maximum travel velocity	1 m/s



XM-60



- 1 Laser unit
- 2 Launch unit
- 3 Receiver unit
- 4 Beam shroud
- 5 90 degree bracket
- 6 Receiver batteries
- 7 Battery charger
- 8 Magnetic base
- 9 Clamp block
- 10 M8 pillars
- 11 Spirit level
- 12 Software kit
- 13 Cable clamp
- 14 Beam blocker

Part number: A-5103-3600

Price: \$129,625

Part number: A-5103-3600-XC*

Price: \$139,702

XM-600



- 1 Laser unit
- 2 Launch unit
- 3 Receiver unit
- 4 Beam shroud
- 5 90 degree bracket
- 6 Receiver batteries
- 7 Battery charger
- 8 Magnetic base
- 9 Clamp block
- 10 M8 pillars
- 11 Spirit level
- 12 Software kit
- 13 Cable clamp
- 14 PICS cable
- 15 Beam blocker

Part number: A-5103-4700

Price: \$257,641

Part number: A-5103-4700-XC*

Price: \$267,717

Note: In addition to the parts shown above, the kits will also contain required cables and product quality documentation.

* Includes XC-80 compensator

Components and accessories

Fixture kit

- Includes:
- 1 Range of extrusions
 - 2 Lathe adaptor
 - 3 Steel mounting plate
 - 4 Extrusion alignment aids
 - 5 Extrusion connectors
 - 6 Magnets
 - 7 Allen drivers



Part number: A-5103-4620

Price: \$3,370

XM power supply kit

Part number: A-5103-4370

Price: \$203



XM battery tray

For holding the battery in the receiver unit of the XM systems.

Part number: A-5103-4480

Price: \$688



Cable clip

For holding the fiber optic cable between the laser and launch units of the XM systems.

Part number: A-5103-4340

Price: \$315



Vertical mount pin kit

These pins are used to give a rough starting alignment along the axis when attaching the laser to the mounting plate.

Part number: A-5103-4664

Price: \$95



Receiver beam shroud

Part number: A-5103-4330

Price: \$62



System case

Part number: A-5103-4360

Price: \$1,393



Portable laser measurement and calibration

Components and accessories continued

Mounting pillar

Part number: M-8003-0470

Price: \$99



Spirit level circular

Part number: A-9908-0323

Price: \$35



Clamp block

Part number: A-8003-0262

Price: \$276



Magnetic base

Suitable for mounting optics and XL-80 laser head when fitted with A-9908-0760 magnetic base adaptor (sold in pairs).

Part number: A-9908-0780

Price: \$82



Battery Li-Polymer 3.7 V

High-power rechargeable lithium battery (three batteries supplied with each XR20-W).

Part number: A-9920-0330

Price: \$104



Battery charger and cables

Battery charger and a set of power cables for any territory (UK, Europe and USA).

Part number: A-9920-0320

Price: \$248



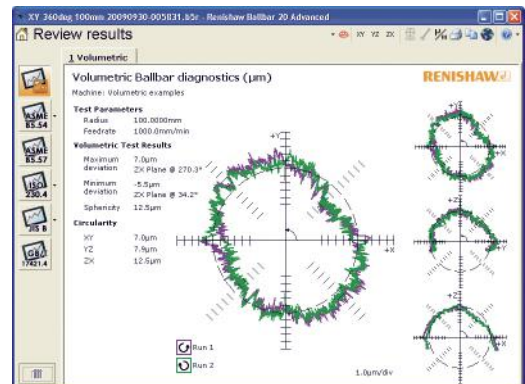
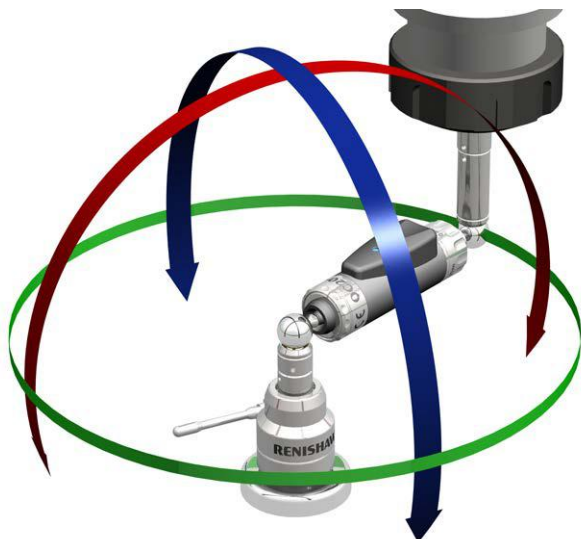
USB cable

Part number: A-9908-0286

Price: \$31



QC20-W wireless ballbar



Portable laser measurement and calibration

QC20-W ballbar kit with glass calibrator

The Renishaw QC20-W ballbar contains a precision linear transducer of Renishaw's own design. Signal processing is carried out within the ballbar and data transmitted to a suitable PC using a Bluetooth® Class 2 module.

- Includes:
- QC20-W wireless ballbar (and one CR2 battery)
 - Center pivot
 - Tool cup
 - Extension bars – 50 mm, 150 mm and 300 mm
 - Glass calibrator
 - System software (including manuals)
 - Setting ball
 - Machine validation cards
 - Calibration certificate
 - Bluetooth® adaptor
 - System carry case (the case includes cut-outs for the optional small circle and VTL adaptors)



Part number: A-8014-1510

Price: \$10,971

QC10 trade-in for QC20-W

A complete working QC-10 kit can be traded in to obtain this special price on a complete QC20-W kit.

Part number: A-8014-BB-TRADEIN

Price: \$7,369

QC20-W ballbar upgrade kit

The lowest cost entry to QC20-W use is with the QC20-W upgrade kit. The kit includes a new ballbar, battery and BB20 software. The packaging fits directly into the later style aluminum framed case. Users with earlier plastic or wooden cases should purchase a new QC20-W case separately (see below).

- Includes:
- QC20-W wireless ballbar upgrade kit
 - QC20-W wireless ballbar
 - Tool cup
 - System software (including manuals)
 - Setting ball
 - Machine validation cards
 - Calibration certificate
 - Foam tray (fits aluminum QC10 case only)
 - Partial arc test kit
 - Bluetooth® adaptor
 - 2nd spare battery



Part number: A-8014-BBUG

Price: \$5,019

QC20-W system carrying case

The new QC20-W case has dedicated locations to carry the small circle accessory kit and VTL, and is lockable.

Part number: M-8014-1600

Price: \$374



Small circle accessory kit (SCAK)

The small circle accessory kit is used with the QC20-W ballbar to allow tests with a radius of 50 mm. The existing QC10 small circle accessory kit (SCAK) cannot be used with the QC20-W. The SCAK includes a 50 mm glass calibrator, calibration certificate and the small circle adaptor, which is supplied with an additional center ball already fitted.

If you already use the QC10 SCAK, just purchase the new adaptor, which is a simple screw mount to the QC20-W body. You can retain your existing 50 mm glass calibrator (see QC20-W spare parts overleaf).

Part number: A-8014-1540

Price: \$1,076



VTL adaptor kit

The VTL adaptor is available for 2-axis CNC applications. This replaces the “tool cup” in the standard set-up and gives restricted movement of the center cup in a single axis, enabling typical 2-axis machines such as vertical turning lathes and laser cutting machines etc to benefit from QC20-W ballbar diagnosis.

Part number: A-8014-0417

Price: \$342



Lathe adaptor kit

The lathe adaptor kit allows you to perform 360°, 100 mm radius ballbar tests on a lathe. The kit consists of an arm assembly for attachment to the lathe turret and a spindle bar for attachment in the lathe spindle. Both arm and spindle include magnetic cups in which to locate the ballbar.

Includes:

- Lathe adaptor arm assembly
- Spindle bar assembly
- Spherical adaptor
- Center cup
- Cup screw (with magnetic cup)
- 5 mm long-arm hex key
- 3 mm hex key
- Set of user instructions
- Plastic carrying case

Part number: A-8014-0551

Price: \$1,252



Portable laser measurement and calibration

Ballbar TRACE kit *

Ballbar TRACE is a new, time-based software package for the QC20-W ballbar. The software is free of charge to existing QC20-W users. The flexibility of Ballbar TRACE opens up QC20-W for many new applications, including 5-axis ballbar verification to ISO 10791-6 and static monitoring.

TRACE kit with 25 mm straight shank *

Part number: TRACE-1003 **Price:** \$996

TRACE kit with ½ in straight shank *

Part number: TRACE-1004 **Price:** \$996

TRACE kit with 1 in straight shank *

Part number: TRACE-1007 **Price:** \$996



Ballbar TRACE individual parts

Ballbar centering device

Used to center the pillar/tool cup on the spindle for performing Ballbar TRACE measurements.

Part number: S-8BBR-0052 **Price:** \$158



Tool kit

For adjusting the ballbar centering device.

Part number: A-4071-0060 **Price:** \$11



Mounting pillar

For extending the tool cup down from the spindle.

Part number: M-8003-0470 **Price:** \$99



Straight shank

Used to help mount centering device in the spindle.

25 mm **Part number:** A-5625-1003 **Price:** \$228

½ in **Part number:** A-5625-1004 **Price:** \$228

1 in **Part number:** A-5625-1007 **Price:** \$228



* TRACE kits vary only by accompanying shank. If multiple shanks are desired, order a single kit and the extra shanks individually.

QC20-W ballbar system spare parts



Item	Description	Part number
1	QC20-W ballbar assembly (including balls)	Only available as RBE
2	QC20-W system carrying case (not fully shown)	M-8014-1600
3	Transducer ball	A-8014-0182
4	Center cup	A-8014-0522
5	Center ball	A-8014-0141
6	Cover ring	A-8014-1592
7	Center pivot assembly	A-8014-1281
8	50 mm extension bar	A-8014-0231
9	150 mm extension bar	A-8014-0144
10	300 mm extension bar	A-8014-0145
11	Tool cup assembly	A-8014-0521
12	Setting ball	A-8014-1570
13	Tool cup extension	A-8014-1610
14	Glass calibrator	A-8014-0280
15	Spanner set	A-8014-1141
16	Lithium battery	A-8014-CR2
17	Battery end cap assembly	A-8014-1593
Not shown	Getting started DVD	A-8014-1285
Not shown	Validation card (minimum order quantity 10)	A-8014-VCAR
Not shown	Validation card holder (minimum order quantity 10)	A-8014-VCHD
Not shown	Ballbar20 software upgrade	A-8014-0717
Not shown	Cup cleaning kit	A-8014-0423

Small circle accessory kit

Item	Description	Part number
18	50 mm glass calibrator	A-8014-0491
19	Small circle adaptor	A-8014-1560

VTL adaptor kit

Item	Description	Part number
20	VTL adaptor kit	A-8014-0417

Lathe kit (cannot be stored in system case)

Item	Description	Part number
Not shown	Cup screw assembly	A-8014-0552
Not shown	Spindle bar assembly	A-8014-0553
Not shown	Lathe kit case	M-8014-0538

QC20-W spare parts continued

Glass calibrator

A glass calibrator is supplied with all QC20-W kits and is used to calibrate the length of a ballbar. This type of calibrator is manufactured from a material which has a temperature expansion coefficient of almost zero.

Part number: A-8014-0280

Price: \$2,283



Cover ring

The cover ring needs to be removed from the QC20-W body before attaching the small circle adaptor.

Part number: A-8014-1592

Price: \$28



Tool cup assembly

The condition of the phosphor bronze bearings in the tool cups affects the errors measured by the transducer. Tool cups cannot be repaired (if they are damaged they must be replaced).

Part number: A-8014-0521

Price: \$147



Tool cup extension

The tool cup extension will provide the required clearances for conducting a vertical 220° partial arc test on a machine, for collet sizes up to ER40 (63 mm diameter collet nut). It has two different outer diameters, the smaller diameter is 12 mm and the larger diameter is 1/2 inch, to suit different collets.

Part number: A-8014-1610

Price: \$48



Transducer ball

If a ball joint is dropped onto a hard surface, the ball sphericity may be affected, which will add to the errors measured by the ballbar system. If this happens, discard the ball joint and replace it with a new one, using the special spanner provided.

Part number: A-8014-0182

Price: \$163



Battery end cap assembly

The battery end cap assembly is supplied with a center ball already fitted.

Part number: A-8014-1593

Price: \$231



Center ball

If a ball joint is dropped onto a hard surface, the ball sphericity may be affected, which will add to the errors measured by the ballbar system. If this happens, discard the ball joint and replace it with a new one.

Part number: A-8014-0141

Price: \$163



Center pivot assembly

The magnetic center pivot assembly has a clamping mechanism that can be locked/unlocked by pulling the lever to the horizontal/vertical position. The center pivot assembly is supplied with a center cup fitted.

Part number: A-8014-1281

Price: \$548



Center cup

The condition of the phosphor bronze bearings in the center cups affects the errors measured by the transducer. Center cups cannot be repaired (if they are damaged they must be replaced).

Part number: A-8014-0522

Price: \$184



Setting ball

The setting ball is placed into the center mount cup when setting the zero coordinates for a test.

Part number: A-8014-1570

Price: \$56



Extension bars

By assembling the ballbar with different combinations of extension bars, it is possible to carry out ballbar tests with 100, 150, 250, 300, 400, 450, 550 or 600 mm radii.

Length 50 mm

Part number: A-8014-0231

Price: \$222

Length 150 mm

Part number: A-8014-0144

Price: \$267

Length 300 mm

Part number: A-8014-0145

Price: \$362



Spanner set

The C spanners can be used to ensure the screw joints on the ballbar (including any extension bars) are not loose and the screw joints on the tool cup extension (if used) are tight. The battery end cap spanner is designed to securely hold the battery end cap when unscrewing the center ball.

Part number: A-8014-1141

Price: \$19



Portable laser measurement and calibration

QC20-W spare parts continued

Spherical adaptor

This adaptor is for use with the lathe kit to set in as the stationary cup.

Part number: A-8014-1565

Price: \$73

30 mm small circle adaptor

Used to run a ballbar test with a 30 mm radius. The ballbar is still physically 130 mm in length but the measurement takes place in the 30 mm section provided by the adaptor.

Part number: A-8014-1272

Price: \$230



Validation card

Double-sided card for recording ballbar test results and displaying on the tested machine (insert into card holder below).

Note: Pack of 10.

Part number: A-8014-VCAR

Price: \$7



Validation card holder

Plastic wallet with self-adhesive back to attach to the machine.

Note: Pack of 10.

Part number: A-8014-VCHD

Price: \$7

Cup cleaning kit

The tool cups are magnetic and may attract steel swarf and chips into the cup during use. Clear any swarf from the cups before storing them away with the cleaning kit.

Part number: A-8014-0423

Price: \$21



50 mm glass calibrator (small circle accessory kit)

The 50 mm glass calibrator includes a calibration certificate.

Part number: A-8014-0491

Price: \$766



Small circle adaptor (small circle accessory kit)

The small circle adaptor is supplied with an additional center ball already fitted. The adaptor is a simple screw fitting to the main ballbar body.

Part number: A-8014-1560

Price: \$331



Spindle bar assembly (lathe adaptor kit)

The spindle bar assembly is fitted with a clamp holder and clamp.

Part number: A-8014-0553

Price: \$333



Cup screw assembly (lathe adaptor kit)

The cup screw assembly is supplied with a center cup already fitted.

Part number: A-8014-0552

Price: \$180



Bluetooth® USB wireless adaptor

Provides Windows PC with Bluetooth® communications capability.
Tested and compatible with QC20-W.

Part number: A-8014-BTA1

Price: \$107

Lithium battery for QC20-W

CR2 lithium battery.

Part number: A-8014-CR2

Price: \$10

Machine checking gage

The Renishaw MCG is designed for rapid, volumetric accuracy evaluation for CMMs. The gage takes account of variations due to probe, machine and software errors.

Measuring range: Vertically: $\pm 45^\circ$
Horizontally: 360°
Total gage error: $\pm 0.5 \mu\text{m}$

Two kits are available, each supplied in a hardwood box.

MCG1 – small kit

Suitable for machines up to 40 in (1000 mm) cubed.

Part number: A-1007-0006

Price: \$3,606

MCG2 – large kit

Suitable for machines larger than 40 in (1000 mm) cubed.

Part number: A-1007-0056

Price: \$4,521



XL laser calibration system

Used for comprehensive accuracy and performance measurement of any machine or system.

Linear measurement range	80 meters
Linear measurement accuracy	±0.5 ppm
Laser frequency accuracy	±0.05 ppm
Resolution	1 nm
Maximum travel velocity	4 m/s
Dynamic capture rate	10 Hz – 50 kHz

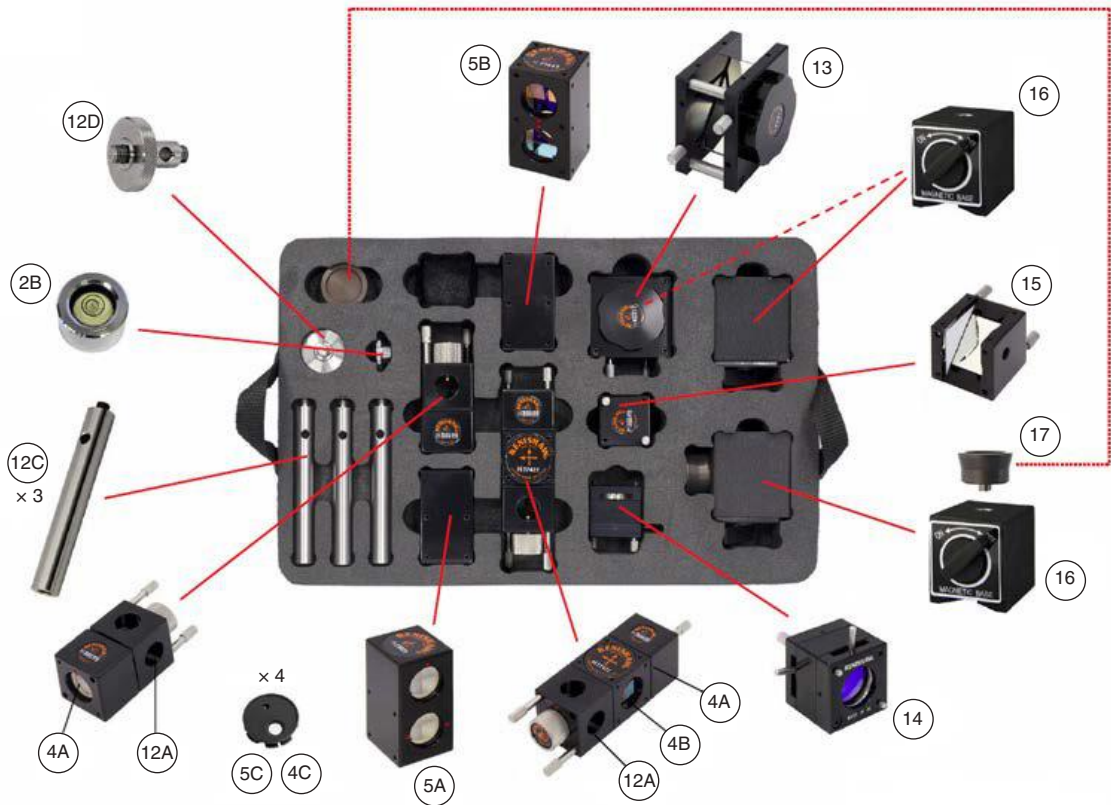


Contents of base XL system case

Portable laser measurement and calibration

XL laser system components

Kit part number	Kit price	Includes	Part number	Price	Index	
A-9908-0405	\$15,287	XL-80 laser Universal power supply USB cable XL system support disk AUX I/O connector Laser Capture and Analysis software	N/A		1A	
			A-9908-0299	\$171	1B	
			A-9908-0286	\$31	1C	
			A-9908-0303	No charge	Not shown	
			A-9908-0329	\$48	Not shown	
			A-9925-0201	\$1,926	Not shown	
A-9908-0700	\$1,077	XL translation stage Spirit level circular Tripod adaptor	A-9908-0700	\$1,077	2A	
			A-9908-0323	\$35	2B	
			A-9908-0770	\$34	Not shown	
A-9908-0510	\$10,077	XC-80 compensator Material temperature sensor and cable Air temperature sensor and cable XC mounting plate USB cable	A-9908-0564	\$8,378	3A	
			A-9908-0879	\$1,754	3B	
			A-9908-0878	\$1,754	3C	
			A-9908-0892	\$130	3D	
			A-9908-0286	\$31	3E	
A-8003-0440	\$3,472	Linear reflector (qty 2) Linear interferometer Alignment target (qty 2)	A-8003-0219	\$712 each	4A	
			A-8003-0557	\$2,755	4B	
			A-8003-0478	\$27 each	4C	
A-8003-0441	\$4,623	Angular interferometer Angular reflector Alignment target (qty 2)	A-8003-0186	\$2,853	5A	
			A-8003-0181	\$2,115	5B	
			A-8003-0478	\$27 each	5C	
A-8003-0443	\$6,206	Short range straightness reflector Woollaston short range	A-8003-0615	\$4,072	6A	
			A-8003-0393	\$3,456	6B	
A-8003-0444	\$6,206	Long range straightness reflector Woollaston long range	A-8003-0620	\$4,072	7A	
			A-8003-0430	\$3,457	7B	
A-8003-4209	\$881	Straightness shutter	A-8003-4209	\$881	8A	
A-8003-STAK	\$3,865	Laser beam steerer LS350 Fixed turning mirror Large straightness retroreflector Straightness base	A-8003-3072	\$1,801	14	
			A-8003-1325	\$987	8B	
			A-8003-0604	\$1,145	8C	
			A-8003-0576	\$327	8D	
A-8003-0665	\$6,206	Optical square Bracket squareness optic	N/A		9A	
			M-8003-1680	\$47	9B	
A-8003-0442	\$3,737	Flatness mirror (qty 2) Base (150 mm) Base (100 mm) Base (50 mm)	A-8003-0630	\$1,456 each	10A	
			A-8003-0256	\$385	10B	
			A-8003-0257	\$375	10C	
			A-8003-0258	\$342	10D	
A-8003-4270	\$3,417	Long range retroreflector Periscope Long range target Clamp screw (qty 2)	A-8003-2061	\$2,417	11A	
			A-8003-2039	\$2,100	11B	
			M-8003-2081	\$34	11C	
			M-8003-0221	\$16 each	11D	
A-8003-0447	\$1,414	Clamp block (qty 2) Base plate (qty 2) Mounting pillar (qty 3) M8 adaptor	A-8003-0262	\$276 each	12A	
			A-8003-0522	\$291 each	12B	
			M-8003-0470	\$99 each	12C	
			A-8003-0979	\$124	12D	
		XL-80Q quad laser head	A-9908-0455	\$16,586	Not shown	
			Base case	M-9908-0313	\$850	
			Full system case	M-9908-0314	\$1,191	
			Tripod	A-9908-0295	\$1,392	Not shown
			Tripod case	M-9908-0527	\$269	Not shown
			Swivel mirror	A-8003-1304	\$1,520	13
			Fixed turning mirror	A-8003-1325	\$987	15
			Magnetic base (qty 2)	A-9908-0780	\$82	16
Magnetic base adaptor	A-9908-0760	\$39	17			



Contents of full XL system case (tray)



Contents of full XL system case (tray removed)

XL laser calibration systems

Base system kit

- Includes: XL-80 laser head
 XC-80 environmental compensator kit
 LaserXL™ software
 Software support disk
 XL tripod stage kit

Part number: XL80-BASE

Price: \$26,441



XL-80 laser head

Linear system kit

- | | |
|---|-------------|
| Includes: Components of base system kit | XL80-BASE |
| Linear measurement optics | A-8003-0440 |
| Beam steerer LS350 | A-8003-3072 |
| Optics mounting kit | A-8003-0447 |
| 2 magnetic bases | A-9908-0780 |
| Magnetic base adaptor | A-9908-0760 |
| Tripod | A-9908-0295 |
| Tripod case | M-9908-0527 |
| Base system case | M-9908-0313 |

Part number: A-9908-LIN1

Price: \$35,760



XC-80 environmental compensation unit

Linear/angular system kit

- | | |
|---|-------------|
| Includes: Components of base system kit | XL80-BASE |
| Linear measurement optics | A-8003-0440 |
| Angular measurement optics | A-8003-0441 |
| Beam steerer LS350 | A-8003-3072 |
| Optics mounting kit | A-8003-0447 |
| 2 magnetic bases | A-9908-0780 |
| Magnetic base adaptor | A-9908-0760 |
| Tripod | A-9908-0295 |
| Tripod case | M-9908-0527 |
| Base system case | M-9908-0313 |

Part number: A-9908-ANG1

Price: \$40,383



XL system case and tripod case

Advanced system kit

- | | |
|---|-------------|
| Includes: Components of base system kit | XL80-BASE |
| Linear measurement optics | A-8003-0440 |
| Angular measurement optics | A-8003-0441 |
| Swivel mirror | A-8003-1304 |
| Long range straightness optics | A-8003-0444 |
| Short range straightness optics | A-8003-0443 |
| Straightness accessory kit | A-8003-STAK |
| Straightness shutter | A-8003-4209 |
| Squareness measurement kit | A-8003-0665 |
| Optics mounting kit | A-8003-0447 |
| 2 magnetic bases | A-9908-0780 |
| Magnetic base adaptor | A-9908-0760 |
| Tripod | A-9908-0295 |
| Tripod case | M-9908-0527 |
| Full system case | M-9908-0314 |

Part number: A-9908-ADV1

Price: \$63,861

ML-10 to XL-80 upgrade

Includes components of base system kit XL80-BASE:

- XL-80 laser head
- XC-80 environmental compensator kit
- LaserXL™ software
- Software support disk
- XL tripod stage kit

Additional parts that are not included but recommended for transportation and mounting purposes are:

- | | |
|----------------------|-------------|
| Base system case | M-9908-0313 |
| or | |
| Full system case | M-9908-0314 |
| ML-XL tripod adaptor | A-9908-0765 |

Traded-in system must include the ML10 and EC10 with an air and material sensor. A non-working unit has a surcharge of \$1,500.

Part number: SYS-XL-UPG **Price:** \$19,830

General laser interferometer system to XL-80 upgrade

Includes components of base system kit XL80-BASE:

- XL-80 laser head
- XC-80 environmental compensator kit
- LaserXL™ software
- Software support disk
- XL tripod stage kit

Additional parts that are not included but recommended for transportation and mounting purposes are:

- | | |
|--------------------------|-------------|
| Base system case | M-9908-0313 |
| or | |
| Full system case | M-9908-0314 |
| Universal tripod | A-9908-0295 |
| Universal tripod case | M-9908-0527 |
| Magnetic bases | A-9908-0780 |
| XL Magnetic base adaptor | A-9908-0760 |

Traded-in system must include the ML10 and EC10 with an air and material sensor. A non-working unit has a surcharge of \$1,500.

Part number: SYS-XL-UG2 **Price:** Call for price

Portable laser measurement and calibration

Optics

All Renishaw optics housings are lightweight aluminum with a hard anodized finish for durability and good thermal stability.

Linear kit (standard 40 m)

Includes: 1 linear beam splitter
2 linear reflectors
2 alignment targets

Part number: A-8003-0440

Price: \$3,472



Small linear accessory kit

Please call for details.

Part number: A-8003-3244

Price: \$1,910



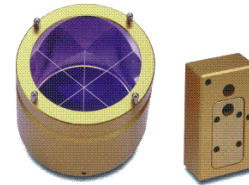
Long range linear optics kit (80 m max)

For use with the ML10X for linear measurements in excess of 40 m.

Includes: Periscope
Large retroreflector

Part number: A-8003-4270

Price: \$3,417



Angular kit

Includes: 1 angular beam splitter
1 angular reflector
2 alignment targets

Part number: A-8003-0441

Price: \$4,623



Linear/angular combination kit

This combination kit is a cost-saving solution, allowing linear and angular measurement to be made with a single set-up.

Includes: 1 angular beam splitter
1 angular reflector
1 linear reflector
2 alignment targets

Part number: A-8003-2774

Price: \$5,288



Straightness measurement kits

Short range

Suitable for measurements up to 4 m (160 in)

Part number: A-8003-0443

Price: \$6,206

Long range

Suitable for measurements from 1 m to 30 m (40 in to 1200 in)

Part number: A-8003-0444

Price: \$6,206



Straightness accessory kit

Facilitates measurements on vertical axes and in other difficult configurations.

- Includes:
- 1 fixed turning mirror
 - 1 large retroreflector
 - 1 stainless steel base
 - 1 LS350 beam steerer

Note: XL-80 and ML10 users require straightness shutter, part number A-8003-4209, shown on page 5-22.

Part number: A-8003-STAK

Price: \$3,865



Squareness measurement

This precision pentaprism is used in conjunction with straightness optics to measure squareness of machine axes. It includes a mounting bracket for a fixed turning mirror and LS350 beam steerer.

Part number: A-8003-0665

Price: \$6,206



Flatness measurement kit

The turning mirrors rotate and tilt for easy alignment and are fitted with non-slip pads. The lightweight aluminum bases have precision stainless feet and guides.

- Includes:
- 2 turning mirrors
 - 1 50 mm flatness base
 - 1 100 mm flatness base
 - 1 150 mm flatness base

Part number: A-8003-0442

Price: \$3,737



Standard optics mounting kit

This universal mounting kit is designed for use with the complete range of Renishaw measuring optics.

- Includes:
- 2 mounting blocks
 - 3 stainless pillars
 - 1 stainless M8 adaptor
 - 2 stainless bases

Part number: A-8003-0447

Price: \$1,414



Magnetic base

Suitable for mounting optics and XL-80 laser head when fitted with A-9908-0760 magnetic base adaptor (sold in pairs).

Part number: A-9908-0780

Price: \$82



Portable laser measurement and calibration

CMM optics mounting kit

Designed specifically to aid the mounting of laser optics and other accessories on coordinate measuring machines. Recommended for UCC error mapping requirements.

Part number: A-1333-0174

Price: \$888

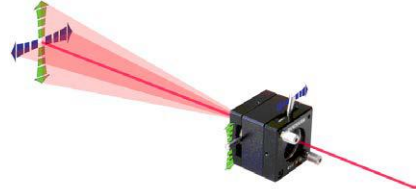


Beam steerer LS350

This is the best time-saving device a laser system user could buy. It works with all the measuring optic kits, including HP optics using the HP optic adaptor plate. Included in straightness accessory kit.

Part number: A-8003-3072

Price: \$1,801



Swivel mirror

This is used for directing the laser beam through any angle from 0° to 106°, for example for diagonal measurement and slant bed lathes. It works with all the optics kits, including HP optics using the HP optic adaptor plate.

Part number: A-8003-1304

Price: \$1,520



Fixed turning mirror

This can be used with angular optics for 90° accessories. Included in straightness accessory kit.

Part number: A-8003-1325

Price: \$987



Quarter wave plate

Used with linear optics for plane mirror interferometry applications.

Part number: A-8003-1998

Price: \$1,712



Straightness shutter

Required for vertical straightness measurements.

Part number: A-8003-4209

Price: \$881



Pan and tilt adaptor

Adaptor for tripod to allow for easy mounting at an angle and easy swivel adjustment.

Part number: A-9908-1170

Price: \$1,402



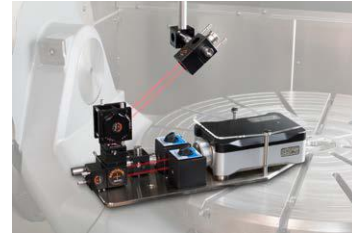
Linear diagonal measurement fixture kit

Includes: Custom diagonal plate to attach laser and optics
 Mounting post
 Heat shield

Laser, optics, clamp blocks and magnetic bases not included.

Part number: S-8LMS-2124

Price: \$1,896



Fixture kit

Includes: 1 Range of extrusions
 2 Lathe adaptor
 3 Steel mounting plate
 4 Extrusion alignment aids
 5 Extrusion connectors
 6 Magnets
 7 Allen drivers

Part number: A-5103-4620

Price: \$3,370



Optic adaptor plate

The adaptor plate provides compatibility for Renishaw accessories with HP, Keysight and Agilent optics.

Part number: M-8003-1307

Price: \$108



Portable laser measurement and calibration

Tripod and cases

Universal tripod

Tripod only, without the stage.

Part number: A-9908-0295

Price: \$1,392



XL translation stage

Part number: A-9908-0700

Price: \$1,077



Tripod adaptor

This allows the XL translation stage to be used with the Renishaw universal tripod or any other tripod with a standard camera mounting thread.

Part number: A-9908-0770

Price: \$34



Tripod converter ML-XL

Part number: A-9908-0765

Price: \$80



Magnetic base adaptor

This allows the XL translation stage to be mounted on any base or fixture with an M8 x 1.25 mounting hole.

Part number: A-9908-0760

Price: \$39



Universal tripod case

Lightweight fabric.

Part number: M-9908-0527

Price: \$269



System cases

Base system case

Suitable for basic laser system including linear and angle optics with accessories.

Part number: M-9908-0313

Price: \$850



Full system case

Suitable for an advanced laser system including linear, angle, short range and long range straightness, squareness and flatness optics with accessories.

Part number: M-9908-0314

Price: \$1,191



TB20 universal kit

Used to activate a trigger based on the signal received from encoders.

- Includes:
- TB20 trigger box
 - XL trigger cable
 - Power supply cable
 - Plug adaptor kit
 - TB20 encoder and controller port connectors
 - Calibration user guide card



Part number: A-8003-4475

Price: \$4,937

TB20 upgrade from TB10

Part number: UPG-TB10-SERV-1

Price: \$3,456

TB20 connector kit

Part number: A-8003-4462

Price: \$151



XL trigger cable

Part number: A-9908-0377

Price: \$454



Power USB cable

Part number: A-9920-0390

Price: \$49



USB power supply

USB power supply adaptors for any territory (UK, Europe and USA).

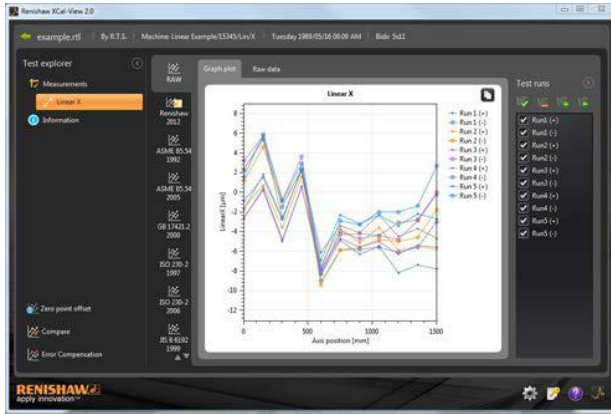
Part number: A-9920-0450

Price: \$53



Software

XCal-View analysis software



XCal-View is used to comprehensively analyze legacy file formats. Its intuitive user interface makes it a simple but powerful tool for data analysis. The software provides automatic reporting that conforms to many international machine performance checking standards, making compliance simple. Standards include ISO, ASME, VDI, JIS and GB/T and an additional Renishaw analysis to succinctly summarize the result.

XCAL View (single user)

Part number: A-9925-0208 **Price:** \$502

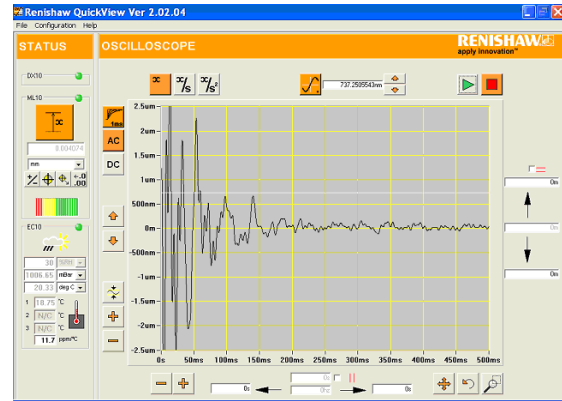
XCAL View (dual user)

Part number: A-9925-0200 **Price:** \$1,004

XCAL View (10 users)

Part number: A-9925-0203 **Price:** \$4,013

QuickView XL software



QuickView is the simple, intuitive software package that allows you to understand the dynamic performance of many different machines and devices such as stages, machine tools and CMMs. It brings the functionality of an oscilloscope to the mechanical engineer, right on your desktop.

- Capture, review, and save dynamic data
- Measure distance, velocity and acceleration against time
- Display continuous “streaming” data or set trigger levels to capture single or multi-shot “events”
- Linear, angular or straightness modes
- Optional hardware – compact low mass optics kit

Applications

- Measure consistency of position, velocity and acceleration
- Determine movement in a locked rotary axis (torsional vibration)
- Detect dynamic yaw and lateral play (slop)
- Measure vibration
- Perform ASME B5.54 CNC tests such as Feedrate and acceleration, Minimum Block Execution Time (MBET) and Least Increment

Benefits include:

- Live data display allowing analysis of motion and positional characteristics
- Save data for analysis in other applications such as Excel® and MathCad
- Flexible measurement – avoids the need for defined measurement targets and sequences

Part number: A-9908-0302

Price: \$1,050

Spare parts

The following items are normally supplied as parts of system kits but can be purchased as individual components for replacement purposes.

Clamp block

Part number: A-8003-0262 **Price:** \$276



Locking screw assembly

For use with clamp block.

Part number: A-8003-4501 **Price:** \$56



Locking screw pressure pad

Brass pad and rubber retaining ring.

Part number: A-8003-4500 **Price:** \$9



Clamp screws

Long (for use with clamp block)

Part number: M-8003-0264 **Price:** \$16

Short (for use with linear and angular optics)

Part number: M-8003-0221 **Price:** \$16

LS350 (for use with LS350 beam steerer)

Part number: M-8003-3083 **Price:** \$16

For use with fixed turning mirror.

Part number: M-8003-1070 **Price:** \$17

For use with swivel mirror.

Part number: M-8003-1063 **Price:** \$17



Mounting pillar

110 mm long with M8 × 1.25 male thread at one end, female at the other.

Part number: M-8003-0470 **Price:** \$99



Portable laser measurement and calibration

Straightness accessory base

Part number: A-8003-0576

Price: \$327



Large retroreflector

For use with vertical straightness measurements.

Part number: A-8003-0604

Price: \$1,145



M8 adaptor

Part number: A-8003-0979

Price: \$124



Alignment target

Part number: A-8003-0478

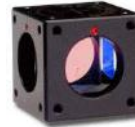
Price: \$27



Linear beam splitter

Part number: A-8003-0557

Price: \$2,755



Linear reflector

Part number: A-8003-0219

Price: \$712



Angular reflector

Part number: A-8003-0181

Price: \$2,115



Angular beam splitter

Part number: A-8003-0186

Price: \$2,853



Cables

XC-80 temperature sensor cable (5 m)

Part number: A-9908-0932

Price: \$152



USB to serial adaptor

Allows QC10 ballbar and other serial devices to be used with notebook PCs that do not have an RS232 serial port.

Part number: A-8014-0670

Price: \$152



USB cable

Part number: A-9908-0286

Price: \$31



Temperature sensor cable connector kit

Part number: A-9904-1636

Price: \$69



Translation stage screws

Part number: A-9908-0750

Price: \$27



XR20-W rotary axis calibrator and components



XR20-W rotary axis calibrator

The XR20-W rotary axis calibrator allows the measurement of rotary axis positional accuracy to within 1 arc second. Totally wireless operation and modular mounting systems ensure suitability for a wide range of machines.

- Includes:
- XR20-W
 - Mounting ring
 - Adaptor plate
 - Centration aid
 - Chuck adaptor
 - Battery charger
 - Batteries Li-polymer × 3
 - Electrical adaptor for use in any territory
 - USB cable and mains adaptor
 - Rotary XL software including system manual
 - Peli™ system case

Part number: A-9920-0400

Price: \$25,115



Off Axis Rotary Software (OARS) package

This optional software package enables the XR20-W to be used on machines where it is difficult or impossible to mount the device on the center of rotation.

Please note: Additional mounting hardware may be required for some machines. Please contact Renishaw for further information.

Part number: A-9920-0304 **Price:** \$1,381

OARS bracket

Part number: A-9920-0700 **Price:** \$3,776

Complete OARS kit

Includes bracket, OARS software and carrying case.

Part number: OARS-KIT1 **Price:** \$4,935



XR20-W rotary axis calibrator upgrade

Part number: XR20W-UPG **Price:** \$16,325

NOTE: The standard trade-in allowance quoted is on the basis that a complete and fully functional RX10 kit is returned. Non-functional, damaged or incomplete kits may be considered for trade-in at Renishaw's discretion. If accepted, the trade-in allowance will be reduced.

Rotary software kit

Part number: A-9925-0202 **Price:** \$1,644

XR20-W kit components

Mounting ring

The mounting ring bolts or clamps directly to the test surface for ease of centering the system on the test axis.

Part number: A-9920-0440 **Price:** \$644



Mounting ring adaptor 150 mm

The adaptor plate enables fitting to rotary tables with unsuitable center recesses. It can also be used to secure the XR20-W to the chuck adaptor and custom mounts.

Part number: A-9920-0270 **Price:** \$404



Chuck (lathe) adaptor

The adaptor has a 40 mm diameter to fit most popular chuck sizes. It can also be used to secure the XR20-W to users' own custom mounts.

Part number: A-9920-0280 **Price:** \$537



Portable laser measurement and calibration

Centration aid

The centration aid fits temporarily inside the mounting ring to assist visual centration before XR20-W insertion.

Part number: A-9920-0340

Price: \$11



Fixings kit

A complete set of screws and allen keys for XR20-W.

Part number: A-9920-0430

Price: \$11



Battery Li-Polymer 3.7 V

High-power rechargeable lithium battery (three batteries supplied with each XR20-W).

Part number: A-9920-0330

Price: \$104



Battery charger and cables

Battery charger and a set of power cables for any territory (UK, Europe and USA).

Part number: A-9920-0320

Price: \$248



Battery cover

Replacement battery cover for XR20-W.

Part number: A-9920-0460

Price: \$37



USB cover plug

Replacement protective plug for USB socket on XR20-W.

Part number: A-9920-0380

Price: \$9



USB power supply

USB power supply adaptors for any territory (UK, Europe and USA).

Part number: A-9920-0450

Price: \$53



XR20 case

Heavy duty transport and storage case for XR20-W.

Part number: A-9920-0360

Price: \$823



Training

Renishaw offers world class training at their modern facilities in West Dundee, Illinois, only about 35 minutes west of Chicago's O'Hare airport. Regular classes are held once per month for both laser and ballbar product groups. In-house courses start on Tuesday morning and conclude around midday on the Friday. The training includes a mix of classroom work and hands-on experience in the Renishaw technology center where we have a selection of modern machines for students to work with. If you have a large group, or prefer not to travel, on-site training is also available.

Information on training classes and class schedules can be found on the web at www.renishaw.com/training-usa.

Our standard, in-house training courses cover the following subjects:

- The 21 degrees of freedom
- Accuracy and the environment
- Relative thermal behavior
- Machine geometry and design
- Determining relative errors
- Interpreting analysis data
- Troubleshooting set-up and machine errors
- Machine tool part programs
- Hardware set-up procedure
- Software set-up and data capture
- Correcting errors on the machine

Two basic training courses are offered:

Learning practical laser interferometry

In addition to the standard metrology subjects, the laser class will cover the following aspects:

- Laser interferometry theory
- Laser kit parts identification
- Current laser technology
- Linear, angular and straightness measurements
- Cosine, deadpath and Abbé errors
- Error compensation
- Using the laser as a diagnostic tool
- Implementing maintenance programs
- Accessories for the laser

Part number: A-8003-LATC **Price:** \$1,882

One-day hands-on ballbar training at Vincennes University

Part number: A-8003-BBVU **Price:** \$555



Using and understanding the QC20-W ballbar and machine metrology

The comprehensive course provides students with a detailed understanding of the most powerful machine tool diagnostic device you can buy.

Specialist features of the course include:

- Why buy a ballbar?
- When to use a ballbar
- Ballbar theory
- Ballbar kit parts identification
- Ballbar accessories

Training materials, lunch and refreshments are provided each day.

Part number: A-8003-BBTC **Price:** \$1,882

Advanced training at Renishaw Inc

Charged per student, per day

Part number: A-8003-0008 **Price:** \$871

Training on-site at customer's premises (1-2 days)

Part number: T-2000-1080-S **Price:** \$6,704

Training on-site at customer's premises (4 days)

Part number: T-2000-1081-S **Price:** \$11,173

Additional day's training on-site at customer's premises

Part number: A-8003-0006 **Price:** \$2,235

Portable laser measurement and calibration

Calibration rentals

All rentals require the creation of a rental agreement that must be sent in with the purchase order. Rentals do not come with a PC. For calibration repairs, please see page 9-9 of this catalog.

XL-80 linear rental

Includes:	Components of the base system kit	XL80-BASE
	Linear measurement optics	A-8003-0440
	Beam steerer LS350	A-8003-3072
	Optics mounting kit	A-8003-0447
	2 magnetic bases	A-9908-0780
	Magnetic base adaptor	A-9908-0760
	Tripod	A-9908-0295
	Tripod case	M-9908-0527
	Base system case	M-9908-0313

Part number: XL80-BASE-RENTAL-US

Price: \$1,789/week

XL-80 linear and angular rental

Includes:	Components of the base system kit	XL80-BASE
	Linear measurement optics	A-8003-0440
	Angular measurement optics	A-8003-0441
	Beam steerer LS350	A-8003-3072
	Optics mounting kit	A-8003-0447
	2 magnetic bases	A-9908-0780
	Magnetic base adaptor	A-9908-0760
	Tripod	A-9908-0295
	Tripod case	M-9908-0527
	Base system case	M-9908-0313

Part number: XL-80-LNAN-RENTAL-US

Price: \$2,020/week

XR20-W rental with angular beam splitter

Includes:	XR20-W
	Mounting ring
	Adaptor plate
	Centration aid
	Chuck adaptor
	Battery charger
	Batteries Li-polymer × 3
	Electrical adaptor for use in any territory
	USB cable and mains adaptor
	Rotary XL software including system manual
	Peli™ system case

Part number: XR20W-RENTAL-US

Price: \$1,397/week

Non-contact position encoders



Non-contact position encoders

Absolute position optical encoders

RESOLUTE™ and EVOLUTE™ absolute encoders

- RESOLUTE absolute encoder 6-7
- EVOLUTE absolute encoder 6-9
- RESOLUTE compatible scales
 - RESOLUTE compatible scales 6-13
 - RELA ZeroMet™ spar scale 6-13
 - RSLA stainless steel spar scale 6-14
 - *FASTRACK*™ carrier-type scale system with RTLA stainless steel ribbon scale (plus RTLA-S self-adhesive version) 6-15
 - RESA angle encoder scale 6-16
 - REXA angle encoder scale 6-17
- EVOLUTE compatible scales 6-18
 - *FASTRACK* and RTLA50-S absolute linear encoder scale 6-18



Incremental position optical encoders

ATOM™ miniature linear and rotary encoder

- ATOM series readhead 6-19
- RTLF stainless steel ribbon scale 6-20
- RCLC glass scale 6-20
- RCDM angle encoder scale 6-20



RG2 20 µm pitch linear encoder range

- RGH22 series readhead 6-21
- RGH24 series readhead 6-22
- RGH25F series readhead 6-23
- RGS20 and RGS40 gold scale 6-24



RG2 20 µm pitch rotary encoder range

- RGH20 and RGH20F series readhead 6-26
- RESR angle encoder scale 6-27



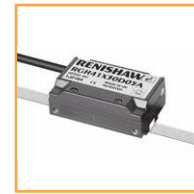
Ultra-high vacuum (UHV) encoder range

- RESOLUTE UHV, TONiC™ UHV, RGH25F UHV and RGH20F UHV readheads 6-28



RG4 40 µm pitch linear and rotary encoder range

- RGH34 series readhead 6-30
- RGH40 series readhead 6-31
- RGH41 series readhead 6-32
- RGH45 series readhead 6-33
- RGS40-G glass scale 6-34
- *FASTRACK* carrier-type scale system with RTLR stainless steel ribbon scale (plus RTLR-S self-adhesive version) 6-35



QUANTiC™ encoder range

- QUANTiC encoder system 6-36



VIONiC™ encoder range

- VIONiC encoder system 6-38



TONiC™ encoder range

- TONiC encoder system 6-40
- TONiC DOP (dual output) encoder system 6-42
- RGSZ20 gold scale 6-44



QUANTiC, VIONiC and TONiC linear and rotary scale range

- RELM linear ZeroMet™ scale 6-46
- RSLM linear stainless steel scale 6-47
- RTLC high-accuracy incremental linear encoder scale system 6-48
- RKLC incremental linear scale 6-50
- RESM angle encoder scale 6-52
- RESD distance-coded scale 6-53
- REXM / REXT ultra-high accuracy angle encoder 6-54



Magnetic encoders

- Rotary magnetic encoders 6-56
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RLE laser interferometer systems

- RLD detector units 6-68
- RLE system benefits 6-68
- RCU10 compensation system 6-69
- RPI parallel interface 6-69
- HS20 laser head 6-70



Welcome

Renishaw offers a wide range of compact magnetic and optical encoders to meet the diverse requirements of industrial automation. This section details an extensive selection of robust magnetic linear, ring and rotary encoders, optical incremental linear and rotary encoders, laser interferometers and our range of optical true-absolute linear and rotary encoders.

Renishaw's optical encoder systems are based on an innovative non-contact arrangement which provides zero mechanical hysteresis and excellent metrology, yet can withstand a variety of contaminants such as dust, light oils and scratches without compromising signal integrity. This ensures customers' machines run reliably with little or no maintenance.

Highlights in Renishaw's range are the VIONiC ultra-high accuracy, all-in-one digital incremental encoder (see page 6-38), the QUANTiC encoder series with exceptionally wide installation tolerances (see page 6-36), the ground-breaking RESOLUTE and EVOLUTE absolute encoders (see page 6-6) and the miniature ATOM incremental encoder (see page 6-19). RESOLUTE and EVOLUTE feature single track technology, a completely unique mode of operation and performance that defies convention, and are world-leading products that define Renishaw's commitment to unrivaled innovation in encoder development. ATOM uniquely combines miniaturization with leading-edge dirt immunity, signal stability and reliability. The new encoder achieves unmatched performance as a consequence of a design which avoids the many compromises traditionally associated with miniaturized encoders.

In addition to these benefits, Renishaw encoders have an established reputation for being easy to install and set up. Scale is available in many lengths with special formula self-adhesive backing, removing the need for drilling and tapping, and saving time and money.

All optical readhead and interface combinations feature a unique set-up LED which speeds installation and removes the need for complex set-up equipment or oscilloscopes.

In addition to market-leading product performance, Renishaw provides unequalled engineering back-up with a global team of experienced engineers always on hand to offer application advice and expert installation support.

To ensure that we never hold up your production, stock is held at over 30 Renishaw operations worldwide and, thanks to flexible manufacturing techniques, even out-of-stock items can be manufactured and shipped promptly.

Renishaw's encoder systems are used in all sectors of industrial automation such as semiconductor, electronics, medical, flat panel display manufacturing, printing, scientific research, robotics, solar PV, specialist machine tools, precision metrology and advanced motion systems.

Innovation

Each year, Renishaw re-invests approximately 14% of turnover into engineering, research and development. The results are ground-breaking products such as VIONiC™ and ATOM that demonstrate our commitment to developing unique technologies that push encoder performance to new levels. You will not find 'me too' replicas of competitors in this catalog; only superior encoder designs that offer higher fidelity positional feedback.



Quality

We are so confident of our products that we warrant them with a comprehensive two-year guarantee. If you need to exchange a product, we will offer an immediate replacement anywhere in the world, to ensure that you do not suffer additional downtime. All returned products are thoroughly investigated and you will receive a report explaining exactly what caused the fault. In cases where problems are caused by customer damage, we can apply our applications engineering experience to help eliminate the cause.

Delivery

ISO9001-certified quality management system meets rapid delivery! Our efficient processes are tuned to enable us to react quicker than the competition to increases in demand. Allied to this, we hold large quantities of stock locally at subsidiaries around the world for 'next-day' deliveries. OEM customers can also benefit from consignment stock and kanban arrangements.

Price

Renishaw not only supplies encoders at a fair price, but also gives customers better price performance ratios and minimizes cost of ownership. How? As well as embedding quality and reliability into the fundamental encoder design, we develop novel production techniques that reduce manufacturing costs, allowing us to pass on the savings.



RESOLUTE™ and EVOLUTE™ absolute encoders

Operating principles of optical encoders

RESOLUTE and EVOLUTE are families of true absolute, fine pitch optical encoder products.

EVOLUTE is only available with the linear scale option – RTLA50-S stainless steel tape scale, also available with the *FASTRACK™* RTLA50 carrier.

RESOLUTE is available with linear and rotary scale options. Linear scale options include high-accuracy RSLA stainless steel spar scale, RELA ZeroMet scale and RTLA-S stainless steel tape scale, also available with the *FASTRACK* RTLA track-mounted linear encoder scale system. Rotary options include RESA stainless steel rings and REXA ultra-high accuracy rings.

How it works...

RESOLUTE and EVOLUTE communicate in purely serial format, using a variety of industry-standard protocols, of both proprietary and open standard.

The process begins...

The controller initiates operation by sending a request to the readhead, instructing it to capture the absolute position on the scale – linear or rotary – at that instant. The readhead responds by flashing a high-power LED source to illuminate the scale. The flash duration is as brief as 50 ns to minimize image blur on moving axes. Crucially, its timing is controlled within a few nanoseconds to preserve the relationship between requested and reported position – one of the essential features that makes RESOLUTE and EVOLUTE ideally suited to very high-specification motion systems.

Single track scale

The scale is essentially a single track of full-width contrasting lines, based on a nominal pitch of 30 μm for RESOLUTE and 50 μm for EVOLUTE. The absence of multiple parallel tracks gives important immunity from yaw errors and much more lateral tolerance in head position.

Image acquisition

The scale is imaged, via an aspheric lens which minimizes distortion, onto a custom detector array designed specifically for RESOLUTE and EVOLUTE. The optical arrangement, with a folded illumination path but direct imaging, is highly compact yet stable, thus assuring the fidelity essential for excellent metrology.

Data decoding and analysis

Once captured by the detector, the image is transferred by analog-to-digital converter (ADC) at about 500 Mb/s to a powerful Digital Signal Processor (DSP). Specially-developed algorithms then obtain a true absolute, but relatively 'coarse' position from the code embedded in the scale. This process is checked, and corrections are made by further algorithms in the DSP which exploit redundancy and intentional restrictions in the scale code. Meanwhile other routines calculate a very high-resolution 'fine' position, which is then combined with the coarse position to provide a truly absolute and very high-resolution location.

Final checks and data output

After final error-checking procedures this information is uploaded again in the appropriate protocol to the controller, as a pure serial word representing position to within 1 nm, in the case of RESOLUTE, and 50 nm, in the case of EVOLUTE. Protection against electrical noise disturbance is provided by the addition of a Cyclic Redundancy Check (CRC). The entire process, from request to response, can take as little as 12 μs and be repeated up to 25 000 times per second. By a variety of techniques, including adjusting the light flash duration to the axis speed, this performance is achieved at up to 100 m/s while, crucially, preserving exceptionally low positional jitter at lower operating speeds.

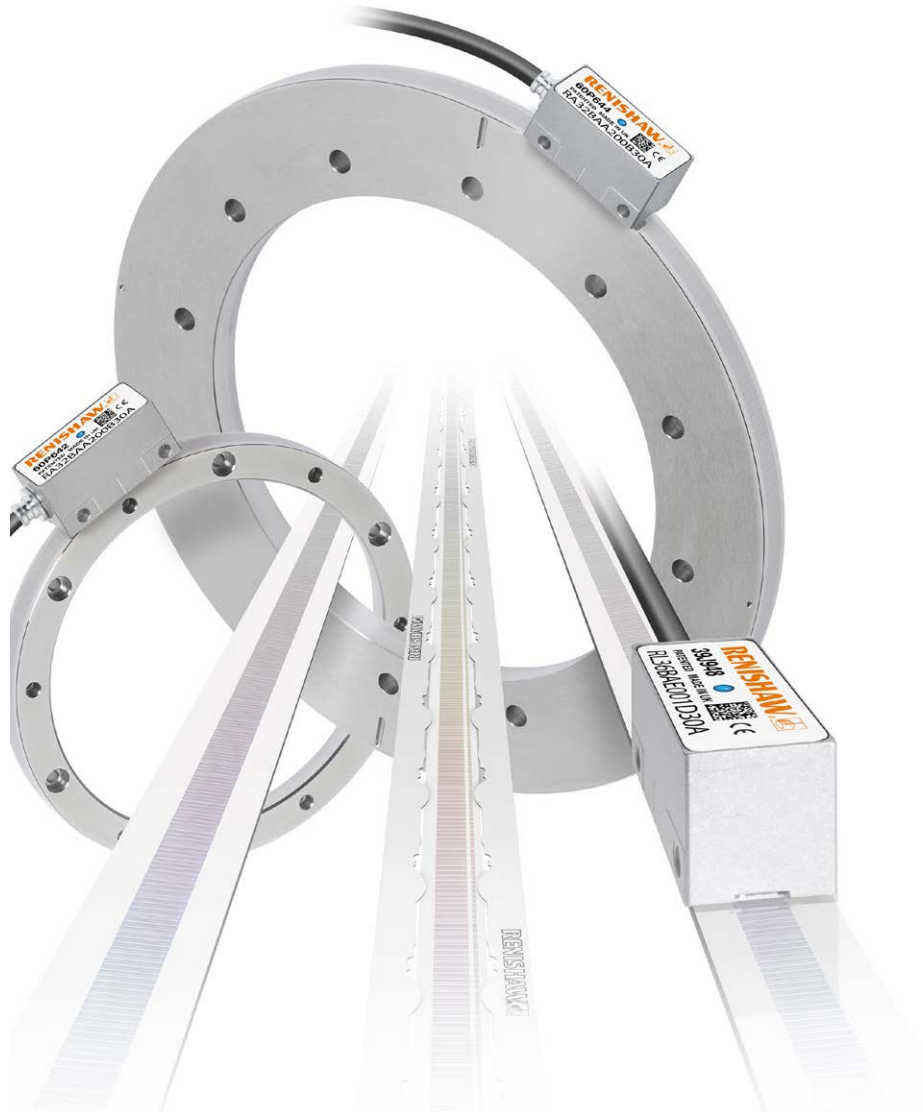
And the result is...

The outcome is an encoder with generous installation tolerances: RESOLUTE allows $\pm 0.5^\circ$ in yaw, pitch and roll and $\pm 150 \mu\text{m}$ in ride height and EVOLUTE allows $\pm 0.75^\circ$ in yaw and an impressive $\pm 250 \mu\text{m}$ in ride height. Meanwhile the generous optical footprint and advanced error correcting procedures confer excellent immunity to optical contamination, both particulate and greasy smears. All this while maintaining high resolution at 100 m/s: RESOLUTE and EVOLUTE are the answer to the toughest absolute challenges.

RESOLUTE™ absolute encoder



RESOLUTE™ absolute optical encoder summary



- True absolute non-contact optical encoder system: no batteries required.
 - Wide set-up tolerances for quick and easy installation.
 - High dirt immunity to scratches and light oils.
 - Resolutions to 1 nm or 32-bit rotary.
 - 100 m/s maximum speed for all resolutions (to 36,000 rev/min).
 - 30 μm nominal scale pitch ensures exceptional motion control performance.
 - ± 40 nm Sub-Divisional Error (SDE) for smooth velocity control.
 - Less than 10 nm RMS jitter for improved positional stability.
 - Built-in separate position-checking algorithm provides inherent safety.
 - IP64-sealed readhead for high reliability in harsh environments.
 - Integral set-up LED enables easy installation and provides diagnostics at a glance.
 - Operates up to 80 °C.
 - Integral over-temperature alarm.
 - Variety of serial protocols available. Contact your local representative for the latest list.
- Compatible with:
- RELA ZeroMet spar scales.
 - RSLA stainless steel spars.
 - *FASTRACK* with RTLA.
 - RTLA-S self-adhesive tape scale.
 - RESA angle encoders.
 - Ultra-high accuracy REXA angle encoders.

EVOLUTE™ absolute encoder



Non-contact position encoders

EVOLUTE™ absolute optical encoder summary



- True absolute non-contact optical encoder system: no batteries required.
- Wider set-up tolerances than RESOLUTE encoder system.
- Integral set-up LED for easy installation and diagnostics at a glance.
- Very high immunity to dirt, scratches and light oils.
- Resolution options of 50 nm, 100 nm and 500 nm.
- 100 m/s maximum speed for all resolutions.
- ± 150 nm sub-divisional error for smooth velocity control.
- 50 μ m nominal scale pitch provides good motion control performance.
- Less than 10 nm RMS jitter for improved positional stability.
- Built-in separate position checking algorithm provides inherent safety.
- Readhead is reversible for flexible mounting. Scale orientation defines count direction only.
- Scale lengths up to 10.02 m.
- Operates up to 80 °C with integral over-temperature alarm.
- Variety of serial protocols available. Contact your local representative for the latest list.

Compatible with:

- RTLA50-S self-adhesive tape scale.
- RTLA50 with *FASTRACK* carrier.

Absolute system features

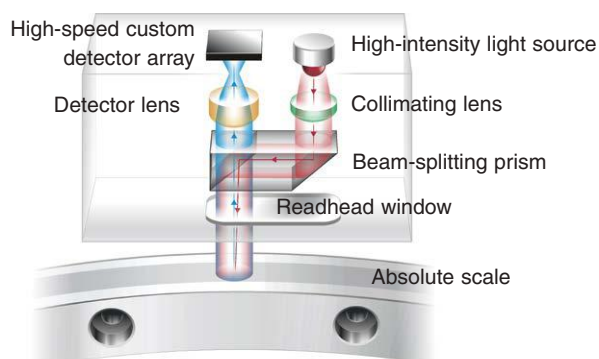
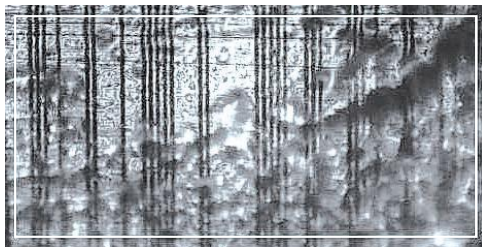
Unique single-track absolute optical scale

- Absolute position is determined immediately upon switch-on.
- No battery back-up.
- Much higher tolerance to yaw de-phasing than dual-track systems.
- Fine pitch (30 μm nominal period for RESOLUTE and 50 μm for EVOLUTE) optical scale for superior motion control compared to inductive, magnetic or other non-contact optical absolute encoders.
- High-accuracy graduations marked directly onto tough engineering materials for outstanding metrology and reliability.



High dirt immunity

- Advanced optics and embedded surplus code means RESOLUTE and EVOLUTE even read dirty scale.
- Absolute position can be determined in all three cases shown here; clean scale (left), grease contamination (below left), particle contamination (below). Images were taken with a digital microscope.



Unique detection method

- Readhead acts like an ultra-fast miniature digital camera, taking images of a coded scale.
- Photos are analyzed by a high-speed DSP to determine absolute position.
- Built-in position-check algorithm constantly monitors calculations for ultimate safety and reliability.
- Advanced optics and determination algorithms are designed to provide low noise (jitter < 10 nm RMS) and low Sub-Divisional Error (SDE) (± 40 nm for RESOLUTE and ± 150 nm for EVOLUTE).

Non-contact position encoders

Range of rotary (angle) and linear scales

RESOLUTE

- Tough RELA high-precision ZeroMet spars with $\pm 1 \mu\text{m}$ accuracy available up to 1500 mm length.
- Shatter-proof RSLA high-precision stainless steel scale, offering higher accuracy than glass scales and long lengths up to 5 m, with $\pm 4 \mu\text{m}$ accuracy over a complete 5 m length (for longer lengths contact your local representative).
- RTLA with *FASTRACK*, and RTLA-S tape scales with $\pm 5 \mu\text{m/m}$ accuracy and easiest installation.
- RESA ring with unique taper mount has large through hole for easy installation.
- REXA ultra-high accuracy ring with ± 1 arc second total installed accuracy with dual readheads.

EVOLUTE

- RTLA with *FASTRACK*, and RTLA-S tape scales with $\pm 10 \mu\text{m/m}$ accuracy and simple installation.

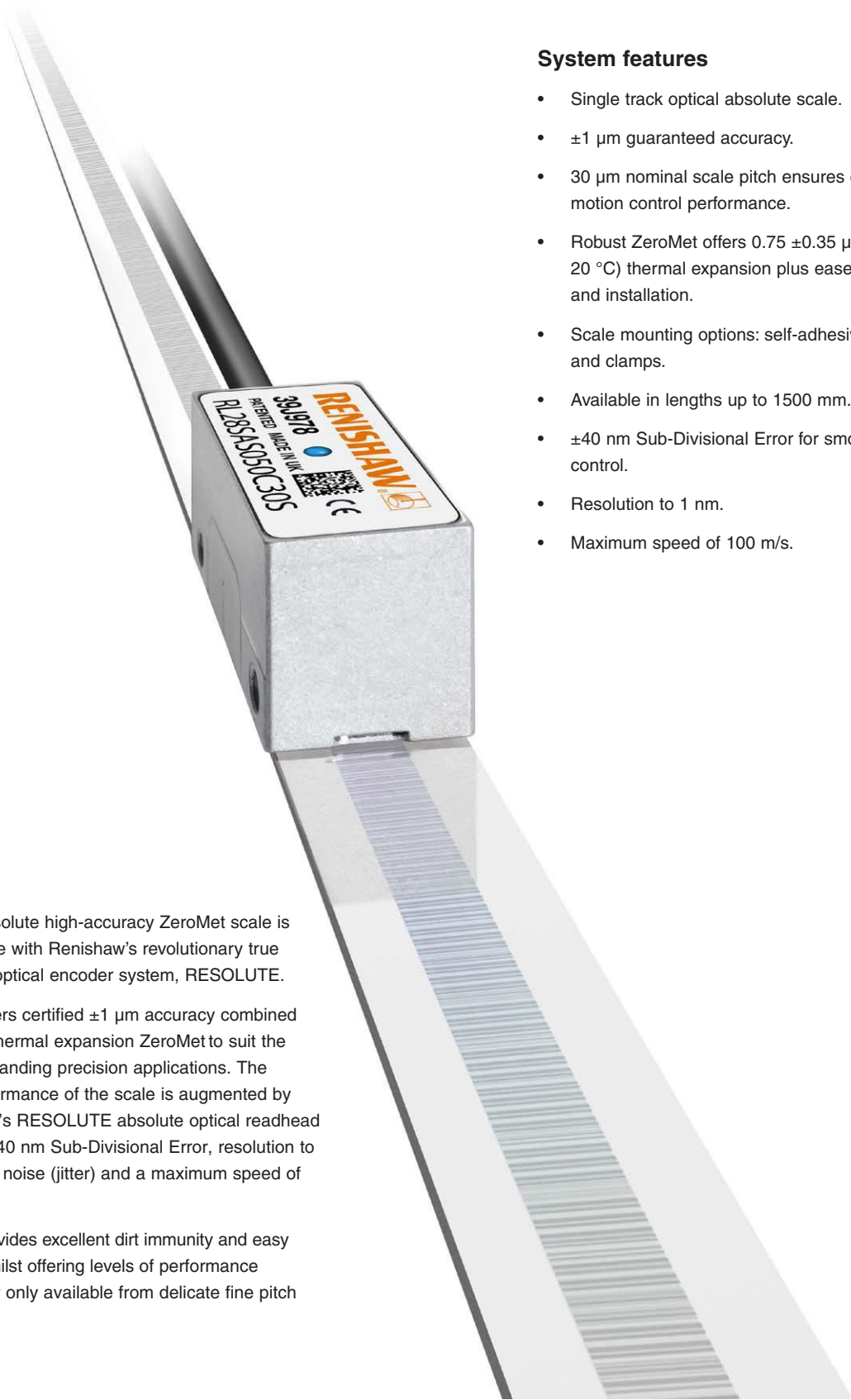
Range of protocols and resolutions

Protocol	Resolutions		
	RESOLUTE		EVOLUTE
	Linear	Rotary	Linear
<i>BiSS</i>	50 nm 5 nm 1 nm	18-bit 26-bit 32-bit	50 nm 100 nm 500 nm
Drive-Cliq*	50 nm 1 nm	26-bit 29-bit	Coming soon
FANUC	50 nm 1 nm	23-bit (high type A) 27-bit (high type B)	Coming soon
Mitsubishi	50 nm 1 nm	23-bit 27-bit	50 nm 100 nm 500 nm
Panasonic	100 nm 50 nm 1 nm	23-bit	50 nm 100 nm 500nm
Yaskawa	50 nm 1 nm	23-bit (fully closed loop) 24-bit (rotary controlled servomotors) 26-bit (rotary controlled servomotors) 30-bit (rotary controlled servomotors)	50 nm 100 nm 500 nm

* Functional safety variant available.

RESOLUTE™ compatible scales

RELA absolute high-accuracy scale



System features

- Single track optical absolute scale.
- $\pm 1 \mu\text{m}$ guaranteed accuracy.
- 30 μm nominal scale pitch ensures exceptional motion control performance.
- Robust ZeroMet offers $0.75 \pm 0.35 \mu\text{m}/\text{n}^\circ\text{C}$ (at 20 $^\circ\text{C}$) thermal expansion plus ease of handling and installation.
- Scale mounting options: self-adhesive or clips and clamps.
- Available in lengths up to 1500 mm.
- $\pm 40 \text{ nm}$ Sub-Divisional Error for smooth velocity control.
- Resolution to 1 nm.
- Maximum speed of 100 m/s.

RELA absolute high-accuracy ZeroMet scale is compatible with Renishaw's revolutionary true absolute optical encoder system, RESOLUTE.

RELA offers certified $\pm 1 \mu\text{m}$ accuracy combined with low thermal expansion ZeroMet to suit the most demanding precision applications. The high performance of the scale is augmented by Renishaw's RESOLUTE absolute optical readhead offering $\pm 40 \text{ nm}$ Sub-Divisional Error, resolution to 1 nm, low noise (jitter) and a maximum speed of 100 m/s.

RELA provides excellent dirt immunity and easy set-up, whilst offering levels of performance previously only available from delicate fine pitch systems.

Non-contact position encoders

RSLA absolute high-accuracy stainless steel scale

System features

- Single track optical absolute scale.
- 30 µm nominal scale pitch ensures exceptional motion control performance.
- Robust special composition stainless steel with defined coefficient of thermal expansion 10.1 ±0.2 µm/m/°C (at 20 °C).
- Coilable for simple storage and handling.
- Available in defined lengths up to 5 m.
- ±40 nm Sub-Divisional Error for smooth velocity control.
- Resolution to 1 nm.
- Maximum speed of 100 m/s.

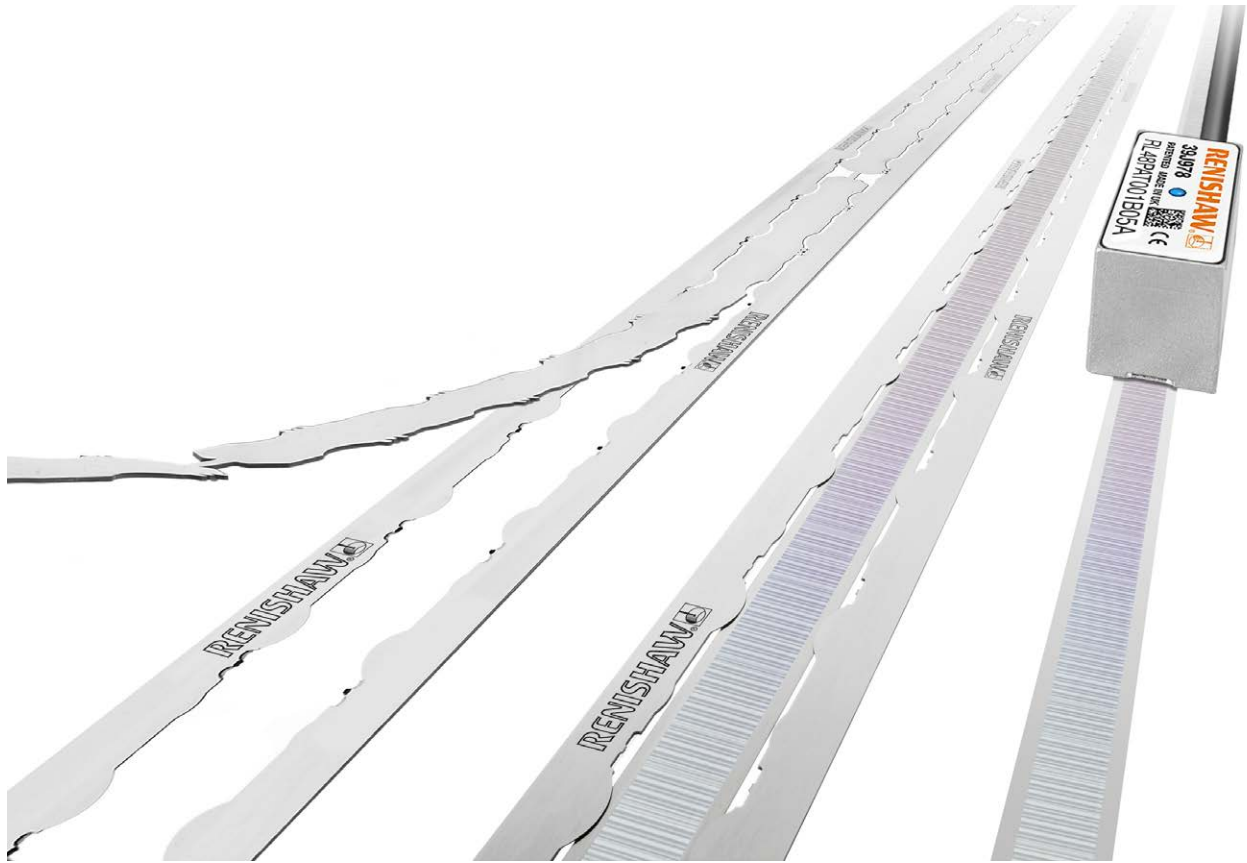


RSLA absolute high-accuracy stainless steel scale is compatible with Renishaw's revolutionary true absolute optical encoder system, RESOLUTE.

RSLA stainless steel scale is available in a range of lengths up to 5 m, with 5 m lengths having an overall accuracy better than ±4 µm – an industry first! Combined with readheads featuring low Sub-Divisional Error (±40 nm), advanced optics, resolution to 1 nm and simple installation and set-up, RSLA provides outstanding motion control performance.

RSLA offers the ease of use of a tape scale yet has the performance of a glass spar; the scale can be coiled for simple storage and handling yet behaves as a spar once uncoiled. The choice of mechanical or adhesive mounting makes RSLA perfect for long-travel applications where metrology cannot be compromised.

FASTRACK™ and RTLA-S high-accuracy absolute linear encoder scale system



RTLA absolute linear encoder tape scale from Renishaw combines $\pm 5 \mu\text{m}/\text{m}$ accuracy with the ruggedness of stainless steel. Two versions are available; self-adhesive RTLA-S, and RTLA for use with the revolutionary *FASTRACK* track system from Renishaw.

Designed for applications that demand high accuracy and an independent expansion coefficient with tape scale convenience, RTLA-S and RTLA are read by Renishaw's ground-breaking RESOLUTE absolute readhead. 1 nm resolution, 100 m/s maximum speed, ultra-low Sub-Divisional Error and jitter result in a linear encoder system that outperforms any other encoder in its class.

RTLA-S is laid onto the substrate using its self-adhesive backing tape. A patented application tool makes this a quick, simple and inexpensive process. A clamp is fitted at a single point to lock the scale to the substrate.

RTLA (without self-adhesive) is used with *FASTRACK*. In this case, the scale is held securely in place by two miniature, yet rugged, guide rails. Again, the scale is clamped in a single point to allow independent expansion with extremely low hysteresis, even over wide temperature ranges. If damaged, the scale can be pulled out of the guide rails and quickly replaced, even where access is limited, thus reducing machine downtime. This feature also makes the linear encoder system ideal for large machines that need to be sectioned for transportation.

RTLA-S and RTLA with *FASTRACK* are suitable for many applications, including FPD manufacturing and inspection machines, P-V manufacturing, linear motors with aluminum substrates, axes that are exposed to potential damage, large CMMs and other machines that require the scale to be installed/removed for transit, or simply for any application where thermal expansion of the scale must be independent of the machine structure.

- High-accuracy ($\pm 5 \mu\text{m}/\text{m}$) absolute scale. Further improvement possible with error correction.
- Compatible with RESOLUTE absolute readheads.
- RTLA scale expands at its own low thermal coefficient ($10.1 \pm 0.2 \mu\text{m}/\text{m}/^\circ\text{C}$ at 20°C).
- Use with *FASTRACK* for very low hysteresis.
- *FASTRACK* guide rails are pre-aligned in reels for cut-to-suit flexibility.
- Quick installation. *FASTRACK* adds fast scale replacement capability.
- Scale can be locked to the substrate at a single datum point anywhere along the axis.
- RTLA scale can bridge gaps in the substrate up to 25 mm.
- High solvent immunity.
- Incremental RTLC version for TONiC readheads also available.

RESA absolute angle encoder



RESA is a one-piece stainless steel ring with a single track, true absolute scale marked directly onto the periphery.

Read by Renishaw's revolutionary absolute fine pitch encoder system, RESOLUTE, it has high tolerance to dirt, scratches and greasy fingerprints that can cause other encoder systems to miscount.

The RESA offers impressive accuracy with resolution to 0.00030 arc second, suiting the most demanding precision applications.

The low profile RESA, with large internal diameter, is easy to design into most installations. Equally important, its low mass, low inertia design does not compromise system performance.

RESA is available in a wide range of sizes and line counts, providing compatibility with industry standard controllers.

System features

- Compatible with the revolutionary true absolute encoder, RESOLUTE.
- Angular resolution to 0.00030 arc second.
- System repeatability to 0.0075 arc second.
- 36,000 rev/min maximum speed for all resolutions.
- Patented taper mount simplifies integration and minimizes installation errors.
- Large internal diameter for ease of integration.
- Available in sizes from Ø52 mm to Ø550 mm.
- Custom sizes also available.
- Low mass and low inertia.
- Ultra-low inertia versions also available.
- Integral set-up LED on readhead for quick set-up and instant 'health check' at any time.
- 30 µm nominal scale pitch ensures exceptional motion control performance.
- Resolutions to 23-bit with Panasonic; to 27-bit with FANUC and Mitsubishi; 29-bit with Siemens DRIVE-CLiQ, 30-bit with Yaskawa; and to 32-bit with BiSS.
- Operates down to -40 °C with RESOLUTE ETR.

REXA ultra-high accuracy absolute angle encoder



With zero coupling losses and exceptional repeatability, the REXA ultra-high accuracy angle encoder achieves better than ± 1 arc second total installed accuracy.

Like the RESM encoder, the REXA is a stainless steel ring with the scale graduations marked axially onto the periphery, but with a number of differences to improve upon RESM's already impressive accuracy.

REXA has a thicker cross-section to ensure that the only significant installation error is eccentricity. Eccentricity is easily removed by using two readheads, and combining the signals inside the host controller.

The only errors remaining are graduation errors and readhead SDE, both of which are so small they are often negligible.

As a non-contact encoder, REXA offers dynamic performance advantages, eliminating coupling losses, oscillation, shaft torsion and other hysteresis errors that plague enclosed encoders.

The REXA system operates at temperatures up to $+80$ °C and speeds to 8 500 rev/min.

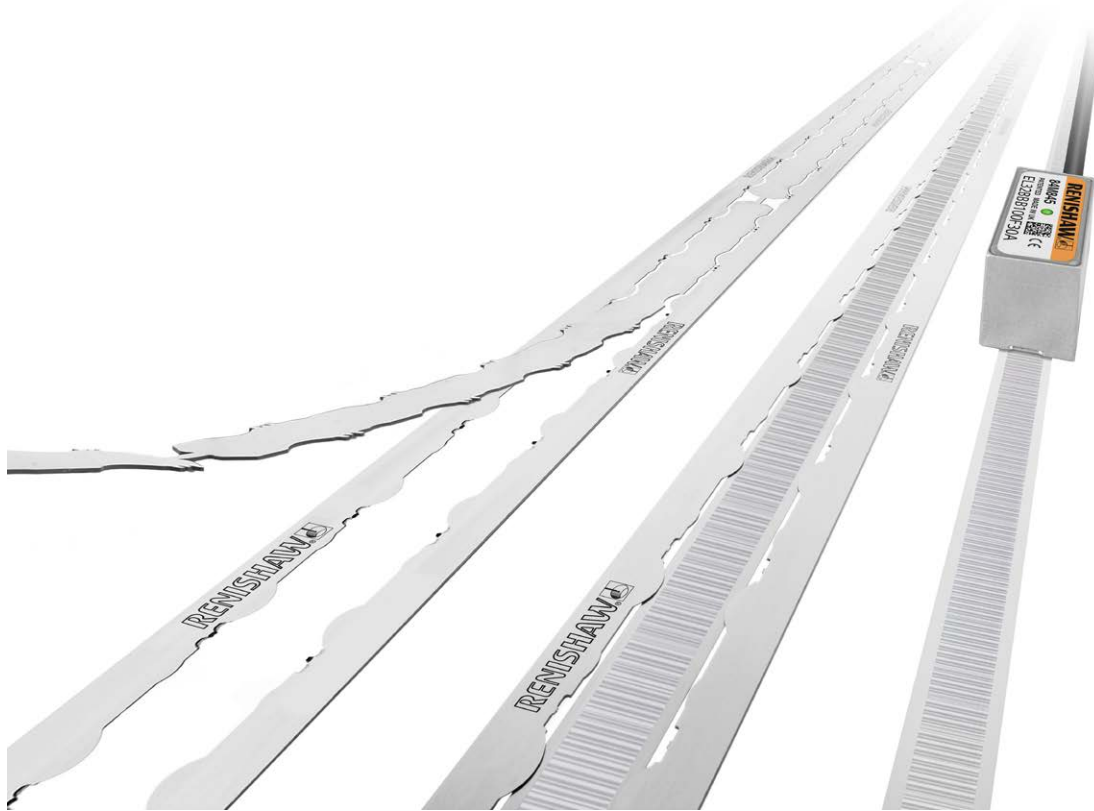
REXA total installed accuracy grades:

REXA diameter	Total installed accuracy (with two readheads)
≥ 100 mm	± 1 arc second
75 mm	± 1.5 arc second
≤ 57 mm	± 2 arc second

- Use with two RESOLUTE readheads to give ultra-high accuracy.
- Installed accuracy to ± 1 arc second with dual readheads.
- Sub-Divisional Error to ± 0.04 arc second.
- Resolutions to 0.00030 arc second.
- Repeatability to 0.01 arc second.
- Wide range of standard sizes from 52 mm to 417 mm.
- Large internal diameter for ease of integration.
- Flange mounted with easy four-point adjustment method.

EVOLUTE compatible scales

FASTRACK and RTLA50-S absolute linear encoder scale system



RTLA50 absolute linear encoder scales from Renishaw give $\pm 10 \mu\text{m/m}$ accuracy in the form of a rugged and easy-to-handle stainless steel tape. RTLA50 scales can be stuck to the substrate using their self-adhesive backing or mounted in the *FASTRACK* track system to offer total design flexibility.

When combined with Renishaw's *EVOLUTE* readhead, the RTLA50 scales offer high accuracy and an independent expansion coefficient with resolutions down to 50 nm. The generous ride height and installation tolerances, impressive dirt immunity and ease of assembly make this encoder ideally suited to a wide variety of applications.

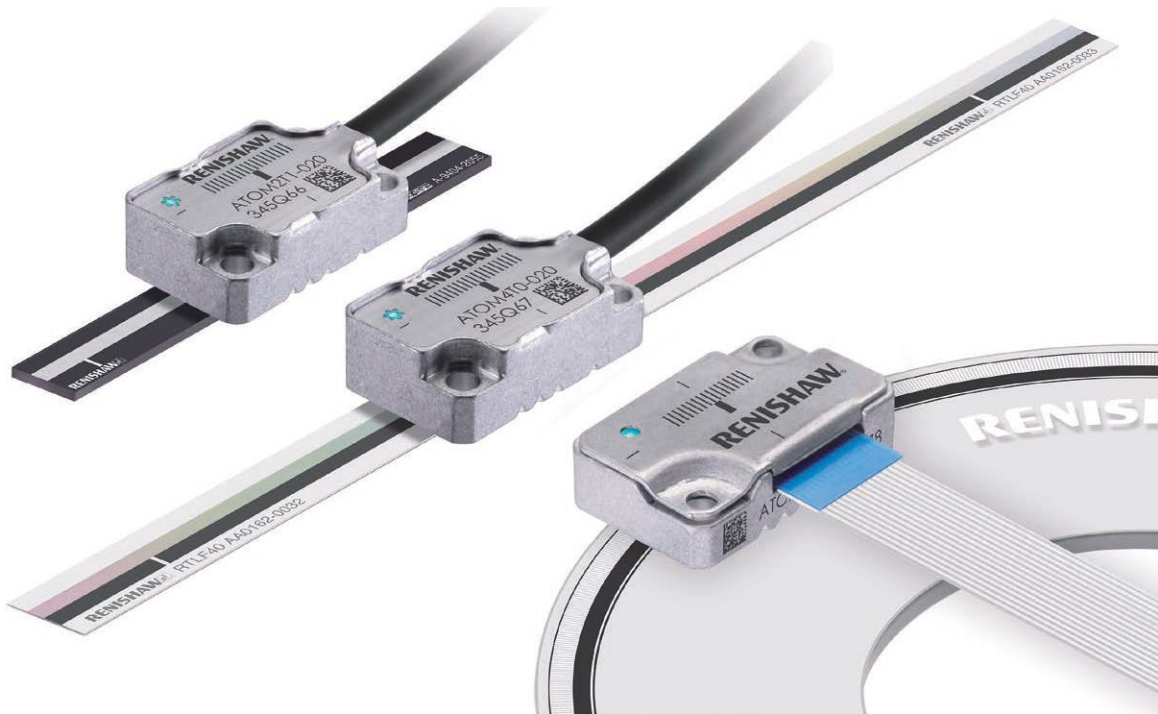
RTLA50 can be used with *FASTRACK*, Renishaw's cut-to-length track-based mounting system, making it ideal for large machines that need to be sectioned for transportation. In this case, the scale is held securely in place by two low-profile yet rugged guide rails and restrained at a single point to allow independent expansion with extremely low hysteresis, even over wide temperature ranges. If damaged, the scale can be slid out of the guide rails and quickly replaced, even where access is limited, thus reducing machine downtime.

When *FASTRACK* is not used, an adhesive-backed version, RTLA50-S, can be laid directly onto the substrate using a patented application tool in a quick, simple and inexpensive process. Metrology is ensured by using the supplied clamp at a single point to lock the scale to the substrate.

RTLA50-S and RTLA50 with *FASTRACK* are suitable for any application where thermal expansion of the scale must be independent of the machine structure, including FPD manufacturing and inspection machines, P V manufacturing, linear motors with aluminum substrates, large CMMs, axes that are exposed to potential damage, and any other machines that require the scale to be installed/removed for transit.

- Stainless tape scale accurate to $\pm 10 \mu\text{m/m}$. Further improvement possible with error compensation.
- RTLA50 scale expands at its own thermal coefficient ($10.1 \pm 0.2 \mu\text{m/m/}^\circ\text{C}$ @ 20°C)
- Repeatable metrology: scale can be locked to the substrate at a single datum point anywhere along the axis.
- High solvent immunity.
- Scale lengths up to 10.02 m.
- Quick installation. Use *FASTRACK* for easy scale replacement.
- *FASTRACK*: sectional form is ideal for large machines and sub-assemblies.
- *FASTRACK* guide rails are pre-aligned on reels for cut-to-suit flexibility.

ATOM™ miniature encoder system



ATOM is the world's first miniature encoder with filtering optics, providing improvements in dirt immunity, signal stability and reliability for linear and rotary applications.

ATOM features a number of other advances that help maintain signal stability, including integral Auto Gain Control and Auto Offset Control, along with a highly reliable IRED light source, making the product suitable for use in applications demanding quality and dependability.

The miniature readhead is available in two formats: hi-flex cable output or Flexible-Printed Circuit (FPC) output. The FPC version helps reduce overall package size, with a reduced Z-height and easy cable routing.

ATOM is available with a range of high-accuracy optical linear and rotary scales, including conventional glass spars, 'unbreakable' stainless steel tape scales and glass discs. Installation has been simplified by an intuitive set-up LED on the readhead that indicates signal level. Optical reference mark phasing and incremental signal optimization can be achieved with the simple press of a button.

ATOM is suitable for use in a variety of applications that require compact size, including laser scanners, CMM arms, semiconductor manufacturing, compact linear motors/motion stages, small DDR torque motors, galvanometers and microscope stages.

ATOM – miniaturization without compromise.

- Miniature package:
8.35 mm × 12.7 mm × 20.5 mm
(7.3 mm × 12.7 mm × 20.5 mm for FPC version).
- Highest signal stability and dirt immunity in its class due to filtering optics.
- Long-term stability provided by integral Auto Gain Control and Auto Offset Control.
- Low Sub-Divisional Error (SDE) and jitter.
- Easy installation and diagnostics using the set-up LED on the readhead.
- Fast, simple calibration at the push of a button.
- Auto-phase optical reference mark.
- Available in 20 µm and 40 µm scale pitch versions.
- Analog output direct from the readhead.
- Multiple interpolation options, with resolutions to 1 nm.
- Range of high-accuracy rotary and linear scales.

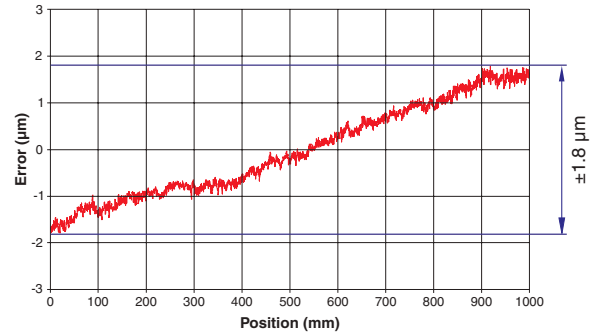
Non-contact position encoders

System features

High performance

- **Need higher speed?**
ATOM is the fastest encoder in its class, with maximum speeds up to 20 m/s and a range of high-speed interpolation options for digital versions.
- **Need higher accuracy?**
ATOM offers linear tape scales with specified overall accuracy to $\pm 5 \mu\text{m/m}$ @ 20 °C, without the need for two-point compensation that competitor encoders require.
- **Need smoother velocity control?**
Reduce velocity ripple, improve scanning performance, reduce blur on vision systems and image capturing – all thanks to ATOM's superior optical scheme and integral Auto Offset Control (AOC).

- **Need improved positional stability and repeatability?**
ATOM has low noise (jitter), allowing users to increase servo-loop gain without instability, whilst reaping other dynamic performance benefits such as faster settling times and higher acceleration.



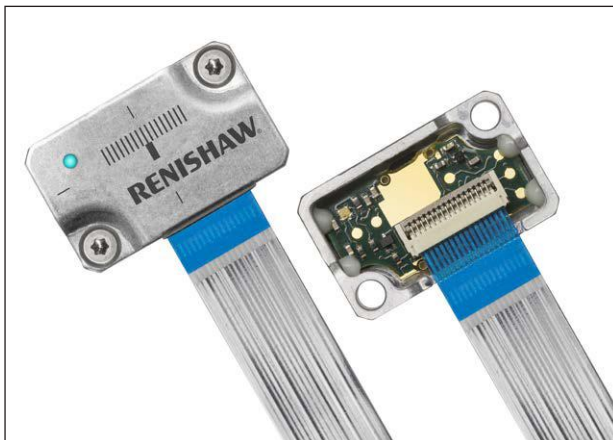
Typical accuracy for a 1 m length of RTL F 20 µm scale

Lissajous stability

ATOM features a miniaturized version of Renishaw's unique filtering optics that are used in the TONiC encoder range.

This optical scheme is tuned to a specific spatial frequency, so it rejects other harmonics, including those caused by dirt or other contaminants.

The result is a Lissajous with high purity, that retains its fidelity even when the scale is exposed to contamination: ideal for applications where reliability is critical.



Product range

- **20 µm and 40 µm readheads with high-flex cable:** for general purpose applications. Superior quality cable tested to 20 million flex cycles.
- **20 µm and 40 µm readheads with FPC cable:** side exit FPC cable allows the smallest overall package size.
- **Stainless steel tape scale (RTL F):** high-accuracy scales with graduations directly marked onto the steel tape surface. Available on reels for cut-to-suit flexibility.
- **Glass linear spars (RCLC):** conventional glass scales, available in lengths up to 130 mm.
- **Glass discs (RCDM):** high-accuracy rotary scales with outer diameters down to 17 mm.



RGH22 series readhead



Renishaw's RG2 linear encoder system is a non-contact optical encoder designed for position feedback solutions.

The system uses a common reflective tape scale scanned by a readhead chosen from a range of options offering industry-standard digital square wave or analog sinusoidal output signal formats.

Renishaw's patented optical scheme is used in all readhead series and gives proven performance benefits together with high tolerance to scale contamination.

The RGH22 range is suitable for use in a broad range of applications, offering high resolution and high speed with stability and reliability.

A dual limit sensor option is also available offering two dedicated signal outputs, left and right end-of-axis travel indication.

RGH22 is an ideal feedback solution wherever precision controlled movement is required. The RGH22 readheads offer the full set of RG2 features and integral interpolation in a robust package, with an integral set-up LED for quick and easy installation.

Common applications include coordinate measuring and layout machines, semi-conductor/electronics manufacturing and inspection, height gages, electronics assembly and testing, linear motors, digital image setters and a variety of custom linear motion solutions.

Single limit range

RGH22D – 5 µm resolution
 RGH22X – 1 µm resolution
 RGH22Z – 0.5 µm resolution
 RGH22Y – 0.1 µm resolution
 RGH22B – 1 Vpp differential

Dual limit range

RGH22P – 5 µm resolution
 RGH22Q – 1 µm resolution
 RGH22R – 0.5 µm resolution
 RGH22S – 0.1 µm resolution
 RGH22H – 50 nm resolution
 RGH22A – 1 Vpp differential

- Non-contact open optical system.
- Integral interpolation.
- Industry-standard digital and analog output options.
- Resolutions from 5 µm to 50 nm.
- Integral reference and limit sensors.
- Dual limit sensor option.
- Integral set-up LED.
- Uses RGS20-S self-adhesive scale.

Non-contact position encoders

RGH24 series readhead



Renishaw's RG2 linear encoder system is a non-contact optical encoder designed for position feedback solutions.

The system uses a common reflective tape scale scanned by a readhead chosen from a range of options offering industry-standard digital square wave or analog sinusoidal output signal formats.

Renishaw's unique patented optical scheme is used in all readhead series to provide high tolerance to scale contamination.

RGH24 is an ideal feedback solution wherever precision controlled movement is required.

The RGH24 readheads offer a wide selection of output configurations and their compact size and low mass makes the system ideal for small XY stages and actuators.

An integral set-up LED enables quick and easy installation.

Common applications include semiconductor/electronics manufacturing and inspection, co-ordinate measuring and layout machines, height gages, linear motors, pre-press printing and a variety of custom linear motion solutions.

Digital range

RGH24D – 5 μm resolution
RGH24X – 1 μm resolution
RGH24Z – 0.5 μm resolution
RGH24W – 0.2 μm resolution
RGH24Y – 0.1 μm resolution
RGH24H – 50 nm resolution
RGH24I – 20 nm resolution
RGH24O – 10 nm resolution

Analog range

RGH24B – 1 V_{pp} differential

- Non-contact open optical system.
- Compact size.
- Low mass.
- Integral interpolation.
- Digital and analog output options.
- Resolutions from 5 μm to 10 nm.
- Integral set-up LED.
- Uses RGS20-S self-adhesive scale.
- Reference mark or limit switch capability.

RGH25F series readhead



Renishaw's RGH25F offers all the benefits of the market-leading RG2 non-contact linear encoder systems; patented filtering optical scheme, high contamination tolerance and high speed.

The RGH25F has been designed for use with Renishaw's RGS20-S gold-plated scale in precision applications requiring fine resolutions, high accuracy, compact size and low mass.

The readhead is enclosed in an RFI screened housing and uses proven solid state components to give outstanding reliability.

The REF interfaces can be mounted remotely to interpolate the signals produced by the readhead.

The interfaces incorporate automatic gain control and unique self-tuning adaptive electronics which, combined with the filtering optics, ensure excellent signal integrity, and give a low cyclic error.

Common applications include optical fiber alignment, semiconductor manufacturing, inspection, precision stages and other systems requiring high resolution where space is at a premium.

Readhead

RGH25F – common readhead

Interfaces:

Digital

REF0004 – 5 μm resolution
 REF0020 – 1 μm resolution
 REF0040 – 0.5 μm resolution
 REF0100 – 0.2 μm resolution
 REF0200 – 0.1 μm resolution
 REF0400 – 50 nm resolution
 REF1000 – 20 nm resolution
 REF2000 – 10 nm resolution
 REF4000 – 5 nm resolution

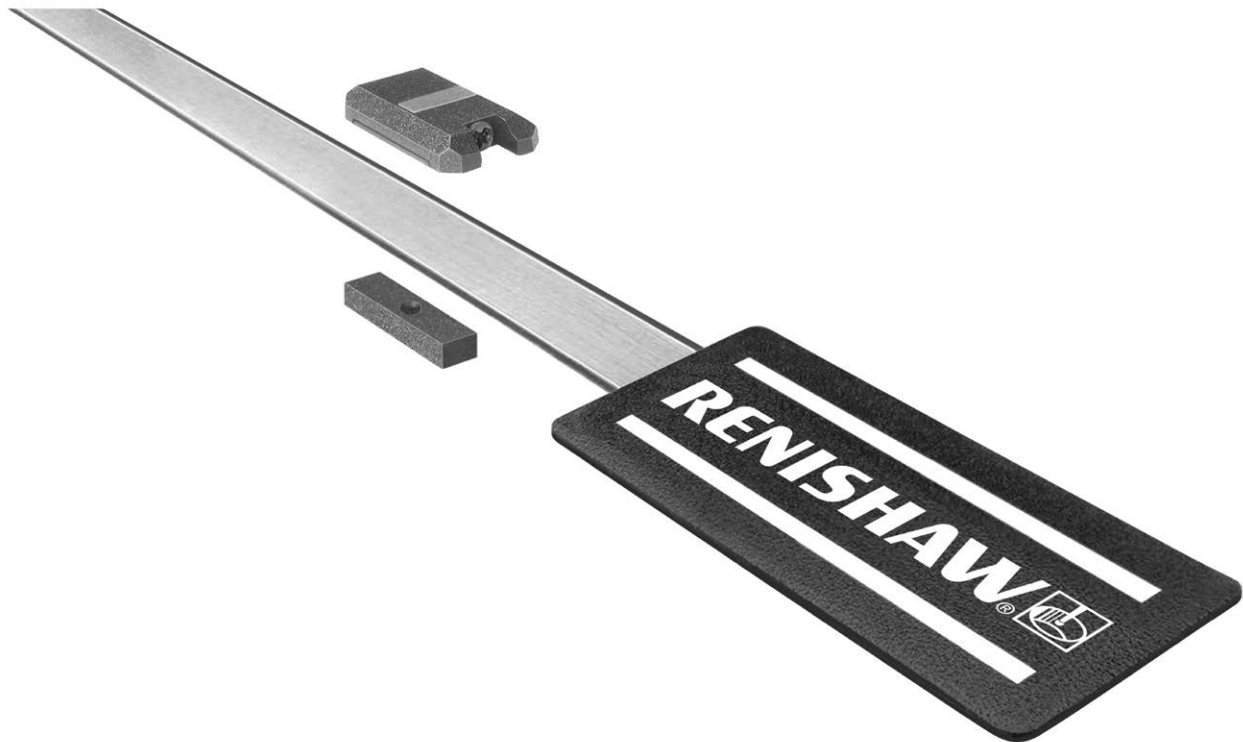
Analog

REF0000 – 1 Vpp differential

- Customer selectable AGC, operational at all speeds.
- Digital and analog output options.
- Resolutions from 5 μm to 5 nm.
- Binary interpolation factors from $\times 4$ to $\times 4096$.
- Low cyclic error (< 50 nm).
- Self-tuning adaptive electronics give reliability and high accuracy.
- Uses low profile RGS20-S self-adhesive scale.
- Low mass.
- Tri-colored set-up LED indicating signal strength.

Non-contact position encoders

RGS20 and RGS40 gold scale



Renishaw's patented RGS20-S scale comprises 20 μm graduations on a steel strip 6 mm wide and 0.2 mm thick and features a thin gold surface layer to enhance reflectivity.

A lacquer coating provides protection against handling and contamination. The 20 μm pitch scale is suitable for use with all Renishaw RG2 series readheads (RGH22, RGH24 and RGH25), whilst the 40 μm RGS40-S is suitable for use with the RGH34 and RGH41 readheads.

The scale is supplied with a specially formulated adhesive backing tape. Installation is quick, easy and suits both high-volume production and one-off field service installations.

To simplify customer inventory and maximize production flexibility, the scale can be supplied on a reel for 'cut-to-suit' convenience at the point of installation.

RGS20-S and RGS40-S are suitable for mounting to most common engineering materials including metals, granites, ceramics and composites, whilst RGS20-P and RGS40-P polyester-coated versions have an increased resilience to solvent and lubricant attack.

The scale ends are rigidly fixed to the axis substrate by means of epoxy fastened end clamps, eliminating the need to drill holes. Because the scale has a very small cross section, it is 'mastered' to the substrate and matches its thermal expansion. Differential movement between the scale and the substrate is close to zero, even throughout significant temperature swings.

- RGS20 20 μm tape scales for RGH22, RGH24 and RGH25 readheads.
- RGS40 40 μm tape scales for RGH34 and RGH41 readheads.
- 'Cut-to-length' flexibility.
- Lengths from 100 mm to 50 m (> 50 m by special order).
- Protective lacquer or tough polyester coating option for applications using harsh solvents.
- Efficient, accurate installation.
- Affixes to most common engineering materials.
- Self-adhesive.
- Automated application.

Technical specifications

Scale

Type	Reflective gold plated steel tape with protective lacquer coating or tough polyester coating option for applications using harsh solvents and self-adhesive backing	
Scale pitch	RGS20-S, RGS20-PC = 20 µm	RGS40-S, RGS40-PC = 40 µm
Linearity	RGS20-S = ±3 µm/m, ±0.75 µm/60 mm RGS20-PC = ±5 µm/m, ±1.5 µm/60 mm	RGS40-S = ±3 µm/m, ±1 µm/60 mm RGS40-PC = ±5 µm/m, ±1.5 µm/60 mm
Scale length	100 mm – 50 m (> 50 m by special order)	
Substrate materials	Metals, ceramics and composites with expansion coefficients between 0 and 22 µm/m/°C (steel, aluminum, ZeroMet, granite, ceramic etc.)	
Expansion coefficient	Matches that of substrate material with scale ends fixed by epoxy mounted end clamps	
End fixing	Epoxy mounted end clamps (A-9523-4015) using two-part epoxy adhesive (A-9531-0342) Scale end movement < 1 µm over temperature range -20 °C to +50 °C	
Operating specification	Temperature: -10 °C to +120 °C (scale only, also refer to readhead data sheet) Minimum installation temperature +10 °C Humidity: 95% relative humidity (non-condensing) to EN 60068-2-78	

Reference mark

Type	Magnetic actuator	
Mounting options	Adhesive mounted	A-9531-0250
	Screw mounted	A-9531-0287
	Adhesive or screw mounted 90° actuator for use with RGH24, RGH25 or RGH34	A-9541-0037
Position	One or more at user selected locations	
Repeatability	Output synchronized with incremental channels Repeatability of position (uni-directional) maintained within these conditions: Temperature range: RGS20-S, RGS20-P ±10 °C from installation temperature RGS40-S, RGS40-P ±20 °C from installation temperature Speed: Refer to individual readhead specifications Magnetic field: steady ±0.02 T or changing ±7.5 T/s	

Limit switch

Type	Magnetic actuator	
Mounting options	Adhesive mounted 10 mm actuator	A-9531-0251
	Adhesive mounted 24.35 mm actuator	A-9531-2052
	Adhesive mounted 50 mm actuator	A-9531-2054
	Flush mounted actuator	A-9531-0285
	Adhesive or screw mounted 90° actuator for use with RGH24, RGH25 and RGH34	A-9541-0040
Position	One or more at user-selected locations	
Repeatability	0.1 mm	

Non-contact position encoders

RGH20 and RGH20F series readhead



The RGH20 is a compact readhead for use with Renishaw's range of 20 µm RESR rotary encoders and RSLR high accuracy linear scale.

Like all Renishaw encoders, the RGH20 offers reliable, high-speed, open, non-contact performance with excellent immunity to dust, scratches and light oils on the scale.

The RGH20 also benefits from Renishaw's integral readhead set-up LED which simplifies installation and monitors signal condition during operation.

The ultra-compact RGH20F connects to the REF interface to give high-accuracy digital and analog outputs. The REF interface incorporates advanced signal processing and offers high speed and resolution.

Digital and analog RGH20

RGH20D – 5 µm resolution
RGH20X – 1 µm resolution
RGH20Z – 0.5 µm resolution
RGH20W – 0.2 µm resolution
RGH20Y – 0.1 µm resolution
RGH20H – 50 nm resolution
RGH20I – 20 nm resolution
RGH20O – 10 nm resolution
RGH20B – 1 Vpp differential

RGH20F/REF system options

REF0004 – 5 µm resolution
REF0020 – 1 µm resolution
REF0040 – 0.5 µm resolution
REF0100 – 0.2 µm resolution
REF0200 – 0.1 µm resolution
REF0400 – 50 nm resolution
REF1000 – 20 nm resolution
REF2000 – 10 nm resolution
REF4000 – 5 nm resolution
REF0000 – 1 Vpp differential

- Compatible with 20 µm RESR angle encoder and RSLR high-accuracy linear scales.
- Filtering optics provide excellent dirt immunity.
- Compact and robust housing.
- Industry-standard digital and analog outputs.
- Integral interpolation and set-up LED on RGH20 option.
- Ultra-compact RGH20F/REF system gives high accuracy and high resolution.
- Resolutions from 5 µm to 5 nm.
- Reference mark or single limit switch sensor.
- Hi-flex double-screen 8-core cable.

RESR angle encoder scale



The RESR is a one-piece stainless steel ring with graduations marked directly onto the periphery.

The RESR offers impressive accuracy with resolution to 0.008 arc second, suiting the most demanding precision applications.

Read by Renishaw's filtering optics readheads, including the RGH20, RGH34 and RGH40, the system has a high tolerance to dirt, scratches and greasy fingerprints that can cause other encoder systems to miscount.

The low profile RESR, with a large internal diameter, is easy to design into most installations. More importantly, its low mass, low inertia design will not compromise system performance. A repeatable reference mark is available to provide a home (datum) position, while Renishaw's RGH40 readhead with filtering optics offers dual limit sensors.

System features

- High-speed, non-contact, optical performance
- Graduation accuracy to ± 0.5 arc second
- Angular resolution to 0.008 arc second
- System repeatability to 0.008 arc second
- Wide range of sizes and line counts provide compatibility with industry-standard controllers ($\text{Ø}52$ mm to $\text{Ø}550$ mm with line counts from 4,096 to 86,400)
- Patented taper mount simplifies integration and minimizes installation errors
- Filtering optics provide excellent dirt immunity
- UHV compatible
- Low magnetic permeability as standard
- Compact size for easy integration
- Low mass and low inertia
- Compatible with RGH20, RGH34 or RGH40 readheads to offer industry-standard analog or digital incremental outputs with reference mark option
- Integral set-up LED on all Renishaw encoders for quick set-up and instant "health check" at any time
- Ultra-low inertia versions also available in 75 mm, 100 mm, 150 mm and 200 mm sizes

Non-contact position encoders

Ultra-high vacuum (UHV) encoders

RESOLUTE UHV, TONiC UHV and RGH25F UHV readheads

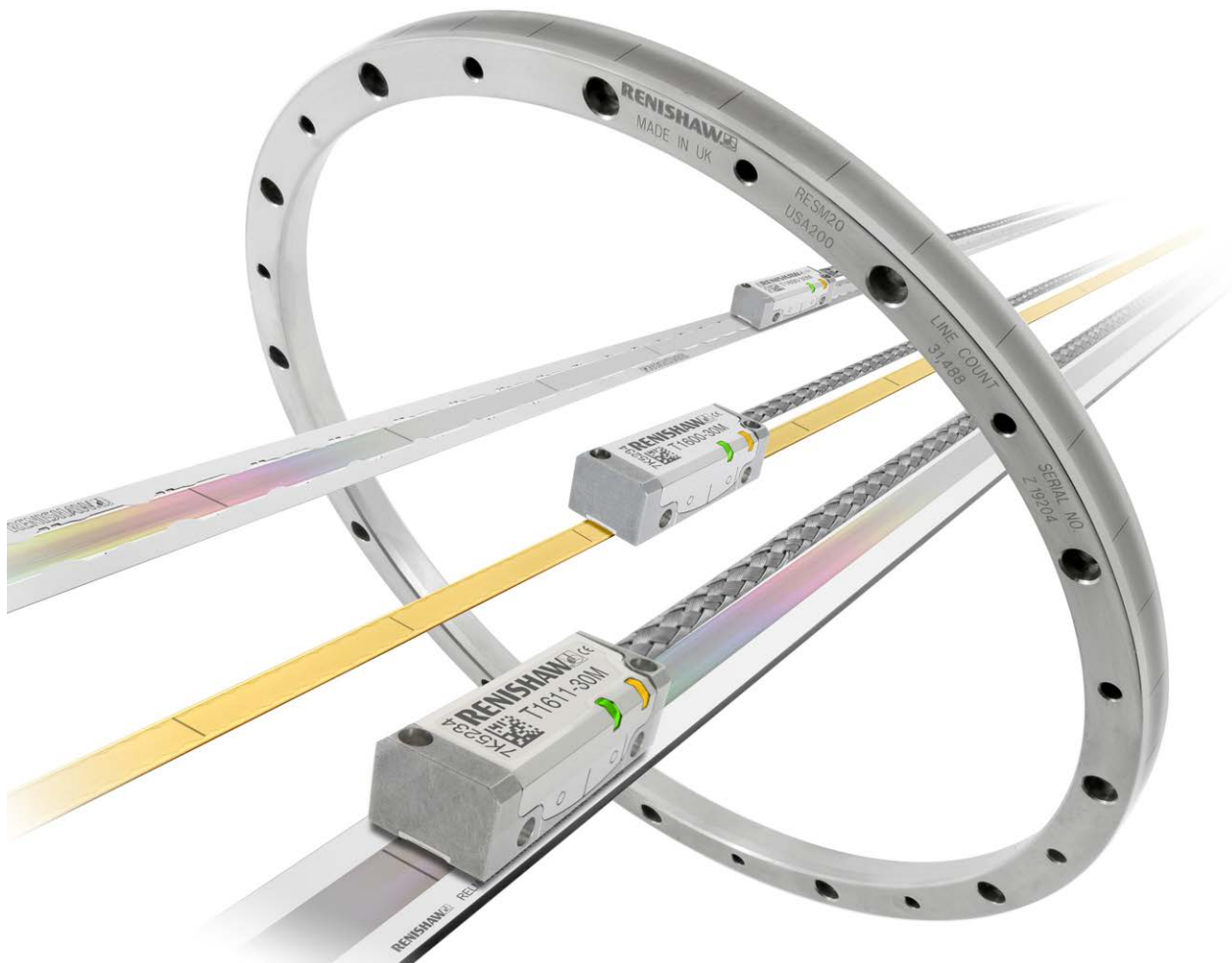
All products in Renishaw's range of ultra-high vacuum (UHV) compatible encoders are designed for use in a variety of scientific, semiconductor and other advanced industrial applications with vacuum pressures to 10^{-11} Torr. The fundamental principles of operation are the same as those for our equivalent standard-atmosphere products, but the UHV variants are designed to eliminate unvented voids and are specially constructed from clean, vacuum-compatible materials and adhesives. The suitability of the products for use in UHV environments is qualified by an independent specialist test house, including a Residual Gas Analysis (RGA) spectrum test.

The range includes versions of RESOLUTE, TONiC and RGH25F readheads, along with a variety of linear and rotary scales, offering superior performance and high reliability.

RESOLUTE UHV uses the same true-absolute encoder operating principles as the rest of the RESOLUTE range. This provides an encoder with fine-pitch performance, combined with wide set-up tolerances and built-in safety. RESOLUTE determines absolute position immediately upon switch-on, eliminating uncontrolled movements and facilitating complete command of axes without the need for reference returns or 'wake-and-shake' routines. With 1 nm resolution, ± 40 nm SDE and < 10 nm RMS noise, RESOLUTE also offers users a significant performance upgrade.

All incremental readheads in the range include dynamic signal conditioning comprising Auto Gain Control (AGC) for solid and dependable signals over extended machine lifetimes, and Auto Offset Control (AOC) for improved signal fidelity. AOC and the encoder's low positional noise also add the benefit of reducing velocity ripple on direct-drive systems, thereby helping minimize heat build-up in motors inside the vacuum.

High accuracy is assured, with linear measuring standards including options of self-adhesive tape scale, stainless steel and ZeroMet spars. Angle encoder options include the low-profile RESR/RESM and the ultra-high accuracy REXM ring with guaranteed installed accuracy better than ± 1 arc second.



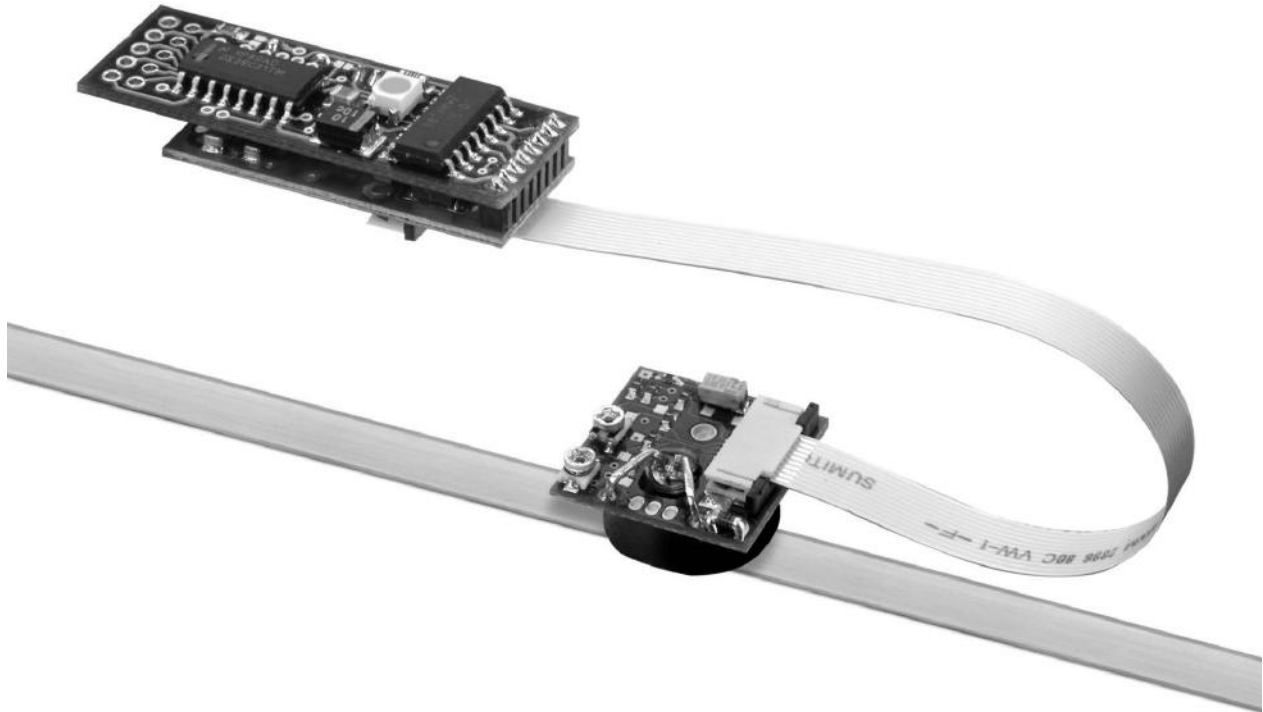
UHV product features

- RESOLUTE UHV is the first true-absolute optical encoder for UHV environments
- Constructed from vacuum-compatible materials and adhesives to give low outgassing rates
- Proven clean RGA
- Bake-out temperature of 120 °C
- Non-contact open optical system for high-speed, reliable operation with zero friction and zero wear
- Industry-standard digital and analog outputs with resolutions to 1 nm
- Low power consumption minimizes heat dissipation
- No unvented voids
- Adaptive electronics offer high performance, long-term reliability and low Sub-Divisional Error (SDE) (± 40 nm for RESOLUTE UHV, ± 30 nm for TONiC UHV, ± 50 nm for RGH25F UHV)
- UHV compatible cables
- TONiC UHV encoder features optical reference mark
- Range of high-accuracy linear and rotary scales

Products	Scale options	Features
RESOLUTE UHV	FASTRACK RTLA track-mounted scale system RTLA-S stainless steel tape scale RSLA stainless spar RELA low expansion ZeroMet spar RESA ring REXA ultra-high accuracy ring	True-absolute with no movement required to determine absolute position, position-checking algorithm, safe extraction after power-outs, pure serial communications with CRC check, excellent motion control performance and easiest installation.
TONiC UHV	RKLC20-S stainless steel tape scale RGSZ20-S tape scale FASTRACK RTLC track-mounted scale system RTLC-S stainless tape scale RSLM stainless spar RELM low expansion ZeroMet spar RESM ring REXM ultra-high accuracy ring	High-accuracy scales, <i>IN-TRAC</i> ™ optical reference mark technology, advanced Auto Gain Control (AGC) and Auto Offset Control (AOC), lowest noise (jitter) and Sub-Divisional Error (SDE) for the best motion control performance, and easy installation.
RGH25F UHV	RGS20-S tape scale	Easy installation, high repeatability, AGC and AOC.

Non-contact position encoders

RGH34 series readhead



Renishaw's RGH34 series is a non-contact optical encoder system that offers the performance and reliability of the established RG2 linear encoder system with the versatility of a miniaturized component system.

Renishaw's unique patented filtering optical technology eliminates friction, hysteresis and wear while giving high contamination tolerance and exceptional reliability. The system reads Renishaw's RGS40-S self-adhesive scale.

The component style construction allows integration flexibility for even the smallest motion systems, while the generous set-up tolerances, easy-to-install adhesive scale and integral set-up LED make installation quick and easy.

Designed for OEM applications where a conventional enclosed readhead cannot be fitted, the RGH34 brings reliable state-of-the-art performance to size-sensitive precision linear and rotary motion applications such as ultra-small linear actuators, microscopes and microstages.

Common readhead

RGH34U

Digital range

RGI34T – 10 μm resolution
RGI34D – 5 μm resolution
RGI34G – 2 μm resolution
RGI34X – 1 μm resolution
RGI34N – 0.4 μm resolution
RGI34W – 0.2 μm resolution
RGI34Y – 0.1 μm resolution

Analog range

RGI34B – Vpp differential

- Non-contact open optical system.
- Compact component style readhead.
- Large installation tolerances.
- High-speed operation.
- Industry-standard digital and analog output options.
- Resolutions from 10 μm to 50 nm.
- Optional reference or limit sensor.
- Integral set-up LED.
- Uses low profile RGS40-S self-adhesive scale.

RGH40 series readhead



Renishaw's RGH40 readhead offers all the benefits of the market-proven RG4 linear encoder system – high-speed, non-contact performance with filtering optics to guarantee reliable performance over light oils, dust and scratches.

The RGH40 readhead is designed for use with Renishaw's RGS40-G (40 µm pitch chrome grating) glass scale and RESR angle encoder. Enclosed within a rugged, die-cast housing, the readhead uses proven solid state components to give outstanding reliability.

Dual limit switch sensing is also included as standard to provide dedicated signals for each end-of-axis indication, together with a repeatable reference or datum mark.

Installation is quick and easy to achieve thanks to generous set-up tolerances and Renishaw's unique set-up LED that indicates when optimum conditions have been achieved. This removes the need for expensive oscilloscopes or set-up equipment.

These added benefits give RGH40 readheads greater flexibility, broadening the range of applications of the existing RG2 and RG4 systems, from co-ordinate measuring and layout machines to electronics assembly and test, high-speed motion control, semiconductor manufacture and a host of custom linear motors.

Digital range

RGH40T – 10 µm resolution
 RGH40D – 5 µm resolution
 RGH40G – 2 µm resolution
 RGH40X – 1 µm resolution
 RGH40N – 0.4 µm resolution
 RGH40W – 0.2 µm resolution
 RGH40Y – 0.1 µm resolution
 RGH40H – 50 nm resolution

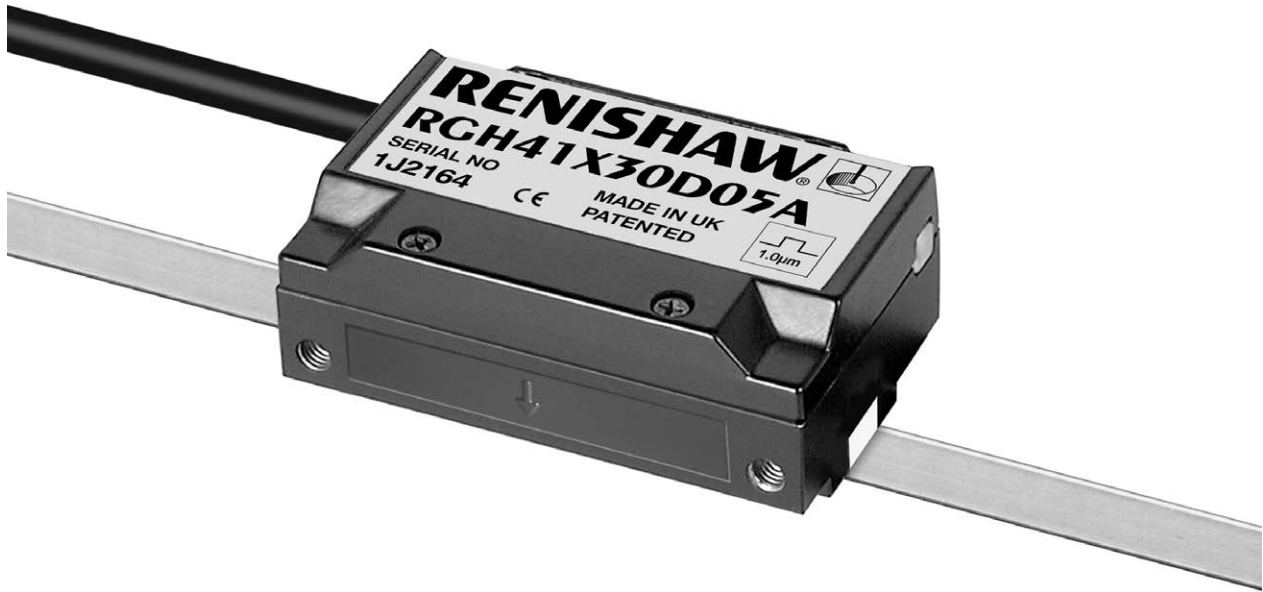
Analog range

RGH40A – 1 Vpp differential

- Non-contact open optical system.
- Large installation tolerances.
- High-speed operation – up to 10 m/s.
- Industry-standard digital and analog output options.
- Resolutions from 10 µm to 50 nm.
- Integral reference and dual limit sensors.
- Integral set-up LED.
- Uses Renishaw RGS40-G glass scale and RESR angle encoder.

Non-contact position encoders

RGH41 series readhead



Renishaw's 40 µm RGH41 series readheads offer all the benefits of the established 20 µm RG2 linear encoder system, such as reflective tape scale, patented filtering optics, set-up LED, good dirt immunity and high speed.

These compact readheads with integral interpolation provide an increased range of resolutions to match the demands of a wide range of applications, whilst their high speed enables an increase in the productivity of the end-user's system.

The 40 µm RGH41 increases the already generous set-up tolerances of the RG2, whilst maintaining Renishaw's famous contamination immunity.

For added flexibility, dual limit switch sensing is included as standard to enable dedicated signals for each end-of-axis indication, along with a repeatable reference or datum mark.

These benefits give the RGH41 greater flexibility complementing the breadth of applications in which the RG2 is already used, from coordinate measuring and layout machines to electronics assembly and test, linear motors and a host of custom linear motor solutions.

Digital range

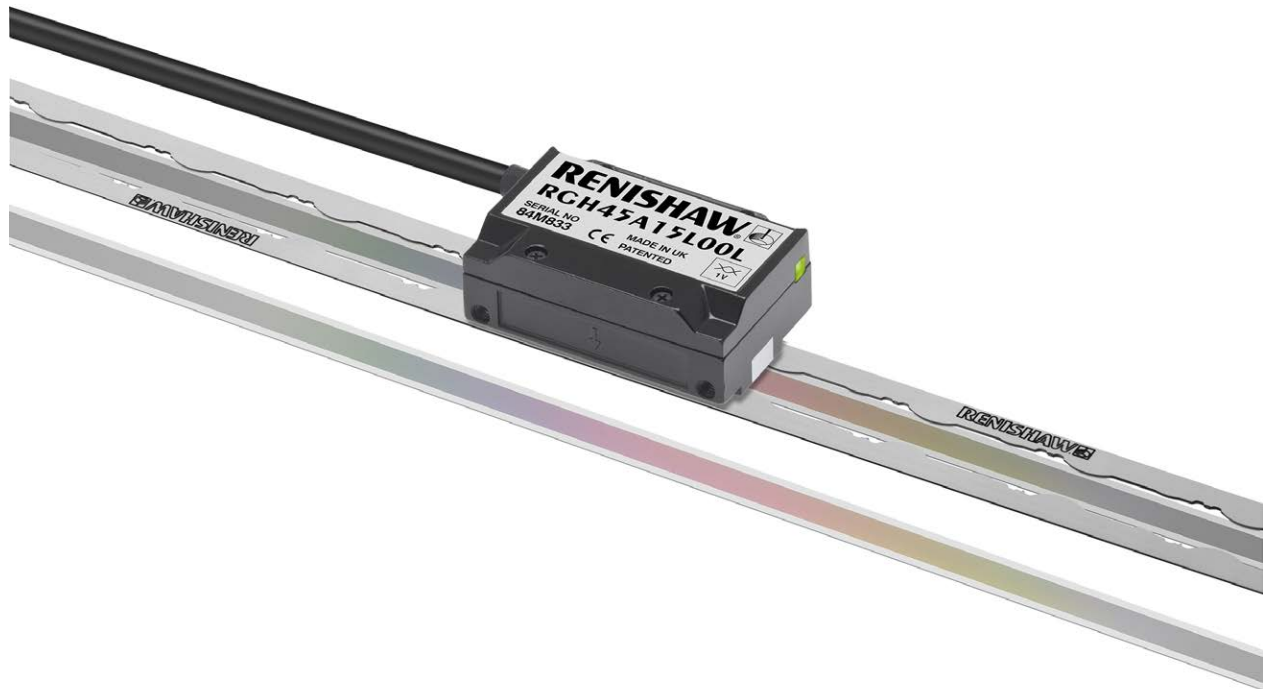
RGH41T – 10 µm resolution
RGH41D – 5 µm resolution
RGH41G – 2 µm resolution
RGH41X – 1 µm resolution
RGH41N – 0.4 µm resolution
RGH41W – 0.2 µm resolution
RGH41Y – 0.1 µm resolution
RGH41H – 50 nm resolution

Analog range

RGH41B – 1 Vpp differential (single limit)
RGH41A – 1 Vpp differential (dual limit)

- Non-contact open optical system.
- Large installation tolerances.
- High-speed operation up to 15 m/s.
- Industry-standard digital and analog output options.
- Resolutions from 10 µm to 50 nm.
- Integral reference and dual limit sensors.
- Integral set-up LED.
- Uses Renishaw RGS40-S self-adhesive scale.

RGH45 encoder system



Renishaw's RGH45 readhead offers all the benefits of the market-proven RG4 linear encoder system – high-speed, non-contact performance with filtering optics to guarantee reliable performance over dirt, contamination and scratches.

The RGH45 readhead is designed for use with Renishaw's high-accuracy stainless steel RTLR40 tape scale. Enclosed within a rugged die-cast housing, the readhead uses proven solid state components to give outstanding reliability.

Dual limit switch sensing is also included as standard to provide dedicated signals for each end-of-axis indication, together with a repeatable reference mark (datum).

Installation is quick and easy to achieve thanks to generous readhead set-up tolerances and a rapid scale installation technique that uses the motion of the axis to lay the scale, which is then locked to the substrate via a single clamp fixed with Loctite®. Renishaw's unique set-up LED indicates when optimum conditions have been achieved, removing the need for complicated oscilloscopes or set-up equipment.

RGH45 is available with self-adhesive RTLR40-S tape scale or RTLR40 with Renishaw's unique *FASTRACK* track system that allows easy scale replacement – ideal for long machines that need to be sectioned for transit. Both scale types feature high-accuracy graduations marked directly onto stainless steel, without any coatings, providing immunity to damage from harsh solvents.

These added benefits give RGH45 readheads greater flexibility, making them ideal for use in a variety of applications including linear motors, FPD manufacturing, electronics assembly and test, printing machines and a variety of high-speed motion control systems.

Digital range

RGH45T – 10 µm resolution
 RGH45D – 5 µm resolution
 RGH45G – 2 µm resolution
 RGH45X – 1 µm resolution
 RGH45N – 0.4 µm resolution
 RGH45W – 0.2 µm resolution
 RGH45Y – 0.1 µm resolution

Analog range

RGH45A – 1 Vpp differential

- Uses RTLR40 and RTLR40-S high-accuracy stainless steel tape scale.
- Unique filtering optics and DC light servo.
- Large installation tolerances.
- Excellent dirt immunity.
- High-speed operation – up to 10 m/s.
- Industry standard digital and analog output options.
- Resolutions from 10 µm to 0.1 µm.
- Integral reference and dual limit sensors.
- Integral set-up LED.

Non-contact position encoders

RGS40-G glass scale



The RGS40-G is a 40 µm chrome on glass scale designed for use with Renishaw's RG4 series RGH40 filtering readheads.

The RGS40-G system offers many of the features that have made Renishaw's famous RGS tape scale such a success – high-speed, non-contact optical performance that is immune to dust, light oil and scratches.

The RGH40 benefits from filtering optics and an integral set-up LED which ensure easy installation and reliable operation.

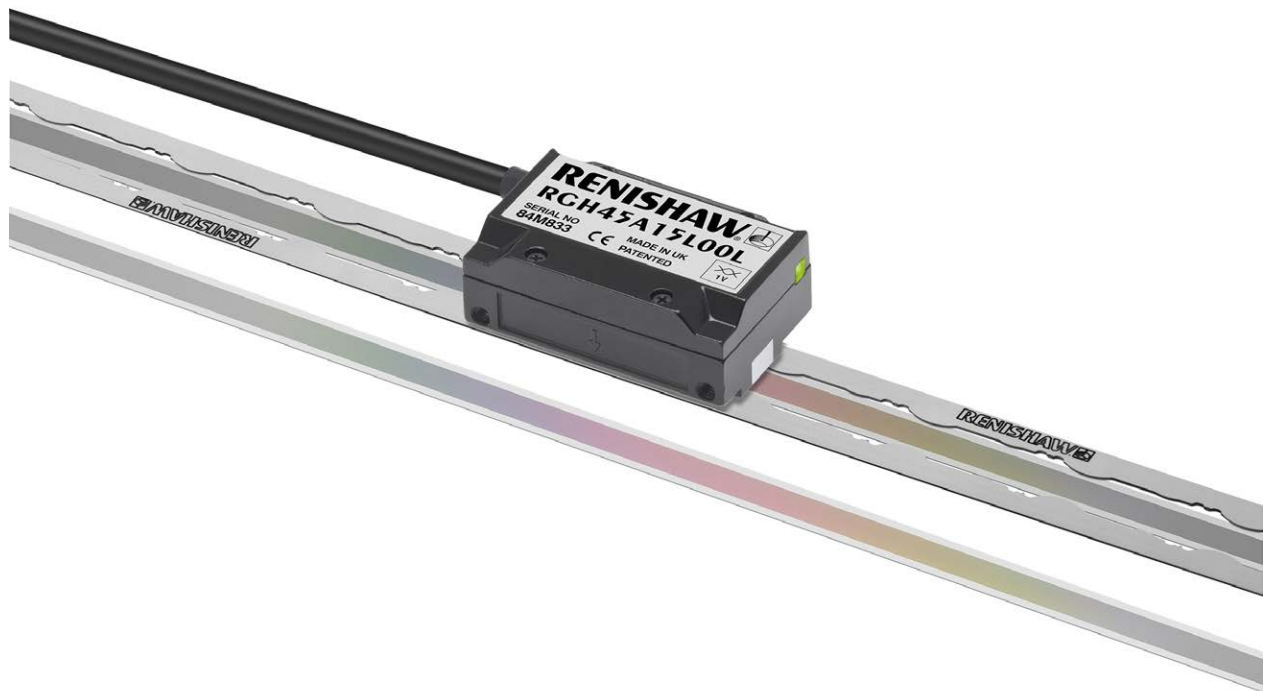
The RGS40-G scale is easy to install and can be mounted directly to the substrate using either mechanical clips or specially-formulated adhesive.

In addition to these features, the RGS40-G is ideally suited for applications where the scale does not need to be mastered to the substrate. The thermal behavior of RGS40-G can be compensated for by simply entering the coefficient of expansion of the scale into the host controller.

The RGS40-G boasts an extensive list of application areas, e.g. linear motion stages, linear motors, scientific instruments, metrology instruments, optical inspection, XY stages, medical equipment.

- Suitable for use with RGH40 series readheads.
- Available in eight convenient lengths.
- Defined thermal behavior.
- Reliable dirt immunity.
- Compatible with reference marks and limit switches.
- Clamp or adhesive mounting options.
- Can be mounted on any substrate.
- 3 × 18 mm cross section for compact installation.

FASTRACK and RTLR40-S incremental linear encoder scale system



RTL40 linear encoder tape scale from Renishaw combines $\pm 15 \mu\text{m/m}$ accuracy with the ruggedness of stainless steel. Two versions are available: self-adhesive RTL40-S and RTL40 for use with the revolutionary *FASTRACK* track system from Renishaw.

Designed for applications that demand accuracy and an independent expansion coefficient with tape scale convenience, RTL40-S and RTL40 are read by Renishaw's RGH45 readhead. RGH45 offers resolutions to $0.1 \mu\text{m}$, 10 m/s maximum speed, excellent dirt immunity and provides significant motion control performance improvements over magnetic, inductive or coarse-pitch optical encoders.

RTL40-S is laid onto the substrate using its self-adhesive backing tape. An application tool makes this a quick, simple and inexpensive process. A clamp is fitted at a single point to lock the scale to the substrate using fast curing Loctite® adhesive.

RTL40 (without self-adhesive) is used with *FASTRACK*. In this case, the scale is held securely in place by two miniature, yet rugged, guide rails. Again, the scale is clamped in a single point to allow independent expansion with extremely low hysteresis, even over wide temperature ranges. If damaged, the scale can be pulled out of the guide rails and quickly replaced, even where access is limited, thus reducing machine downtime. This feature also makes the linear encoder system ideal for large machines that need to be sectioned for transit.

RTL40-S and RTL40 with *FASTRACK* are suitable for many applications, including FPD manufacturing and inspection machines, printing machines, linear motors, axes that are exposed to potential damage, large CMMs and other machines that require the scale to be installed/removed for transit, or simply for any application where thermal expansion of the scale must be independent of the machine structure.

- Graduations marked directly onto stainless steel scale with no coatings.
- High-accuracy ($\pm 15 \mu\text{m/m}$) scale. Further improvement possible with error correction.
- Compatible with rugged and reliable RGH45 readheads.
- RTL40 scale expands at its low thermal coefficient ($10.6 \mu\text{m/m}^\circ\text{C}$).
- Use with *FASTRACK* for very low hysteresis.
- *FASTRACK* and scale are available on reels for cut-to-suit flexibility.
- Quick installation – *FASTRACK* adds fast scale replacement capability.
- Locks to substrate via a single clamp that is fixed with fast-curing Loctite®.
- High solvent immunity.

Non-contact position encoders

QUANTiC™ series encoder system



The QUANTiC encoder series provides robust incremental position measurement for linear and rotary systems with excellent metrology and wide installation tolerances. This reduces or eliminates the need for mounting adjustment during the installation process.

QUANTiC includes Renishaw's high-performance integrated interpolation technology, removing the need for additional adaptors or separate interfaces. This provides stable and reliable position signals for a wide range of demanding measurement and motion control applications.

QUANTiC's easy-to-use built-in installation and calibration functions can be enhanced with the optional Advanced Diagnostic Tool ADTi-100, providing comprehensive real-time encoder feedback during installation and diagnostics.

In addition to Renishaw's proven unique filtering optics, QUANTiC has a new detector design which gives superior signal purity and dirt immunity. They are combined in a compact readhead body, joining the VIONiC™ and TONiC™ family of encoders.

- Compact, all-in-one, digital output, optical encoder
- Wide installation tolerances:
Ride height from ± 0.2 mm
Yaw $\pm 0.9^\circ$
- Maximum speed up to 24 m/s (3.63 m/s @ 0.1 μ m resolution)
- Improved dirt immunity for robust operation
- Resolutions from 10 μ m to 50 nm
- Optical *IN-TRAC*™ auto-phase reference mark and dual magnetic limits
- Integrated set-up LED
- Auto Gain Control (AGC), Auto Balance Control (ABC) and Auto Offset Control (AOC) ensure consistent signal strength for long-term reliability
- Optional Advanced Diagnostic Tool ADTi-100 to optimize set-up and assist with system diagnostics

System features

In-built reliability and ease of installation

Robust position measurement over contamination

QUANTiC readheads ensure excellent motion control performance in a wide range of applications by minimizing positional error over scale contamination. A new detector design provides an additional layer of signal filtering which helps to eliminate non-harmonic signal frequencies, ensuring low Sub-Divisional Error (SDE) and minimal signal variation over dirt or contamination on the scale.

Increased operating tolerances whilst maintaining metrology

The new detector design helps to increase installation and operational tolerances, whilst maintaining metrological performance. Combining this with Renishaw's established filtering optics and signal processing technology makes QUANTiC a robust and easy to use incremental encoder.



Optional Advanced Diagnostic Tool ADTi-100



The QUANTiC encoder system is compatible with the Advanced Diagnostic Tool ADTi-100 and ADT View software. They provide comprehensive real-time encoder data feedback to aid more challenging installations and diagnostics. The intuitive software interface can be used for:

- Remote calibration
- Signal optimization over the entire axis length
- Readhead pitch indication
- Limit and reference mark indication
- Digital readout of encoder position (relative to scale)
- Monitoring velocity
- Exporting and saving data

Non-contact position encoders

VIONiC™ series encoder system



The VIONiC encoder series is Renishaw's highest performing incremental optical encoder. It provides digital position feedback with superior metrology, high speeds and high reliability.

The VIONiC readhead integrates Renishaw's market proven filtering optics and advanced interpolation technology. This provides excellent dirt immunity, ultra-low Sub-Divisional Error (SDE), and the benefit of eliminating the need for additional adaptors or separate interfaces. Designed with intuitive auto calibration mode, VIONiC is easy to install. In addition, an optional Advanced Diagnostic Tool ADTi-100 provides comprehensive real-time encoder feedback during installation and diagnostics.

VIONiC reads a wide range of linear and rotary scales, from low expansion ZeroMet™ to high accuracy REXM rings. This makes it a versatile product suitable for a wide variety of applications, where metrology cannot be compromised.

- Compact, all-in-one, digital output, optical encoder
- Dynamic signal processing provides ultra-low Sub-Divisional Error of typically $< \pm 15$ nm
- Compatible with linear and rotary scales with *IN-TRAC*™ auto-phase optical reference mark (datum)
- Auto Gain Control, Auto Balance Control and Auto Offset Control ensure consistent signal strength for long-term reliability
- Integrated set-up LED for ease of installation
- Maximum speed to 12 m/s (3.63 m/s at 0.1 μ m resolution)
- Digital signals direct from the readhead: resolutions from 5 μ m to 2.5 nm
- Integrated dual limits (linear only)
- Filtering optics optimized for excellent dirt immunity
- Optional Advanced Diagnostic Tool ADTi-100 to optimize set-up and assist with system diagnostics

System features

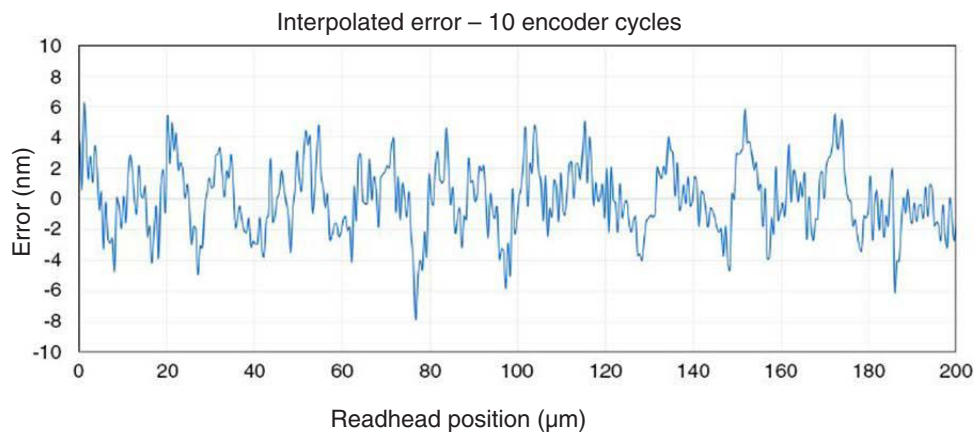
Need superior motion control?

- VIONiC implements our latest interpolation algorithms and signal processing techniques to achieve a Sub-Divisional Error as low as $< \pm 15$ nm. Low SDE directly equates to low velocity ripple which is important for constant velocity applications, such as scanning measurement systems. Its intelligent interpolation chip can achieve $8,000 \times$ interpolation which equates to 2.5 nm resolution directly out of the readhead. This system is used when precision and repeatability is of paramount importance.

System type	SDE
Linear	$< \pm 15$ nm*
Rotary $\varnothing > 135$ mm	$< \pm 15$ nm*
Rotary $\varnothing \leq 135$ mm	$< \pm 20$ nm

* $< \pm 10$ nm SDE can be achieved with optimized set-up. Please contact your local Renishaw representative for further details.

Typical SDE graph for VIONiC linear readheads



Need higher speed?

- At its highest clock rate (50 MHz counter speed) the VIONiC readhead outputs quadrature edges with a minimum separation of 25.3 ns to allow this maximum possible speed at fine resolutions.

Need higher accuracy?

- VIONiC readheads are compatible with a range of linear and rotary scales, from ± 1 $\mu\text{m}/\text{m}$ low expansion linear spar scales to ± 1 arc second total installed accuracy rings.

Optional Advanced Diagnostic Tool ADTi-100

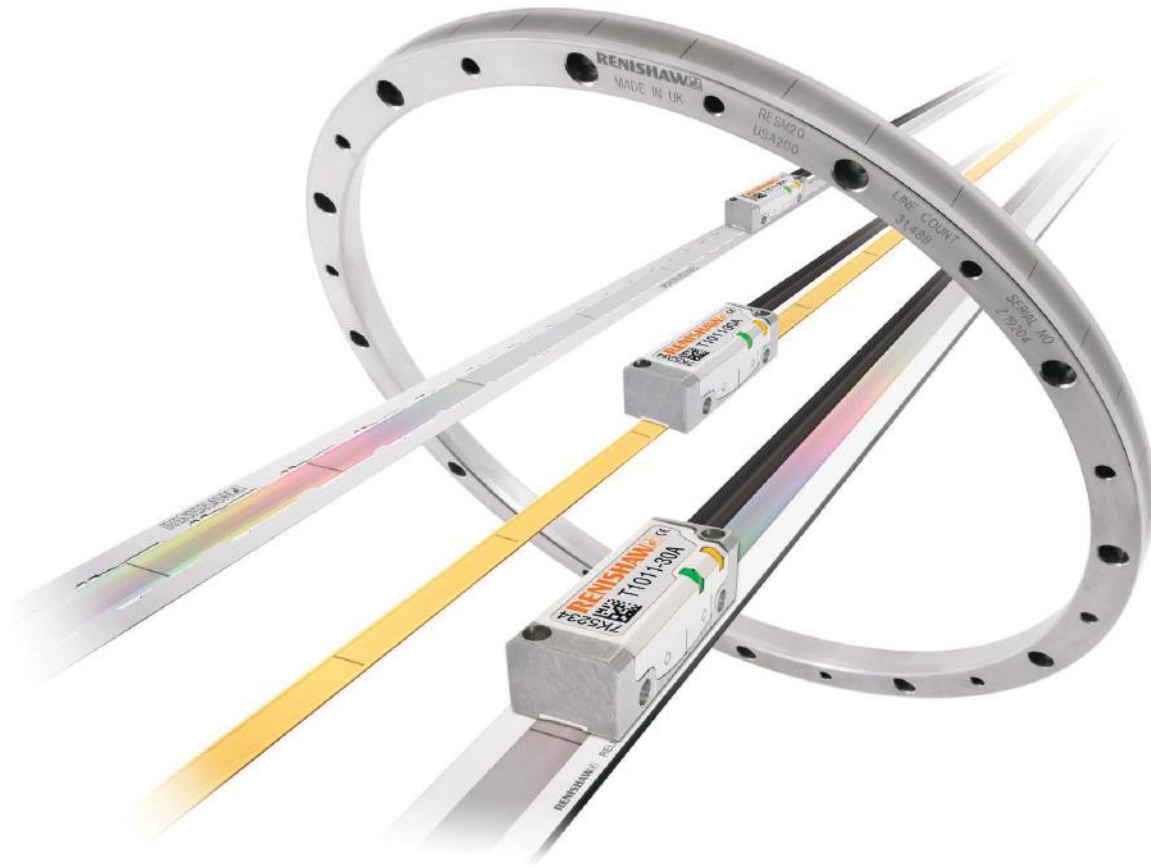


The VIONiC encoder system is compatible with the Advanced Diagnostic Tool ADTi-100 and ADT View software. They provide comprehensive real-time encoder data feedback to aid more challenging installations and diagnostics. The intuitive software interface can be used for:

- Remote calibration
- Signal optimization over the entire axis length
- Readhead pitch indication
- Limit and reference mark indication
- Digital readout of encoder position (relative to scale)
- Monitoring velocity
- Exporting and saving data

Non-contact position encoders

TONiC™ encoder system



Renishaw's TONiC series represents a generation of super-compact encoders, designed for highly-dynamic precision motion systems, bringing higher accuracy, speed and greater reliability to a wide variety of demanding industry sectors.

The readhead is complemented by the latest evolution of RGSZ20 gold tape scale, REXM ultra-high accuracy angle encoder and *FASTRACK* / *RTL*C scale system with bi-directional optical *IN-TRAC* reference marks, in addition to established RSLM stainless steel scale, RELM high-accuracy ZeroMet scale and RESM rotary rings.

For ultimate reliability and high dirt immunity, TONiC readheads incorporate third-generation filtering optics, tuned for even lower noise (jitter) and further enhanced by dynamic signal processing including Auto Gain Control and Auto Offset Control. The result is low Sub-Divisional Error (SDE) giving smoother velocity control for improved scanning performance and increased positional stability.

TONiC readheads also feature a detachable analog or digital interface in the form of a robust, convenient connector that can be located up to 10 m from the readhead. The interface offers digital interpolation to 1 nm resolution, with clocked outputs for optimized speed performance at all resolutions for industry-standard controllers.

- Compact readhead (35 mm × 13.5 mm × 10 mm).
- Compatible with RKL20-S scale, RGSZ20 gold tape scale, *FASTRACK* / *RTL*C scale system RSLM, RELM, RESM, RESD and REXM with customer-selectable *IN-TRAC* auto-phase optical reference mark (datum).
- Third-generation filtering optics optimized for even lower noise (jitter).
- Dynamic signal processing inside the readhead provides ultra-low cyclic error of typically ± 30 nm.
- Auto Gain Control ensures consistent signal strength for long-term reliability.
- Increased ride height tolerance and patented set-up LED for ease of installation.
- Maximum speed to 10 m/s (3.24 m/s at 0.1 μ m resolution).
- Detachable analog or digital connector with integral interpolation to 1 nm resolution (0.00075 arc seconds).
- Integral dual limits (linear only).
- Operating temperature to +70 °C.
- Dual resolution version available.

System features

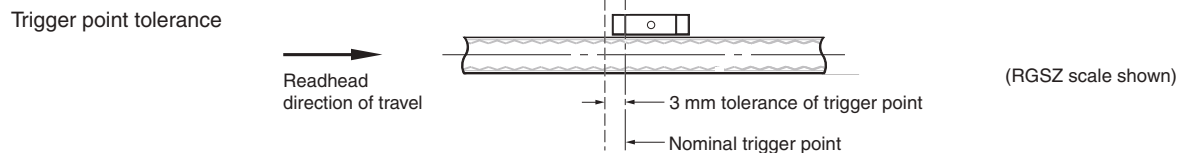
Reference mark

Form	<i>IN-TRAC</i> reference mark, directly in incremental track Refer to RGSZ, <i>FASTRACK</i> / RTLC, RELM, RSLM, RESM, RESD or REXM data sheets for reference mark location Bi-directionally repeatable across full speed and temperature range Electronically phased, requires no physical adjustment
Selection	T1xx0: Single reference mark selection by magnetic actuator (self-adhesive A-9653-0143 or bolted A-9653-0290), customer positioned. T1xx1 and T2xx1: No selector required, all reference marks output
Repeatability	Unit of resolution repeatability, over full operating temperature and speed

Dual limit switches (linear systems only, not available on TD interfaces)

Form	Magnetic actuators for P and Q limit switches	
	Self-adhesive	Bolted
	10 mm P limit	A-9653-0138
	10 mm Q limit	A-9653-0139
	20 mm P limit	A-9653-0237
	20 mm Q limit	A-9653-0238
	50 mm P limit	A-9653-0235
	50 mm Q limit	A-9653-0236

Trigger point Leading edge of magnet from direction of travel



Mounting	Self-adhesive or bolted.
Position	Customer-placed at desired locations
Repeatability	< 0.1 mm

Dynamic signal processing

- Real time signal conditioning for optimized performance across a range of operating conditions
- Automatic Gain Control (AGC)
- Automatic Offset Control (AOC)
- Ultra-low cyclic error of ± 30 nm

Calibration

- Simple calibration at the press of a button, no physical adjustment required
- Optimization of incremental and reference mark signals

TD dual resolution interfaces

- Allows output to be switched between two resolutions
- NOTE:** It is recommended that movement should be halted before switching resolutions
- No limit outputs

Non-contact position encoders

TONiC™ DOP (dual output) encoder system



Renishaw's TONiC series encoders are now available with simultaneous dual output interfacing.

The robust DOP interface can be situated up to 10 m from the TONiC readhead and offers simultaneous analog and digital outputs with interpolation to 1 nm resolution. Digital outputs are clocked for optimized speed performance at all resolutions for industry-standard controllers.

The readhead is complemented by the latest evolution of RGSZ20 gold tape scale, REXM ultra-high accuracy angle encoder and *FASTRACK* / RTLC scale system with bi-directional optical *IN-TRAC* reference marks, in addition to established RSLM stainless steel scale, RELM high accuracy ZeroMet scale and RESM rotary rings.

For ultimate reliability and high dirt immunity, TONiC readheads incorporate third-generation filtering optics, tuned for even lower noise (jitter), further enhanced by dynamic signal processing including Auto Gain Control and Auto Offset Control. The result is low Sub-Divisional Error (SDE), giving smoother velocity control for improved scanning performance and increased positional stability.

- Compact readhead (35 mm × 13.5 mm × 10 mm).
- Detachable DOP interface with integral interpolation to 1 nm resolution (0.00075 arc seconds) and simultaneous digital and analog outputs.
- Compatible with RGSZ20 gold tape scale, *FASTRACK* / RTLC scale system, RSLM, RELM, RESM, RESD and REXM with customer-selectable *IN-TRAC* auto-phase optical reference mark (datum).
- Third-generation filtering optics optimized for even lower noise (jitter).
- Dynamic signal processing inside the readhead provides ultra-low Sub-Divisional Error of typically ±30 nm.
- Auto Gain Control ensures consistent signal strength for long-term reliability.
- Increased ride height tolerance and integral set-up LED for ease of installation.
- Maximum speed to 10 m/s (3.24 m/s at 0.1 μm resolution).
- Integral dual limits (linear only).
- Operating temperature to +70 °C.

System features

Reference mark

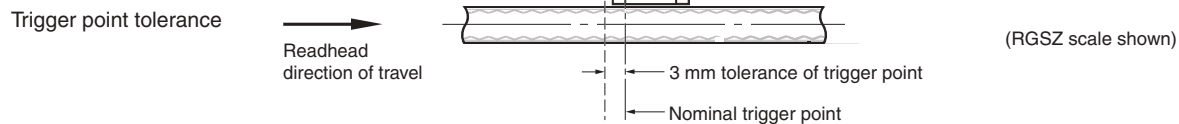
Form	<p><i>IN-TRAC</i> reference mark, directly in incremental track</p> <p>Refer to RGSZ, <i>FASTRACK</i> / RTLC, RELM, RSLM, RESM, RESD or REXM data sheets for reference mark location</p> <p>Bi-directionally repeatable across full speed and temperature range</p> <p>Electronically phased, requires no physical adjustment</p>
Selection	<p>T1xx0: Single reference mark selection by magnetic actuator (self-adhesive A-9653-0143 or bolted A-9653-0290), customer-positioned</p> <p>T1xx1 and T2xx1: No selector required, all reference marks output</p>
Repeatability	Unit of resolution repeatability, over full operating temperature and speed

Dual limit switches (linear systems only)

Form Magnetic actuators for P and Q limit switches

	Self-adhesive	Bolted
10 mm P limit	A-9653-0138	A-9653-0292
10 mm Q limit	A-9653-0139	A-9653-0291
20 mm P limit	A-9653-0237	–
20 mm Q limit	A-9653-0238	–
50 mm P limit	A-9653-0235	–
50 mm Q limit	A-9653-0236	–

Trigger point Leading edge of magnet from direction of travel



Mounting	Self-adhesive or bolted.
Position	Customer-placed at desired locations.
Repeatability	< 0.1 mm

Dynamic signal processing

- Real-time signal conditioning for optimized performance across a range of operating conditions
- Automatic Gain Control (AGC)
- Automatic Offset Control (AOC)
- Ultra-low cyclic error of typically ± 30 nm

Calibration

- Simple calibration at the press of a button, no physical adjustment required
- Optimization of incremental and reference mark signals

Non-contact position encoders

RGSZ20 gold scale



Renishaw's patented RGSZ20 20 μm gold scale features customer-selectable optical *IN-TRAC* reference marks. Uniquely, these are directly embedded into the incremental channel to enable electronic auto-phasing simply by pressing a button.

RGSZ20 scale is suitable for use with the TONiC encoder, featuring dynamic signal processing, ultra-low cyclic error (± 30 nm) and resolutions to 1 nm.

The scale is supplied with a specially formulated adhesive backing tape. Installation is quick, easy and suits both high-volume production and one-off field service installations.

To simplify customer inventory and maximize production flexibility, the scale can be supplied on a reel for 'cut-to-suit' convenience at the point of installation.

RGSZ20 is suitable for mounting to most common engineering materials including metals, granites, ceramics and composites, whilst the RGSZ20-P polyester-coated version has an increased resilience to solvent and lubricant attack.

The scale ends are rigidly fixed to the axis substrate by means of epoxy-fastened end clamps, eliminating the need to drill holes. Because the scale has a very small cross section, it is 'mastered' to the substrate and matches its thermal expansion. Differential movement between the scale and the substrate is close to zero, even throughout significant temperature swings.

- IN-TRAC optical reference marks embedded directly into the incremental channel.
- Compatible with the TONiC encoder system.
- 'Cut-to-length' flexibility.
- Lengths from 20 mm to over 50 m.
- Protective lacquer or tough polyester coating option for applications using harsh solvents.
- Quick and easy one-person installation.
- Affixes to most common engineering materials.
- Self-adhesive.
- Dual limits provide end-of-travel indication.
- Linearity of ± 3 $\mu\text{m}/\text{m}$; ± 0.75 $\mu\text{m}/60$ mm.
- RGSN20 version is supplied without IN-TRAC reference marks.

Technical specifications

Scale

Type	<p>RGSZ20-S: High-stability gold-plated steel tape with protective polymer coating. Fitted with a self-adhesive backing tape.</p> <p>RGSZ20-T: High-stability gold-plated steel tape with protective polymer coating. No self-adhesive backing tape.</p> <p>RGSZ20-P: High-stability gold-plated steel tape with tough polyester coating for use in applications requiring resistance to harsh solvents. Fitted with a self-adhesive backing tape.</p> <p>RGSZ20-Q: High-stability gold-plated steel tape with tough polyester coating for use in applications requiring resistance to harsh solvents. No self-adhesive backing tape.</p> <p>NOTE: RGSN20 variants of all above scales are manufactured without reference marks.</p>
Scale pitch	20 µm
Linearity	<p>RGSZ20-S and RGSZ20-T: ±3 µm/m; ±0.75 µm/60 mm</p> <p>RGSZ20-P and RGSZ20-Q: ±5 µm/m; ±1.5 µm/60 mm</p>
Scale length	20 mm to 50 m in 50 mm increments (> 50 m by special order)
Substrate materials	Metals, ceramics and composites with expansion coefficients between 0 and 23 µm/m/°C (e.g. steel, aluminum, ZeroMet, granite, ceramic etc.)
Expansion coefficient	Matches that of substrate material with scale ends fixed by epoxy-mounted end clamps
End fixing	<p>Epoxy-mounted end clamps (A-9523-4015)</p> <p>Approved epoxy adhesive (A-9531-0342)</p> <p>Performance < 1 µm movement over temperature range -20 °C to +50 °C</p>
Operating specification	<p>Temperature: -10 °C to +120 °C (Scale only, also refer to readhead data sheet)</p> <p>Minimum installation temperature: +10 °C</p> <p>Humidity: 80% maximum RH (non-condensing)</p>

Reference mark

Type	<p><i>IN-TRAC</i> reference mark, directly embedded into incremental track</p> <p>50 mm (nominal) spacing</p> <p>Bi-directional position repeatability</p>
Selection	Single reference mark selection by magnetic actuator (A-9653-0143), customer positioned
Repeatability	Unit of resolution repeatability (bi-directional) across full system-rated speed and temperature ranges

Limit switches

Type	Magnetic actuators; with dimple triggers Q limit, without dimple triggers P limit
Trigger point	The limit output is nominally asserted when the readhead limit switch sensor passes the limit magnet leading edge, but can trigger up to 3 mm before that edge
Mounting	Customer placed at desired locations
Repeatability	< 0.1 mm

Non-contact position encoders

RELM linear ZeroMet™ scale



RELM high-accuracy scale is compatible with Renishaw's VIONiC and TONiC range of high-performance encoders, featuring the *IN-TRAC* auto-phase optical reference mark.

RELM offers the highest accuracy of any 20 μm pitch encoder system available today, combined with low thermal expansion ZeroMet to suit the most demanding precision applications.

RELM offers excellent dirt immunity and easy set-up, whilst offering levels of performance previously only available from delicate fine pitch systems.

RELM is easy to design into most applications, due to the flexible mounting methods, integral set-up LEDs and optional software.

System features

- *IN-TRAC* bi-directional auto-phase optical reference mark.
- High accuracy, certified to $\pm 1 \mu\text{m}$ up to 1 m, calibrated against International Standards.
- Robust ZeroMet offers $0.75 \pm 0.35 \mu\text{m}/\text{m}/^\circ\text{C}$ thermal expansion plus ease of handling and installation.
- Dual limits provide on-scale end-of-travel indication.
- Scale mounting with self-adhesive or clips and clamps.

RSLM linear stainless steel scale

System features

- Total accuracy of $\pm 4 \mu\text{m}$ over 5 m.
- Available in defined lengths up to 5 m.
- Coilable for simple storage and handling.
- IN-TRAC auto-phase optical reference mark.
- Robust special composition stainless steel with defined coefficient of thermal expansion $10.1 \pm 0.2 \mu\text{m}/\text{m}/^\circ\text{C}$ @ 20 °C.
- Dual limits provide on-scale end-of-travel indication.

RSLM high-accuracy stainless steel scale is compatible with Renishaw's VIONiC and TONiC range of high-performance encoders, offering advanced features including dynamic signal processing and the *IN-TRAC* optical reference mark.

RSLM scale is available in lengths up to 5 m with an overall accuracy better than $\pm 4 \mu\text{m}$ on 5 m lengths – an industry first! Combined with readheads featuring ultra-low Sub-Divisional Error (SDE), unique filtering optics, resolution to 1 nm and simple installation and set-up, RSLM provides all the performance of a fine pitch system with the benefits of a 20 μm encoder.

RSLM offers the ease of use of a tape scale yet the performance of a glass spar; the scale can be coiled for simple storage and handling yet behaves as a spar once uncoiled. Available with a number of *IN-TRAC* reference mark options and a choice of mechanical or adhesive mounting, RSLM is perfect for long-travel applications where metrology cannot be compromised.

RTLC high-accuracy incremental linear encoder scale system



RTLC 20 μm or 40 μm linear encoder tape scale combines $\pm 5 \mu\text{m}/\text{m}$ accuracy with the ruggedness of stainless steel. Two versions are available: self-adhesive RTLC-S and RTLC for use with the revolutionary *FASTRACK*[™] track system from Renishaw.

Designed for applications that demand high accuracy and an independent expansion coefficient with tape scale convenience, RTLC is read by Renishaw's compact and reliable VIONiC[™], TONiC[™] and QUANTiC[™] readheads.

RTLC-S is laid onto the substrate using its self-adhesive backing tape. An application tool makes this a quick, simple and inexpensive process. A datum clamp is fitted at a single point to lock the scale to the substrate.

RTLC (without self-adhesive) is used with *FASTRACK*. In this case, the scale is held securely in place by two miniature, yet rugged, guide rails. Again, the scale is clamped in a single point to allow independent expansion with extremely low hysteresis, even over wide temperature ranges. If damaged, the scale can be pulled out of the guide rails and quickly replaced, even where access is limited, thus reducing machine downtime. This feature also makes the new linear encoder system ideal for large machines that need to be sectioned for transportation.

RTLC-S and RTLC with *FASTRACK* are suitable for many applications, including FPD manufacturing and inspection machines, P-V manufacturing, linear motors with aluminum substrates, axes that are exposed to potential damage, large CMMs and other machines that require the scale to be installed/removed for transit, or simply for any application where thermal expansion of the scale must be independent of the machine structure.

- Scale accuracy up to $\pm 5 \mu\text{m}/\text{m}$. Further improvement possible with error correction
- 20 μm and 40 μm pitch versions available
- 'Cut to length' flexibility
- Compatible with VIONiC, TONiC and QUANTiC high-performance readheads
- RTLC scale expands at its own low thermal coefficient ($10.1 \pm 0.2 \mu\text{m}/\text{m}/^\circ\text{C}$ @ 20 $^\circ\text{C}$)
- Use with *FASTRACK* for very low hysteresis
- *FASTRACK* guide rails are pre-aligned in reels for cut-to-suit flexibility
- Quick installation. *FASTRACK* adds fast scale replacement capability
- Scale can be locked to the substrate at a single datum point anywhere along the axis
- RTLC scale can bridge gaps in the *FASTRACK* up to 25 mm
- High solvent immunity

System features






Example accuracy test result of 3400 mm length of RTALC scale

Compatible with VIONiC, TONiC and QUANTiC readheads

- Filtering optics and Auto Gain Control for high reliability and solid Lissajous signals.
- Dynamic signal processing ensures ultra-low Sub-Divisional Error (SDE). Result: smoother scanning performance.
- High signal-to-noise ratio provides ultra-low jitter for optimum positional stability.
- Auto-phasing of *IN-TRAC* reference mark.
- Clocked outputs ensure optimized speed performance for all resolutions, for a wide variety of industry-standard controllers.
- DOP Dual output interfaces available to provide simultaneous analog and digital outputs (TONiC systems only).

High-accuracy RTALC and RTALC-S scale

- $\pm 5 \mu\text{m}/\text{m}$ accuracy @ 20°C , including slope and linearity. Linearity of $\pm 2.5 \mu\text{m}/\text{m}$ can be achieved with two point error correction.
- Hardened stainless steel construction is rugged and reliable, with high scratch and solvent resistance.
- Independent expansion coefficient ($10.1 \pm 0.2 \mu\text{m}/\text{m}/^\circ\text{C}$ @ 20°C).
- Very low hysteresis: e.g. sub-micron on a center-clamped 2 m axis over the entire operating temperature range.
- $20 \mu\text{m}$ scale pitch.
- Features optical *IN-TRAC* reference marks every 50 mm; identify one or more using the reference mark selector magnet(s).
- Scale can be cut to length using a guillotine, for easy customization.
- Track-mounted RTALC using the revolutionary new *FASTRACK* or self-adhesive mounted RTALC-S.

	VIONiC	TONiC	QUANTiC
			
Scale type	RTLC20	RTLC20	RTLC40
Pitch	20 μm	20 μm	40 μm
Outputs	Digital resolutions from 5 μm to 2.5 nm direct from the readhead	Analog 1 Vpp only. RS422 digital resolutions from 5 μm to 1 nm available when connected to a Ti, TD or DOP interface	Digital resolutions from 10 μm to 50 nm direct from the readhead
SDE (typical)	< ± 15 nm	± 30 nm	< ± 50 nm
Jitter (RMS)	down to 1.6 nm	down to 0.5 nm	down to 2.73 nm
Maximum speed	12 m/s	10 m/s	24 m/s

Non-contact position encoders

RKLC incremental linear scale



RKLC is a robust, 6 mm wide stainless steel encoder tape scale with a thickness of 0.15 mm. This allows the scale, when rigidly fixed to a machine axis, to become 'mastered' to the machine substrate, matching its thermal expansion coefficient and behavior. Differential movement between the scale and the machine is thus minimized, improving the metrological performance that can be achieved with simple thermal system compensation.

Index positions are provided by *IN-TRAC* optical reference marks which are directly embedded into the incremental scale markings to enable auto-phasing. The combination of these compact reference marks with the narrow 6 mm wide scale facilitates encoder installation in space-constrained applications.

RKLC tape scale also combines $\pm 5 \mu\text{m}/\text{m}$ accuracy with the mechanical and chemical ruggedness of stainless steel, easy coiling and cut-to-length convenience.

RKLC is installed onto the axis substrate by a self-adhesive backing tape and a simple application tool makes this a quick, straightforward and inexpensive process. The scale ends are rigidly fixed to the axis substrate by means of epoxy fastened end clamps, eliminating the need to drill holes.

- Mastered scale matches the coefficient of thermal expansion of the substrate
- Narrow 6 mm wide scale suitable for confined spaces
- *IN-TRAC* optical reference marks
- 20 μm and 40 μm pitch versions available
- 'Cut-to-length' convenience
- Up to 20 m lengths (> 20 m on request)
- Compatible with VIONiC, TONiC and QUANTiC high-performance readheads
- High solvent immunity
- Scale accuracy up to $\pm 5 \mu\text{m}$. Further improvement possible with error correction

Technical specifications

Scale

Form (H × W)	0.15 mm × 6 mm including adhesive	
Pitch	RKLC20-S	20 µm
	RKLC40-S / RKLC40H-S	40 µm
Accuracy (at 20 °C)	RKLC20-S / RKLC40H-S	±5 µm/m
	RKLC40-S	±15 µm/m
Linearity	RKLC20-S / RKLC40H-S	±2.5 µm/m achievable with two point error correction
	RKLC40-S	±3 µm/m achievable with two point error correction
Supplied length	Up to 20 m (> 20 m available on request)	
Material	Hardened and tempered stainless steel	
Mass	4.6 g/m	
Coefficient of thermal expansion (at 20 °C)	Matches that of substrate material with scale ends fixed by epoxy-mounted end clamps	
Temperature	Storage	-20 °C to +80 °C
	Operating	0 °C to +70 °C
	Bakeout	120 °C
	Installation	+10 °C to +35 °C
Humidity	95% relative humidity (non-condensing) to EN 60068-2-78	
Shock	Operating	500 m/s ² , 11 ms, ½ sine, 3 axes
Vibration	Operating	100 m/s ² max @ 55 Hz to 2000 Hz, 3 axes
End fixing	Epoxy mounted end clamps (A-9523-4015) Approved epoxy adhesive (A-9531-0342) Scale end movement typically < 1 µm up to +40 °C	

Reference mark

Type	<i>IN-TRAC</i> reference mark, directly embedded into incremental track 50 mm (nominal) spacing. Bi-directional position repeatability
Selection	Single reference mark selection by magnetic actuator (A-9653-0143), customer positioned
Repeatability	Unit of resolution repeatability (bi-directional) across full system-rated speed and temperature ranges

Limit switches

Type	Magnetic actuators; with dimple triggers Q limit, without dimple triggers P limit
Trigger point	The limit output is nominally asserted when the readhead limit switch sensor passes the limit magnet leading edge, but can trigger up to 3 mm before that edge
Mounting	Customer placed at desired locations
Repeatability	< 0.1 mm

Non-contact position encoders

RESM angle encoder scale



The RESM is a one-piece stainless steel ring with 20 µm scale marked directly onto the periphery, featuring the *IN-TRAC* auto-phase optical reference mark.

The RESM offers impressive accuracy with resolution to 0.00075 arc second, suiting the most demanding precision applications.

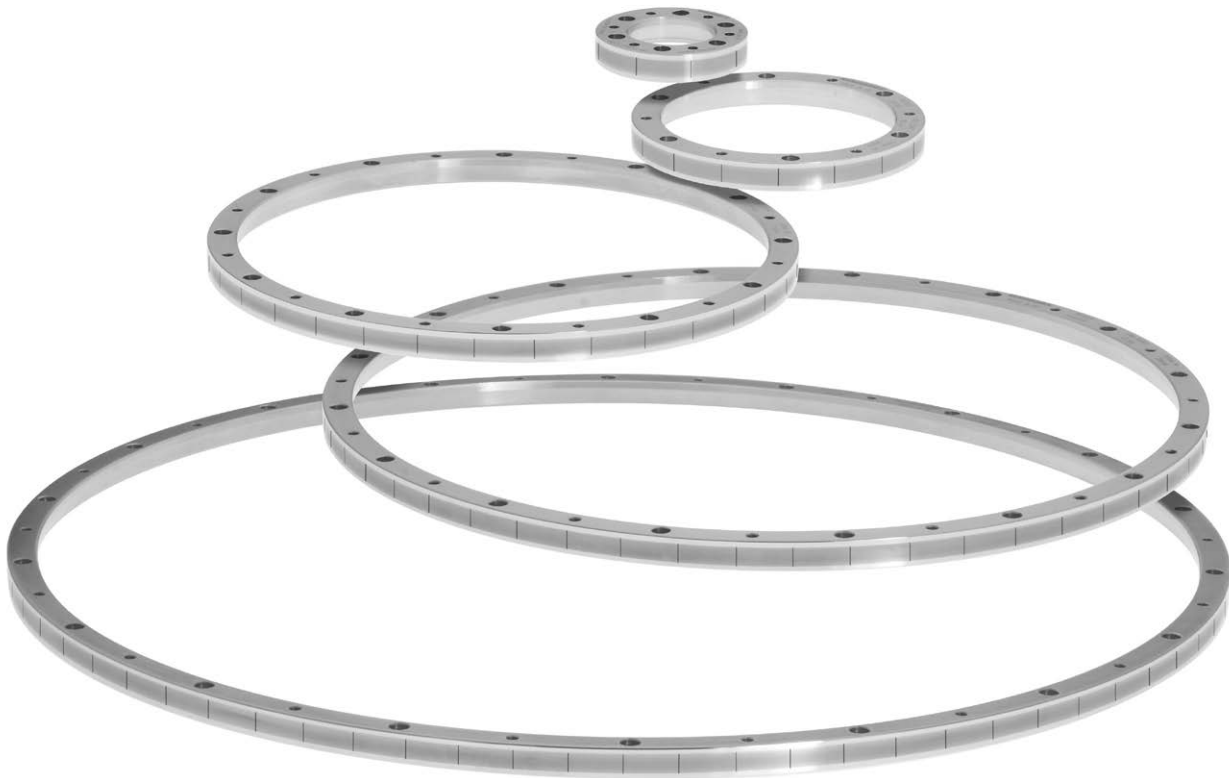
Read by Renishaw's VIONiC, TONiC and QUANTiC encoder systems, it has high tolerance to dirt, scratches and greasy fingerprints that can cause other encoder systems to miscount.

The low profile RESM, with large internal diameter, is easy to design into most installations. Equally important, its low mass, low inertia design does not compromise system performance. Available in a wide range of sizes and line counts, providing compatibility with industry-standard controllers.

System features

- Compatible with the VIONiC, TONiC and QUANTiC encoder systems offering industry standard analog or digital incremental outputs.
- *IN-TRAC* bi-directional optical reference mark.
- Graduation accuracy to ± 0.5 arc second (550 mm ring).
- Patented taper mount simplifies integration and minimizes installation errors.
- Large internal diameter for ease of integration.
- Available in sizes from $\text{Ø}52$ mm to $\text{Ø}550$ mm with line counts from 8,192 to 86,400.
- Custom sizes also available.
- Low mass and low inertia.
- Ultra-low inertia versions also available.

RESD distance-coded scale



The RESD is a one-piece stainless steel ring with 20 µm scale marked directly onto the periphery, featuring distance-coded *IN-TRAC* auto-phase optical reference marks.

Distance-coded reference marks are spaced at defined unique intervals, allowing a controller to calculate absolute position with only a small movement of the axis. The RESD offers impressive accuracy with resolution to 0.001 arc second, suiting the most demanding precision applications.

Read by Renishaw's TONiC encoder system, it has high tolerance to dirt, scratches and greasy fingerprints that can cause other encoder systems to miscount.

The low profile RESD, with large internal diameter, is easy to design into most installations. Equally important, its low mass, low inertia design does not compromise system performance. RESD is available in a range of sizes and line counts, providing compatibility with industry-standard controllers.

System features

- Compatible with the TONiC T20x1 encoder system offering industry-standard analog or digital incremental outputs.
- Distance code IN-TRAC bi-directional optical reference marks allow absolute position to be calculated after a small movement.
- High-speed operation, up to 3,672 rev/min (10 m/s).
- Graduation accuracy to ±0.99 arc second (209 mm ring).
- High-resolution, 2 nm and 1 nm digital versions.
- Angular resolution to 0.002 arc second.
- System repeatability to 0.003 arc second.
- Patented taper mount simplifies integration and minimizes installation errors.
- Large internal diameter enables easy design-in.
- Available in sizes from Ø52 mm to Ø209 mm with line counts from 8,192 to 32,768.
- Low mass and low inertia.
- Integral set-up LED on readhead for quick set-up and instant 'health check' at any time.
- True absolute encoders also available from Renishaw. Please contact your local representative for details.

Non-contact position encoders

REXM/REXT ultra-high accuracy angle encoder



With zero coupling losses and exceptional repeatability, the REXM/REXT ultra-high accuracy angle encoder achieves better than ± 1 arc second total installed accuracy.

Like the RESM encoder, the REXM/REXT is a stainless steel ring with the scale graduations marked axially onto the periphery, but with a number of differences to improve upon the already impressive accuracy of RESM.

REXM/REXT has a thicker cross section, to ensure that the only significant installation error is eccentricity.

Eccentricity is easily removed using two readheads, either with Renishaw's DSi (Dual Signal interface), or by combining the signals inside the host controller. The only errors remaining are graduation errors and readhead SDE, both of which are so small they are often negligible.

As a non-contact encoder, REXM/REXT offers dynamic performance advantages, eliminating coupling losses, oscillation, shaft torsion and other hysteresis errors that plague enclosed encoders.

Combining two readheads is easy with the DSi, which also offers an angularly repeatable reference position (*propoZ*[™]) which is unaffected by bearing wander or power cycling.

REXM/REXT total installed accuracy grades:

REXM/REXT diameter	Total installed accuracy
≥ 100 mm	± 1 arc second
75 mm	± 1.5 arc second
≤ 57 mm	± 2 arc second

Designed for axes that are limited to partial rotation, REXT rings have two reference marks, oriented diametrically opposed, for use with partial arc versions of DSi. DSi processes these reference marks to give a single, angularly-repeatable *propoZ* reference output.

- Use with two VIONiC and TONiC encoders, combined with DSi to give ultra-high accuracy.
- Installed accuracy to ± 1 arc second with dual readheads.
- Wide range of standard sizes from 52 mm to 417 mm.
- Large internal diameter for ease of integration.
- Flange-mounted with easy four-point adjustment method.
- Angularly-repeatable *propoZ* reference position is unaffected by bearing wander or power cycling.

Magnetic encoder overview

AksIM true-absolute encoder

Encoder module and off-axis encoder.



Orbis absolute rotary encoder



OnAxis™ encoder ICs

AM4096, AM4096Q, AM256, AM256Q and AM512B, AM8192B.



OnAxis encoder modules

RMB20, RMB28, RMB29, RMB30 and RMF44



OnAxis robust encoders

RM08, RM22, RM36, RM44, RE22, RE36 and RE58



LM robust incremental encoders

LM10, LM13, LM15 and LA11 with magnetic scales and rings



OnAxis commutation and incremental encoders

RMC22 and RMC35.



Accessories

Magnets and magnet actuators, interfaces and adapters, applicator tools, end clamps, reference marks, zeroing pen for RM44



The magnetic encoder range is designed and manufactured by RLS d.o.o (www.rls.si) in Slovenia, Renishaw's partner in encoder technology.

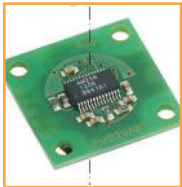
Non-contact position encoders

OnAxis magnetic encoders

Based on the proven OnAxis Hall sensor technology, a range of incremental and absolute encoder solutions are produced for use in harsh environments. There are many housing options available for use in a wide range of applications including automotive, industrial, medical and marine. Custom designs can also be offered to match specific design requirements.



OnAxis – the IC senses the angular position of a permanent magnet placed above it. The sine and cosine signals produced are then converted to absolute angle position data with a fast flash interpolator.



The sensor chip can be used directly on a circuit board or packaged into a protective housing.



The ability of the encoder to operate with a gap between the magnetic actuator and the encoder chip allows its incorporation into designs that need isolation of the moving elements.



Standard interface flanges with bearing/shafts can be provided for easy integration to existing designs.



Why rotary magnetic?

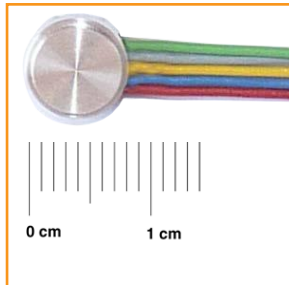
- Resolutions to 13 bit (8,192 cpr).
- High-speed operation to 60,000 rpm.
- Non-contact, frictionless design.
- Excellent dirt immunity to IP68.
- Operational temperature from $-40\text{ }^{\circ}\text{C}$ to $+125\text{ }^{\circ}\text{C}$.
- Industry-standard absolute, incremental and analog output formats.
- Accuracy to $\pm 0.2^{\circ}$.
- Simple installation – with self-locating design.

Optional 58 mm mounting flanges



RM08 super-small non-contact rotary encoder

RM08



Features

- Super-small size – 8 mm diameter body
- 3.3 V or 5 V power supply versions
- Non-contact, frictionless design
- High speed operation to 30,000 rpm
- Protection grade IP68
- Incremental resolution to 4096 cpr
- Synchro serial with 5 to 12 bit resolution
- Industry standard analog sinusoidal, incremental, SSI and linear output formats
- Accuracy to $\pm 0.3^\circ$
- RoHS compliant (lead free)
- For limited space applications

Non-contact position encoders

Technical specifications

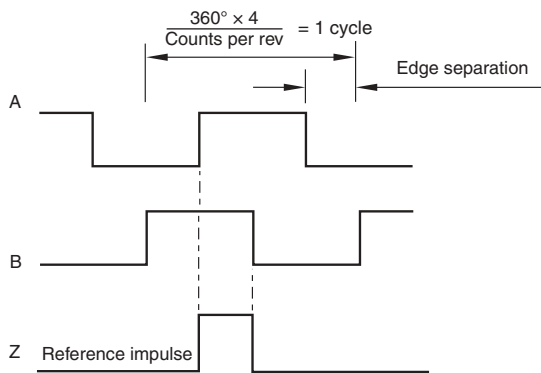
Mechanical data

Encoder housing material	Aluminum
Encoder mass	< 2 g (with 200 mm long wires)
Wire thickness	AWG30
Magnet material	SmCo (Sm17Co2), NiCuNi coated
Magnet mass	0.4 g

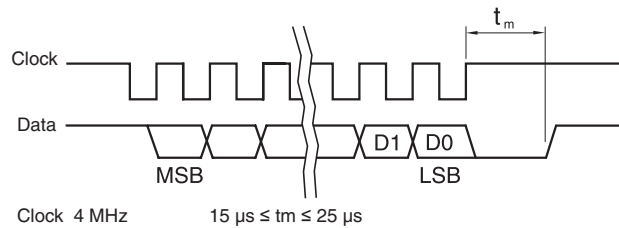
Environmental data

Operating and storage temperature	-40 °C to +85 °C
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Timing diagram for incremental outputs

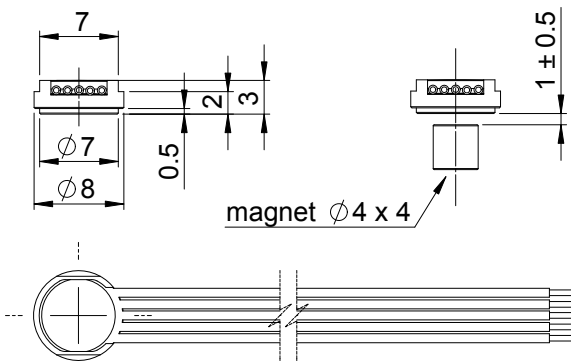


Timing diagram for SSI



RM08 / RE08 dimensions

RM08



Orbis™ true absolute rotary encoder



Features

- True absolute encoder
- 14 bit resolution
- 8 proprietary Hall sensor ASICs
- Through-hole design enables its mounting anywhere along the shaft
- Wide installation tolerances
- Self-calibration after assembly
- Multiturn counter option
- Built-in self-diagnostics
- Status LED
- SPI, SSI, BiSS-C, PWM and asynchronous serial communication

Non-contact position encoders

Technical specifications

System data

Reading type	Axial reading
Resolution	14 bit
Maximum speed	10,000 rpm
Accuracy	$\pm 0.2^\circ$ (optimal installation)
Accuracy thermal drift	$\pm 0.01^\circ/\text{C}$
Repeatability	± 2 LSB

Electrical data

Supply voltage	4.5 V to 5.5 V (at the connector)
Power consumption	65 mA typical (no output load)

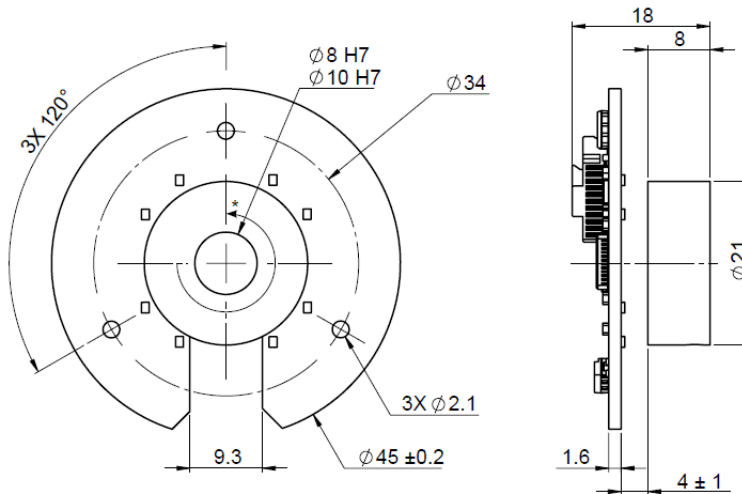
Mechanical data

Available magnet sizes (ID)	12 mm, 16 mm
Available magnetic actuator sizes (ID)	6 mm, 8 mm, 10 mm, 12 mm, 15 mm
Readhead outer diameter	45 mm
Readhead inner diameter	16 mm

Environmental data

Operating temperature	0 °C to +85 °C
Storage temperature	-40 °C to +105 °C

Dimensions



* counterclockwise = positive measuring direction

Dimensions and tolerances in mm

AksIM™ off-axis absolute rotary encoder



Features

- True absolute
- Single track
- Resolution to 20 bits
- No hysteresis
- Non contact
- High speed
- Low profile
- Custom ASIC based magnetic sensor
- Built-in self-monitoring
- Integrated status LED
- SSI, SPI, PWM, CAN or asynchronous serial RS422 communication interface
- Corrosion resistant
- Multiturn counter option

Applications

Robotic arm joints



Pan/tilt positioning



Precision gearboxes



Medical



UAV



Non-contact position encoders

Technical specifications

System data

Reading type	Axial reading
Resolution	From 16 to 20 bit and 16 bit multiturn counter option
Maximum speed	> 10,000 rpm
Encoder accuracy	$\pm 0.05^\circ$ (before installation – errors caused by mounting inaccuracy of the readhead, ring and drive shaft are not included)

Electrical data

Supply voltage	4 V to 6 V – voltage on readhead. Consider voltage drop over cable.
Power consumption	Typ. 115 mA, max. 150 mA
Voltage drop over cable	~ 55 mV/m – without load

Mechanical data

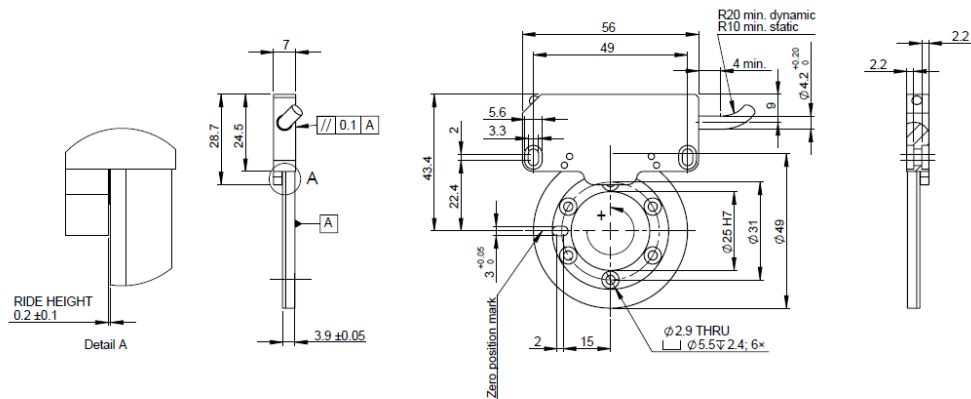
Available ring sizes (outer diameter)	49 mm (ring MRA7), 80 mm (ring MRA8)
Cable	$\varnothing 4.2 \pm 0.2$ mm, PUR highly flexible cable, drag-chain compatible, double-shielded

Environmental data

Operating temperature	-30 °C to +85 °C with static cable -10 °C to +80 °C with cable under dynamic conditions
Storage temperature	-40 °C to +85 °C

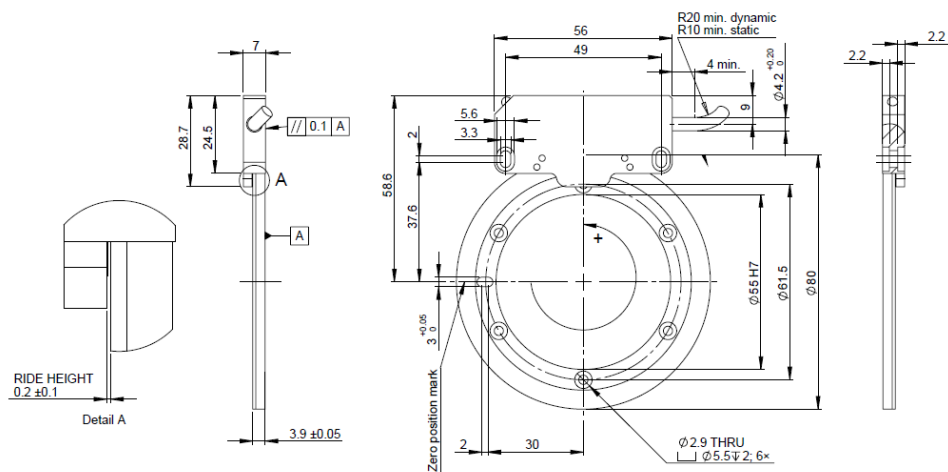
Dimensions

Ring type 7



NOTE:
CCW positive measuring direction.

Ring type 8



NOTE:
CCW positive measuring direction.

Dimensions and tolerances in mm

Linear and ring magnetic encoders

The linear and ring encoder system consists of a compact readhead and a magnetized ring or scale. The readhead detects the magnetic signature of the magnetized scale or ring and processes these signals to the required output.



The magnetic incremental rings bring reliable solutions to tough, hard-working applications including spindles, lathes and other machine tool applications.



The system is easy to install with a set-up LED on the readhead and an applicator tool for the tape scale.



A stick-on reference mark can be easily installed at the required position using the tool provided. Alternatively, the reference mark can be ordered at a set position within the scale.



The scale can be supplied on a reel or cut to a specific length. A stainless steel cover strip can be provided to protect the scale.



Why linear or ring magnetic?

- High-speed operation
- Excellent dirt immunity to IP68
- Stick-on reference mark
- Integral set-up LED
- Industry-standard digital and analog output options

Non-contact position encoders

LA11 absolute linear magnetic encoder system

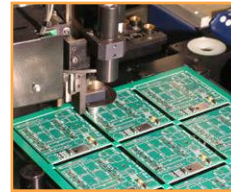


Features

- True absolute system
- Suitable for highly dynamic control loops
- Small footprint
- High accuracy
- Resolutions up to 0.244 μm
- Axis lengths up to 16.3 m
- Speeds up to 7 m/s at 0.977 μm resolution
- Integral status LED
- Synchronous (SSI, SPI, BiSS) communication protocols available
- Parallel incremental output (analog or digital)
- Double shielded, drag-chain compatible cable
- Simple and fast installation
- Robust measuring principle
- Excellent degree of protection to IP68

Applications

SMT pick and place



Printing technology



Machine tools



Assembly lines



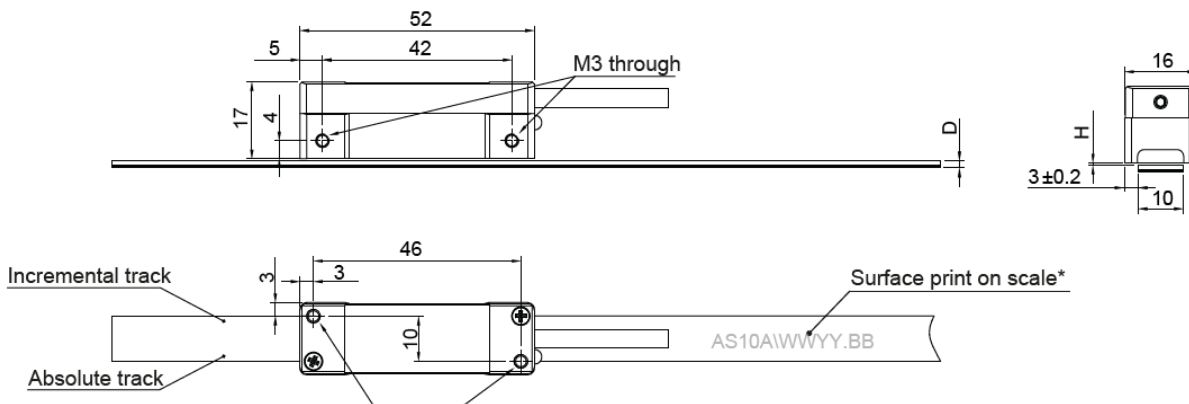
Medical



Technical specifications

System data		Environmental data	
Incremental pole length	2 mm	Temperature	Operating 0 °C to +55 °C
Maximum scale length	16.3 m		Storage -20 °C to +70 °C
System accuracy	±40 µm/m	Vibration (55 Hz to 2000 Hz)	300 m/s ² (IEC 60068-2-6)
Short range accuracy	< ±10 µm/10 mm	Shock (11 ms)	300 m/s ² (IEC 60068-2-27)
Coefficient of thermal expansion (CTE)	11 ±1 µm/m/K	Humidity	100% (condensation permitted)
Hysteresis	< 2 µm at 0.1 mm ride height	EMC immunity	IEC 61000-6-2 (particularly: ESD: IEC 61000-4-2; EM fields: IEC 61000-4-3; Burst: IEC 61000-4-4; Surge: IEC 61000-4-5; Conducted disturbances: IEC 61000-4-6; Power frequency magnetic fields: IEC 61000-4-8; Pulse magnetic fields: IEC 61000-4-9)
Unidirectional repeatability	Unit of resolution	EMC emission	IEC 61000-6-4 (for industrial, scientific and medical equipment: IEC 55011)
Electrical data		Environmental sealing	IP68 (according to IEC 60529)
Power supply	5 V ±5% (voltage on readhead) and from 8 V to 30 V Consider voltage drop over cable		
Reverse polarity protection	Only for 5 V		
Set-up time after switch-on	< 350 ms		
Power consumption (without any load)	< 170 mA at 5 V power supply		
Voltage drop over cable	~ 80 mV/m – without load		
Mechanical data			
Mass	Readhead (with 1 m cable, no connector) 41 g Magnetic scale 60 g/m		
Cable	PUR high-flexibility cable, drag-chain compatible, double-shielded. Durability: 20 million cycles at 20 mm bend radius at whole temperature range		

LMA dimensions

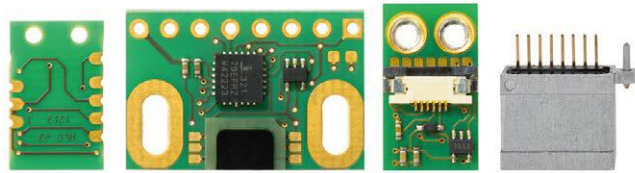


* Scale surface print does not represent the actual ordering code. For orientation purpose only.

Non-contact position encoders

RoLin™ miniature encoder family

The RoLin miniature encoder family has been specifically designed for integration into high volume OEMs. High speed, high reliability and high resolution coupled with large installation tolerances all ensure that this sensor can be installed quickly and cost effectively every time.



Technical specifications

	RLM	RLB
Readhead size	12 mm × 8.5 mm × 5 mm	14 mm × 8 mm × 2 mm
Application	Linear, rotary (axial or radial reading)	
Outputs	TTL, RS422, SSI and BiSS output options available	Incremental quadrature TTL (ABZ; optionally with periodic reference mark)
Resolutions	From 0.244 μm for linear and corresponding CPR for rotary applications (depends on ring diameter)	
Speed	Up to 80 m/s for linear and corresponding rpm for rotary applications (depends on ring diameter)	
Sub-divisional error (SDE)	±2 μm	
Pole length	2 mm	
MS scales accuracy grade	±40 μm/m	
Connection accessories	E201/RLACC	

	RLC2HD	RLC2IC
Readhead size	14 mm × 8 mm × 2 mm	20 mm × 13.5 mm × 3.3 mm
Application	Linear, rotary (axial or radial reading)	
Outputs	Incremental quadrature TTL (ABZ; optionally with periodic reference mark)	Incremental quadrature RS422 (ABZ; optionally with unique or periodic reference marks)
Resolutions	From 0.244 μm for linear and corresponding CPR for rotary applications (depends on ring diameter)	
Speed	Up to 80 m/s for linear and corresponding RPM for rotary applications (depends on ring diameter)	
Sub-divisional error (SDE)	±2 μm	
Pole length	2 mm	
MS scales accuracy grade	±40 μm/m	
Connection accessories	E201/RLACC	

Scale and ring options



Scales with or without cover foil



Axial rings



Radial rings

Interferometric feedback solutions

The RLE system is a unique, advanced homodyne laser interferometer system, specifically designed for position feedback applications.

Simple system architecture reduces hardware requirements to:

- RLU laser unit
- one or two RLD10 detector heads
- measurement optics

Optical configurations allow for the following measurement types:

- linear
- planar (X-Y)
- differential

System components can be configured for specific applications to achieve:

- sub-nanometer resolution
- axis lengths up to 4 m
- velocities up to 2 m/s

The RLU laser unit, containing the HeNe laser tube, system electronics and the fiber optic launch mechanism, forms the heart of the RLE system.

Fiber optic launch capability allows the laser unit to be mounted remotely from the measurement axis, thereby eliminating a potential heat source.

RLU laser unit

Two models of the RLU are available – RLU10 and RLU20.

- Both are available in single or dual axis configurations
- The key difference is frequency stability (RLU10 = 50 ppb* and RLU20 = 2 ppb*)

Position output signals from the RLU are available as:

- differential digital RS422 with resolutions up to 10 nm
- 1 Vpp analog sine/cosine signal with a period of 158 nm (PMI)† and 316 nm (RRI)††

Higher resolution interpolator options are also available:

- REE to provide resolutions up to 0.39 nm
- RPI20 to provide resolutions up to 38.6 picometers

* parts per billion

† PMI – plane mirror interferometer

†† RRI – retro reflector interferometer



RLE10 laser system



RLU10 laser user



X-Y stage application
 – Anorad – Rockwell
 Automation

RLE laser interferometer systems

RLD detector units

Most RLD10 detector units contain the fringe detection scheme, interferometer optic and integrated laser beam steerer(s).

- **Single pass interferometer (RRI)** – uses an external retroreflector target optic
 - axis lengths up to 4 m
 - 0° or 90° beam launch orientations
 - 316 nm signal period
 - Digital quadrature resolution of 20 nm
 - RPI20 resolution of 77.2 picometers
- **Double pass interferometer (PMI)** – uses an external plane mirror target optic.
 - Axis length up to 1 m
 - 0° or 90° beam launch orientations
 - 158 nm signal period
 - Digital quadrature resolution of 10 nm
 - RPI20 resolution of 38.6 picometers
- **No internal interferometer** – allows for the head to be configured with external optics for linear, angular and straightness measurements.
 - 0° beam launch orientation only
- **Double pass differential interferometer** – requires external plane mirror targets for both the reference and measurement arms
 - Axis length up to 1 m
 - 158 nm signal period
 - Digital quadrature resolution of 10 nm
 - RPI20 resolution of 38.6 picometers

As the measurement and reference beam paths have an element of commonality, this detector head offers a number of benefits:

- Measures stage/workpiece versus column/ tool for true differential measurement
- Removal of errors due to thermal translation of the interferometer mounting
- Minimization of the effects of laser frequency instability as this relationship effects both paths
- Common mode environmental effects enable the detector head to be mounted on the outside of the process chamber with minimal effect on accuracy

RLE system benefits

The unique fiber optic launch based architecture provides interferometer system performance with the ease of use normally associated with glass or tape scale based encoder systems.

These architectural advantages are achieved through a combination of the following features:

- **Fiber optic laser launch** – Enables the laser light to be taken directly to where the axis position needs to be measured, eliminating the requirement for remote beam benders, splitters and associated mounts.
- **Integrated laser beam steerers** – Incorporated in all RLD10 detector heads to further reduce alignment complexity.
- **Integrated interferometer optics** – Most RLD detector heads include prealigned interferometer optics and fringe detection system, making installation simple.
- **Removal of potential heat error source** – Fiber optic launch enables the RLU laser head to be mounted in a location that is insensitive to dissipated heat without affecting alignment or stability.



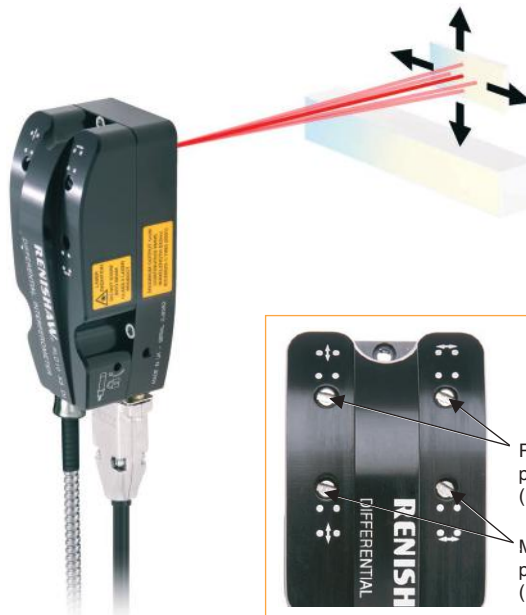
RLD10 single pass interferometer



RLD10 double pass interferometer



RLD10 differential interferometer



RLE system accessories

RCU10 compensation system

When using any laser interferometer system in a non-vacuum environment, some form of refractive index compensation is required to maintain accuracy under varying environmental conditions. This is because the fundamental fringe spacing (unit of count) is a function of the wavelength of the laser light which varies fractionally depending on the refractive index of the air through which it travels.

To counter these refractive index changes, Renishaw offers the RCU10 real-time quadrature compensation system, providing the following features and benefits:

- ± 1 ppm positioning over a broad range of environmental conditions
- Simultaneous implementation of multiple error correction algorithms
- Individual air temperature sensors for each axis
- RCU10-CS configuration software enables the RCU10 system to be configured to match the specific requirements of the application
- One to six axis capability: multi-axis systems can be formed using a number of individual RCU10 compensators connected via a high-speed serial link

RPI20 parallel interface

Renishaw's RLE laser interferometer systems directly produce 1 Vpp sine/cosine signals with periods of 316 nm and 158 nm from single and double pass interferometers respectively. These sinusoidal signals can be interpolated to provide ultra-high resolution positional feedback.

Although sine/cosine interpolation is available within a number of proprietary control systems, the analog bandwidth of these systems is often designed for tape and glass scale based encoders. These scale systems produce relatively coarse signal periods and the sinusoidal frequencies for any given velocity are considerably lower than those produced by an interferometer. This bandwidth limitation means that laser interferometer feedback systems can only be used in low velocity motion applications.

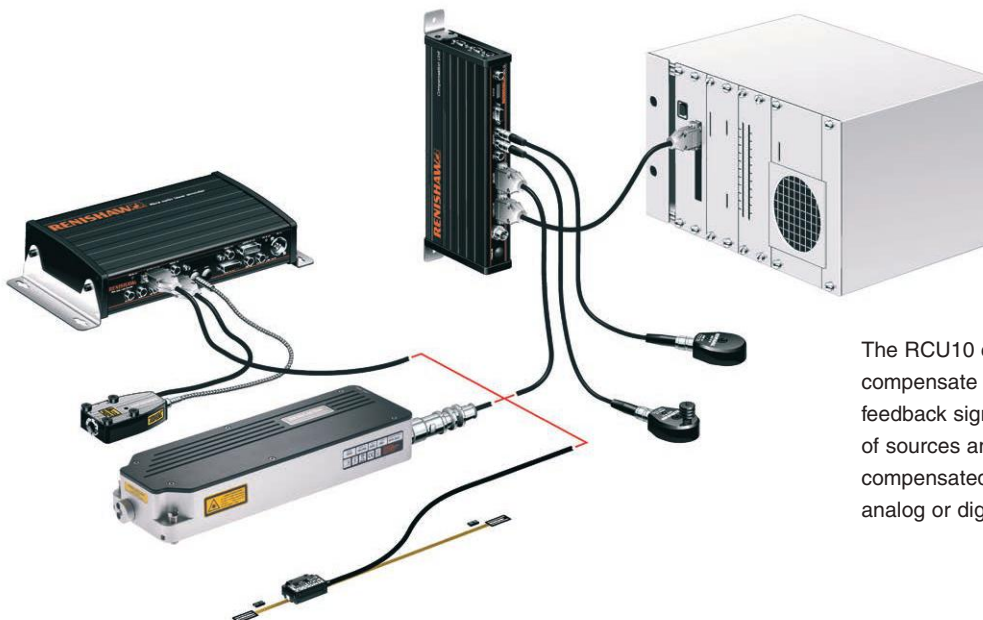
The Renishaw RPI20 parallel interface has been specifically designed to overcome this limitation by providing ultra-high resolution parallel format output at high speed. The RPI20 interpolates by 4096, produces resolutions of up to 38.6 picometers and has an analog input bandwidth of < 6.5 MHz, enabling the interferometer system to be used in applications that have velocity requirements of up to 1 m/s.



RCU10 compensator and sensors



RPI20 parallel interface



The RCU10 can be used to compensate digital position feedback signals from a variety of sources and can produce compensated output signals in analog or digital format.

Non-contact position encoders

HS20 laser head

The Renishaw HS20 laser head, in combination with an external linear optics kit, forms a non-contact interferometric based encoder system for long axis, high-accuracy, linear position feedback applications.

The HS20 laser system is suitable for use in harsh machine shop environments with part per million (ppm or $1 \mu\text{m}/\text{m}$) accuracy being achievable for axis lengths of up to 60 m.[†]

Features of the HS20 laser head include:

- Stabilized Class II (< 1 mW) HeNe laser source
- User-selectable output resolution and update rate
- Industry-standard AQuadB positional output
- 24 V system status lines
- Visual error reporting via two integral tri-color LEDs

A single set of configuration (DIP) switches enables the HS20 to be configured to match the application. These allow selection of nominal output resolutions of 79 nm, 158 nm, 316 nm or 633 nm when used with a single pass retroreflector based interferometer configuration, and output update rates of 16 MHz, 8 MHz, 4 MHz, 2 MHz and 1 MHz, ensuring count integrity.

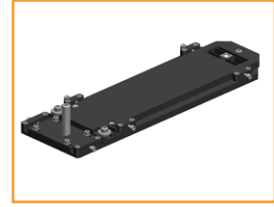
A digital, serial comms output is available for direct signal strength monitoring.

To maintain accuracy over a range of environmental conditions, the HS20 should be used in combination with the RCU10 compensation system, which compensates for air refractive index changes due to variations in the ambient environment. The RCU10 can also be used to convert a laser wavelength related resolution to a more standard resolution. For example, in some long axis applications the RCU10 is used to convert a resolution of 633 nm to $1 \mu\text{m}$.

[†] When used together with RCU10 environmental compensator

In addition to the laser head, compensation system and optics, Renishaw offer the following components to ease installation and ensure system reliability:

HS20 alignment plate – this robust steel assembly provides mounting locations for both the HS20 and interferometer optics. This provides translation and rotation adjustment to ease laser alignment.



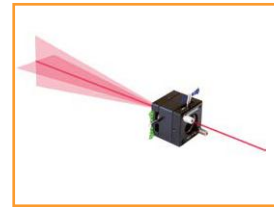
Standard linear optics – suitable for axis lengths up to 30 m, includes two retroreflectors and one interferometer.



Long range linear optics – suitable for axis lengths up to 60 m, includes one standard retroreflector, one long range retroreflector, a periscope and one interferometer.



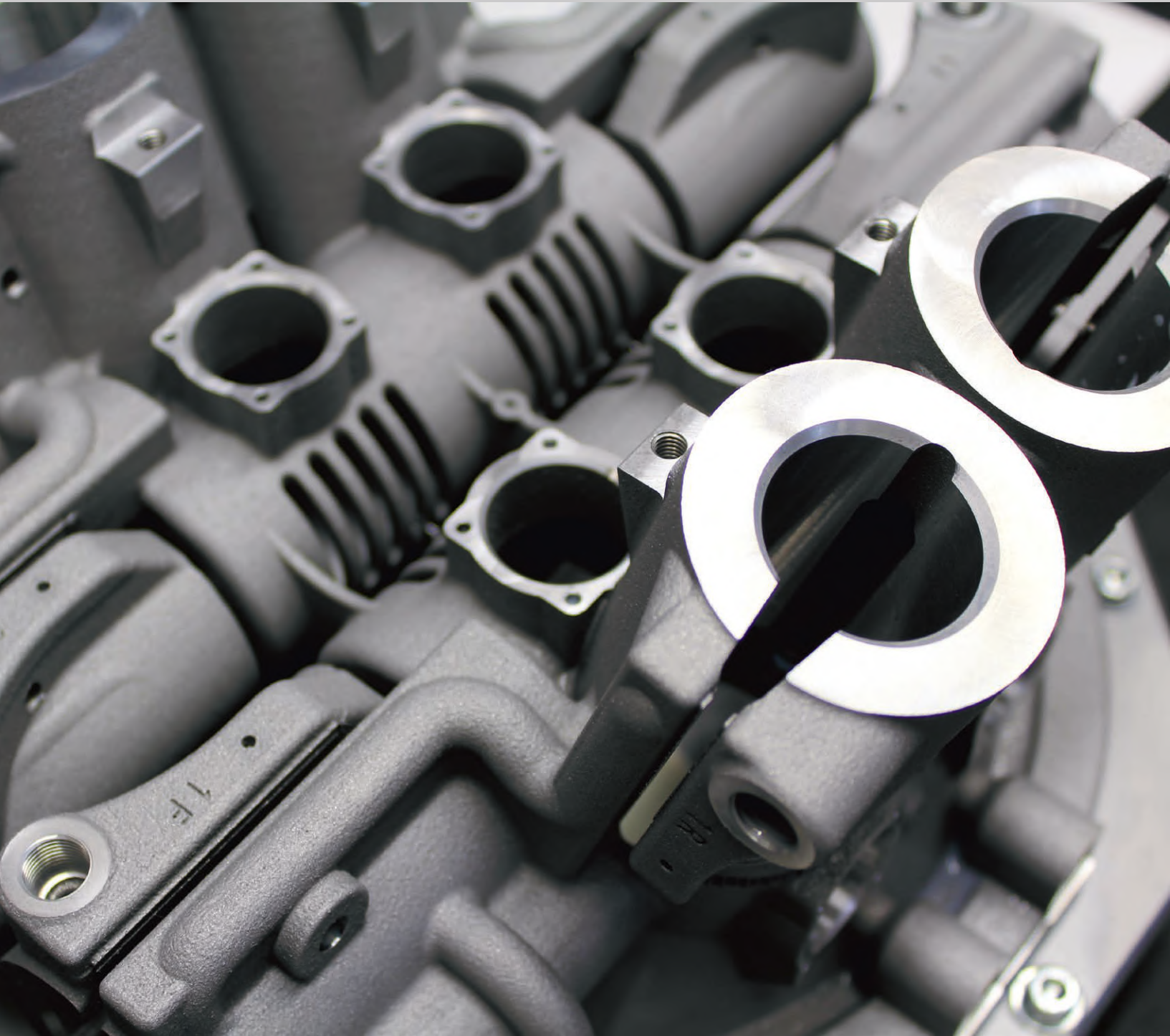
Long range laser steerer – provides 0.6 mrad of pitch and yaw adjustment to ease laser alignment.



Beam-protecting ducting – supplied in 3 m sections, this beam-protecting ducting includes an air distribution system which 'stirs' the air along the axis, breaking down the thermal gradients.



Additive manufacturing solutions



Why metal AM?

Metal additive manufacturing (AM) is helping innovators create new product designs and develop new business opportunities. Deciding if AM has a part to play in your business requires a thorough evaluation of your products, supply chains, operational capability and business needs. For maximum benefit, parts need to be designed to exploit the advantages of AM. Some of the areas below are where metal AM is already delivering exceptional value for our customers:

Design freedom

- Produce geometries with hollow and hidden features
- Build complex structures and lattices

Part performance

- Consolidate parts into single objects to improve reliability
- Use conformal channels to improve thermal management

Supply chain

- Geometry-independent raw materials
- Reduce inventory, manufacture on demand

Production flexibility

- Increased customization possibilities
- Minimum batch size of one

Materials

- Process alloys that are difficult to form
- Waste reduction, as material is only used where it is needed

RenAM 500 series additive manufacturing systems

Metal additive manufacturing (AM) is already transforming the way many products are designed and manufactured, leading to improved in-service performance and new innovations. Broadening the adoption of metal AM depends on increasing processing speed, assuring consistent high product quality and improving process economics. The RenAM 500 series of AM systems is designed to break down the barriers to wider use and enable organizations to create production environments for manufacturing a new generation of high performance components.

The RenAM 500 series of AM systems can be configured with a choice of one, two, three or four 500 W ytterbium fiber lasers. The RenAM 500Q is configured with four high-power 500 W lasers. Each laser is able to access the entire powder bed surface simultaneously to achieve the most efficient laser assignment, so RenAM 500Q can achieve significantly higher build rates, vastly improving productivity and lowering the cost per part.



Additive manufacturing solutions

RenAM 500 series key features

- Intelligent gas flow system
- High-precision dynamic optical control
- Controlled powder management
- Integrated process control software
- Connected and intelligent sensing technologies

Options

- LaserVIEW (factory fit only) and MeltVIEW optical process monitoring
- SonicVIEW acoustic monitoring (factory fit only)
- Reduced Build Volume (RBV) for materials experimentation
- High Temperature Build Volume (HTBV) for residual stress management and special materials (factory fit only)

On site engineer upgrades

- Additional lasers can be added to S, D and T models on site, providing expandability is specified at initial purchase
- MeltVIEW optical process monitoring
- RBV integration

See page 7-8 for a full options list.

Some of the key features of Renishaw 500 series machines are described on the following pages.

High-precision dynamic optical control

High-performance laser guiding technology

To deliver accuracy at the powder bed takes expert optical and control engineering, something Renishaw has spent years perfecting for products like our REVO® 5-axis measurement system for co-ordinate measuring machines. A critical component in the RenAM 500 series is the new innovative multi-laser optical system which has been designed, developed and manufactured in-house.

Each ytterbium fiber laser enters the optical system and is guided by a pair of mirrors driven by precision galvanometers which rotate to steer the laser beam across the build plate. The optical system focuses the laser dynamically, continually adjusting its focal length to maintain a consistent spot size as the beam angles change.



Renishaw patented galvanometer housing

Achieving and maintaining a precise relationship between each laser requires an integrated approach. Whilst other multi-laser AM systems combine separate optical systems, the RenAM 500 series is different. Renishaw uses a single water cooled additively manufactured galvanometer (galvo) mounting to ensure tight thermal control and unmatched precision.

Using AM to produce the galvo mount component is a key enabler, and has allowed Renishaw to achieve tighter packaging of the guiding mirrors and the incorporation of internal conformal cooling channels to maintain precise thermal stability. This has led to a class-leading compact high performance multi-laser system.



Additive manufacturing solutions

High precision z-axis

The z-axis is equipped with a Renishaw RESOLUTE™ optical encoder with a 1 nm resolution for high-accuracy positional sensing. Maintaining a precise relationship between the optical system and the working plane as the machine indexes through each layer is vital to ensure precise beam-to-beam interaction is maintained.



Kinematic recoater with flexible blade

A kinematic recoater mounting for rapid and precise recoater changes reduces operator error and improves turn-around time. Fitted with Renishaw's flexible recoater blade, the recoater can be removed without special tools and refitted to a precise and repeatable location to maintain a precise relationship between the working plane and the optical system. A flexible blade offers an excellent compromise, and allows both solid and lattice geometries to be built.



Controlled powder management

Cyclone pre-filter separator

The use of multiple lasers increases the rate at which process emissions are generated.

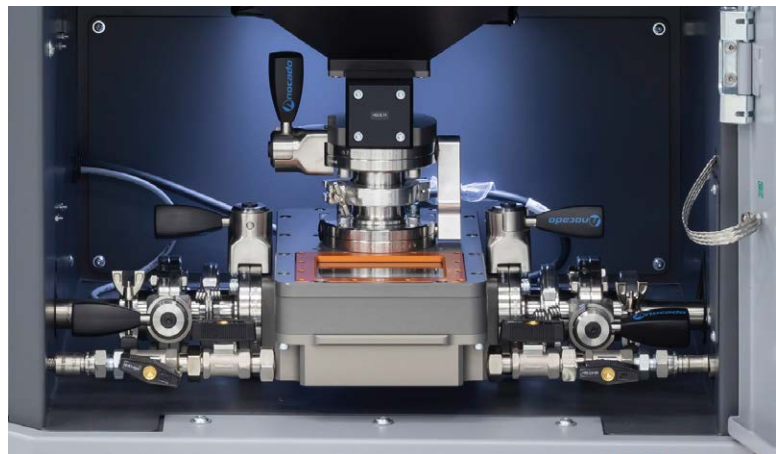
The RenAM 500 series multi-laser systems feature high volume intelligent gas flow control to remove process emissions safely and efficiently. To allow high volumes of gas at a high velocity to be used, a pre-filter cyclone separator captures larger process emissions from the gas stream before they reach the SafeChange™ filters. This extends the life of the filters and allows surplus powder to be recovered. The larger sized particles are collected directly from the cyclone in a separate flask. These can be re-processed and classified for re-use if required.



Built-in sieve and powder recirculation system

The built-in sieve and powder recirculation system ensures all powder handling is automated and under a safe argon gas atmosphere. Unused powder passes through the on-board sieve and any oversize particles are collected and removed from the machine via a metal flask. Sieve meshes to suit different materials are available.

Options for external powder handling are available, should working methods require it.



Standard, optional and required equipment

Equipment	RenAM 500 series model			
	Q – quad	T – triple	D – dual	S – single
Four × 500 W ytterbium lasers	•	n/a	n/a	n/a
Three × 500 W ytterbium lasers	n/a	•	n/a	n/a
Two × 500 W ytterbium lasers	n/a	n/a	•	n/a
One × 500 W ytterbium laser	n/a	n/a	n/a	•
Upgrade to four × 500 W ytterbium lasers	n/a	U	U	U
Upgrade to three × 500 W ytterbium lasers	n/a	n/a	U	U
Upgrade to two × 500 W ytterbium lasers	n/a	n/a	n/a	U
Kinematic recoater with flexible blade	•	•	•	•
Additional kinematic recoater to reduce build turn-around time	O	O	O	O
Dual SafeChange™ filters	•	•	•	•
Additional SafeChange™ filter to reduce build turn-around times	O	O	O	O
Cyclone pre-filter separator	•	•	•	•
Intelligent gas flow control with intercooler	•	•	•	•
High-precision Z-axis with Renishaw RESOLUTE™ encoder	•	•	•	•
Built-in sieve and powder recirculation system	•	•	•	•
Renishaw designed and manufactured galvanometer housing	•	•	•	•
High-performance laser guiding technology	•	•	•	•
Touch screen control panel	•	•	•	•
RenAMP operating software	•	•	•	•
Chiller	•	•	•	•
ATEX vacuum cleaner	R	R	R	R
Renishaw equipment lift	O	O	O	O
Renishaw powder silo trolley	O	O	O	O
Furnace	O	O	O	O
Bead blaster and extractor	O	O	O	O
High Temperature Build Volume (HTBV)	F	F	F	F
Reduced Build Volume (RBV) (compatible with HTBV equipped systems with heater off)	O	O	O	O
Interfaces for Smart manufacturing with Industry 4.0 technology	•	•	•	•
InfiniAM Central software	O	O	O	O
InfiniAM Spectral software	O	O	O	O
Build chamber camera	•	•	•	•
LaserVIEW sensing hardware	F	F	F	F
MeltVIEW sensing hardware	U	U	U	U
SonicVIEW sensing hardware	F	F	F	F
QuantAM build preparation software	O	O	O	O

• = standard equipment F = factory option O = optional equipment U = upgrade R = required equipment n/a = not available

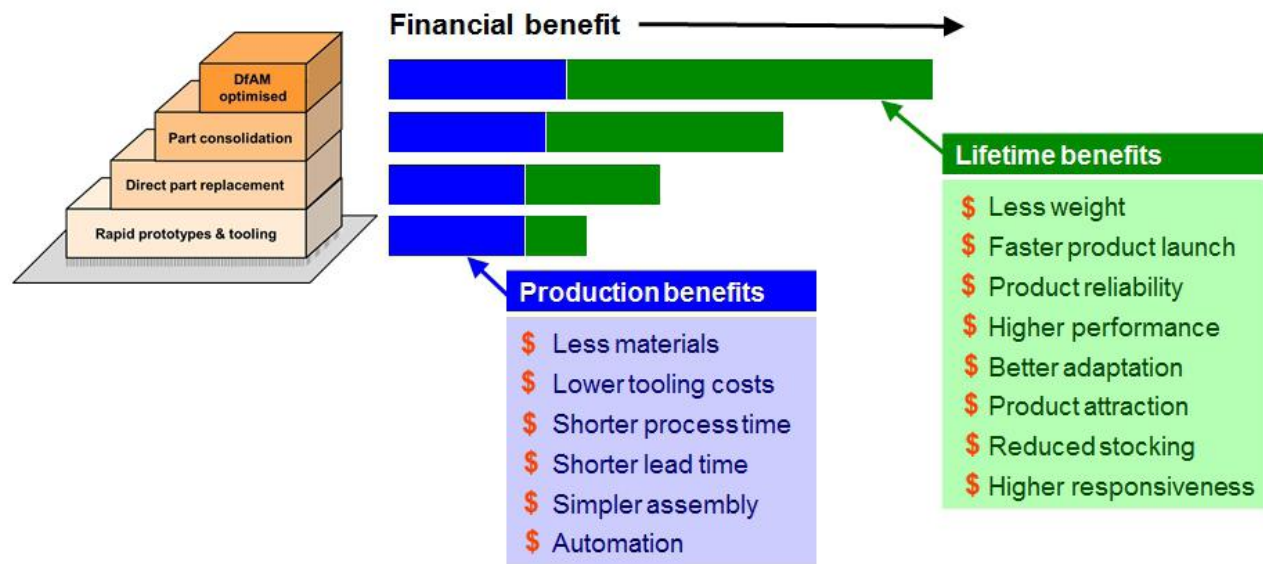
Renishaw strongly recommends you purchase the ATEX vacuum cleaner to ensure standards of safety and AM system integrity are maintained.

For further information or pricing please call Renishaw direct at: 847-286-9953 or go to www.renishaw.com/additive

The benefits of metal additive manufacturing

Metal additive manufacturing opens up significant production and financial benefits across the manufacturing process, first from shortening the design and development cycle, through rapid prototyping and lower tooling costs, to easier direct part replacement (especially legacy parts) in maintenance, overhaul and repair operations. With the latest 500 series multi-laser systems, metal AM is now also increasingly being used for serial production of parts.

Moreover, truly significant value-add and financial benefits arise through the ability to design and grow complex parts that simply cannot be manufactured through traditional means.



Applications

Healthcare – dental and medical

Thin wall dental copings are manufactured in production volumes. The highly complex, tailored parts are ideally suited to additive manufacturing – where intricate parts with a low overall volume are competitive when compared with traditional methods.

Early adopters of metal additive manufacturing for medical orthopedics benefit from manufacturing complex geometries and structures in high grade materials such as titanium.

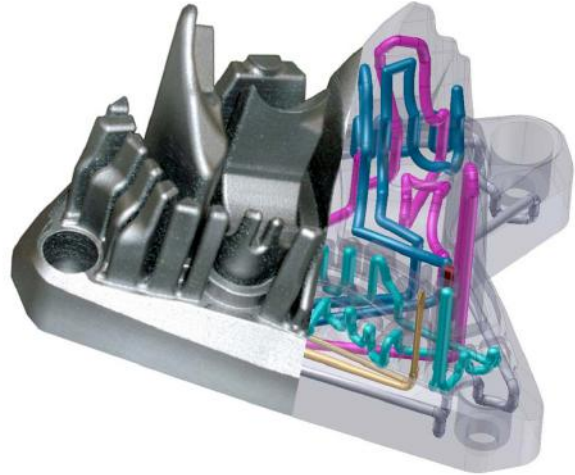


Additive manufacturing solutions

Mold tooling and conformal cooling channels

Metal additive manufacturing can be used to help improve production cycle times and productivity in injection molding.

Metal mold tools used for injection moldings contain channels to cool the mold. With conventional tool making methods, these cooling channels are drilled into the tool in straight lines. Metal additive manufacturing allows cooling channels to be designed and built to contour the mold. This helps to improve cooling performance, extend the life of the mold and reduce waste.



Automotive

The motor sport industry has adopted metal additive manufacturing to produce customized parts, for example cooling ducts.

Development contributes to a high proportion of the work in this industry and speed of turnaround of prototyped parts is key to competitive advantage. Functional metal parts can be rapidly produced and performance tested.



Aerospace

Metal additive manufactured parts are used in the aerospace industry for functional parts including engine turbine blades, fuel systems and guide vanes.

The topological optimization of parts can improve functionality and reduce weight. Lighter parts can contribute to lighter aircraft and reduce fuel consumption.



Integrated process control software

QuantAM build preparation software

QuantAM is a dedicated file preparation software tool for Renishaw additive manufacturing (AM) systems. With an intuitive workflow and easy navigation, QuantAM accepts CAD exports in the form of STL data and allows you to prepare your model for the AM process.

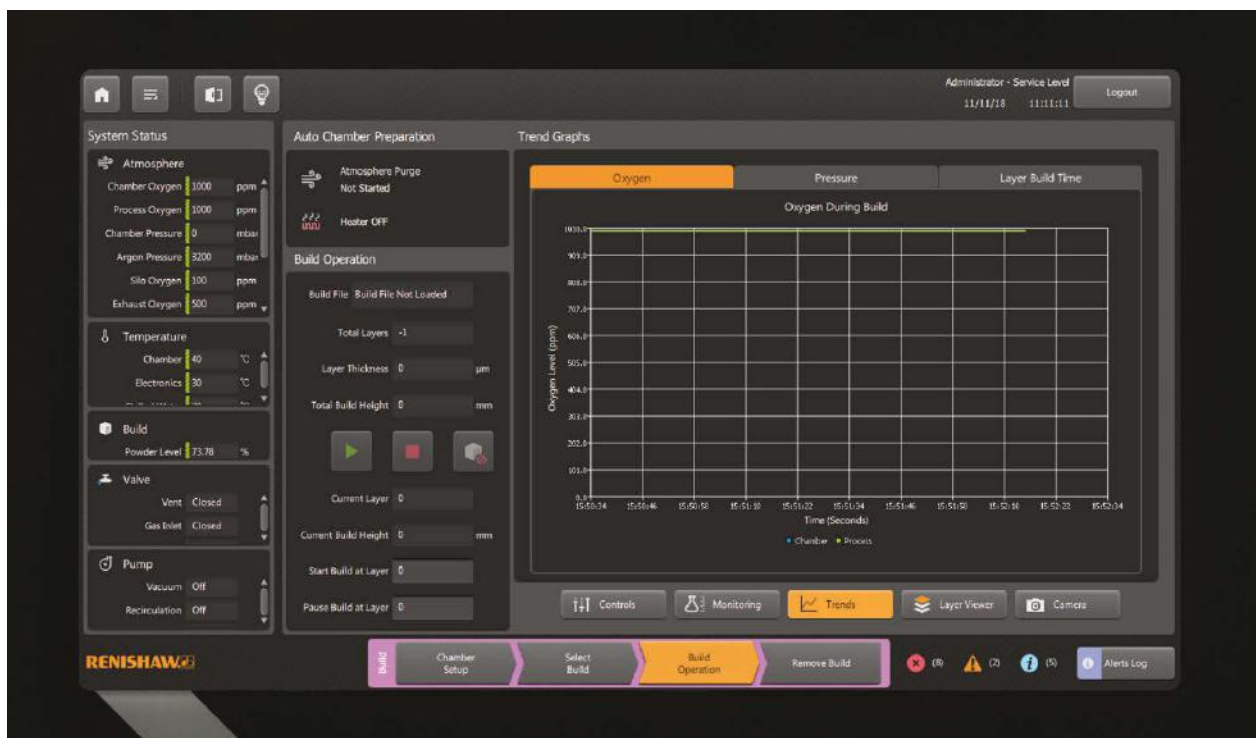
QuantAM is designed specifically for Renishaw AM platforms, allowing tighter integration into the machine control software and the ability to accurately and rapidly review all build files for Renishaw AM systems, including files from third-party software packages. QuantAM can also be used as a tool to guide your Design for Additive Manufacturing (DfAM) process, helping you unlock the benefits of additive manufacturing.



RenAMP operating software

At the heart of the RenAM 500 series is the RenAMP operating software. RenAMP controls all aspects of how the AM system operates, from the laser firing sequence to the oxygen levels in the build chamber. RenAMP has been designed and built in-house as a modular platform to enable easy updates when new features become available.

RenAMP's graphic rich user interface is operated from an industrial grade 480 mm (19 in) touch screen and features user configurable access controls and password protection.



Connected and intelligent sensing technologies

Smart manufacturing with Industry 4.0 technologies

Intelligent manufacturing processes are critical to companies that want to exploit the full benefits of Industry 4.0. Smart factory concepts require connected systems that are easy to use and generate data sets immediately.

Renishaw additive manufacturing systems support a digital workflow from inventory and part design to traceable high-quality functional components. Embedding AM into smart factories requires an integrated data driven approach that connects manufacturing systems and processes together to deliver exceptional value.

Renishaw InfiniAM Central and Spectral software allows users to capture view and manage key process performance data.



InfiniAM Central software

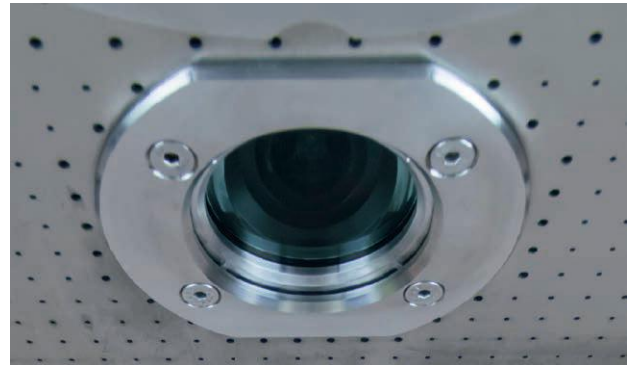
InfiniAM Central is Renishaw's AM workflow planning and process monitoring software solution. It enables live process monitoring and build data recording for your Renishaw AM systems.

Build data forms an essential part of a quality management system to ensure consistent and repeatable AM production. InfiniAM Central enables real-time insight into your live AM builds and access to analyze historic builds. System sensor and build information is displayed in graphic form to enable intuitive in-depth analysis.



Build chamber camera

A process monitoring build chamber camera enables visual monitoring and recording pre- and post-layer. Images can be downloaded from the machine for sequential viewing via image viewing software. For maximum benefit, camera images can be imported into InfiniAM Spectral and viewed in combination with other process sensor data, either as a 2D image or 3D render.



InfiniAM Spectral software

InfiniAM Spectral is designed to operate with Renishaw's LaserVIEW, MeltVIEW and SonicVIEW hardware. It provides feedback on laser energy input, optical and acoustic emissions from the AM build process, and is licensed on a subscription basis. Raw sensor data is captured alongside high-accuracy galvanometer actual position data and streamed directly to a layer-specific data file. Volumes of data can be viewed offline almost immediately using the viewing tools in InfiniAM Spectral software.

MeltVIEW monitors the optical emissions from the AM process across a wide spectral range within the visible and infrared (IR) fields.

LaserVIEW measures the energy contained in every laser pulse during a build.

SonicVIEW monitors acoustic emissions from the build, and displays a graphical representation of magnitude and location.



Additive Manufacturing Solutions Center



Located within Renshaw's new 133,000 sq. ft. facility in West Dundee, IL, USA is our 5000 sq. ft. Additive Manufacturing Solution Center.

Renishaw Solutions Centers provide a secure development environment in which you can build your knowledge and confidence using AM technology. Equipped with the latest AM systems and staffed with knowledgeable engineers, our Solutions Center offers you a fast and accessible way to rapidly deploy this exciting technology in your business.

Renishaw will support you throughout your investigation and business case development process, helping you to optimize your design, build your confidence in the AM process, and gain the evidence you need to make investment decisions, all at predictable and manageable costs.

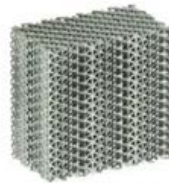
Whilst AM can create complex geometries in a single process step, some level of finishing is generally required to produce functional products. Our world-leading knowledge and expertise in metrology, machining and finishing processes will assist you to develop an integrated manufacturing solution for your AM parts.



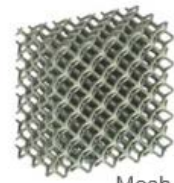
Satellite bracket



Intercooler cut-away



Mesh cube



Mesh cube



Heat exchanger



Rocket chamber nozzle



Manifold



Conformal cooling Insert

Additive Manufacturing Solutions Center service

Service details	Incubator cell access (fully supported)	Incubator cell access (partially supported)
Dedicated incubator cell	✓	✓
Secure office and workstation	✓	✓
Reserved access to de-build room ¹	✓	✓
Renishaw AM operator support	✓	✓
Applications support to optimize initial build	✓	✓
HSE induction and system training	✓	✓
Free powder pre-load	✓	✓
Substrates and other consumables	✓	✓
Power and argon supply	✓	✓
Powder consumption (price per kg) ²	✓	✓
Build integrity checks – density, hardness, finish	✓	✓
Build traceability – design, run times, process parameters, materials usage, inspection results	✓	✓
Applications engineering support ³	✓	✗
Design for A.M. (D4AM) training	✓	✗
Reserved access to ⁴: Heat treatment, Part removal (EDM, saw), Support removal, Surface treatment	✓	✗

In addition to Incubator Cell hire, Renishaw can offer a range of further Production Process Development Services for those customers wishing to develop an integrated AM manufacturing process. Services include:

- CAM-driven 5-axis CNC machining, including process development and operator support
- Metrology (CMM and/or gaging) including process development and operator support
- Fixtures for machining and inspection
- Materials lab access (in Stone, UK) supporting SEM analysis, porosity checks, tensile and fatigue testing

¹ Central manned facility. Customers can reserve for sole use when required

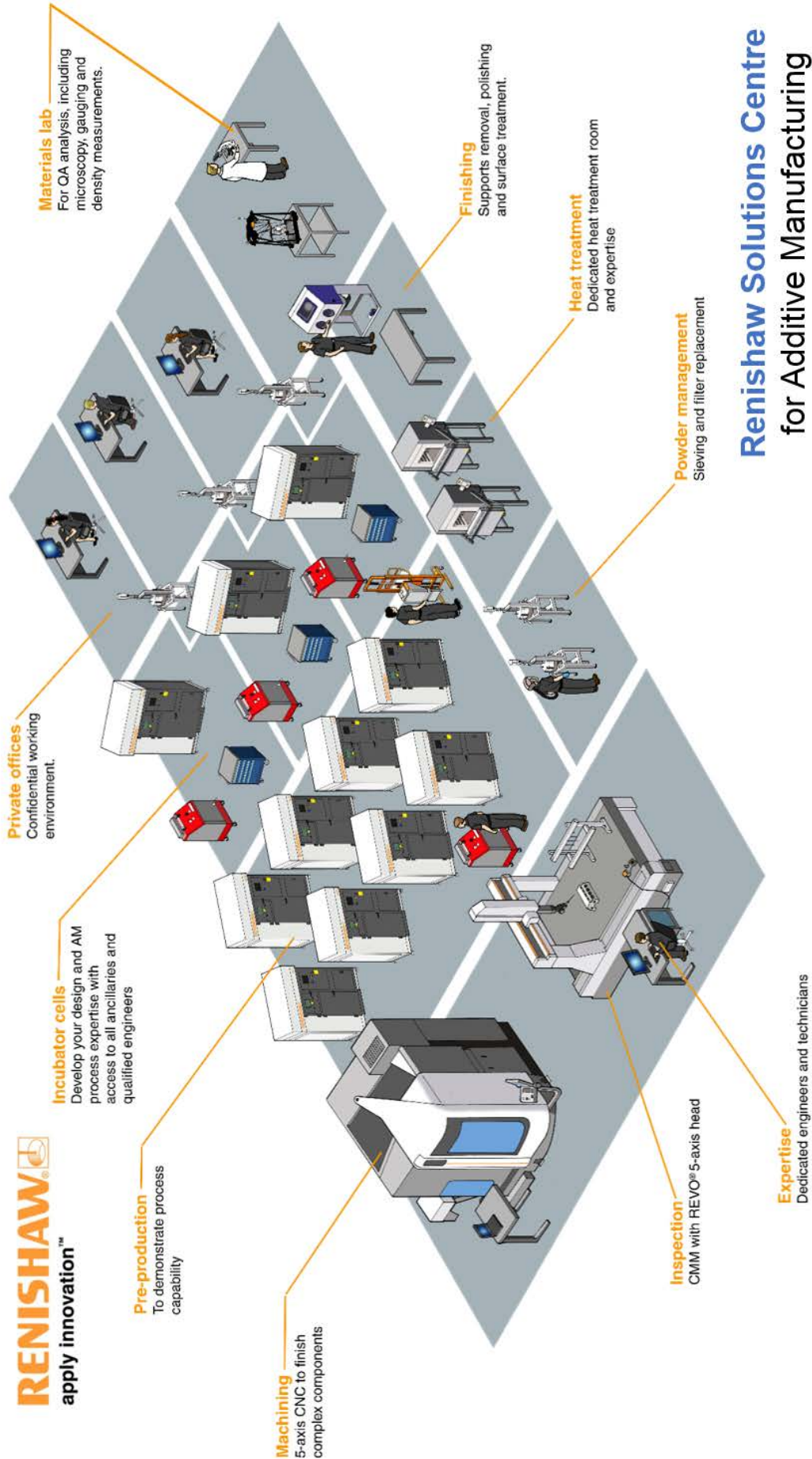
² Machines supplied with full hopper of powder. Customer pays for consumption. N/A if customer supplies powder

³ Supported by local Customer Projects team with access to UK HQ personnel as required

⁴ Machining and metrology are central, manned facilities that customers can reserve for their sole use when required. Customer Project Engineers are available to develop machining and measurement processes. Chargeable time includes machine set-up and operation. Hourly rate is inclusive of consumption of standard cutting tools and use of standard styli. Customized tooling and styli will be charged at cost.

Bespoke services are POA. Please contact us for pricing.

RENISHAW
apply innovation™



Private offices
Confidential working environment.

Incubator cells
Develop your design and AM process expertise with access to all ancillaries and qualified engineers

Pre-production
To demonstrate process capability

Machining
5-axis CNC to finish complex components

Finishing
Supports removal, polishing and surface treatment.

Heat treatment
Dedicated heat treatment room and expertise

Powder management
Sieving and filter replacement

Inspection
CMM with REVO® 5-axis head

Expertise
Dedicated engineers and technicians

Renishaw Solutions Centre for Additive Manufacturing

Styli and accessories



Styli and accessories



Page 8-3

Technical specifications and quick reference guides

Quick selection from our extensive range.



Page 8-8

Accuracy at the point of contact

An explanation of why it is important to choose the right stylus for your application, and an overview of the entire range of stylus types.



Page 8-13

M2 threaded stylus range

Styli for use with the industry-standard CMM probes TP2, TP20 and TP200.



Page 8-21

M3 threaded stylus range

Styli for use with manual CMM probes TP1 and TP6 and the most flexible scanning probe, SP25M.



Page 8-27

M4 threaded stylus range

Optimized for stiffness and weight, styli purposely designed for the high accuracy TP7M and our comprehensive range of probing for machine tools.



Page 8-38

M5 threaded stylus range

A premium range specifically designed for highest accuracy scanning probes from Renishaw and other manufacturers.



Page 8-53

Styli for Faro arms and Zeiss probing systems

These styli have been designed especially for use on Faro portable arm CMMs and with Zeiss probing systems.



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Accessories

All of the 'bits and pieces' that you need to assemble anything from the most complex stylus clusters to a simple star.

Technical specifications

Ball material properties

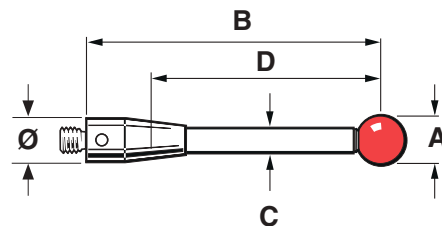
Stylus type	Material	Grade	Deviation from spherical form	Structure	Composition	Purity	Density	Hardness	Compression strength	Bending strength	Fracture toughness K1c
			(μm)	–	(wt%)	(%)	(g/cm^3)	HV	(MPa)	(MPa)	($\text{MN}/\text{m}^{3/2}$)
AL ₂ O ₃ ruby balls	Synthetic ruby monocrystalline	Grade 5*	0.13	mono	99% AL ₂ O ₃	99.90	3.90	2300	2100	400-700	1
Silicon nitride balls	Hard pressed Si ₃ N ₄	Grade 5*	0.13	poly	Si ₃ N ₄	90	3.0-3.2	1600	3000	850	6
Zirconia oxide balls	Sintered ZrO ₂	Grade 5*	0.13	poly	ZrO ₂	90-95	6.05	1200	2000	1000	10
Alumina hollow balls	White ceramic sintered alumina AL ₂ O ₃	–	1	poly	AL ₂ O ₃	99.80	3.8-3.9	1900	2500	350	3.5
Silver steel disks	Silver steel	–	1	–	–	–	8	450	–	–	–
Silver steel simple cylinder	Silver steel	–	Roundness 4 μm	–	–	–	8	200	–	–	–
Ruby ball ended cylinder	Synthetic ruby	Ball: Grade 5*	Ball deviation from spherical form: 0.13 Concentricity: Ball/cylinder 4 μm	mono	99% AL ₂ O ₃	99.90	3.99	2300	2300	400-700	1
Tungsten carbide ball ended cylinder	Tungsten carbide	–	+ 20 μm end radius	–	92-93.5% WC 6.5-8% CO	14.8	14.95	1550	6000	–	–
Silver steel simple pointer	Silver steel	–	Cone angle 30°	–	–	–	8	300	–	–	–
Tungsten carbide radius end pointer	Tungsten carbide	–	Cone angle 30°	–	92-93.5% WC 6.5-8% CO	99.90	15	1550	6000	–	–
Aluminum hollow balls	Al. alloy 6082-T6	–	30 μm	–	95.2-98.3% AL	–	2.7	95	–	–	–

* Refers to DIN-5401 ball grade standard

* Grade 3 sphericity balls are available on request.

Extension material properties

Material	Coefficient of expansion @ 25 °C
Stainless steel	16x10 ⁻⁶ /°C
Tungsten carbide	5x10 ⁻⁶ /°C
White ceramic sintered alumina	8.1x10 ⁻⁶ /°C
Carbon fiber	-0.4x10 ⁻⁶ /°C
Titanium	9.2x10 ⁻⁶ /°C
Ruby	4.5x10 ⁻⁶ /°C
Silicon nitride	3.2x10 ⁻⁶ /°C
Zirconia	10.5x10 ⁻⁶ /°C



- A** Ball diameter
- B** Overall length
- C** Stem diameter
- D** Effective working length
- Ø M2 = 3 mm
- Ø M3 = 4 mm
- Ø M4 = 7 mm
- Ø M5 = 10 mm

Styli and accessories

M2 styli and extensions quick reference guide

These are a selection of the most popular styli.

Ruby ball / stainless steel stem

Ball diameter	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
Length 10 mm	A-5000-7806	A-5000-7802	A-5000-7807	A-5000-7803	A-5000-3604	A-5000-4154	A-5000-4155	A-5000-4156	A-5000-4158
20 mm	-	-	A-5000-3603	A-5000-7804	A-5000-4160	A-5000-4161	-	-	-

Ruby ball / tungsten carbide stem

Ball diameter	0.3 (0.012)	0.5 (0.02)	0.7 (0.03)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
Length 10 mm	A-5000-7800	A-5000-7805	A-5000-7801	A-5003-1325	-	-	-	-	-	-
20 mm	-	A-5003-1345	A-5003-0577	SEE DRAWING	A-5003-0034	A-5003-3822	A-5003-1896	A-5003-0938	A-5003-1029	A-5003-0046
30 mm	-	-	-	A-5000-8663	A-5003-0035	A-5003-0036	A-5003-0038	A-5003-0040	A-5003-0043	A-5003-0047
40 mm	-	-	-	-	-	A-5003-0037	A-5003-0039	A-5003-0041	A-5003-0044	A-5003-0048
50 mm	-	-	-	-	-	-	-	A-5003-0042	A-5003-0045	A-5003-0049

Ruby ball / ceramic stem

Ball diameter	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
Length 30 mm	A-5003-4177	A-5003-1370	A-5003-4779	A-5003-4780
50 mm	A-5003-0064	A-5003-0065	A-5003-0066	A-5003-0470

Ruby ball / carbon fiber stem

Ball diameter	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
Length 30 mm	A-5003-4241	A-5003-4781	A-5003-4782
50 mm	A-5003-2285	A-5003-2286	A-5003-2287
75 mm	A-5003-4784	A-5003-4785	A-5003-4786
100 mm	A-5003-2289	A-5003-2290	A-5003-2291

Stylus extensions

Length	5.0 (0.20)	10.0 (0.40)	20.0 (0.80)	30.0 (1.19)	40.0 (1.58)	50.0 (1.97)	70.0 (2.76)	90.0 (3.55)
Stainless steel	A-5004-7610	A-5004-7585	A-5004-7586	A-5004-7591	A-5004-7611	-	-	-
Ceramic	-	-	-	A-5003-0070	A-5003-0071	A-5003-0072	-	-
Carbon fiber	-	-	-	-	A-5003-2280	A-5003-2281	A-5003-2282	A-5003-2283

M3 styli and extensions quick reference guide

These are a selection of the most popular styli.

Ruby ball / stainless steel stem

Ball diameter		1.0 (0.04)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
Length	21 mm	A-5000-3551	A-5000-3552	A-5000-3553	A-5000-7606	A-5000-7630
	31 mm	–	–	–	A-5000-3554	A-5000-7648

Ruby ball / tungsten carbide stem

Ball diameter		0.5 (0.02)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
Length	21 mm	A-5000-7632	A-5003-0050	–	A-5003-0054	–	–	–
	30 mm	–	A-5003-0051	A-5003-0052	A-5003-0055	A-5003-0057	–	–
	40 mm	–	–	A-5003-0053	A-5003-0056	A-5003-0058	A-5003-0060	A-5003-0062
	50 mm	–	–	–	–	A-5003-0059	A-5003-0061	A-5003-0063

Ruby ball / ceramic stem

Ball diameter		3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
Length	50 mm	A-5003-0067	A-5003-0068	A-5003-0069

Ruby ball / carbon fiber stem

Ball diameter		6.0 (0.24)	8.0 (0.32)
Length	75 mm	A-5003-4860	A-5003-4861
	100 mm	A-5003-4862	A-5003-4863

Stylus extensions

Length	10.0 (0.40)	20.0 (0.80)	35.0 (1.38)	50.0 (1.97)	70.0 (2.76)
Stainless steel	A-5004-7609	A-5004-7583	A-5004-7584	–	–
Ceramic	–	–	–	A-5003-0075	–
Carbon fiber	–	–	–	A-5003-4864	A-5003-4865

M4 styli and extensions quick reference guide

These are a selection of the most popular styli.

Ruby ball / stainless steel stem

Ball diameter	1.0 (0.04)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
Length 10 mm	–	–	–	–	A-5000-6350	–	–
20 mm	A-5000-7545	A-5000-7547	A-5000-7549	A-5000-7551	SEE DRAWING	A-5000-7555	A-5000-7557
30 mm	–	–	–	–	A-5000-6352	–	–
50 mm	–	–	–	–	A-5000-7521	–	–
100 mm	–	–	–	–	A-5000-7522	–	–

Ruby ball / tungsten carbide stem

Ball diameter	1.0 (0.04)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
Length 20 mm	A-5003-4792	A-5003-2932	A-5003-4793	A-5003-4794	A-5003-4795	A-5003-4796
50 mm	–	A-5003-4797	A-5003-3680	A-5003-4799	A-5003-4800	A-5003-4801

Ruby ball / ceramic stem

Ball diameter	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
Length 50 mm	A-5003-0235	A-5000-3709	A-5000-7795
75 mm	A-5003-0236	A-5003-2764	A-5003-4802
100 mm	A-5000-9761	A-5000-3712	A-5000-7796

Ruby ball / carbon fiber stem

Ball diameter	6.0 (0.24)	8.0 (0.32)
Length 50 mm	A-5003-1436	–
100 mm	A-5003-1358	–
150 mm	A-5003-1255	–
200 mm	A-5003-1075	–
300 mm	–	A-5003-3461

Stylus extensions

Length	10.0 (0.41)	15.0 (0.60)	20.0 (0.79)	30.0 (1.19)	50.0 (1.97)	100.0 (3.94)
Stainless steel	A-5004-7559	A-5004-7600	A-5004-7601	A-5004-7602	–	–
Ceramic	–	–	–	A-5000-7754	A-5000-7755	A-5000-7727

M5 styli and extensions quick reference guide

These are a selection of the most popular styli.

Ruby ball / tungsten carbide stem

Ball diameter	0.3 (0.012)	0.5 (0.02)	0.7 (0.03)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
Length 20 mm	A-5003-5201	A-5003-5202	A-5003-5203	A-5003-5204	A-5003-5205	A-5003-5206	A-5003-5207	A-5003-5208	A-5003-5209	A-5003-5210
30 mm	A-5003-5211	A-5003-5212	A-5003-5213	A-5003-5214	A-5003-5215	A-5003-5216	A-5003-5217	A-5003-5218	A-5003-5219	A-5003-5220
40 mm	–	–	–	–	A-5003-5221	A-5003-5222	A-5003-5223	A-5003-5224	–	–
50 mm	A-5003-5225	A-5003-5226	A-5003-5227	A-5003-5228	A-5003-5229	SEE DRAWING	A-5003-5232	A-5003-5234	A-5003-5235	A-5003-5236
75 mm	A-5003-5240	A-5003-5241	A-5003-5242	A-5003-5243	A-5003-5244	–	–	A-5003-5253	SEE DRAWING	SEE DRAWING
100 mm	–	–	–	–	–	–	A-5003-5254	–	–	–

Ruby ball / carbon fiber stem

Ball diameter	2.5 (0.10)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)
Length 20 mm	–	–	–	–
30 mm	–	–	–	–
40 mm	–	–	–	–
50 mm	–	A-5003-5237	A-5003-5238	A-5003-5239
75 mm	–	A-5003-5250	A-5003-5251	A-5003-5252
100 mm	–	SEE DRAWING	SEE DRAWING	SEE DRAWING
150 mm	–	A-5003-5265	A-5003-5266	A-5003-5267
200 mm	–	A-5003-5268	A-5003-5269	A-5003-5270
300 mm	–	A-5003-5271	A-5003-5272	A-5003-5273

Stylus extensions

Length	10.0 (0.41)	20.0 (0.79)	30.0 (1.19)	40.0 (1.58)	50.0 (1.97)	60.0 (2.37)	70.0 (2.76)	80.0 (3.15)	90.0 (3.55)	100.0 (3.94)
CF/titanium (Ø11 mm)	–	–	–	A-5555-0647	A-5555-0648	A-5555-0649	A-5555-0623	A-5555-0650	A-5555-0651	A-5555-0652
CF/titanium (Ø20 mm)	–	–	–	A-5555-0620	A-5555-0657	A-5555-0658	–	A-5555-0621	–	A-5555-0659
Stainless steel	A-5555-0142	A-5555-0140	A-5555-0669	–	A-5555-0670	–	–	–	–	A-5555-0136
Aluminum tube	–	–	–	–	A-5555-0671	–	–	–	–	A-5555-0127

Length	120.0 (4.76)	150.0 (5.91)	180.0 (7.09)	200.0 (7.88)	250.0 (9.85)	300.0 (11.82)	400.0 (15.76)	500.0 (19.70)	600.0 (23.64)
CF/titanium (Ø11 mm)	A-5555-0425	A-5555-0424	A-5555-0653	A-5555-0654	A-5555-0655	A-5555-0642	A-5555-0656	–	–
CF/titanium (Ø20 mm)	A-5555-0660	A-5555-0661	A-5555-0662	A-5555-0663	A-5555-0427	A-5555-0664	A-5555-0665	A-5555-0667	A-5555-0668
Stainless steel	–	–	–	–	–	–	–	–	–
Aluminum tube	–	–	–	A-5555-0125	–	–	–	–	–

Accuracy at the point of contact

As industry has developed its requirement for increasingly diverse and complex manufactured parts, inspection systems have had to work hard to keep up. The use of co-ordinate measuring machines (CMMs) with probing systems and in-process inspection on machine tools are two of the solutions offered by Renishaw to help you maximize your productivity and maintain the highest quality.

Successful gaging depends very much on the ability of the probe's stylus to access a feature and then maintain accuracy at the point of contact. At Renishaw, we have used our expertise in probe and stylus design to develop a comprehensive range of CMM and machine tool styli to offer you the greatest possible precision.

These notes explain the critical features of every stylus type, helping you to choose the right design for each inspection need.

What is a stylus?

A stylus is that part of the measuring system which makes contact with the component, causing the probe's mechanism to displace. The generated signal enables a measurement to be taken. The feature to be inspected dictates the type and size of stylus used. In all cases, however, maximum rigidity of the stylus and perfect sphericity of the tip are vital.

To achieve this, Renishaw's stylus stems are produced on CNC machine tools to exacting standards. Great care is taken to ensure that location faces give maximum stiffness whilst stylus mass is optimized to suit Renishaw's range of probes.

Genuine Renishaw stylus balls are produced to the highest standards and are bonded to the stems in such a way as to ensure maximum joint integrity.

The performance of your gaging can easily be degraded if you use a stylus with poor ball roundness, poor ball location, bad thread fit or a compromised design that allows excessive bending during measurement. To ensure the integrity of the data you gather, make certain that you specify and use a stylus from the comprehensive range of genuine Renishaw styli.

What naming protocol do Renishaw use to describe their styli range?

Renishaw uses the following naming protocol to allow easy identification of styli by name and part number. The examples below show how this protocol is assigned and describe the abbreviations used:

Straight styli

M2 STY D2R L20 EWL14 d1.4SS

The above protocol describes an M2 threaded straight stylus fitted with a 2 mm diameter ruby ball. It has an overall length of 20 mm, has an effective working length (EWL) of 14 mm and has a 1.4 mm diameter stainless steel stem.

Star styli

M2 STR D2R L20 5BALL L19.5 S32

The above protocol describes an M2 threaded star stylus fitted with a 2 mm diameter ruby ball. It has five balls on the star and an overall length of 19.5 mm (from the center of the ball to the rear of the star mounting face when assembled to a probe). The span of the star cluster is 32 mm.

Disk styli

M2 DSC SD18 SLVS T2.2 L2.6 BR-Y

The above protocol describes an M2 threaded disk stylus with a spherical diameter disk of 18 mm. It is made from silver steel with a disk thickness of 2.2 mm and a length of 2.6 mm. BR stands for balls/rollers followed by yes (Y) or no (N).

Cylinder styli

M2 CYL D3 SLVS L13 EWL4

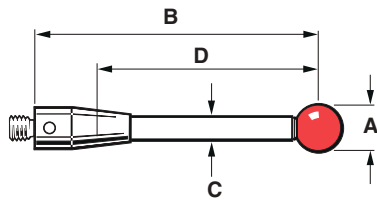
The above protocol describes an M2 threaded cylinder stylus with a critical measuring element diameter of 3 mm made from silver steel. It has an overall length of 13 mm and an EWL of 4 mm.

Extensions

M4 EXT L15 d7 SS

The above protocol describes an M4 threaded extension with a length of 15 mm and a diameter of 7 mm. The extension is made from stainless steel.

Terminology



- A Ball diameter
- B Overall length
- C Stem diameter
- D Effective working length

Overall length

Renishaw uses a standard description of overall length, measuring from the rear mounting face of the stylus to the center of the ball.

Effective working length (EWL)

This is measured from the center of the ball to the point at which the stem will foul against the feature when measuring 'normal' to the part.

Choosing a stylus

To maintain accuracy at the point of contact, we recommend that you:

Keep styli short

The more a stylus bends or deflects, the lower the accuracy. Probing with the minimum stylus length for your application is the best option.

Minimize joints

Every time you join styli and extensions, you introduce potential bending and deflection points. Try, wherever possible, to keep to the minimum number of pieces for your application.

Keep the ball as large as possible

There are two reasons for this:

- firstly, it maximizes your ball/stem clearance, thereby reducing the chances for false triggers caused by 'shanking out' on the stylus stem
- secondly, the larger ball reduces the effect of the surface finish of the component being inspected.

The range of genuine Renishaw styli

Ball material

Ruby

The industry standard and the optimum stylus ball material for a vast majority of measurement applications, ruby is one of the hardest known materials. Synthetic ruby is 99% pure aluminum oxide which is grown into crystals (or "boules") at 2000 °C using the Verneuil process.

The boules are then cut and gradually machined into a highly spherical form. Ruby balls are exceptionally smooth on the surface, have great compressive strength and a high resistance to mechanical corrosion.

Very few applications exist where ruby is not the preferred ball material, however there are two applications where balls manufactured from other materials are recommended.

The first is for heavy-duty scanning applications on aluminum. Because the materials attract, a phenomenon known as 'adhesive wear' can occur, which involves build up of aluminum from the surface onto the ball. A better ball material for such applications is silicon nitride.

The second is in heavy-duty scanning applications on cast iron. Interaction between the two materials can result in 'abrasive wear' of the ruby ball surface. For such applications, zirconia balls are recommended.

Silicon nitride

Silicon nitride possesses many similar properties to ruby. It is a very hard and wear-resistant ceramic which can be machined into very high precision spheres. It can also be polished to an extremely smooth surface finish. Silicon nitride does not have the attraction to aluminum and so does not exhibit the adhesive wear seen with ruby in similar applications. However, silicon nitride does show significant abrasive wear characteristics when scanning on steel surfaces and so its applications are best confined to aluminum.

Zirconia

Zirconia is a particularly tough ceramic material with hardness and wear characteristics approaching those of ruby. Its surface properties make it an ideal material for aggressive scanning applications on cast iron components.

Stem material

Steel

Stylus stems manufactured from stainless steel are used widely for styli with ball/tip diameters of 2 mm or greater and with lengths up to 30 mm. Within this range, one-piece steel stems offer the optimum stiffness-to-weight ratio, giving adequate ball/stem clearance without compromising stiffness with a joint between the stem and threaded body.

Please contact us if you require any styli with special ball materials. We can recommend the most suitable material for scanning different materials.

Styli and accessories

Tungsten carbide

Tungsten carbide stems are best used for maximizing stiffness with either small stem diameters required for ball diameters of 1 mm and below, or lengths up to 50 mm. Beyond this, weight can become a problem and stiffness is lost due to deflection at the stem to body joint.

Ceramic

For ball diameters greater than 3 mm, and lengths over 30 mm, ceramic stems offer stiffness comparable to steel but are significantly lighter than tungsten carbide. Ceramic stemmed styli can also offer additional crash protection to your probe as the stem will shatter in a collision.

Carbon fiber (Renishaw GF)

There are many grades of carbon fiber materials, however Renishaw GF combines optimum stiffness characteristics, both longitudinally and in torsion (important in star constructions), with extremely low weight. Carbon fiber is inert and this, combined with a special resin matrix, provides excellent protection in the most hostile of machine tool environments.

Renishaw GF is ideal for maximizing stiffness while giving very low mass for styli above 50 mm in length. It is the optimum stem material for high-accuracy strain gage technology probes with excellent vibration-damping characteristics and negligible co-efficient of thermal expansion.

The genuine Renishaw stylus range comprises several types:

Straight styli



These are the simplest form of stylus, incorporating highly spherical industrial ruby balls and a choice of stem material.

Ruby is an extremely hard material and hence stylus wear is minimized. It is also of low density, keeping tip mass to a minimum, which avoids unwanted probe triggers caused by machine motion or vibration.

Mounted on stems made from a range of materials – stainless steel, tungsten carbide, ceramic and a specialized carbon fiber material, “Renishaw GF” – these simple ruby ball styli are suitable for most inspection applications.

Each stylus has an effective working length (EWL) which is the penetration that can be achieved by the ball before the stem fouls against the feature.

The size of the ball and the EWL of the stylus chosen are dictated by the size of the feature to be inspected. However, keeping the stylus ball as large as possible and the stem as short as possible will ensure maximum ball/stem clearance, whilst providing a greater yet still rigid EWL. Using larger ruby balls also reduces the effect of the surface finish of the component being inspected.

Probing with very long stylus/extension combinations is not recommended with standard kinematic touch trigger probes as the rigidity is reduced and accuracy lost due to stylus bending. This is not the case with other types of probe such as those with strain gage technology, as their very low trigger forces permit the use of long stylus/extension combinations without a significant loss of accuracy.

Star styli



These stylus clusters provide you with multiple-tip probing of complex features and bores. Four or five ruby ball systems are mounted rigidly on a stainless steel center. Three standard sizes are offered – alternatively, you can create custom-made star styli using a 5-way stylus center and any of the genuine Renishaw stylus range.

Star styli can be used to inspect a variety of different features. Their use can reduce inspection cycle times by allowing multi-tip probing, minimizing the need to move the probe to extreme points of internal features such as the sides or grooves in a bore. Using star styli also allows effective probing in the –Z (upwards) direction when using a 5-way probe, provided that the stylus tips extend beyond the diameter of the probe body. Each tip on a star stylus requires datuming (sometimes referred to as ‘qualifying’ or ‘calibrating’) in the same manner as a single-ball stylus. The ‘span’ of star styli is taken from ball center to ball center.

Disk styli



These styli are used to probe undercuts and grooves within bores which may be inaccessible to star styli. They are ‘sections’ of highly spherical balls and are available in various diameters and thicknesses. Full rotational adjustment and the ability to add a center stylus are features of the Renishaw range of disk styli that make them particularly flexible and easy to use.

Probing with the 'spherical edge' of a simple disk is effectively the same as probing on or about the equator of a large stylus ball. However, only a small area of this ball surface is available for contact and hence thinner disks require careful angular alignment in order to ensure correct contact with the feature being probed.

A simple disk requires datuming for only one diameter (usually in a ring gage), but limits effective probing to only X and Y directions.

Adding a 'radius end roller' allows you to datum and hence probe in the Z direction, provided that the center of the 'radius end roller' extends beyond the diameter of the probe. The 'radius end roller' can be datumed on a sphere or a slip gage. Rotating and locking the disk about its center axis allows the 'radius end roller' to be positioned to suit the application.

Disks may also have a threaded center to allow the fixing of a center stylus, giving the additional flexibility of probing the bottom of deep bores (where access for the disk may be limited).

Styli for specialist applications

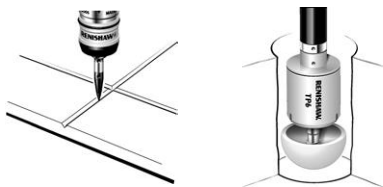
A range of specialist styli is available to enable probing of features such as thread form, thin sectioned material, tool setting and other specialist applications.

Cylinder styli



These are used for probing holes in thin sheet material. In addition, various threaded features can be probed and the centers of tapped holes located. Ball-ended cylinder styli allow full datuming and probing in X, Y and Z directions, thus allowing surface inspection to be performed.

Pointer and ceramic hollow ball styli



Pointer styli are designed for the inspection of thread forms, specific points and scribed lines (to lower accuracy). The use of a radius end pointer stylus allows more accurate datuming and probing of features as detailed above and can also be used to inspect the location of very small holes.

Ceramic hollow ball styli are ideal for probing deep features and bores in X, Y and Z directions, with the need to datum only one ball. There are two versions in the range, 18 mm and 30 mm diameter, specially designed for the TP2 / TP20 / TP200 and TP6 probes respectively. Probing with such a large diameter ball can average out the effects of very rough surfaces.

Tool setting styli



Typically, these are fitted with a square tip and can have threaded or plain shaft attachments. The tip faces are ground to ensure high squareness and parallelism. The TS27R tool setting probe for machining centers can also be fitted with a tungsten carbide disk stylus.

Crash protection devices



Renishaw's stylus crash protection devices are designed to break in the event of impact and protect the probe from damage.

Accessories and tools

A wide range of accessories including extensions, 4 and 5-way centers and stylus knuckles complement the genuine Renishaw stylus range to achieve fully flexible inspection.

Stylus centers



These provide maximum probing flexibility with a single probe. Taking up to five styli of the same mounting thread, this accessory allows you to build stylus configurations to your own specification.

Stylus knuckles



These give full adjustment about two axes, allowing the stylus to be orientated to probe angled features. This adjustment is especially useful when the probe cannot be correctly orientated by the probe head, or when access for the head is limited.

Styli and accessories

Stylus extensions



These provide additional probing penetration by extending the stylus away from the probe. However, using stylus extensions can reduce probe accuracy due to loss of rigidity. This is not the case with electronic probes, whose extremely low trigger forces render them less sensitive to this type of inaccuracy.

Stylus thread adaptors



These allow M2, M3, M4 and M5 threaded styli to be interchanged on the majority of touch trigger probes. They are particularly useful for adapting the extensive range of specialized application M2 styli for use on larger probes.

Stylus tools

Specifically designed for mounting styli correctly onto probes and for the construction of specialized stylus combinations, Renishaw's stylus tools protect your investment.

S7 stylus tool



The S7 stylus tool is used for tightening styli and accessories when connecting to one another or directly into the probe. It is specifically designed to yield if excessive tightening force is applied, avoiding damage to the threads of stylus and probe.

Stylus crank



A stylus crank can allow access to features that are otherwise difficult to reach, and are often used in lathe inspection applications.

Renishaw stylus kits

Renishaw styli and accessories are available in a wide selection of kits, ranging from a small precision set of the most frequently used styli, to a comprehensive set to meet virtually every inspection need.

Some sets are housed in a quality wooden case for maximum protection and superb presentation. The styli are held in a wood insert, individually located in a nylon sleeve providing protection for the mounting threads. This type of box features a removable module which houses up to twelve ruby ball styli and contains a tray for disks, tools and accessories. This allows the stylus selection for a particular inspection task to be brought to the CMM's table. The sloping lid design of this kit provides easy access to styli, minimizing handling of ruby balls and contact surfaces, thus aiding cleanliness.

Probing kits are also available to include a probe, probe head, extension bars and styli.

Custom design service

If you cannot achieve your objectives using our extensive range of standard products, Renishaw's Styli and Custom Products Division offers a unique service by providing customers with a total solution for their probing needs for CMM, machine tool or scanning applications.

The Division includes expertise in applications, design, engineering and manufacturing with extensive experience in providing tailor-made product solutions to specific customer's requirements.

In many application problems, the solution lies in the choice of the stylus which influences access of the workpiece features, inspection times and probe performance. All of these aspects are considered within the design of a custom stylus, ensuring that the solution incorporates the ideal choice of materials and optimizes probe performance for your particular application.

Renishaw's Styli and Custom Products Division has supplied over 5,000 different custom styli into probing applications worldwide, so the solution to your application problem may already exist.

For advice and further details, please contact your nearest Renishaw distributor.

Always use genuine Renishaw styli or your probe performance will be compromised!

M2 threaded stylus range

Ruby ball styli (stainless steel stems)

Ball material	Part number									
Ruby	A-5000-7806	A-5000-7802	A-5000-7807	A-5000-7803	A-5000-3604	A-5000-4154	A-5000-4155	A-5000-4156	A-5000-4158	
Price	\$32	\$22	\$22	\$22	\$22	\$22	\$36	\$39	\$72	
Silicon nitride	A-5004-0210	A-5004-1918	A-5003-6120	A-5004-1920	A-5003-2138**	A-5003-9524	A-5004-1921	A-5004-0237**	A-5004-1922	
Price	\$53	\$69	\$69	\$69	\$69	\$69	\$78	\$78	\$112	
Zirconia	A-5003-7757**	A-5004-0165	A-5003-7723	A-5004-2913	A-5004-2914	A-5003-7261**	A-5003-2186	A-5004-2203**	A-5004-2915	
Price	\$69	\$69	\$69	\$69	\$69	\$69	\$78	\$78	\$112	
A	Ball dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
B	Length mm (in.)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	11.0 (0.44)
C	Stem dia. mm (in.)	0.7 (0.03)	0.7 (0.03)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)	1.5 (0.06)	2.5 (0.10)	2.5 (0.10)	2.5 (0.10)
D	EWL* mm (in.)	4.5 (0.18)	4.5 (0.18)	6.0 (0.24)	6.5 (0.26)	7.0 (0.28)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	11.0 (0.44)
	Mass grams	0.3	0.3	0.3	0.3	0.4	0.4	0.7	0.9	1.5

10 mm range

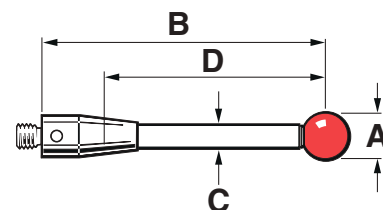
Ball material	Part number				
Ruby	A-5000-3603	A-5000-7804	A-5000-4160	A-5000-4161	
Price	\$25	\$25	\$25	\$25	
Silicon nitride	A-5003-1730**	A-5004-1923	A-5003-6691	A-5004-0236**	
Price	\$76	\$69	\$73	\$69	
Zirconia	A-5004-2916	A-5004-2917	A-5004-1057	A-5004-2918	
Price	\$69	\$69	\$69	\$69	
A	Ball dia. mm (in.)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)
B	Length mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
C	Stem dia. mm (in.)	1.4 (0.06)	1.4 (0.06)	1.5 (0.06)	1.5 (0.06)
D	EWL* mm (in.)	14.0 (0.56)	16.4 (0.65)	17.0 (0.67)	20.0 (0.79)
	Mass grams	0.4	0.4	0.5	0.6

20 mm range

Ruby ball styli (tungsten carbide stems)

Ball material	Part number				
Ruby	A-5000-7800	A-5000-7805	A-5000-7801	A-5003-1325	
Price	\$111	\$90	\$84	\$77	
Silicon nitride	A-5004-2016**	A-5003-2020**	–	A-5004-2018	
Price	\$189	\$169	–	\$69	
Zirconia	–	A-5003-7672**	A-5004-2632**	A-5004-2919**	
Price	–	\$165	\$210	\$191	
A	Ball dia. mm (in.)	0.3 (0.012)	0.5 (0.02)	0.7 (0.03)	1.0 (0.04)
B	Length mm (in.)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)
C	Stem dia. mm (in.)	0.2 (0.01)	0.4 (0.02)	0.5 (0.02)	0.7 (0.03)
D	EWL* mm (in.)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	4.0 (0.16)
	Mass grams	0.3	0.3	0.3	0.3

10 mm range



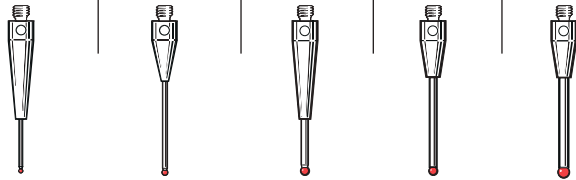
** Special * Effective working length

M2 styli

Ruby ball styli (tungsten carbide stems) – continued

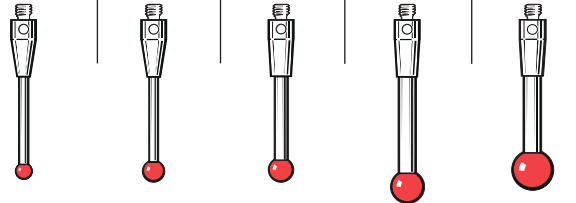
Ball material	Part number					
Ruby	A-5003-1345	A-5003-0577	A-5000-7808	A-5003-0033	A-5003-0034	
Price	\$105	\$107	\$49	\$55	\$55	
Silicon nitride	A-5004-2019**	–	A-5004-1508	A-5004-2021	A-5004-1925	
Price	\$169	–	\$86	\$86	\$86	
Zirconia	A-5004-2920	A-5004-1714**	A-5004-0435	A-5004-2921	A-5004-2922	
Price	\$217	\$104	\$86	\$86	\$86	
A	Ball dia. mm (in.)	0.5 (0.02)	0.7 (0.03)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)
B	Length mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
C	Stem dia. mm (in.)	0.3 (0.012)	0.5 (0.02)	0.7 (0.03)	0.8 (0.04)	1.0 (0.04)
D	EWL* mm (in.)	7.0 (0.28)	12.0 (0.48)	7.0 (0.28)	12.5 (0.50)	12.5 (0.50)
	Mass grams	0.48	0.32	0.50	0.41	0.50

20 mm range



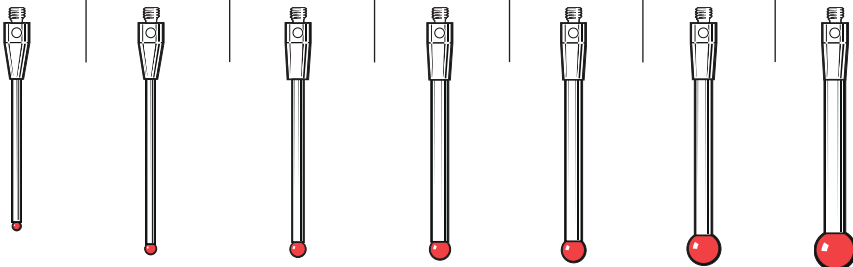
Ball material	Part number					
Ruby	A-5003-3822	A-5003-1896	A-5003-0938	A-5003-1029	A-5003-0046	
Price	\$27	\$72	\$78	\$78	\$44	
Silicon nitride	A-5004-1017**	A-5004-1928	A-5004-1021	A-5004-1929	A-5004-1930	
Price	\$86	\$86	\$86	\$86	\$95	
Zirconia	A-5004-2923	A-5004-2924	A-5004-0437	A-5004-2925	A-5004-2926	
Price	\$86	\$86	\$86	\$86	\$95	
A	Ball dia. mm (in.)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B	Length mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	22.0 (0.87)	20.0 (0.79)
C	Stem dia. mm (in.)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)
D	EWL* mm (in.)	14.0 (0.55)	15.5 (0.62)	17.0 (0.67)	22.0 (0.87)	20.0 (0.79)
	Mass grams	0.48	0.50	0.77	1.24	1.98

20 mm range



Ball material	Part number							
Ruby	A-5000-8663	A-5003-0035	A-5003-0036	A-5003-0038	A-5003-0040	A-5003-0043	A-5003-0047	
Price	\$84	\$38	\$44	\$44	\$44	\$44	\$49	
Silicon nitride	A-5004-2022	A-5004-1931	A-5003-7573**	A-5004-1932	A-5004-1933	A-5004-1944	A-5004-1945	
Price	\$86	\$86	\$86	\$86	\$86	\$86	\$95	
Zirconia	A-5004-2927	A-5004-1711**	A-5004-1058	A-5004-2928	A-5004-0264	A-5004-2929	A-5004-2930	
Price	\$104	\$86	\$86	\$86	\$86	\$86	\$95	
A	Ball dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B	Length mm (in.)	27.5 (1.08)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
C	Stem dia. mm (in.)	0.7 (0.03)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)
D	EWL* mm (in.)	20.5 (0.81)	22.5 (0.89)	22.5 (0.89)	22.5 (0.89)	27.0 (1.06)	30.0 (1.19)	30.0 (1.19)
	Mass grams	0.40	0.58	0.99	1.48	1.49	1.57	2.57

30 mm range



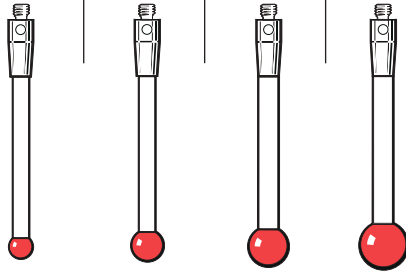
* Effective working length

** Special

Ruby ball styli (ceramic stems)

Ball material	Part number			
Ruby	A-5003-4177	A-5003-1370	A-5003-4779	A-5003-4780
Price	\$84	\$50	\$86	\$92
Silicon nitride	A-5004-1946	A-5004-1952	A-5004-1953	A-5004-1954
Price	\$103	\$103	\$112	\$121
Zirconia	A-5004-2931	A-5004-2932	A-5004-2933	A-5004-2934
Price	\$103	\$103	\$112	\$121
A Ball dia. mm (in)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B Length mm (in)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
C Stem dia mm (in)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)
D EWL* mm (in)	27.0 (1.06)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
Mass grams	0.44	0.68	0.93	1.11

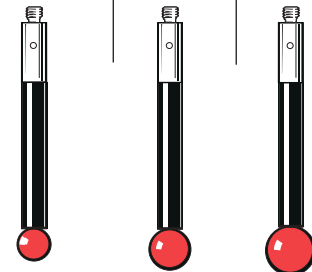
30 mm range



Ruby ball styli (carbon fiber stems)

Ball material	Part number		
Ruby	A-5003-4241**	A-5003-4781	A-5003-4782
Price	\$100	\$104	\$109
Silicon nitride	A-5004-1955	A-5004-1956	A-5004-1957
Price	\$103	\$112	\$121
Zirconia	A-5004-2935	A-5004-2936	A-5004-0618
Price	\$164	\$112	\$121
A Ball dia. mm (in)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B Length mm (in)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
C Stem dia mm (in)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)
D EWL* mm (in)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
Mass grams	0.57	0.79	0.96

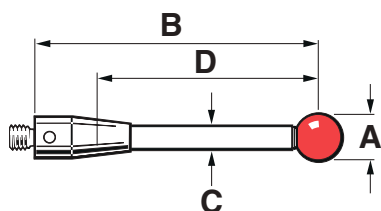
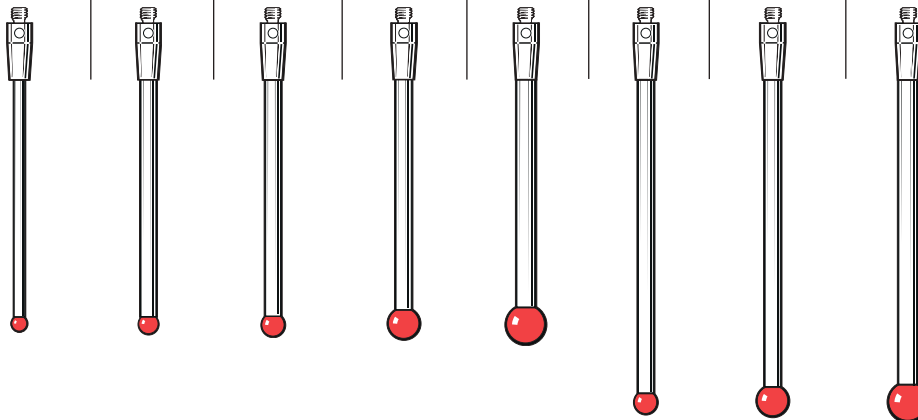
30 mm range



Ruby ball styli (tungsten carbide stems)

Ball material	Part number								
Ruby	A-5003-0037	A-5003-0039	A-5003-0041	A-5003-0044	A-5003-0048	A-5003-0042	A-5003-0045	A-5003-0049	A-5003-0049
Price	\$49	\$49	\$49	\$49	\$53	\$44	\$49	\$53	\$53
Silicon nitride	A-5003-7269**	A-5004-1959	A-5004-1960	A-5004-1961	A-5004-1962	A-5004-1963	A-5004-1964	A-5004-1965	A-5004-1965
Price	\$143	\$86	\$86	\$86	\$95	\$86	\$86	\$95	\$95
Zirconia	A-5004-2937	A-5004-2938	A-5004-1059	A-5004-2939	A-5004-2940	A-5004-2942	A-5004-2943**	A-5004-2944	A-5004-2944
Price	\$86	\$86	\$86	\$86	\$95	\$86	\$86	\$95	\$95
A Ball dia. mm (in.)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	5.0 (0.20)
B Length mm (in.)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C Stem dia. mm (in.)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)
D EWL* mm (in.)	32.5 (1.28)	32.5 (1.28)	37.0 (1.46)	40.0 (1.58)	40.0 (1.58)	47.0 (1.85)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
Mass grams	1.29	1.95	1.97	2.04	3.17	2.44	2.52	3.75	3.75

40 mm – 50 mm range



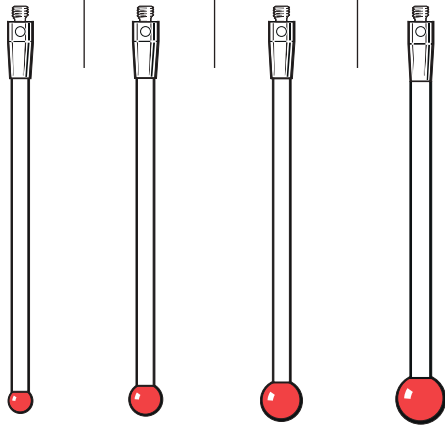
** Special * Effective working length

M2 styli

Ruby ball styli (ceramic stems)

Ball material	Part number			
Ruby	A-5003-0064	A-5003-0065	A-5003-0066	A-5003-0470
Price	\$70	\$70	\$90	\$86
Silicon nitride	A-5004-1967	A-5004-1519	A-5004-1968**	A-5004-1969
Price	\$103	\$115	\$112	\$201
Zirconia	A-5004-2945	A-5004-2946	A-5004-2947	A-5004-2948
Price	\$103	\$103	\$112	\$121
A Ball dia. mm (in)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B Length mm (in)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C Stem dia. mm (in)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)
D EWL* mm (in)	47.0 (1.85)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
Mass grams	0.83	0.91	1.31	1.49

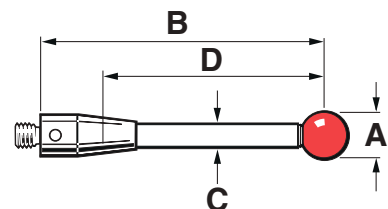
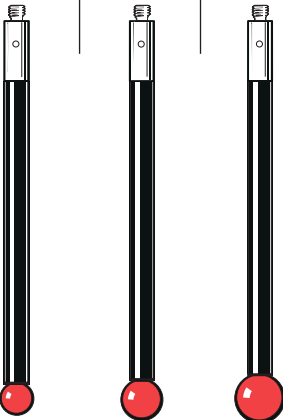
50 mm range



Ruby ball styli (carbon fiber stems)

Ball material	Part number		
Ruby	A-5003-2285	A-5003-2286	A-5003-2287
Price	\$105	\$110	\$115
Silicon nitride	A-5004-1970	A-5004-1971	A-5004-1972
Price	\$103	\$112	\$121
Zirconia	A-5004-1331	A-5004-1330	A-5004-1329
Price	\$103	\$112	\$121
A Ball dia. mm (in)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B Length mm (in)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C Stem dia. mm (in)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)
D EWL* mm (in)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
Mass grams	1.00	1.10	1.20

50 mm range



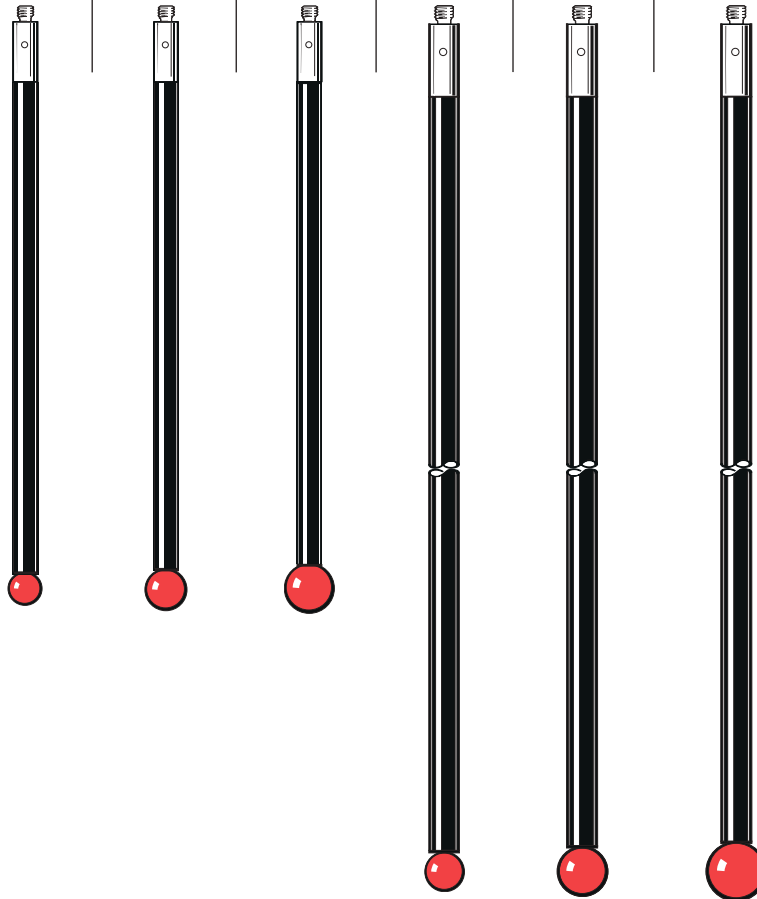
* Effective working length

** Special

Ruby ball styli (carbon fiber stems)

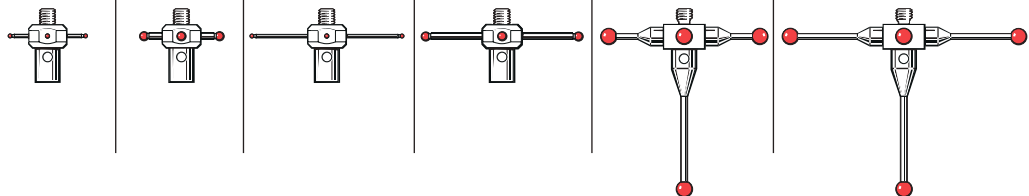
Ball material	Part number					
Ruby	A-5003-4784	A-5003-4785	A-5003-4786	A-5003-2289	A-5003-2290	A-5003-2291
Price	\$135	\$144	\$152	\$154	\$163	\$172
Silicon nitride	A-5004-1973	A-5004-1974	A-5004-1975	A-5004-1976	A-5004-1977	A-5004-1978
Price	\$121	\$121	\$121	\$121	\$121	\$138
Zirconia	A-5004-2949	A-5004-2950	A-5004-2951	A-5004-2952	A-5004-2953	A-5004-2954
Price	\$121	\$121	\$121	\$121	\$121	\$138
A Ball dia. mm (in.)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B Length mm (in.)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)
C Stem dia. mm (in.)	2.0 (0.08)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)
D EWL* mm (in.)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)
Mass grams	0.75	1.35	1.45	1.50	1.59	1.78

75 mm – 100 mm range



Star styli (fixed)

Part number	A-5003-4011	A-5000-7811	A-5003-4787	A-5003-4788	A-5000-7629	A-5000-3626
Span mm (in.)	10.0 (0.40)	10.0 (0.40)	20.0 (0.79)	20.0 (0.79)	18.0 (0.71)	30.0 (1.19)
Ball mm (in.)	0.5 (0.02)	1.0 (0.04)	0.5 (0.02)	1.0 (0.04)	2.0 (0.08)	2.0 (0.08)
Stem dia. mm (in.)	0.3 (0.012)	0.7 (0.03)	0.3 (0.012)	0.7 (0.03)	1.4 (0.06)	1.4 (0.06)
EWL* mm (in.)	N/A	N/A	N/A	N/A	12.0 (0.48)	12.0 (0.48)
Mass grams	0.7	0.5	0.7	0.9	1.3	1.8
Price	\$249	\$138	\$264	\$221	\$139	\$133

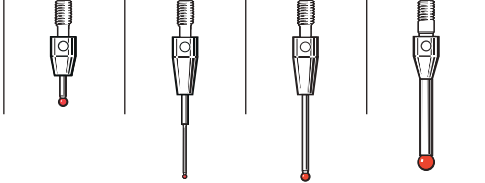


* Effective working length

M2 styli

Star stylus centers

Part number	A-5003-4789	A-5003-4790	A-5003-4791	A-5000-3609
Ball mm (in.)	1.0 (0.04)	0.5 (0.02)	1.0 (0.04)	2.0 (0.08)
Stem dia. mm (in.)	0.7 (0.03)	0.4 (0.02)	0.7 (0.03)	1.4 (0.06)
EWL* mm (in.)	3.5 (0.14)	7.0 (0.28)	11.0 (0.44)	12.0 (0.48)
Mass grams	0.31	0.43	0.45	0.44
Price	\$125	\$163	\$125	\$71

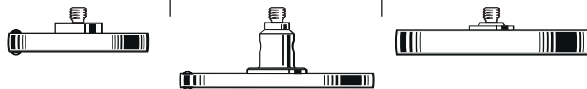


Disk styli

Part number	A-5000-3611 Ruby	A-5004-1387 Silver steel	A-5004-1395 Silver steel	A-5004-1396 Silver steel	A-5000-7809 Silver steel
Disk dia. mm (in.)	6.0 (0.24)	10.0 (0.39)	12.0 (0.47)	14.0 (0.55)	18.0 (0.71)
Disk depth mm (in.)	1.2 (0.05)	1.2 (0.05)	1.6 (0.06)	1.6 (0.06)	1.6 (0.06)
Roller depth mm (in.)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)	2.5 (0.10)
Stem dia. mm (in.)	2.0 (0.08)	2.0 (0.08)	4.2 (0.17)	4.2 (0.17)	4.2 (0.17)
Mass grams	0.6	1.0	2.0	2.5	3.0
Price	\$70	\$103	\$121	\$121	\$89

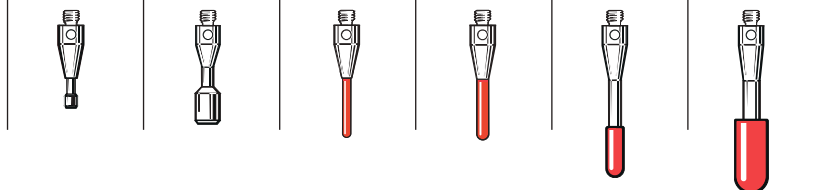


Part number	A-5000-3613 Silver steel	A-5000-7810 Silver steel	A-5000-4187 Silver steel
Disk dia. mm (in.)	18.0 (0.71)	25.0 (0.99)	25.0 (0.99)
Disk depth mm (in.)	2.3 (0.10)	1.6 (0.06)	3.1 (0.13)
Roller depth mm (in.)	3.0 (0.12)	2.5 (0.10)	N/A
Stem dia. mm (in.)	N/A	4.2 (0.17)	N/A
Mass grams	2.7	4.0	3.8
Price	\$105	\$89	\$99



Cylinder styli

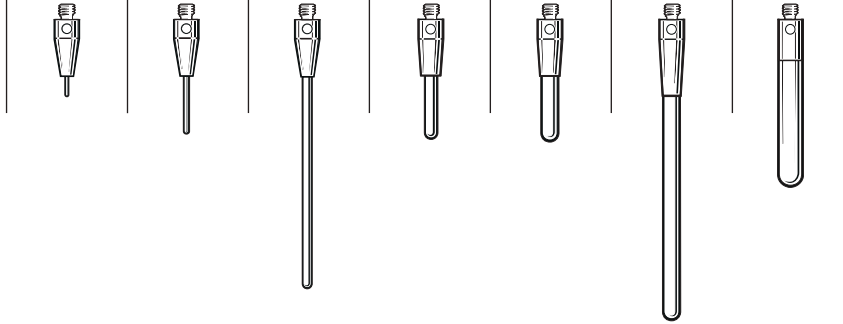
Part number	A-5004-7589 Silver steel	A-5004-7590 Silver steel	A-5000-8876 Ruby	A-5000-8877 Ruby	A-5000-7812 Ruby	A-5003-0073 Ruby
Cylinder dia. mm (in.)	1.5 (0.06)	3.0 (0.12)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	4.0 (0.16)
Overall length mm (in.)	10.75 (0.42)	12.75 (0.50)	15.0 (0.60)	15.0 (0.60)	21.2 (0.83)	22.0 (0.87)
Stem dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	N/A	N/A	1.6 (0.07)	2.0 (0.08)
EWL* mm (in.)	1.25 (0.05)	3.8 (0.15)	8.0 (0.32)	8.0 (0.32)	7.2 (0.29)	10.0 (0.40)
Mass grams	0.3	0.6	0.3	0.3	0.5	0.9
Price	\$26	\$26	\$185	\$270	\$147	\$130



* Effective working length

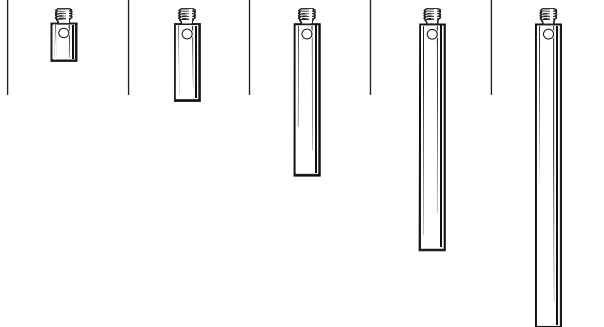
Parallel hemispherical-ended styli (tungsten carbide)

Part number	A-5003-1208	A-5003-1210	A-5003-1218	A-5003-1219	A-5003-1228	A-5003-0074	A-5003-1258
Cylinder dia. mm (in.)	0.3 (0.012)	0.5 (0.02)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	3.0 (0.12)
Overall length mm (in.)	10.2 (0.41)	15.3 (0.61)	35.5 (1.40)	15.8 (0.63)	16.0 (0.63)	40.0 (1.58)	22.5 (0.89)
EWL* mm (in.)	2.7 (0.11)	7.8 (0.31)	28.0 (1.10)	8.3 (0.33)	8.5 (0.34)	32.0 (1.26)	22.5 (0.89)
Mass grams	0.3	0.3	0.7	0.6	0.8	2.0	2.0
Price	\$220	\$190	\$160	\$85	\$85	\$87	\$155



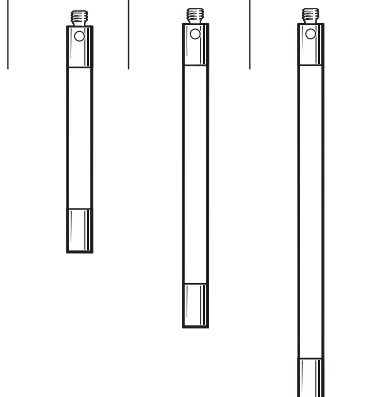
Stylus extensions (stainless steel)

Part number	A-5004-7610	A-5004-7585	A-5004-7586	A-5004-7591	A-5004-7611
Length mm (in.)	5.0 (0.20)	10.0 (0.40)	20.0 (0.79)	30.0 (1.19)	40.0 (1.58)
Stem dia. mm (in.)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)
Mass grams	0.2	0.4	0.9	1.4	1.8
Price	\$12	\$13	\$15	\$17	\$19



Stylus extensions (ceramic)

Part number	A-5003-0070	A-5003-0071	A-5003-0072
Length mm (in.)	30.0 (1.19)	40.0 (1.58)	50.0 (1.97)
Stem dia. mm (in.)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)
Mass grams	0.97	1.22	1.51
Price	\$58	\$58	\$60

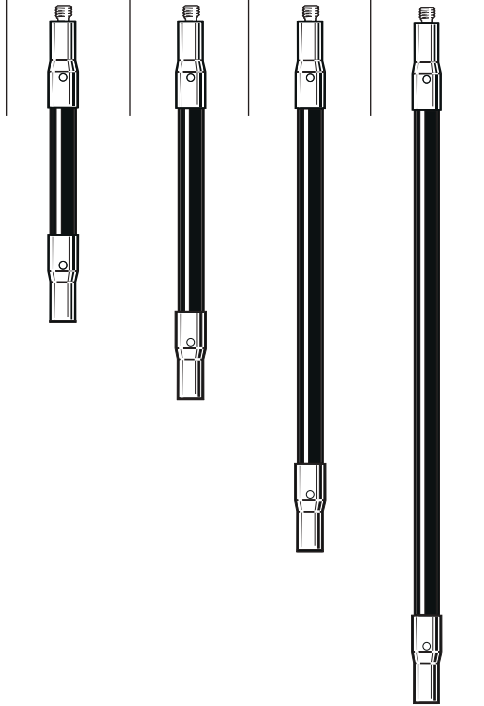


** Special * Effective working length

M2 styli

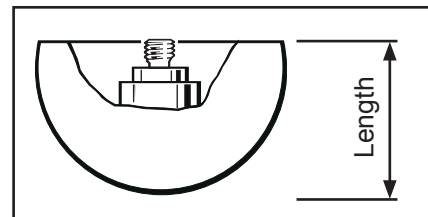
Stylus extensions (carbon fiber)

Part number	A-5003-2280	A-5003-2281	A-5003-2282	A-5003-2283
Length mm (in.)	40.0 (1.58)	50.0 (1.97)	70.0 (2.76)	90.0 (3.55)
Stem dia. mm (in.)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)	3.0 (0.12)
Outer dia. mm (in.)	3.5 (0.14)	3.5 (0.14)	3.5 (0.14)	3.5 (0.14)
Mass grams	0.9	1.0	1.3	1.5
Price	\$97	\$101	\$105	\$110



Special purpose styli

Part number	A-5004-7588 Silver steel	A-5000-7813 Tungsten carbide	A-5000-3614 Ceramic
Length mm (in.)	15.0 (0.60)	10.0 (0.40)	11.0 (0.44)
Ball dia. mm (in.)	N/A	N/A	18.0 (0.71)
End feature mm (in.)	Flat rad. 0.05 (0.002)	Spherical rad. 0.1 (0.004)	N/A
Angles	30° inclusive	30° inclusive	N/A
Mass grams	0.7	0.7	3.3
Price	\$25	\$67	\$279

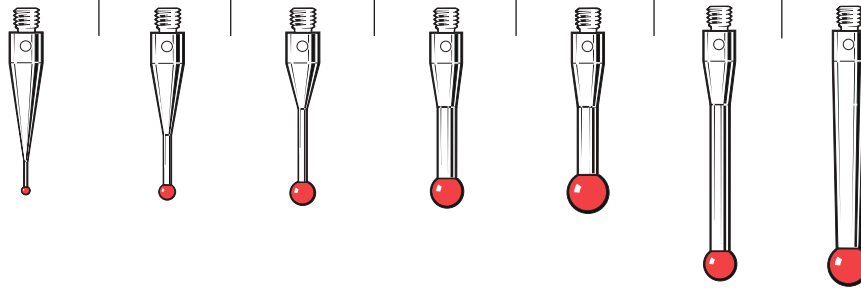


M3 threaded stylus range

Ruby ball styli (stainless steel stems)

Ball material	Part number						
Ruby	A-5000-3551	A-5000-3552	A-5000-3553	A-5000-7606	A-5000-7630	A-5000-3554	A-5000-7648
Price	\$32	\$32	\$32	\$32	\$32	\$32	\$32
Silicon nitride	A-5004-1979	A-5003-5723	A-5003-6257**	A-5003-5061	A-5003-6695**	A-5004-1980	A-5004-1981
Price	\$69	\$69	\$69	\$69	\$78	\$69	\$78
Zirconia	A-5004-2955	A-5003-5736	A-5004-2956	A-5003-5737	A-5003-9500	A-5004-2957	A-5004-2958
Price	\$84	\$84	\$84	\$84	\$94	\$84	\$94
A Ball dia. mm (in.)	1.0 (0.04)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	4.0 (0.16)	5.0 (0.20)
B Length mm (in.)	21.0 (0.83)	21.0 (0.83)	21.0 (0.83)	21.0 (0.83)	21.0 (0.83)	31.0 (1.23)	31.0 (1.23)
C Stem dia. mm (in.)	0.7 (0.03)	1.4 (0.06)	1.5 (0.06)	2.5 (0.10)	2.5 (0.10)	2.5 (0.10)	3.5 (0.14)
D EWL* mm (in.)	4.0 (0.16)	9.6 (0.38)	14.7 (0.58)	17.2 (0.68)	21.0 (0.83)	27.0 (1.07)	31.0 (1.23)
Mass grams	1.0	1.0	1.0	1.3	1.5	2.5	3.0

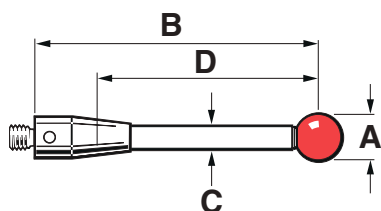
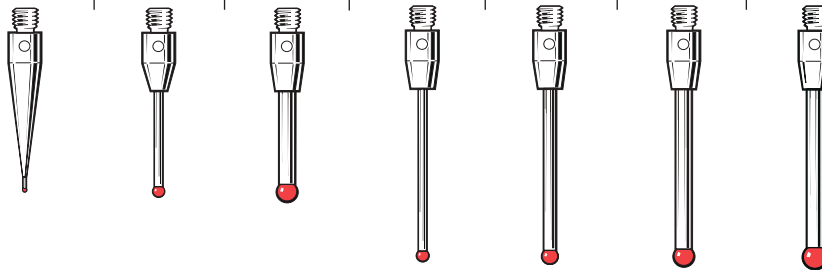
21 mm – 31 mm range



Ruby ball styli (tungsten carbide stems)

Ball material	Part number						
Ruby	A-5000-7632	A-5003-0050	A-5003-0054	A-5003-0051	A-5003-0052	A-5003-0055	A-5003-0057
Price	\$98	\$44	\$44	\$49	\$44	\$44	\$44
Silicon nitride	A-5004-2023**	A-5004-1198	A-5004-1982	A-5003-8091**	A-5003-5724	A-5004-1983	A-5004-1984**
Price	\$323	\$86	\$86	\$86	\$86	\$86	\$86
Zirconia	A-5004-2959	A-5004-2960	A-5004-2961	A-5004-2962	A-5003-5738	A-5004-2963	A-5003-6766
Price	\$230	\$104	\$104	\$104	\$104	\$104	\$104
A Ball dia. mm (in.)	0.5 (0.02)	1.5 (0.06)	2.5 (0.10)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)
B Length mm (in.)	21.0 (0.83)	20.0 (0.79)	20.2 (0.80)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
C Stem dia. mm (in.)	0.4 (0.02)	1.0 (0.04)	2.0 (0.08)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)
D EWL* mm (in.)	2.0 (0.08)	12.5 (0.50)	12.5 (0.50)	22.5 (0.89)	22.8 (0.90)	22.5 (0.89)	24.0 (0.94)
Mass grams	1.0	0.8	1.3	0.93	1.32	1.81	1.83

20 mm – 30 mm range



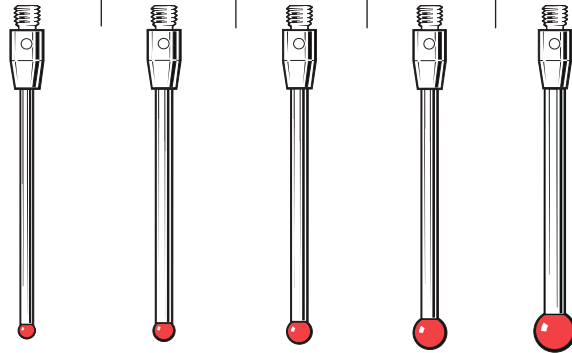
** Special * Effective working length

M3 styli

Ruby ball styli (tungsten carbide stems) – continued

Ball material	Part number					
Ruby	A-5003-0053	A-5003-0056	A-5003-0058	A-5003-0060	A-5003-0062	
Price	\$49	\$49	\$49	\$44	\$74	
Silicon nitride	A-5004-1985	A-5004-1986	A-5004-1987	A-5004-1195	A-5004-1718	
Price	\$86	\$86	\$86	\$86	\$103	
Zirconia	A-5003-2043**	A-5004-2964	A-5004-2965	A-5003-6767	A-5004-2966	
Price	\$104	\$104	\$104	\$104	\$115	
A	Ball dia. mm (in.)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B	Length mm (in.)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)
C	Stem dia. mm (in.)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)
D	EWL* mm (in.)	32.5 (1.28)	32.5 (1.28)	33.7 (1.33)	36.0 (1.42)	40.0 (1.58)
	Mass grams	1.58	2.28	2.30	2.38	3.50

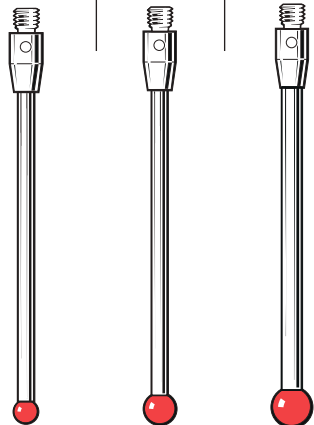
40 mm range



Ruby ball styli (tungsten carbide stems)

Ball material	Part number			
Ruby	A-5003-0059	A-5003-0061	A-5003-0063	
Price	\$53	\$53	\$53	
Silicon nitride	A-5004-1199	A-5004-1988	A-5004-1201	
Price	\$86	\$86	\$95	
Zirconia	A-5004-2968	A-5003-6768	A-5003-7665**	
Price	\$104	\$104	\$115	
A	Ball dia. mm (in.)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)
D	EWL* mm (in.)	43.7 (1.72)	46.0 (1.82)	50.0 (1.97)
	Mass grams	2.78	2.85	4.10

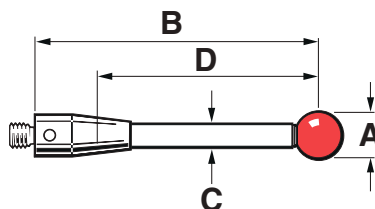
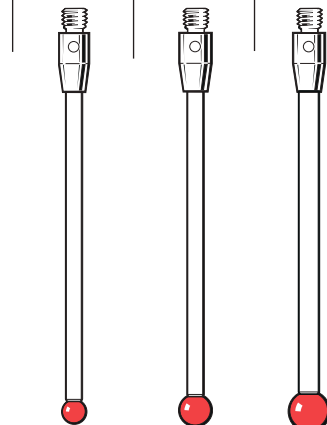
50 mm range



Ruby ball styli (ceramic stems)

Ball material	Part number			
Ruby	A-5003-0067	A-5003-0068	A-5003-0069	
Price	\$70	\$70	\$70	
Silicon nitride	A-5004-1989	A-5003-5725	A-5004-1990	
Price	\$103	\$103	\$112	
Zirconia	A-5004-2969	A-5003-5739	A-5004-2970	
Price	\$125	\$125	\$136	
A	Ball dia. mm (in.)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)
D	EWL* mm (in.)	43.7 (1.72)	46.0 (1.82)	50.0 (1.97)
	Mass grams	1.17	1.24	1.33

50 mm range



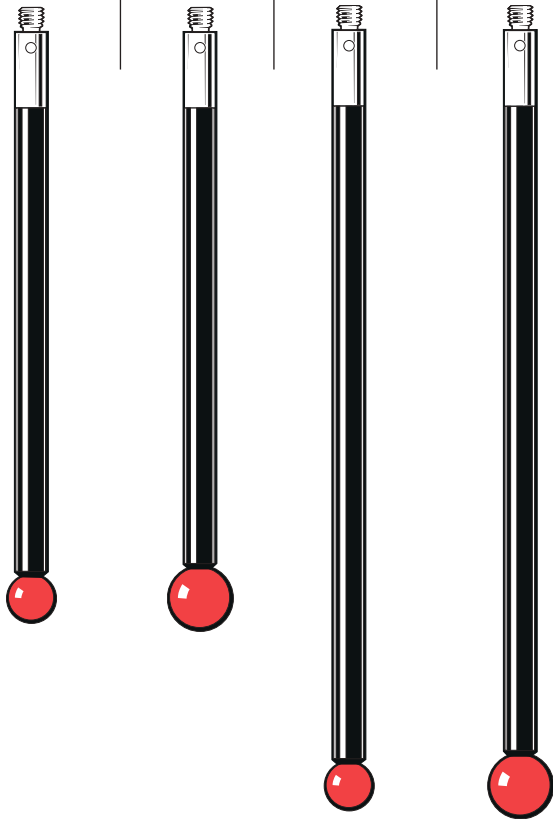
* Effective working length

** Special

Ruby ball styli (carbon fiber stems)

Ball material	Part number			
Ruby	A-5003-4860	A-5003-4862	A-5003-4861	A-5003-4863
Price	\$158	\$180	\$168	\$190
Silicon nitride	A-5003-5726	A-5004-1991	A-5003-5727	A-5004-5466
Price	\$129	\$147	\$147	\$155
Zirconia	A-5003-5740	A-5003-6771	A-5003-5741	A-5003-6778**
Price	\$157	\$178	\$178	\$188
A Ball dia. mm (in.)	6.0 (0.24)	8.0 (0.32)	6.0 (0.24)	8.0 (0.32)
B Length mm (in.)	75.0 (2.96)	75.0 (2.96)	100.0 (3.94)	100.0 (3.94)
C Stem dia. mm (in.)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)
D EWL* mm (in.)	75.0 (2.96)	75.0 (2.96)	100.0 (3.94)	100.0 (3.94)
Mass grams	2.40	2.98	2.89	3.47

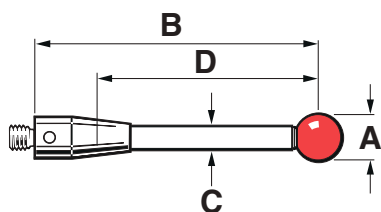
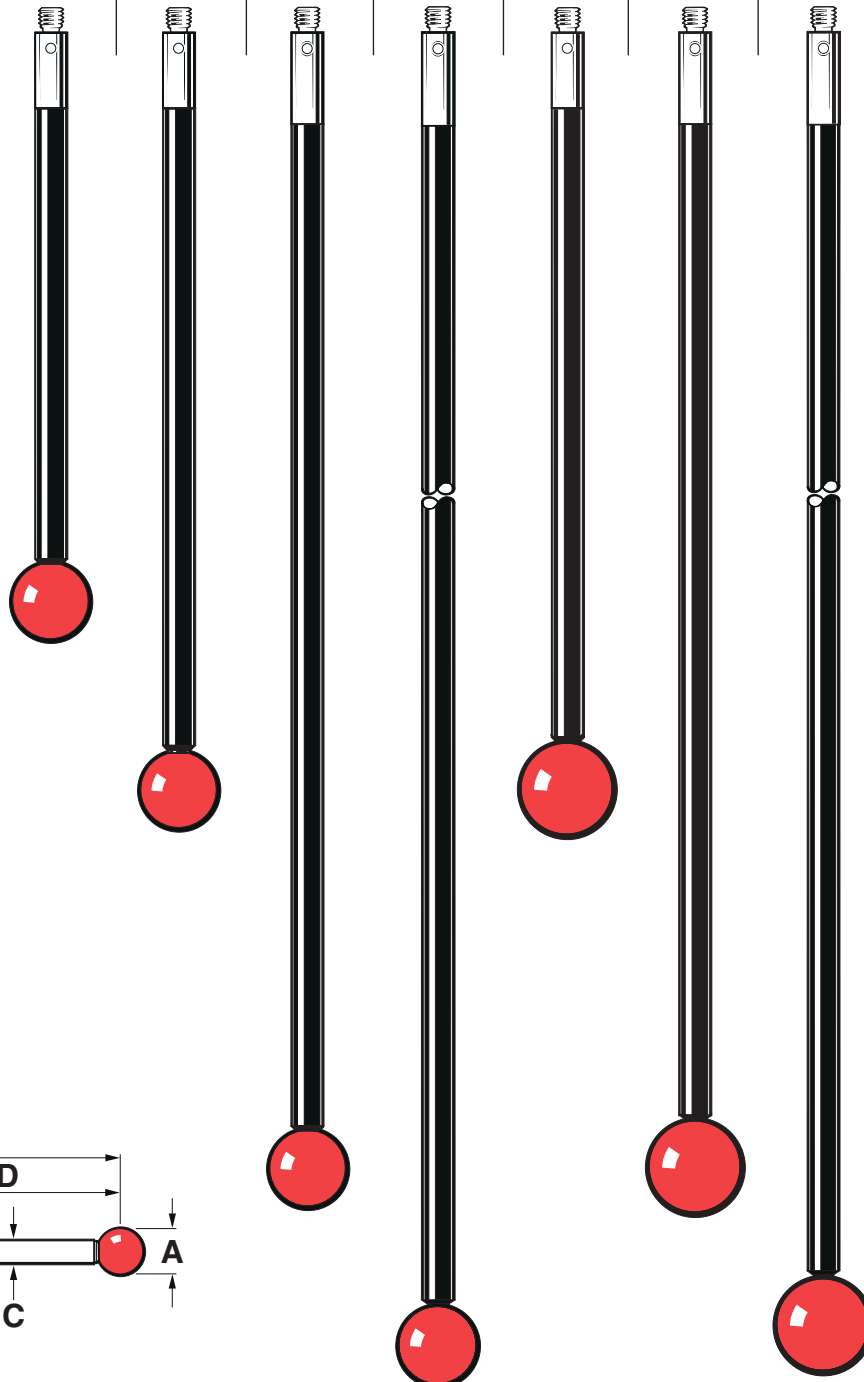
75 mm – 100 mm
range



M3 styli

Ruby ball styli (carbon fiber stems) – continued

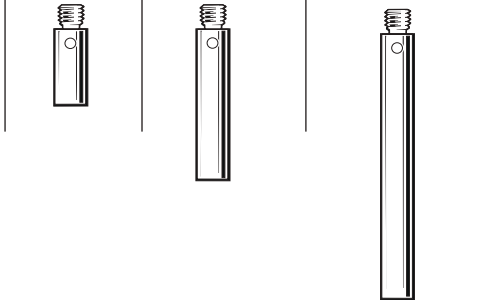
Ball material	Part number						
Ruby	A-5003-7057	A-5003-7056	A-5003-7055	A-5003-7054	A-5003-7445	A-5003-7446	A-5003-7447
Price	\$275	\$275	\$301	\$301	\$275	\$301	\$301
Silicon nitride	A-5004-1992	A-5004-1993	A-5004-1994	A-5004-1995	A-5004-1996	A-5004-1997	A-5004-1998
Price	\$293	\$293	\$293	\$293	\$310	\$310	\$310
Zirconia	A-5004-2972	A-5003-9495	A-5004-2973	A-5004-2974	A-5004-2975	A-5004-2976	A-5004-2977
Price	\$355	\$355	\$355	\$355	\$376	\$376	\$376
A Ball dia. mm (in.)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	10.0 (0.40)	12.0 (0.48)	12.0 (0.48)	12.0 (0.48)
B Length mm (in.)	75.0 (2.96)	100.0 (3.94)	150.0 (5.91)	200.0 (7.88)	100.0 (3.94)	150.0 (5.91)	200.0 (7.88)
C Stem dia. mm (in.)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)
D EWL* mm (in.)	75.0 (2.96)	100.0 (3.94)	150.0 (5.91)	200.0 (7.88)	100.0 (3.94)	150.0 (5.91)	200.0 (7.88)
Mass grams	4.05	4.53	5.49	6.47	5.9	6.9	7.9



* Effective working length

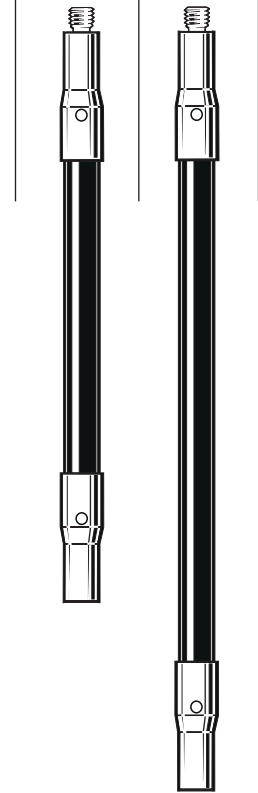
Stylus extensions (stainless steel)

Part number	A-5004-7609	A-5004-7583	A-5004-7584
Length mm (in.)	10.0 (0.40)	20.0 (0.79)	35.0 (1.38)
Stem dia. mm (in.)	4.0 (0.16)	4.0 (0.16)	4.0 (0.16)
Mass grams	0.9	1.6	2.9
Price	\$13	\$15	\$12



Stylus extensions (carbon fiber)

Part number	A-5003-4864	A-5003-4865
Length mm (in.)	75.0 (2.96)	100.0 (3.94)
Stem dia. mm (in.)	4.0 (0.16)	4.0 (0.16)
Mass grams	2.53	3.02
Price	\$102	\$110



Stylus extensions (ceramic)

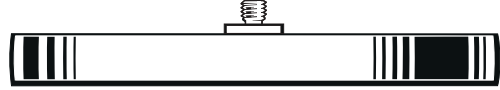
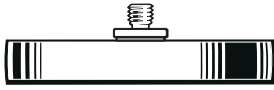
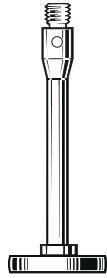
Part number	A-5003-0075
Length mm (in.)	50.0 (1.97)
Stem dia. mm (in.)	4.0 (0.16)
Mass grams	2.95
Price	\$58



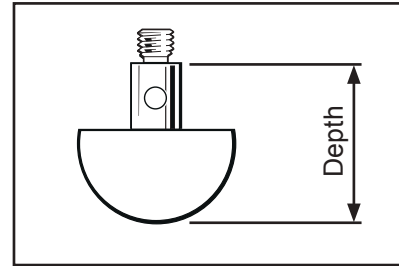
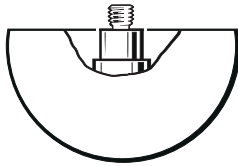
M3 styli

Disk and hollow ball styli

Part number	A-5000-3615 Silver steel	A-5000-7612 Silver steel	A-5000-7669 Carbon steel
Disk dia. mm (in.)	12.7 (0.50)	35.0 (1.38)	63.5 (2.51)
Disk depth mm (in.)	2.2 (0.09)	5.0 (0.20)	6.0 (0.24)
Stem dia. mm (in.)	3.5 (0.14)	N/A	N/A
Mass grams	4.0	10.0	45.0
Price	\$74	\$126	\$134

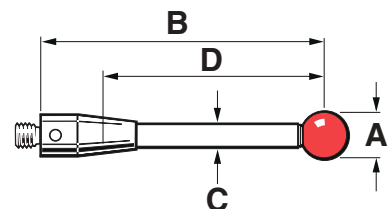
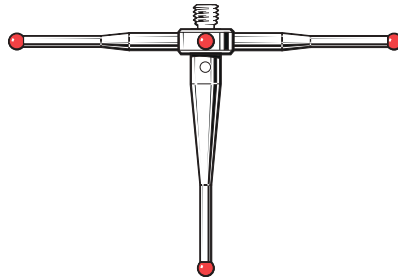
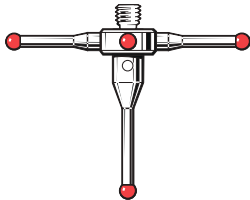


Part number	A-5000-7814 Ceramic	A-5003-7098 Ceramic
Disk dia. mm (in.)	30.0 (1.19)	30.0 (1.19)
Disk depth mm (in.)	17.0 (0.67)	1.5 (0.06)
Stem dia. mm (in.)	N/A	4.0 (0.16)
Mass grams	13.0	3.6
Price	\$343	\$300



Star styli (fixed)

Part number	A-5003-0076	A-5003-0077
Span mm (in.)	30.0 (1.19)	50.0 (1.97)
Ball mm (in.)	2.0 (0.08)	2.0 (0.08)
Stem dia. mm (in.)	1.4 (0.06)	1.4 (0.06)
EWL* mm (in.)	11.0 (0.44)	11.0 (0.44)
Mass grams	2.38	5.25
Price	\$140	\$140

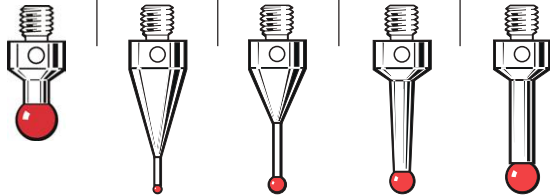


* Effective working length

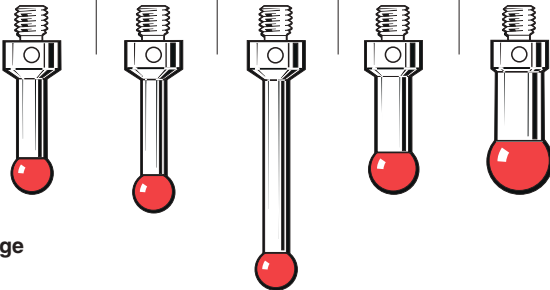
M4 threaded stylus range

Ruby ball styli (stainless steel stems)

Ball material	Part number				
Ruby	A-5000-6350	A-5000-7545	A-5000-7547	A-5000-7549	A-5000-7551
Price	\$70	\$87	\$76	\$45	\$45
Silicon nitride	–	–	A-5003-5728	–	A-5003-5729
Price	–	–	\$71	–	\$63
Zirconia	–	–	A-5003-5742	–	A-5003-5743
Price	–	–	\$71	–	\$63
A Ball dia. mm (in.)	5.0 (0.20)	1.0 (0.04)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)
B Length mm (in.)	10.0 (0.39)	19.5 (0.77)	19.0 (0.75)	18.5 (0.73)	18.0 (0.71)
C Stem dia. mm (in.)	3.0 (0.12)	0.7 (0.03)	1.4 (0.05)	2.0 (0.08)	3.0 (0.12)
D EWL* mm (in.)	5.0 (0.20)	4.5 (0.18)	9.2 (0.36)	13.0 (0.52)	13.7 (0.54)
Mass grams	1.9	2.5	2.3	2.0	2.1



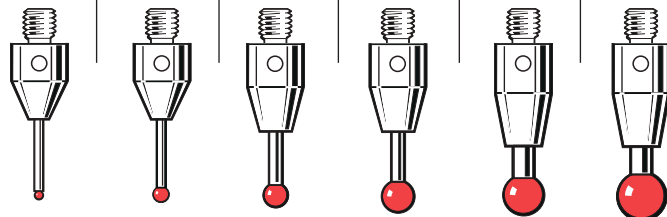
Part number	A-5000-7553	A-5000-6731	A-5000-6352	A-5000-7555	A-5000-7557
A Ball dia. mm (in.)	5.0 (0.20)	5.0 (0.20)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
B Length mm (in.)	17.5 (0.69)	20.0 (0.79)	30.0 (1.19)	17.0 (0.67)	16.0 (0.63)
C Stem dia. mm (in.)	3.5 (0.14)	3.0 (0.12)	3.0 (0.12)	4.5 (0.18)	6.0 (0.24)
D EWL* mm (in.)	13.6 (0.54)	15.89 (0.63)	26.0 (1.03)	13.3 (0.52)	16.0 (0.63)
Mass grams	2.3	2.4	3.0	3.0	3.9
Price	\$45	\$70	\$70	\$50	\$67



10 mm – 30 mm range

Ruby ball styli (tungsten carbide stems)

Part number	A-5003-4792	A-5003-2932	A-5003-4793	A-5003-4794	A-5003-4795	A-5003-4796
A Ball dia. mm (in.)	1.0 (0.04)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B Length mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
C Stem dia. mm (in.)	0.7 (0.03)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)
D EWL* mm (in.)	10.0 (0.40)	10.0 (0.40)	8.5 (0.33)	8.5 (0.33)	7.9 (0.31)	10.7 (0.42)
Mass grams	2.39	3.01	3.53	3.53	4.52	4.66
Price	\$77	\$86	\$86	\$86	\$92	\$92



20 mm range

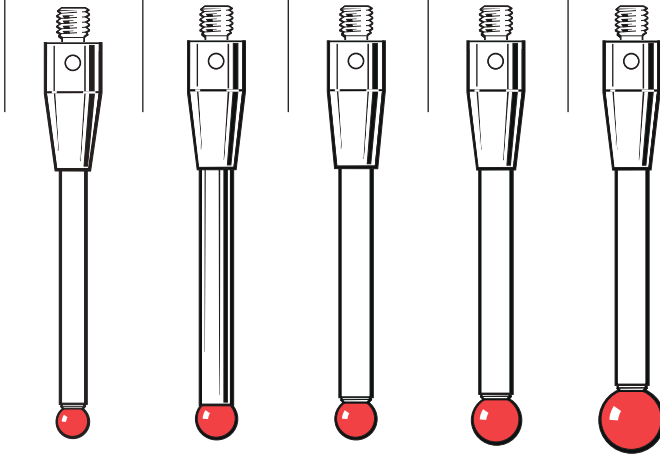
* Effective working length

M4 styli

Ruby ball styli

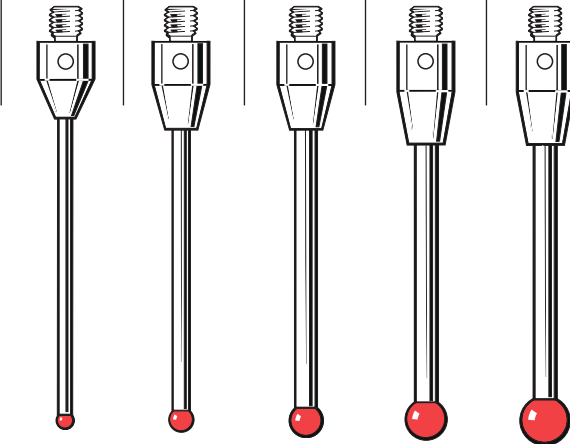
Part number	A-5003-0233 Ceramic	A-5000-7521 Stainless steel	A-5003-0235 Ceramic	A-5000-3709 Ceramic	A-5000-7795 Ceramic	
A	Ball dia. mm (in.)	4.0 (0.16)	5.0 (0.20)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	3.0 (0.12)	4.5 (0.18)	3.8 (0.15)	4.5 (0.18)	4.5 (0.18)
D	EWL* mm (in.)	33.5 (1.32)	33.5 (1.32)	33.5 (1.32)	38.5 (1.52)	50.0 (1.97)
	Mass grams	3.9	5.8	5.0	4.8	5.4
	Price	\$70	\$70	\$82	\$97	\$108

50 mm range



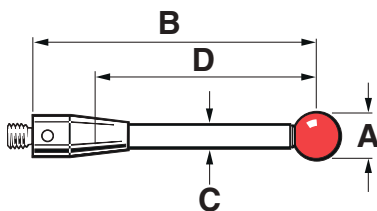
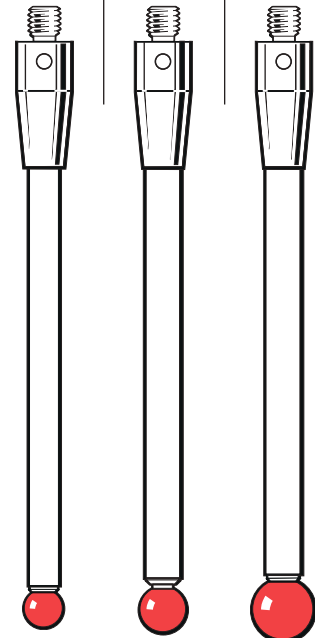
Part number	A-5003-4797 Tungsten carbide	A-5003-3680 Tungsten carbide	A-5003-4799 Tungsten Carbide	A-5003-4800 Tungsten carbide	A-5003-4801 Tungsten carbide	
A	Ball dia. mm (in.)	2.0 (0.08)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)
D	EWL* mm (in.)	40.0 (1.58)	38.5 (1.52)	38.5 (1.52)	37.9 (1.49)	40.7 (1.60)
	Mass grams	3.80	4.94	4.99	6.72	6.86
	Price	\$92	\$96	\$96	\$100	\$100

50 mm range



Part number	A-5003-0236 Ceramic	A-5003-2764 Ceramic	A-5003-4802 Ceramic	
A	Ball dia. mm (in.)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)
B	Length mm (in.)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)
C	Stem dia. mm (in.)	3.8 (0.15)	4.5 (0.18)	4.5 (0.18)
D	EWL* mm (in.)	58.5 (2.30)	63.5 (2.51)	75.0 (2.96)
	Mass grams	5.63	5.64	6.20
	Price	\$86	\$103	\$115

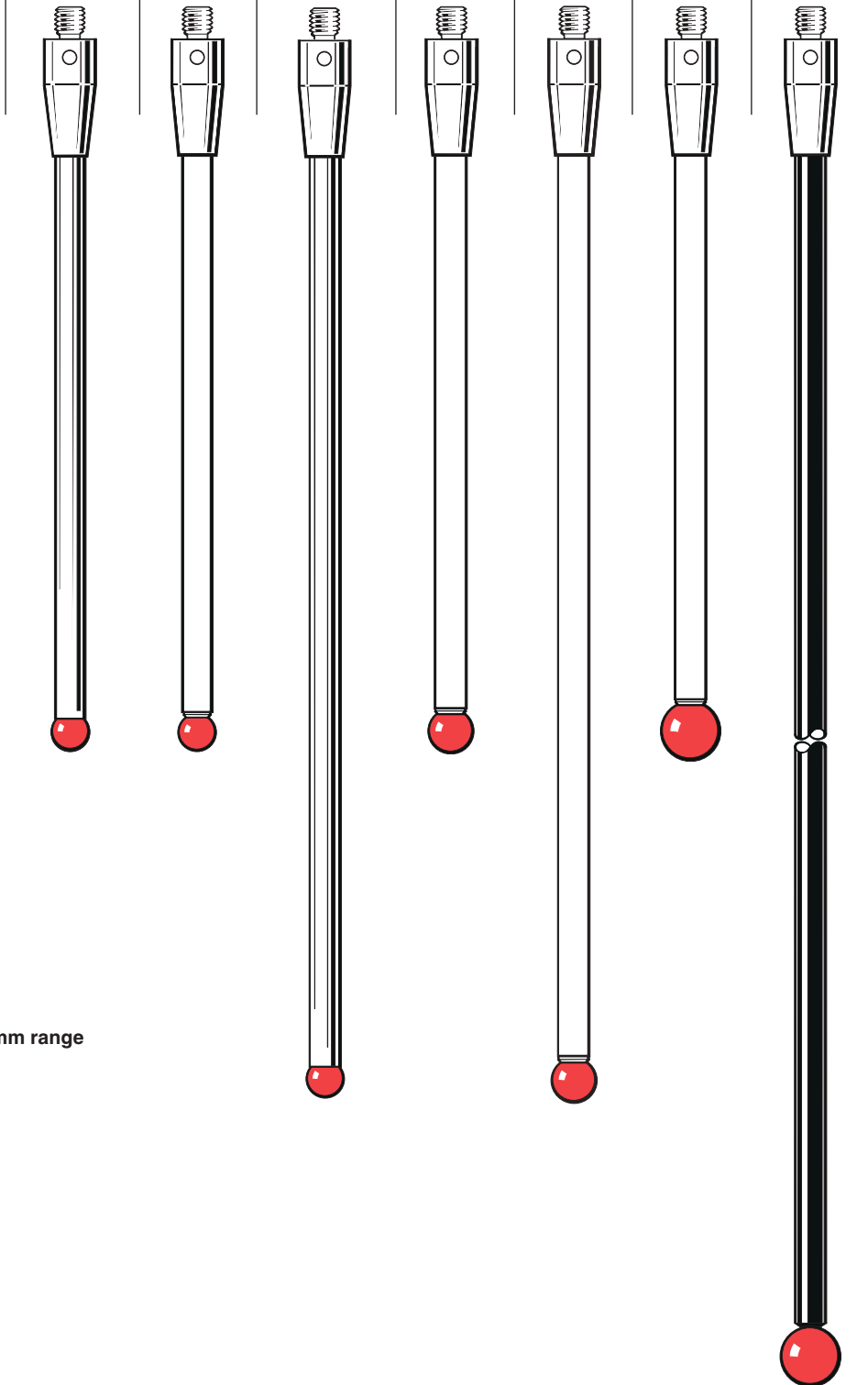
75 mm range



* Effective working length

Ruby ball styli

Part number	A-5000-7522 Stainless steel	A-5000-9761 Ceramic	A-5000-7523 Stainless steel	A-5000-3712 Ceramic	A-5000-8156 Ceramic	A-5000-7796 Ceramic	A-5003-3461 Carbon fiber
A Ball dia. mm (in)	5.0 (0.20)	5.0 (0.20)	5.0 (0.20)	6.0 (0.24)	6.0 (0.24)	8.0 (0.32)	8.0 (0.32)
B Length mm (in)	100.0 (3.94)	100.0 (3.94)	150.0 (5.91)	100.0 (3.94)	150.0 (5.91)	100.0 (3.94)	300.0 (11.82)
C Stem dia mm (in)	4.5 (0.18)	3.8 (0.15)	4.4 (0.17)	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)
D EWL* mm (in)	83.2 (3.38)	83.5 (3.29)	133.00 (5.24)	88.5 (3.48)	135.0 (5.31)	100.0 (3.94)	300.0 (11.82)
Mass grams	11.3	6.3	17.4	6.3	7.9	7.5	10.4
Price	\$79	\$150	\$88	\$109	\$170	\$140	\$430



100 mm – 300 mm range

* Effective working length

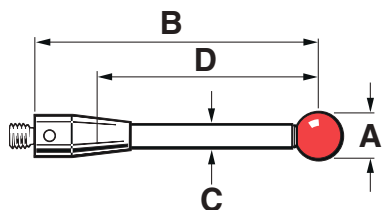
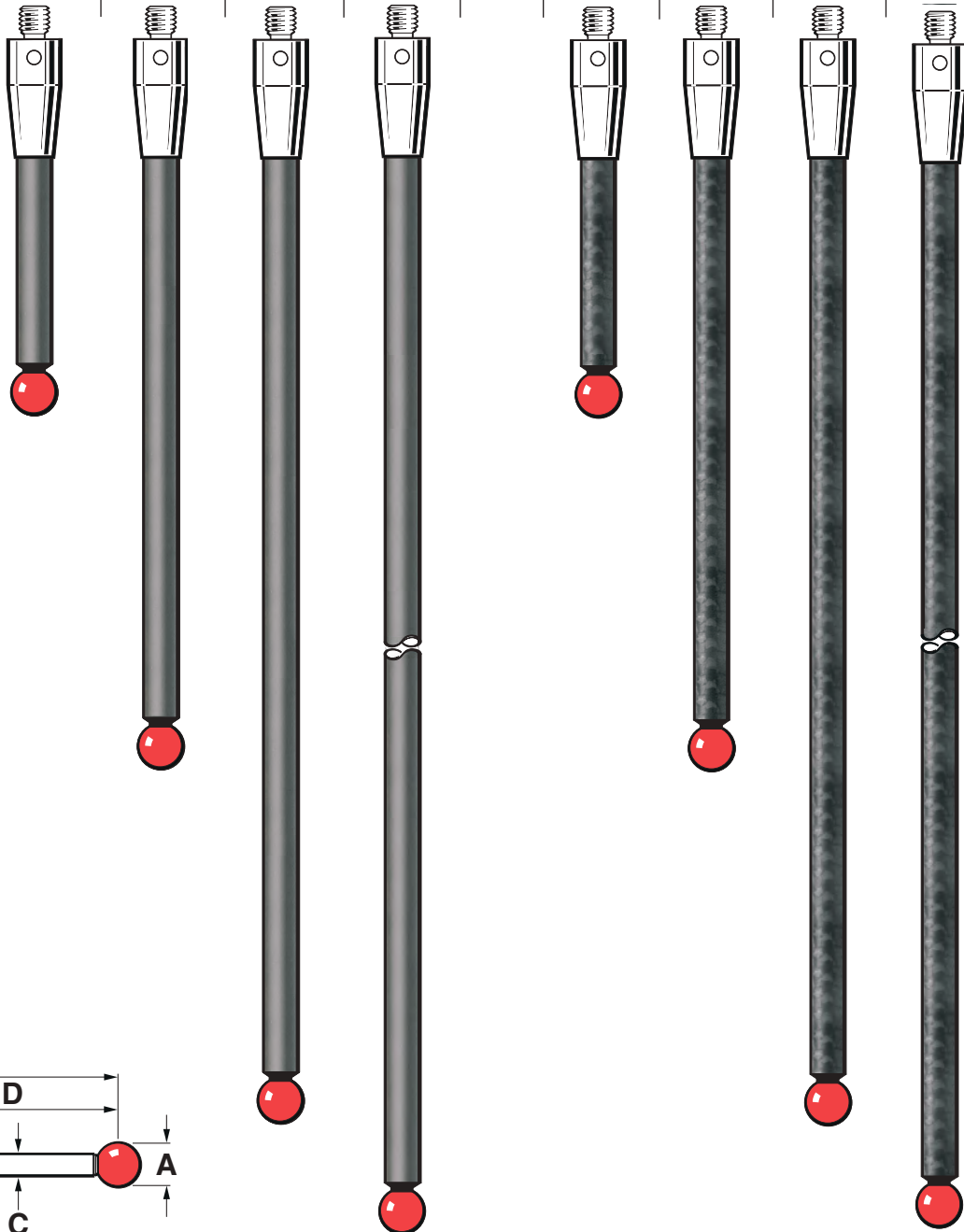
M4 styli

Ruby ball styli (carbon fiber stems)

Recommended for use with OMP400 and RMP600

Ball material	Part number			
Ruby	A-5003-7306	A-5003-6510	A-5003-6511	A-5003-6512
Price	\$128	\$145	\$274	\$289
Silicon nitride	A-5003-5730	A-5003-5731	—	—
Price	\$221	\$240	—	—
Zirconia	A-5003-5744	A-5003-5745	—	—
Price	\$221	\$240	—	—
A Ball dia. mm (in)	6.0 (0.24)	6.0 (0.24)	6.0 (0.24)	6.0 (0.24)
B Length mm (in)	50.0 (1.97)	100.0 (3.94)	150.0 (5.91)	200.0 (7.88)
C Stem dia mm (in)	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)
D EWL* mm (in)	38.5 (1.52)	88.5 (3.48)	138.5 (5.45)	188.5 (7.42)
Mass grams	4.1	6.2	7.5	8.7

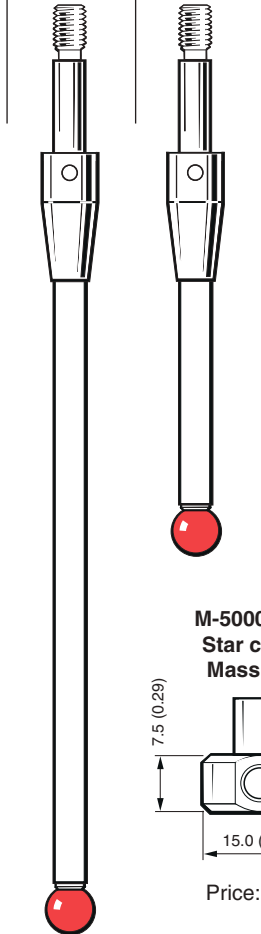
A-5003-1436	A-5003-1358	A-5003-1255	A-5003-1075
\$128	\$145	\$274	\$289
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—
6.0 (0.24)	6.0 (0.24)	6.0 (0.24)	6.0 (0.24)
50.0 (1.97)	100.0 (3.94)	150.0 (5.91)	200.0 (7.88)
4.5 (0.18)	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)
38.5 (1.52)	88.5 (3.58)	138.5 (5.46)	188.5 (7.42)
4.1	6.2	7.5	8.7



* Effective working length

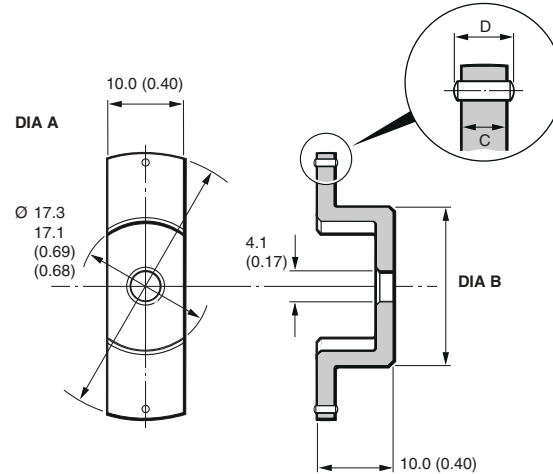
Star styli

Part number	A-5000-6462 Ceramic	A-5000-7098 Ceramic
Ball mm (in.)	6.0 (0.24)	6.0 (0.24)
Length mm (in.)	100.0 (3.94)	50.0 (1.97)
Stem dia. mm (in.)	4.5 (0.18)	4.5 (0.18)
EWL* mm (in.)	88.5 (3.48)	38.5 (1.52)
Mass grams	7.5	6.0
Price	\$94	\$89

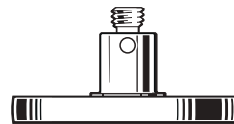


Disk styli

Part number	A-5000-7596	A-5000-7597	A-5000-7598
Diameter A mm (in.)	30.0 (1.19)	35.0 (1.38)	50.0 (1.97)
Diameter B mm (in.)	21.0 (0.83)	21.0 (0.83)	23.0 (0.91)
C mm (in.)	2.2 (0.09)	2.2 (0.09)	3.0 (0.12)
D mm (in.)	3.0 (0.12)	3.0 (0.12)	4.0 (0.16)
Mass grams	8.01	9.57	13.55
Price	\$114	\$109	\$119

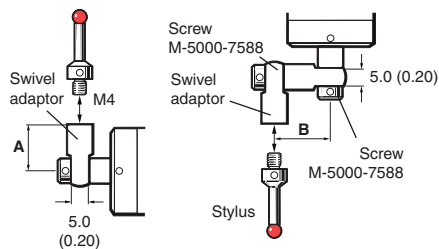


Part number	A-5000-6351 Silver steel
Disk dia. mm (in.)	30.0 (1.18)
Disk depth mm (in.)	3.0 (0.12)
Length mm (in.)	10.0 (0.39)
Rollers	NO
Mass grams	7.9
Price	\$165



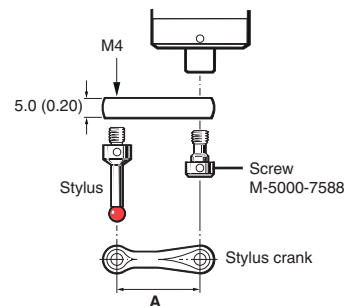
Swivel adaptor

Part number	A-5004-7607	A-5004-7608
Length A mm (in.)	10.0 (0.40)	13.5 (0.54)
Length B mm (in.)	12.5 (0.50)	16.0 (0.63)
Mass grams	2.76	3.70
Price	\$50	\$50



Stylus crank

Part number	A-5004-7605	A-5004-7606
Length A mm (in.)	21.9 (0.86)	27.6 (1.09)
Mass grams	6.07	6.94
Price	\$57	\$57



* Effective working length

M4 styli

Crash protection devices

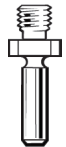
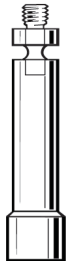
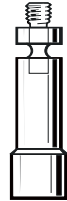
Part number	A-5004-7598	A-5004-7603	A-5004-7604	A-5004-7621	* A-5003-0661	A-5004-7624	A-5004-6723
	Stainless steel	Stainless steel	Stainless steel	Silver steel	Silver steel	Silver steel	Silver steel
Price	\$8	\$5	\$5	\$25	\$25	\$25	\$25
For pack of ten	-	-	-	-	A-5004-1865	A-5004-1867	A-5004-1869
Price	-	-	-	-	\$165	\$165	\$165
Length mm (in.)	8.0 (0.32)	8.0 (0.32)	10.0 (0.40)	12.0 (0.48)	15.2 (0.60)	9.0 (0.36)	16.0 (0.63)
Mass grams	1.8	1.4	1.5	2.7	4.6	1.5	2.1
For use on	LP2	LP2	LP2	MP10	TS27R	HPMA	HPMA
	-	-	-	MP12	-	HPRA	HPRA
	-	-	-	RMP60	-	HPPA	HPPA
	-	-	-	OMP60	-	-	-
	-	-	-	MP3	-	-	-
	-	-	-	MP11	-	-	-



Use P-TL09-0003
to tighten

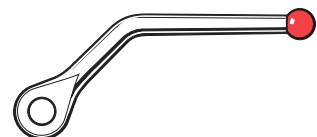
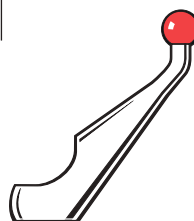
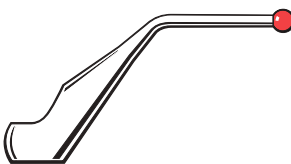
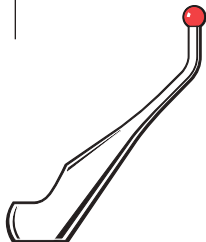
* Please note: If you require the full TS27R break stem kit, please order A-5003-5171.

Part number	A-5004-7616	A-5004-7618	A-5004-7619	A-5004-7620	A-5004-7622
	M3	M3	M3	M4	M4
	Silver steel	Silver steel	Silver steel	Silver steel	Silver steel
Length mm (in.)	13.3 (0.52)	22.3 (0.88)	30.3 (1.19)	13.5 (0.53)	19.0 (0.75)
Mass grams	2.43	3.6	4.5	1.37	2.2
Price	\$25	\$25	\$25	\$25	\$25
For use on	TS20	TS20	TS20	RP1/RP2	TSA



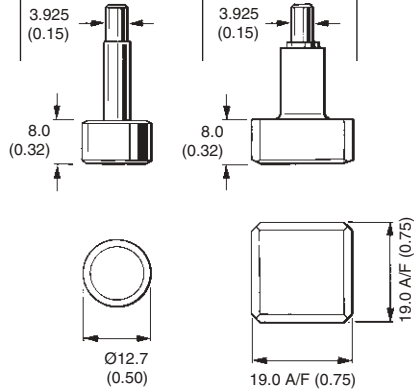
Cranked styli

Part number	A-5000-5302	A-5000-5307	A-5000-6620	A-5000-7580
	M4	M4	M4	M4
	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel
Length mm (in.)	32.0 (1.26)	21.6 (0.85)	27.4 (1.08)	38.8 (1.53)
Mass grams	3.8	3.85	4.7	2.5
For use on	LP2	LP2	LP2	LP2
Price	\$122	\$122	\$122	\$52



TS27R styli – parallel shafted (not M4) – not compatible with TS27 probes

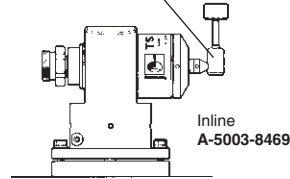
Part number	A-2008-0382 Tungsten carbide	A-2008-0384 Ceramic
Overall length mm (in.)	23.0 (0.91)	22.0 (0.87)
Mass grams	12.1	7.1
Price	\$111	\$260



Stylus conversion kit for TS27R to allow horizontal machining applications (**A-2008-0448**)

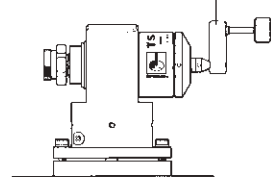
Price: \$120

Stylus holder assembly
A-2008-0389
Price: \$25



Vertical machining applications

Stylus holder
A-5004-7617*
Price: \$95

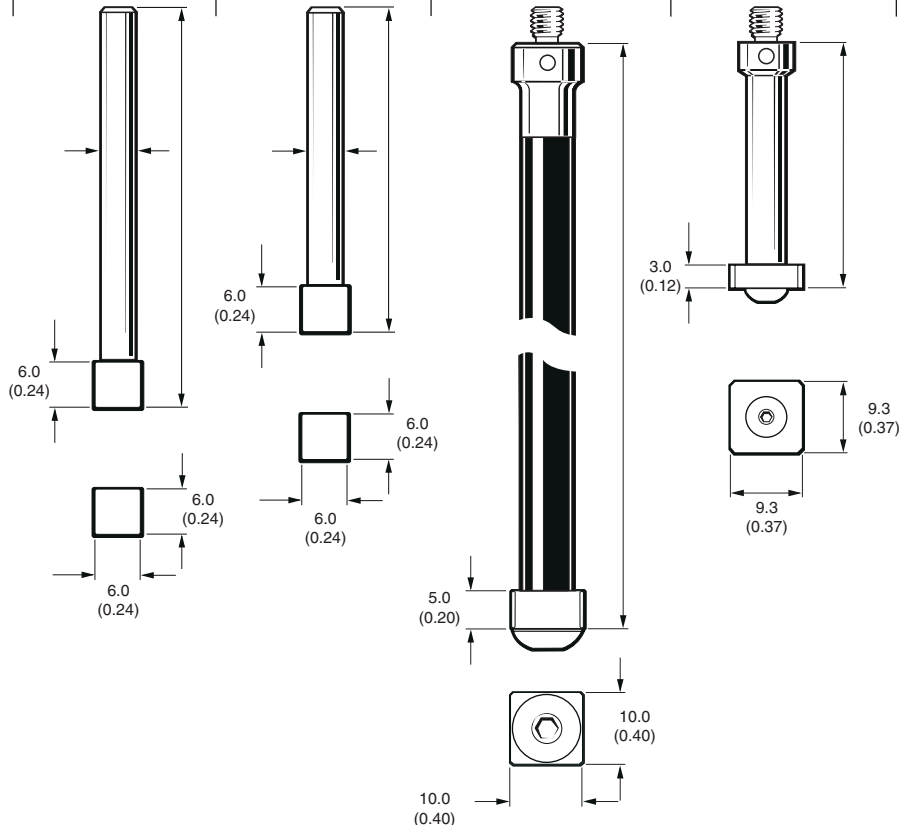


Horizontal machining applications

* Order also requires 2 x P-SC13-0404

Tool datuming styli

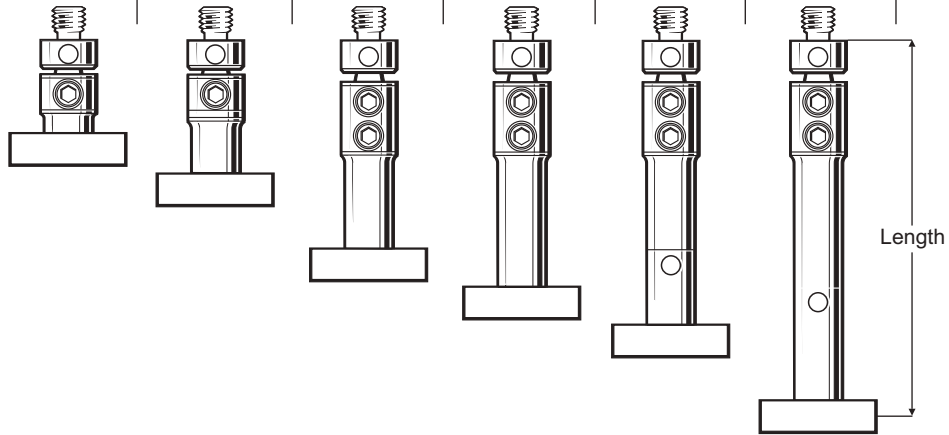
Part number	A-5000-3212 Stainless steel	A-5000-6701 Stainless steel	A-5000-6713 Aluminum	A-5000-6403 Stainless steel
Overall length mm (in.)	53.0 (2.09)	43.0 (1.70)	96.5 (3.80)	32.5 (1.28)
Stem dia. mm (in.)	4.5 (0.18)	4.5 (0.18)	7.5 (0.30)	5.4 (0.22)
Mass grams	4.5	4.3	21.9	11.0
Price	\$107	\$107	\$128	\$107



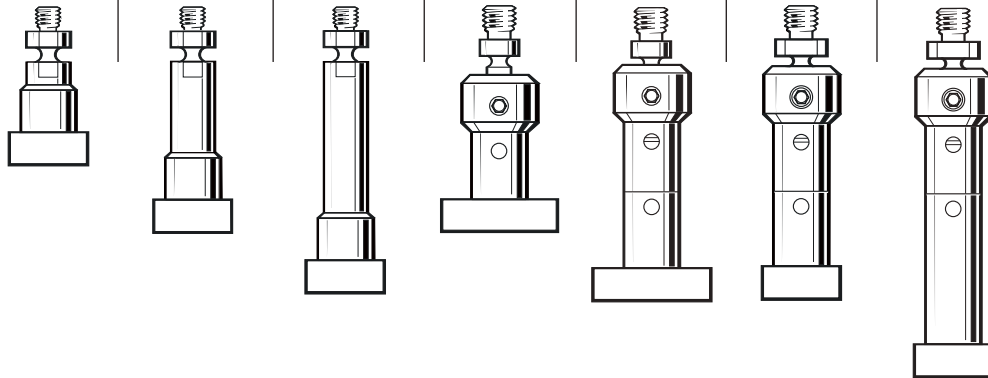
M4 styli

Tool datuming styli – continued

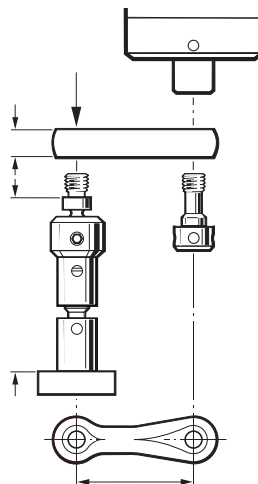
Part number	A-2197-0157 Tungsten steel	A-2197-0158 Tungsten steel	A-2197-0159 Tungsten steel	A-2197-0160 Tungsten steel	A-2197-0161 Tungsten steel	A-2197-0162 Tungsten steel
Length mm (in.)	14.2 (0.56)	19.5 (0.77)	29.5 (1.16)	34.5 (1.36)	39.5 (1.55)	49.5 (1.95)
Mass grams	14.86	16.0	20.0	20.7	21.8	23.5
Price	\$116	\$116	\$116	\$116	\$116	\$116
For use on	HPPA	HPPA	HPPA	HPPA	HPPA	HPPA
	HPMA	HPMA	HPMA	HPMA	HPMA	HPMA
	HPRA	HPRA	HPRA	HPRA	HPRA	HPRA
	RP3	RP3	RP3	RP3	RP3	RP3



Part number	A-2008-0601 M3	A-2008-0602 M3	A-2008-0603 M3	A-2048-2050 M4	A-2048-2051 M4	A-2116-0140 M4	A-2116-0141 M4
	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel	Tungsten steel
Length mm (in.)	15.4 (0.61)	24.0 (0.96)	32.4 (1.27)	23.2 (0.91)	32.0 (1.26)	32.0 (1.26)	42.0 (1.65)
Mass grams	9.1	8.0	8.95	18.14	20.64	13.56	16.05
Price	\$116	\$116	\$116	\$137	\$137	\$109	\$127
For use on	TS20	TS20	TS20	HPA (M6 MTG)	HPA (M6 MTG)	TSA	TSA



Part number	A-2116-0142
Length mm (in.)	30.3 (0.40)
Mass grams	22.6
Price	\$158
For use on	TSA



Stylus extensions

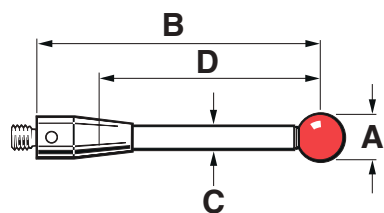
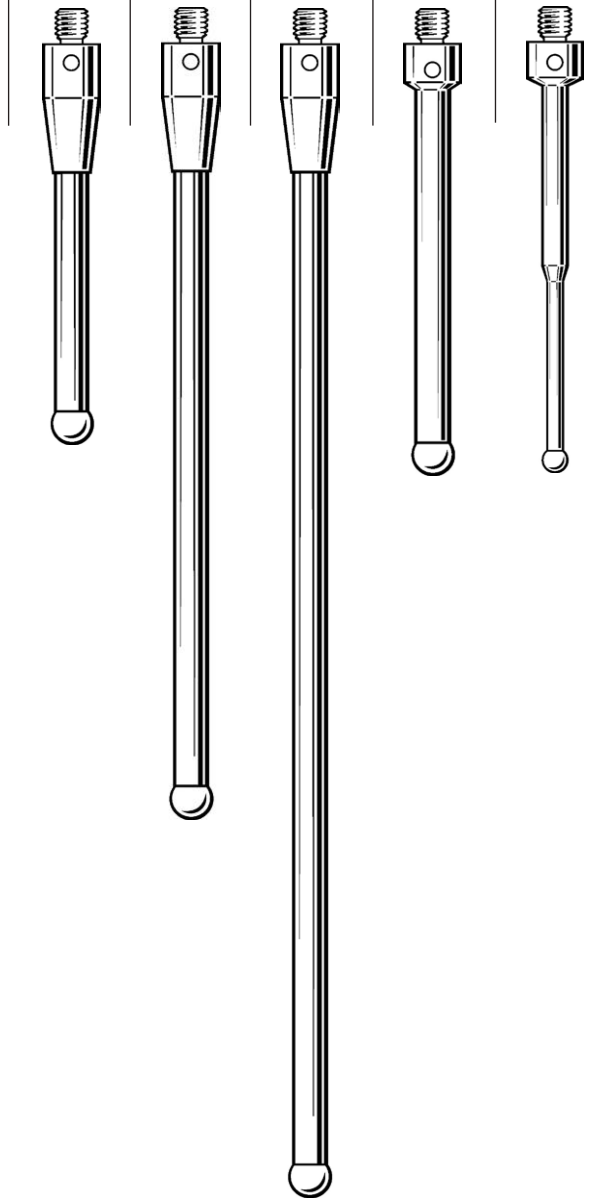
Part number	A-5004-7599 Stainless steel	A-5004-7600 Stainless steel	A-5004-7601 Stainless steel	A-5004-7602 Stainless steel	A-5000-7754 Ceramic	A-5000-7755 Ceramic	A-5000-7727 Ceramic	A-5003-0587 Ceramic
Length mm (in.)	10.0 (0.40)	15.0 (0.60)	20.0 (0.79)	30.0 (1.19)	30.0 (1.19)	50.0 (1.97)	100.0 (3.94)	200.0 (7.87)
Stem dia. mm (in.)	7.0 (0.28)	7.0 (0.28)	7.0 (0.28)	7.0 (0.28)	7.4 (0.29)	7.4 (0.29)	7.4 (0.29)	7.4 (0.29)
Mass grams	2.4	3.7	4.8	7.4	5.1	6.7	10.6	18.4
Price	\$36	\$36	\$36	\$36	\$51	\$60	\$154	\$165



M4 styli

Tungsten carbide styli (stainless steel stems)

Part number	A-5000-7670	A-5000-7671	A-5000-7672	A-5000-9685	A-5000-9697
A	Ball dia. mm (in.)	5.0 (0.20)	5.0 (0.20)	5.0 (0.20)	3.0 (0.12)
B	Length mm (in.)	50.0 (1.97)	100.0 (3.94)	150.0 (5.91)	54.0 (2.12)
C	Stem dia. mm (in.)	4.5 (0.18)	4.5 (0.18)	4.5 (0.18)	3.9 (0.15)
D	EWL* mm (in.)	35.0 (1.38)	85.0 (3.35)	135.0 (5.31)	25.0 (0.99)
	Mass grams	6.2	11.9	18.2	6.9
	Price	\$70	\$79	\$88	\$159
					\$147



* Effective working length

Walter styli

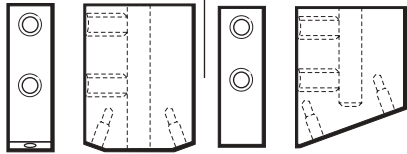
M1.4 thread styli

Part number	A-5003-3814	A-5003-3045	A-5003-3042	A-5000-9860	A-5003-1699
	M1.4	M1.4	M1.4	M1.4	M1.4
Stem material	Tungsten carbide	Stainless steel	Tungsten carbide	Tungsten carbide	Stainless steel
Ball material	Tungsten carbide	Tungsten carbide	Ruby	Tungsten carbide	Tungsten carbide
A Ball dia. mm (in.)	0.5 (0.02)	1.0 (0.04)	0.5 (0.02)	1.0 (0.04)	0.6 (0.02)
B Length mm (in.)	12.5 (0.49)	25.0 (0.98)	12.5 (0.49)	13.0 (0.51)	12.75 (0.50)
D EWL* mm (in.)	1.5 (0.059)	1.5 (0.059)	3.0 (0.12)	1.0 (0.04)	1.0 (0.04)
Mass grams	0.2	1.1	0.19	0.22	0.41
Price	\$259	\$172	\$259	\$129	\$259



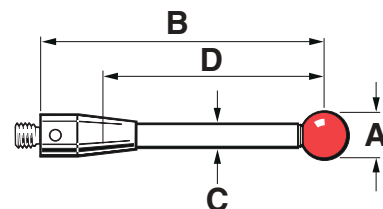
Adaptors

Part number	A-5003-1448	A-5000-9724
D3 MTG	2 x M1.4 adaptor 20°	M1.4 adaptor 20°
Mass grams	9.73	8.31
Price	\$172	\$172



Crash protection device

Part number	A-5004-7615
Length mm (in.)	16.0 (0.63)
Mass grams	2
Price	\$60



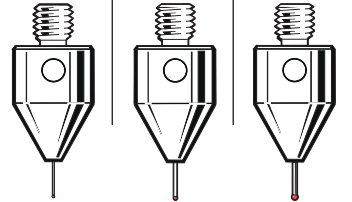
* Effective working length

M5 threaded stylus range

Ruby micro ball styli (tungsten carbide stems)

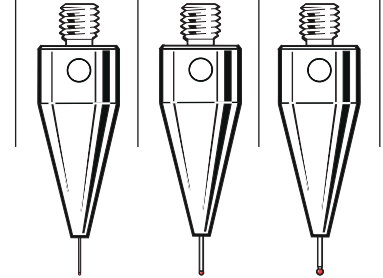
Part number	A-5003-5201	A-5003-5202	A-5003-5203	
A	Ball dia. mm (in.)	0.3 (0.012)	0.5 (0.02)	0.7 (0.03)
B	Length mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
C	Stem dia. mm (in.)	0.2 (0.01)	0.4 (0.02)	0.5 (0.02)
D	EWL* mm (in.)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
	Mass grams	6.5	6.5	6.5
	Price	\$92	\$79	\$79

20 mm range



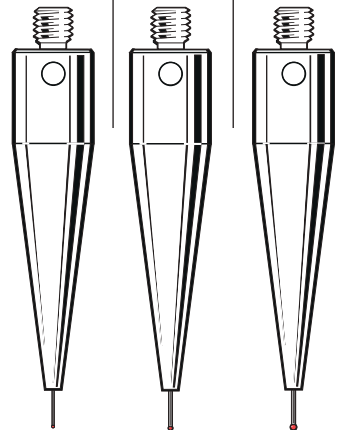
A-5003-5211	A-5003-5212	A-5003-5213
0.3 (0.012)	0.5 (0.02)	0.7 (0.03)
30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
0.2 (0.01)	0.4 (0.02)	0.5 (0.02)
3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
8.95	8.95	8.98
\$96	\$86	\$86

30 mm range



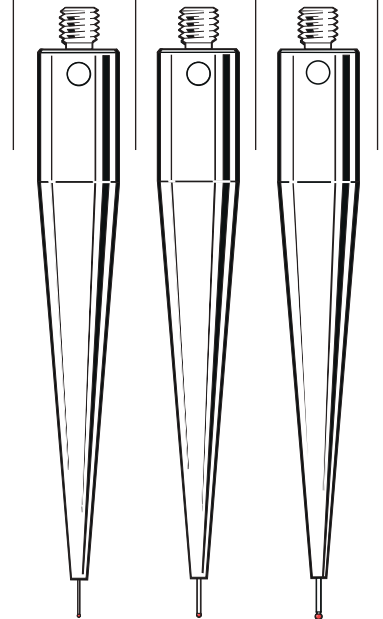
Part number	A-5003-5225	A-5003-5226	A-5003-5227	
A	Ball dia. mm (in.)	0.3 (0.012)	0.5 (0.02)	0.7 (0.03)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	0.2 (0.01)	0.4 (0.02)	0.5 (0.02)
D	EWL* mm (in.)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
	Mass grams	15.79	15.79	15.79
	Price	\$125	\$115	\$115

50 mm range



A-5003-5240	A-5003-5241	A-5003-5242
0.3 (0.012)	0.5 (0.02)	0.7 (0.03)
75.0 (2.96)	75.0 (2.96)	75.0 (2.96)
0.2 (0.01)	0.4 (0.02)	0.5 (0.02)
3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
23.84	23.84	23.84
\$134	\$125	\$115

75 mm range

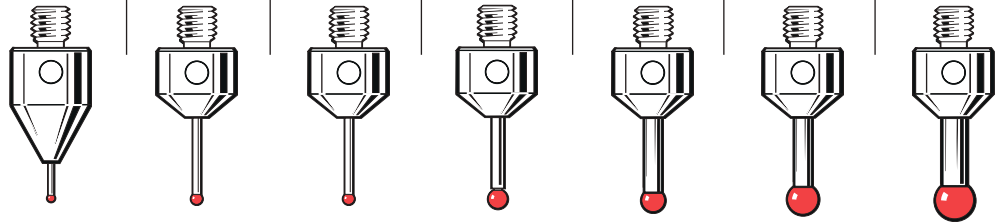


* Effective working length

Ruby ball styli (tungsten carbide stems)

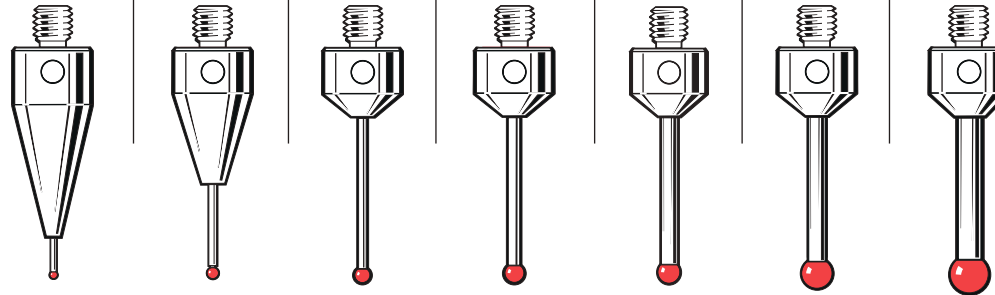
Ball material	Part number						
Ruby	A-5003-5204	A-5003-5205	A-5003-5206	A-5003-5207	A-5003-5208	A-5003-5209	A-5003-5210
Price	\$71	\$61	\$61	\$61	\$61	\$67	\$67
Silicon nitride	–	–	A-5003-5732	–	–	A-5003-5733	–
Price	–	–	\$86	–	–	\$94	–
Zirconia	–	–	A-5003-5746	–	–	A-5003-5747	–
Price	–	–	\$86	–	–	\$94	–
A Ball dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B Length mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
C Stem dia. mm (in.)	0.7 (0.03)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	3.0 (0.12)
D EWL* mm (in.)	5.0 (0.20)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.9 (0.47)	11.5 (0.45)
Mass grams	6.52	4.68	4.70	4.84	5.12	5.19	6.06

20 mm range



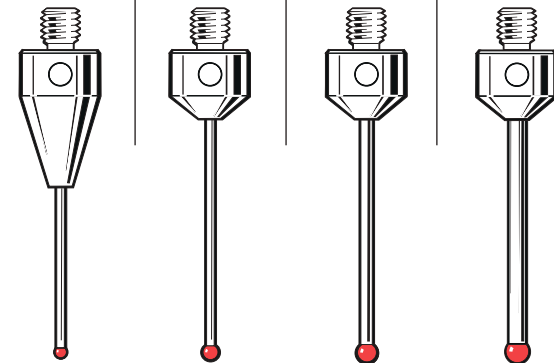
Part number	A-5003-5214	A-5003-5215	A-5003-5216	A-5003-5217	A-5003-5218	A-5003-5219	A-5003-5220
A Ball dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)	5.0 (0.20)
B Length mm (in.)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)	30.0 (1.19)
C Stem dia. mm (in.)	0.7 (0.03)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	3.0 (0.12)
D EWL* mm (in.)	5.0 (0.20)	12.0 (0.48)	21.0 (0.83)	21.0 (0.83)	21.0 (0.83)	21.9 (0.86)	21.5 (0.85)
Mass grams	9.01	7.28	4.81	5.14	5.58	5.64	7.10
Price	\$77	\$46	\$67	\$67	\$67	\$72	\$77

30 mm range



Part number	A-5003-5221	A-5003-5222	A-5003-5223	A-5003-5224
A Ball dia. mm (in.)	1.5 (0.06)	2.0 (0.08)	2.5 (0.10)	3.0 (0.12)
B Length mm (in.)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)	40.0 (1.58)
C Stem dia. mm (in.)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)
D EWL* mm (in.)	22.0 (0.87)	31.0 (1.23)	31.0 (1.23)	31.0 (1.23)
Mass grams	7.39	4.93	5.40	6.04
Price	\$96	\$86	\$86	\$86

40 mm range



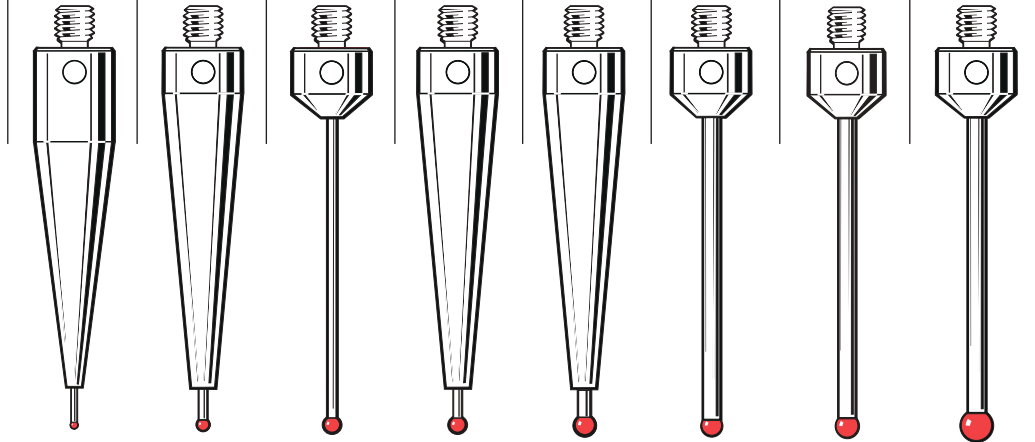
* Effective working length

M5 styli

Ruby ball styli (< 5 mm ball diameter) (tungsten carbide stems)

Part number	A-5003-5228	A-5003-5229	A-5003-5230	A-5003-5231	A-5003-5233	A-5003-5232	A-5003-5234	A-5003-5235	
A	Ball dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.5 (0.10)	2.5 (0.10)	3.0 (0.12)	4.0 (0.16)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	0.7 (0.03)	1.0 (0.04)	1.0 (0.04)	1.0 (0.04)	1.5 (0.06)	2.0 (0.08)	2.0 (0.08)	2.0 (0.08)
D	EWL* mm (in.)	5.0 (0.20)	5.0 (0.20)	41.0 (1.62)	5.0 (0.20)	5.0 (0.20)	41.0 (1.62)	41.0 (1.62)	41.9 (1.65)
	Mass grams	15.81	14.82	5.05	14.85	14.94	6.48	6.50	6.55
	Price	\$109	\$105	\$96	\$77	\$77	\$86	\$86	\$86

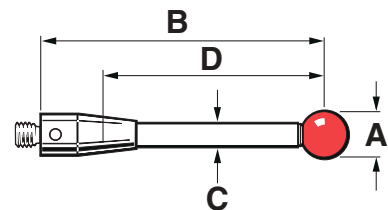
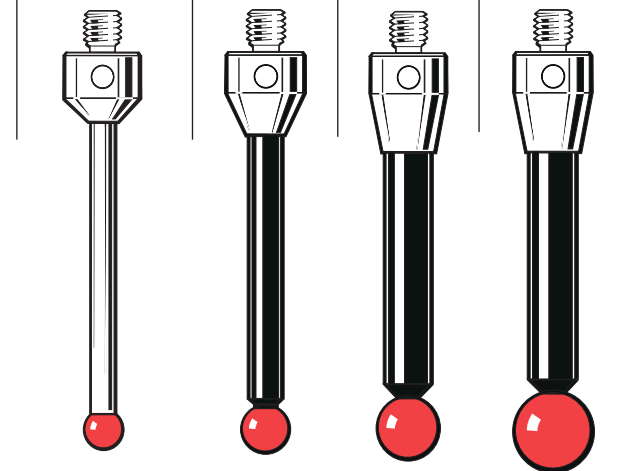
50 mm range



Ruby ball styli (≥ 5 mm ball diameter)

Ball material	Part number				
Ruby	A-5003-5236	A-5003-5237	A-5003-5238	A-5003-5239	
Price	\$86	\$96	\$105	\$115	
Silicon nitride	–	A-5003-5734	–	–	
Price	–	\$134	–	–	
Zirconia	–	A-5003-5748	–	–	
Price	–	\$134	–	–	
	Tungsten carbide	Carbon fiber	Carbon fiber	Carbon fiber	
A	Ball dia. mm (in.)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)
B	Length mm (in.)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
C	Stem dia. mm (in.)	3.0 (0.12)	4.0 (0.16)	6.0 (0.24)	6.0 (0.24)
D	EWL* mm (in.)	41.5 (1.63)	39.5 (1.56)	39.5 (1.56)	44.5 (1.75)
	Mass grams	9.19	6.10	7.96	8.91

50 mm range

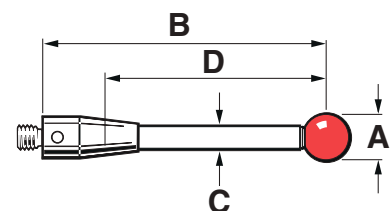
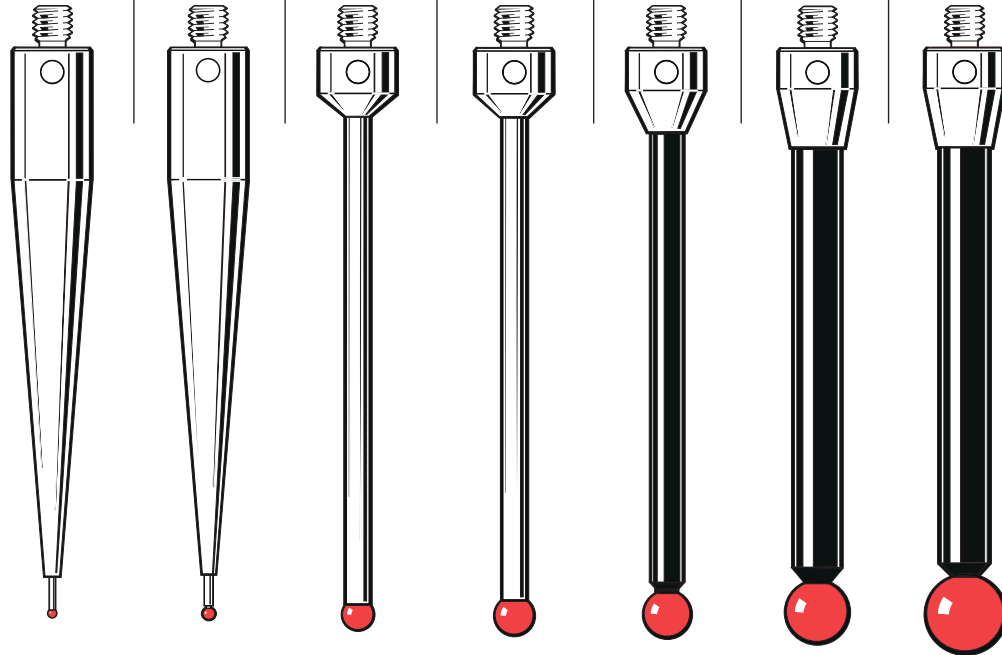


* Effective working length

Ruby ball styli (1 mm – 10 mm ball diameter)

Part number	A-5003-5243 Tungsten carbide	A-5003-5244 Tungsten carbide	A-5003-5248 Tungsten carbide	A-5003-5249 Tungsten carbide	A-5003-5250 Carbon fiber	A-5003-5251 Carbon fiber	A-5003-5252 Carbon fiber
A Ball dia. mm (in.)	1.0 (0.04)	1.5 (0.06)	4.0 (0.16)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)
B Length mm (in.)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)	75.0 (2.96)
C Stem dia. mm (in.)	0.7 (0.03)	1.0 (0.04)	3.0 (0.12)	3.0 (0.12)	4.0 (0.16)	6.0 (0.24)	6.0 (0.24)
D EWL* mm (in.)	5.0 (0.20)	5.0 (0.20)	66.0 (2.60)	66.0 (2.60)	65.1 (2.56)	64.5 (2.54)	69.5 (2.74)
Mass grams	23.86	23.90	11.61	11.80	6.59	9.06	10.01
Price	\$115	\$105	\$96	\$105	\$125	\$115	\$125

75 mm range



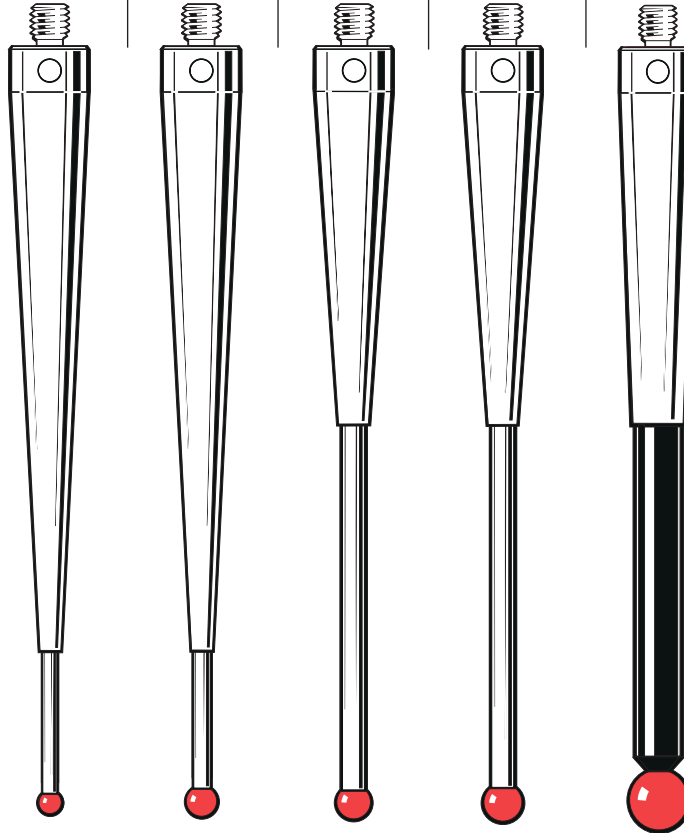
* Effective working length

M5 styli

Ruby ball styli (≤ 50 mm EWL)

Part number	A-5003-5253 Tungsten carbide	A-5003-5255 Tungsten carbide	A-5003-5256 Tungsten carbide	A-5003-5257 Tungsten carbide	A-5003-5261 Carbon fiber	
A	Ball dia. mm (in.)	3.0 (0.12)	4.0 (0.16)	4.0 (0.16)	5.0 (0.20)	8.0 (0.32)
B	Length mm (in.)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)
C	Stem dia. mm (in.)	2.0 (0.08)	2.0 (0.08)	3.0 (0.12)	3.0 (0.12)	6.0 (0.24)
D	EWL* mm (in.)	20.0 (0.79)	30.5 (1.20)	50.0 (1.97)	50.0 (1.97)	50.0 (1.97)
	Mass grams	25.71	25.75	23.07	23.31	22.97
	Price	\$125	\$125	\$144	\$125	\$144

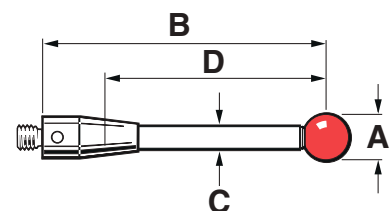
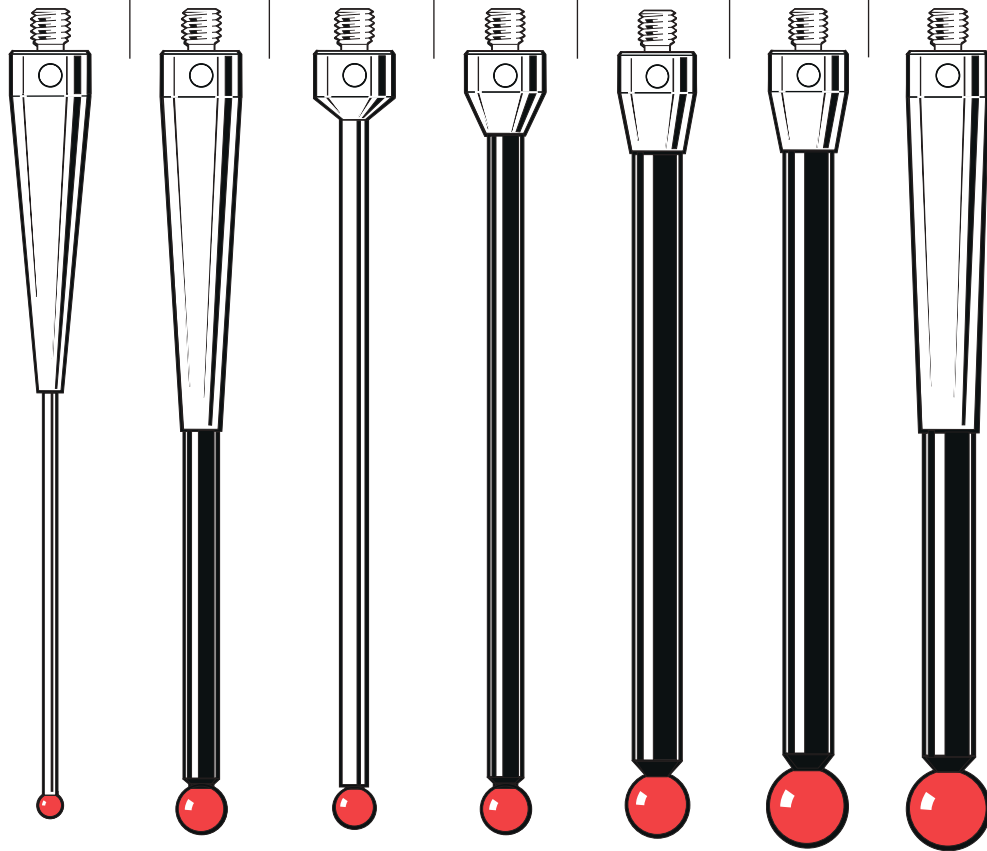
100 mm range



Ruby ball styli (> 50 mm EWL)

Ball material		Part number						
Ruby		A-5003-5254	A-5003-5259	A-5003-5258	A-5003-5260	A-5003-5262	A-5003-5264	A-5003-5263
Price		\$144	\$134	\$144	\$153	\$163	\$173	\$153
Silicon nitride		–	A-5003-5735	–	–	–	–	–
Price		–	\$188	–	–	–	–	–
Zirconia		–	A-5003-5749	–	–	–	–	–
Price		–	\$188	–	–	–	–	–
		Tungsten carbide	Carbon fiber	Tungsten carbide	Carbon fiber	Carbon fiber	Carbon fiber	Carbon fiber
A	Ball dia. mm (in.)	3.0 (0.12)	6.0 (0.24)	5.0 (0.20)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)	10.0 (0.40)
B	Length mm (in.)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)	100.0 (3.94)
C	Stem dia. mm (in.)	1.5 (0.06)	4.0 (0.16)	3.0 (0.12)	4.0 (0.16)	6.0 (0.24)	6.0 (0.24)	6.0 (0.24)
D	EWL* mm (in.)	55.0 (2.17)	58.9 (2.32)	91.0 (3.59)	90.1 (3.55)	89.5 (3.52)	94.5 (3.72)	95.5 (3.76)
	Mass grams	16.30	19.66	14.40	7.08	10.17	11.11	23.91

100 mm range



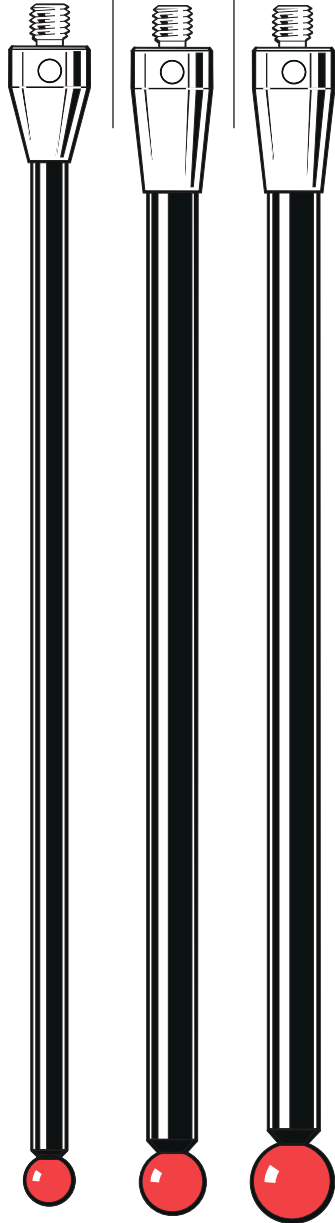
* Effective working length

M5 styli

Ruby ball styli (carbon fiber stems)

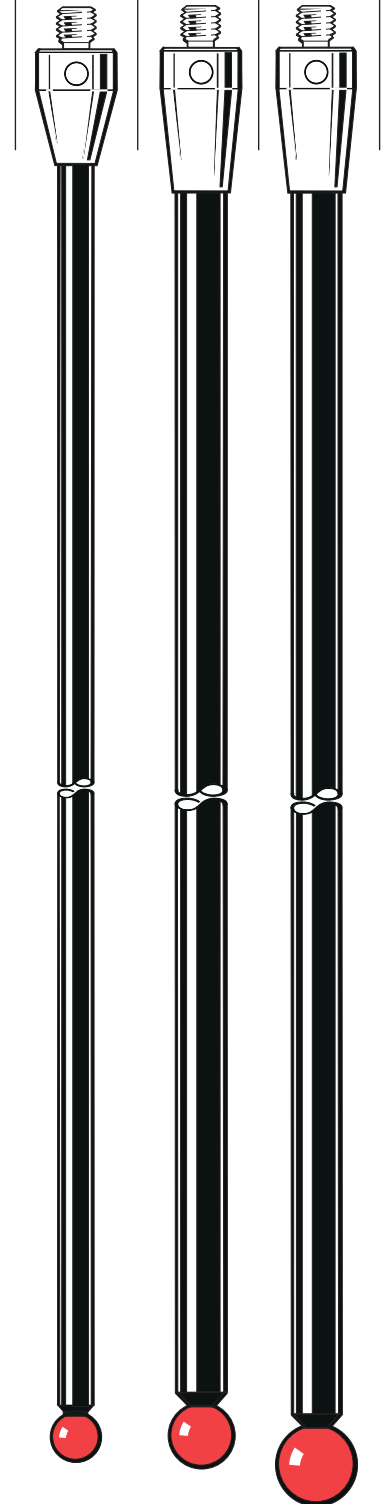
Part number	A-5003-5265	A-5003-5266	A-5003-5267	
A	Ball dia. mm (in.)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)
B	Length mm (in.)	150.0 (5.91)	150.0 (5.91)	150.0 (5.91)
C	Stem dia. mm (in.)	4.0 (0.16)	6.0 (0.24)	6.0 (0.24)
D	EWL* mm (in.)	137.0 (5.39)	135.0 (5.31)	144.5 (5.69)
	Mass grams	9.09	13.71	14.66
	Price	\$230	\$249	\$269

150 mm range



A-5003-5268	A-5003-5269	A-5003-5270	
Ball dia. mm (in.)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)
Length mm (in.)	200.0 (7.88)	200.0 (7.88)	200.0 (7.88)
Stem dia. mm (in.)	4.0 (0.16)	6.0 (0.24)	6.0 (0.24)
EWL* mm (in.)	187.0 (7.36)	180.0 (7.09)	194.5 (7.66)
Mass grams	10.07	15.92	16.87
Price	\$326	\$345	\$364

200 mm range

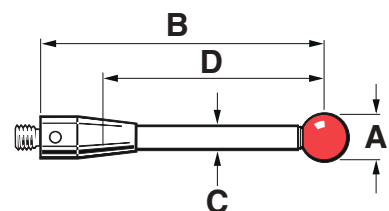
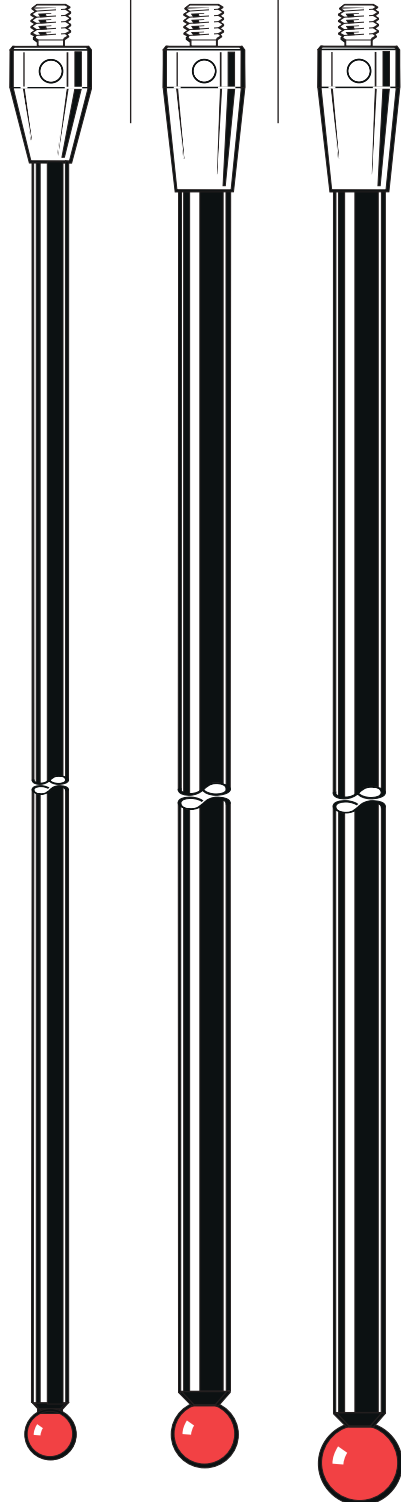


* Effective working length

Ruby ball styli (carbon fiber stems)

Part number	A-5003-5271	A-5003-5272	A-5003-5273	
A	Ball dia. mm (in.)	6.0 (0.24)	8.0 (0.32)	10.0 (0.40)
B	Length mm (in.)	300.0 (11.82)	300.0 (11.82)	300.0 (11.82)
C	Stem dia. mm (in.)	4.0 (0.16)	6.0 (0.24)	6.0 (0.24)
D	EWL* mm (in.)	287.0 (11.30)	280.0 (11.03)	294.5 (11.59)
	Mass grams	12.02	20.33	21.28
	Price	\$422	\$441	\$460

300 mm range

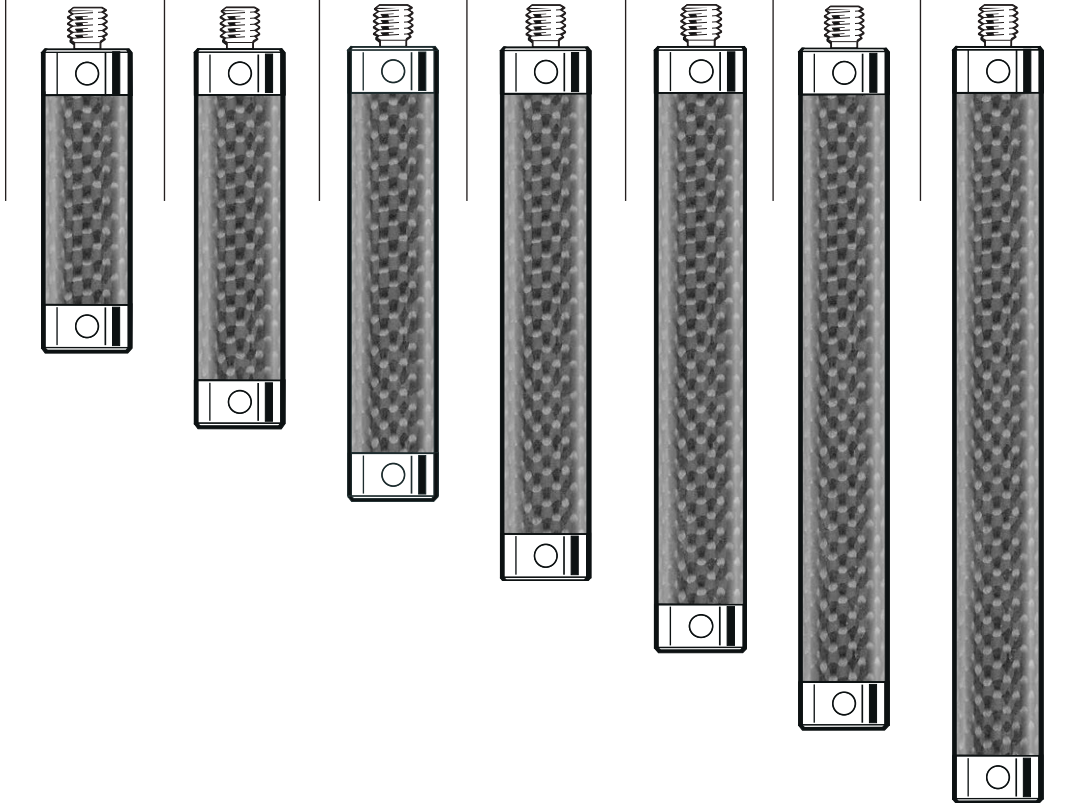


* Effective working length

M5 styli

Stylus extensions – thermo stable carbon fiber stems, titanium ends

Part number	A-5555-0647	A-5555-0648	A-5555-0649	A-5555-0623	A-5555-0650	A-5555-0651	A-5555-0652
Length mm (in.)	40.0 (1.58)	50.0 (1.97)	60.0 (2.37)	70.0 (2.76)	80.0 (3.15)	90.0 (3.55)	100.0 (3.94)
Stem dia. mm (in.)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)
Mass grams	7.6	8.3	9.0	9.7	10.4	11.1	11.8
Price	\$157**	\$159**	\$162**	\$166**	\$170**	\$182**	\$187**



M5 extension tools

A-5003-6134

For M5 threaded extensions with
11 mm (0.44 mm stem diameter

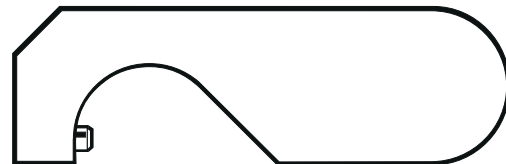
Price: \$21



A-5003-6135

For M5 threaded extensions with
20 mm (0.79 in) stem diameter

Price: \$21

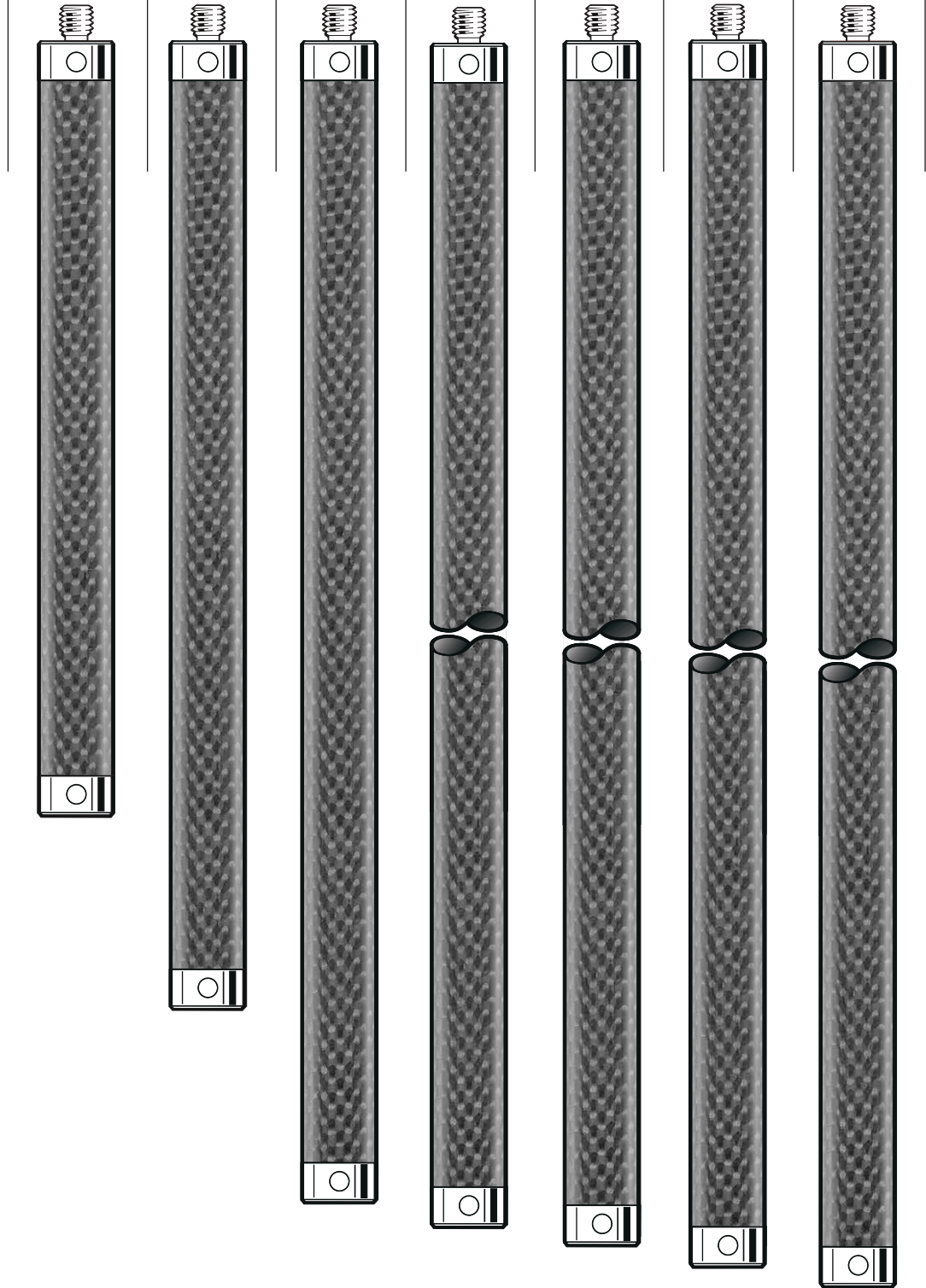


Note: These tools are designed to fit stylus extensions for Renishaw probes without causing any internal damage.

** Special

Stylus extensions – thermo stable carbon fiber stems, titanium ends

Part number	A-5555-0425	A-5555-0424	A-5555-0653	A-5555-0654	A-5555-0655	A-5555-0642	A-5555-0656
Length mm (in.)	120.0 (4.73)	150.0 (5.91)	180.0 (7.09)	200.0 (7.88)	250.0 (9.85)	300.0 (11.82)	400.0 (15.76)
Stem dia. mm (in.)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)
Mass grams	13.2	15.4	17.5	18.9	22.4	25.9	33.0
Price	\$191**	\$201**	\$208**	\$221**	\$238**	\$280**	\$333**

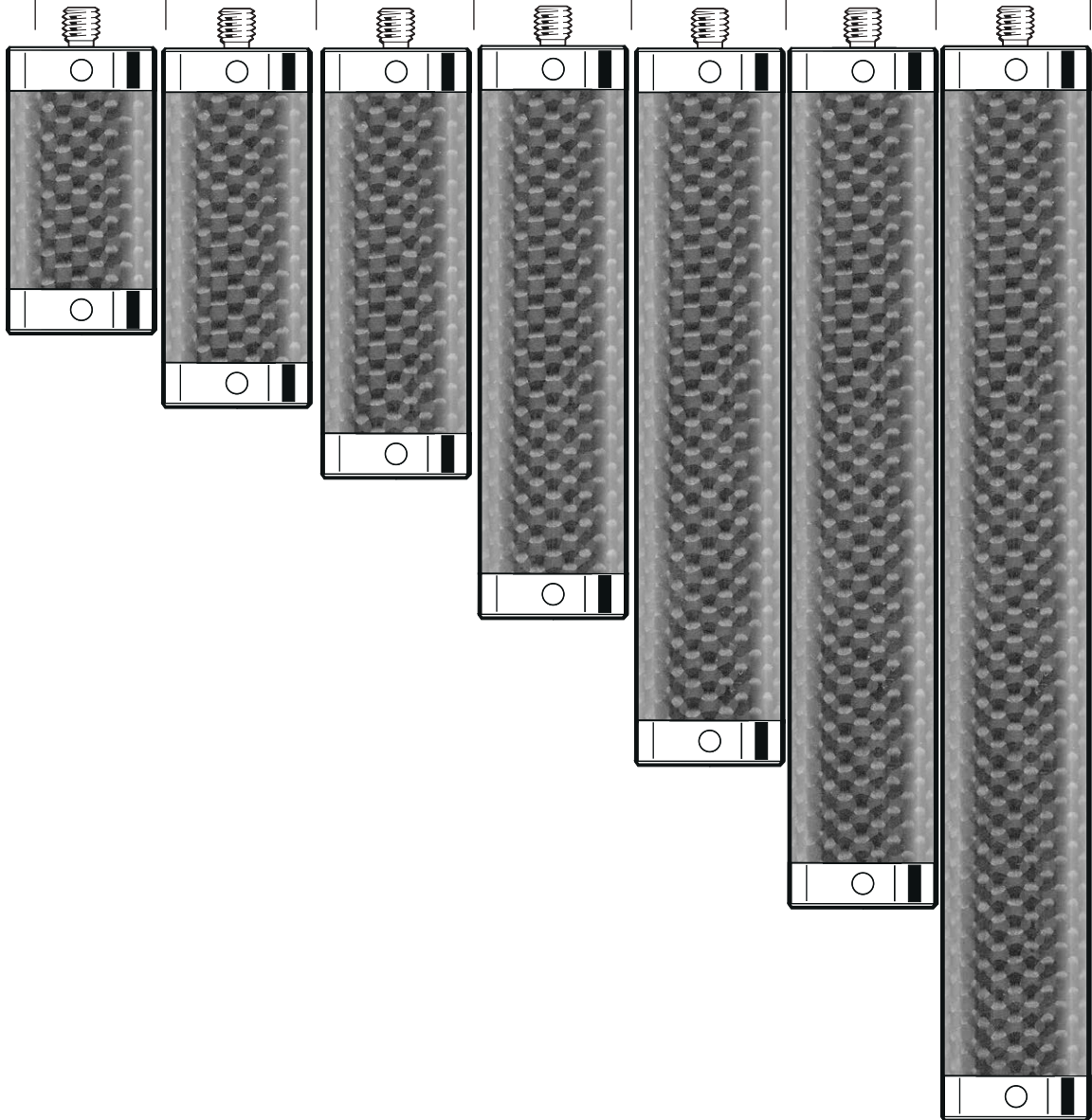


** Special

M5 styli

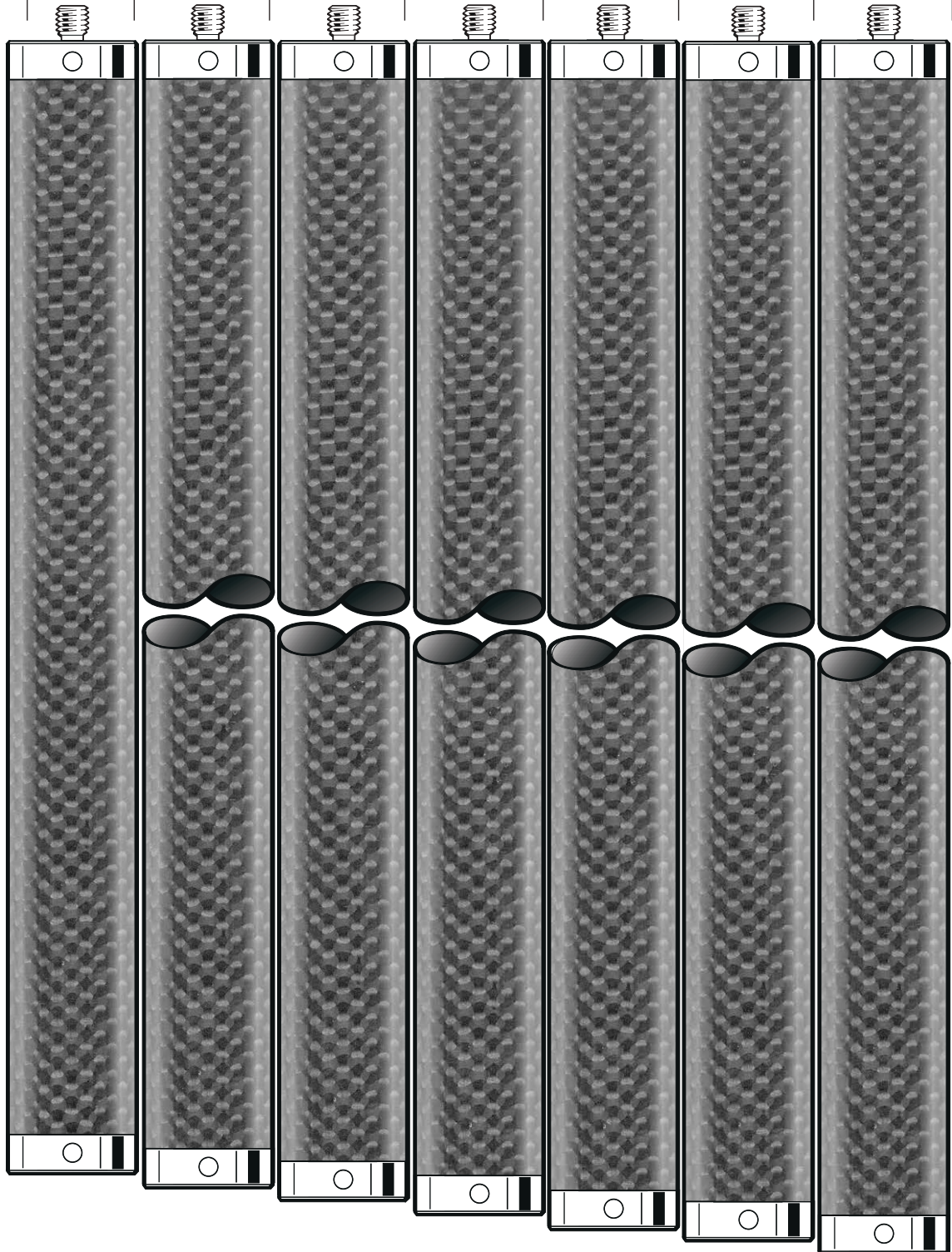
Stylus extensions – thermo stable carbon fiber stems, titanium ends

Part number	A-5555-0620	A-5555-0657	A-5555-0658	A-5555-0621	A-5555-0659	A-5555-0660	A-5555-0661
Length mm (in.)	40.0 (1.58)	50.0 (1.97)	60.0 (2.37)	80.0 (3.15)	100.0 (3.94)	120.0 (4.73)	150.0 (5.91)
Stem dia. mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
Mass grams	23.8	25.1	26.5	29.3	32.1	34.9	39.0
Price	\$154**	\$159**	\$162**	\$170**	\$192**	\$203**	\$214**



Stylus extensions – thermo stable carbon fiber stems, titanium ends

Part number	A-5555-0662	A-5555-0663	A-5555-0427	A-5555-0664	A-5555-0665	A-5555-0667	A-5555-0668
Length mm (in.)	180.0 (7.09)	200.0 (7.88)	250.0 (9.85)	300.0 (11.82)	400.0 (15.76)	500.0 (19.70)	600.0 (23.64)
Stem dia. mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
Mass grams	43.2	46.0	52.9	59.9	73.8	87.7	101.5
Price	\$229**	\$238**	\$266**	\$298**	\$349**	\$420**	\$280**



** Special

M5 styli

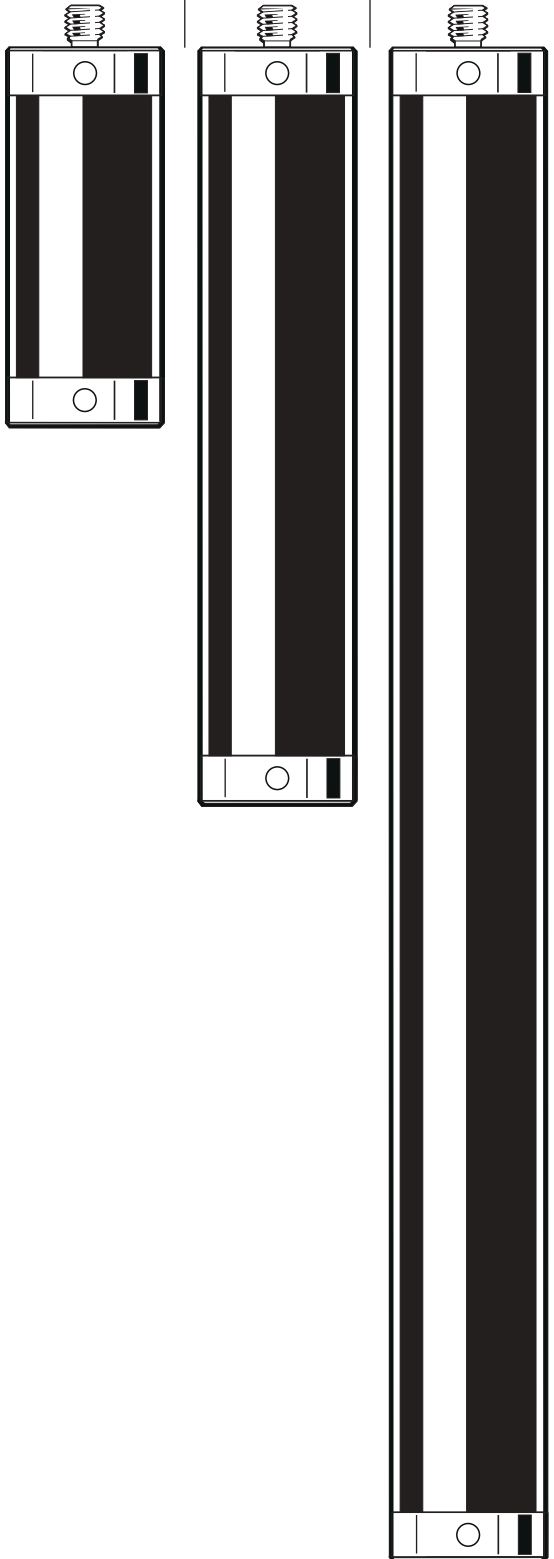
Stylus extensions – stainless steel

Part number	A-5555-0142	A-5555-0140	A-5555-0669	A-5555-0670	A-5555-0136
Length mm (in.)	10.0 (0.40)	20.0 (0.79)	30.0 (1.19)	50.0 (1.97)	100.0 (3.94)
Stem dia. mm (in.)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)	11.0 (0.44)
Mass grams	6.0	13.0	20.0	34.8	73.0
Price	\$25**	\$25**	\$25**	\$27**	\$29**



Stylus extensions – aluminum

Part number	A-5555-0671	A-5555-0127	A-5555-0125
Length mm (in.)	50.0 (1.97)	100.0 (3.94)	200.0 (7.88)
Stem dia. mm (in.)	20.0 (0.79)	20.0 (0.79)	20.0 (0.79)
Mass grams	47.2	50.0	85.0
Price	\$71**	\$73**	\$92**

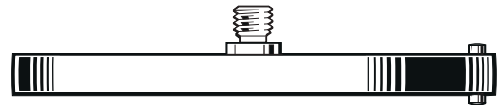
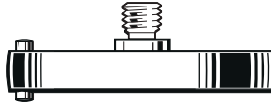
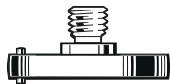
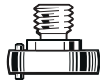


** Special

M5 styli

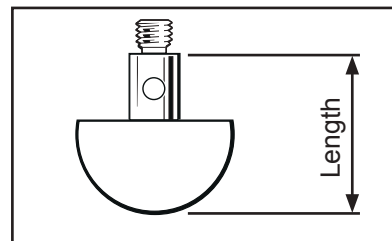
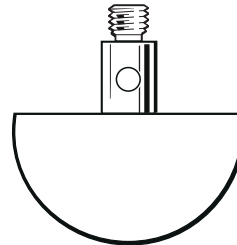
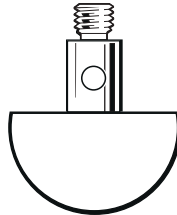
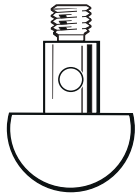
Disk styli

Part number	A-5003-5288 Silver steel	A-5003-5289 Silver steel	A-5003-5290 Silver steel	A-5003-5291 Silver steel
Disk diameter mm (in.)	12.0 (0.48)	21.0 (0.83)	35.0 (1.38)	63.5 (2.51)
Disk depth mm (in.)	3.0 (0.12)	3.0 (0.12)	5.0 (0.20)	5.0 (0.20)
Roller depth mm (in.)	5.0 (0.20)	5.0 (0.20)	8.0 (0.32)	8.0 (0.32)
Mass grams	2.52	5.23	14.00	51.00
Price	\$125	\$134	\$144	\$163



Hemispherical styli

Part number	A-5003-5275 Ceramic	A-5003-5276 Ceramic	A-5003-5277 Ceramic
Ball diameter mm (in.)	16.0 (0.63)	22.0 (0.87)	30.0 (1.19)
Length mm (in.)	19.5 (0.77)	20.5 (0.81)	24.5 (0.96)
Mass grams	7.0	14.0	19.7
Price	\$225	\$225	\$300

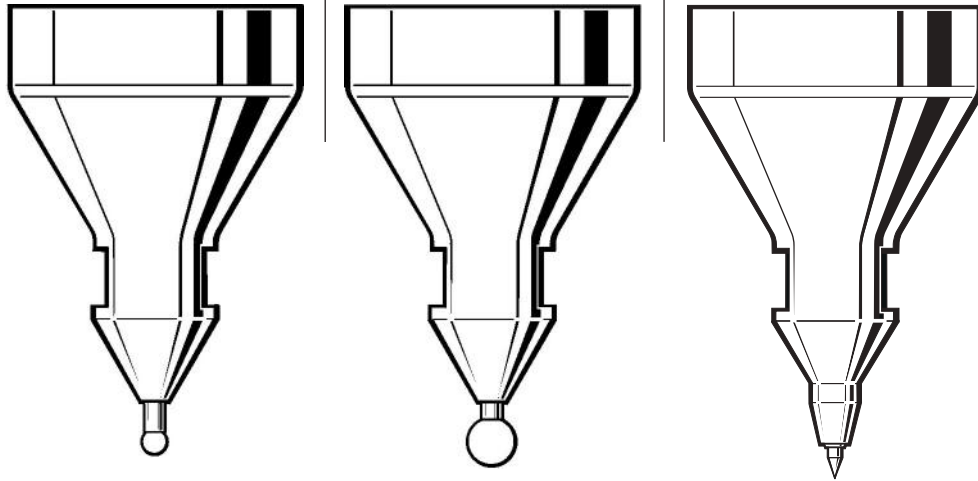


Styli for FARO® arms

These styli have been designed especially for use on FARO® portable arm CMMs. Their robust design and construction utilizes Grade 5 Zirconia balls that have a high fracture toughness. The balls are bonded to the high strength tungsten carbide stem with impact resistant adhesive, and specialist construction techniques have been incorporated to ensure that the joint between the body and stem is extremely rigid and virtually indestructible.

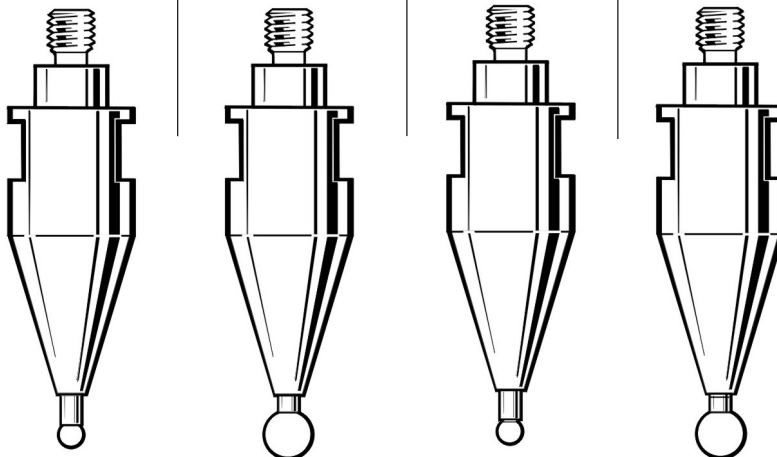
1¼–20 UN thread styli

Part number	A-5003-7673	A-5003-7674	A-5003-7675
Ball dia (mm)	3	6	N/A
Length (mm)	57	57	57
Price	\$325	\$325	\$325



M6 styli

Part number	A-5003-7676	A-5003-7677	A-5003-7678	A-5003-7679
Ball dia	1/8 in	1/4 in	3 mm	6 mm
Length (mm)	43	43	43	43
Price	\$225	\$225	\$225	\$225

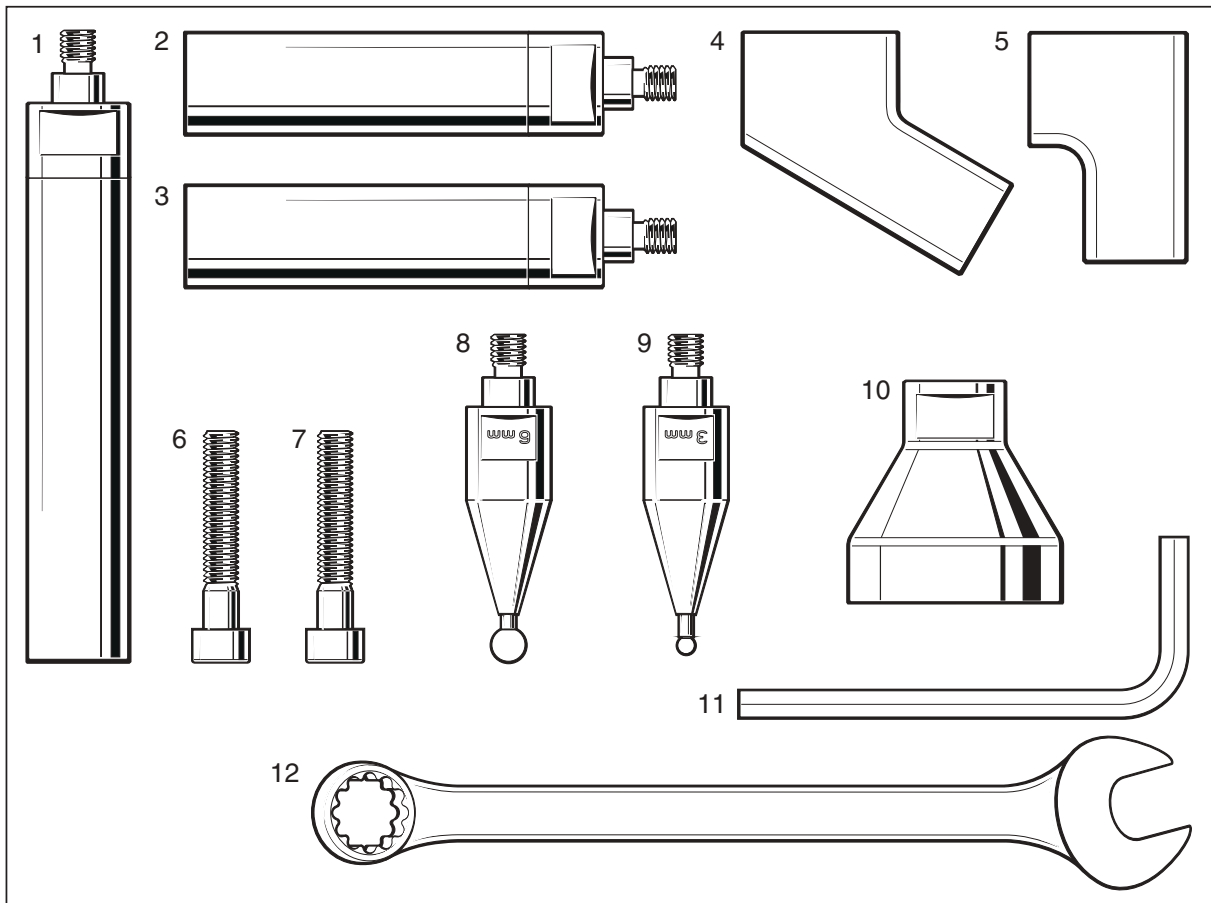


Styli for FARO® arms

FARO® kit

A-5003-9190 FARO® probe kit 0073 12 piece

Price: \$1,034



Position	Part number	Description
1	A-5003-9127	M6M - M6F EXT L101.6 (4.0) D18 AL
2 and 3	A-5003-9126	M6M - M6F EXT L76.2 (3.0) D18 AL
4	A-5003-9186	M6F FARO EXT 60 DEG ADAPTOR
5	A-5003-9187	M6F FARO EXT 90 DEG ADAPTOR
6 and 7	P-SC08-0635	SCREW HEX SKT CAPHD M6X35 STST
8	A-5003-7679	STYLUS M6 DIA 6 MM 21 PROBE 0067
9	A-5003-7678	STYLUS M6 DIA 3 MM 21 PROBE 0065
10	M-5003-9133	FARO ADAPTOR 1.25-20 UN-M6
11	P-TL01-0500	SKT WRENCH 5MM A/F
12	P-TL09-0012	12 MM A/F OPEN/RING SPANNER

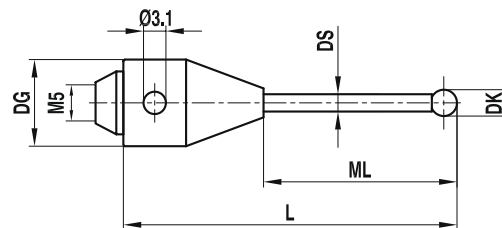
M5 styli, adaptors and accessories for Zeiss analog probe systems

Schematics not shown to scale

Styli with conical stem base, titanium base, tungsten carbide stem, ruby ball

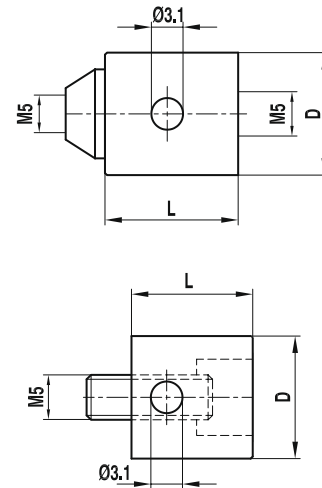
Part number	A-5555-0001	A-5555-0002	A-5555-0003	A-5555-0004	A-5555-0005	A-5555-0006	A-5555-0007	A-5555-0008
Zeiss order number	600331-9096	602030-9003	602030-9004	600331-9098	602030-9005	602030-9006	602030-9007	600331-9097
DK (mm)	3	3	3	3	5	5	5	8
L (mm)	50	75	75	115	75	75	100	80
DG (mm)	19	19	19	19	19	19	19	19
ML (mm)	21.5	35	50	18	35	50	60	57
DS (mm)	2	2	2	2	3.5	3.5	3.5	6
Weight (g)	23	30	22	56	34	28	38	45
Price	\$94	\$96	\$90	\$143	\$106	\$101	\$106	\$140

Part number	A-5555-0009	A-5555-0010	A-5555-0011
Zeiss order number	600331-9099	602030-9008	602030-9009
DK (mm)	8	8	8
L (mm)	100	115	140
DG (mm)	19	19	19
ML (mm)	60	56.5	100
DS (mm)	6	6	6
Weight (g)	57	68	74
Price	\$150	\$150	\$159



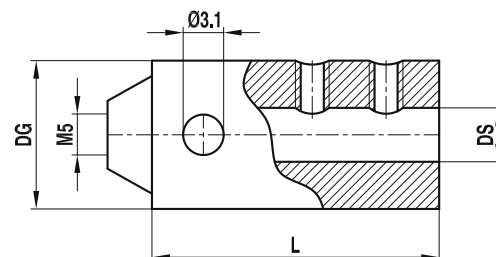
Adaptor with thread/conical stem base, stainless steel

Part number	A-5555-0013	A-5555-0014
Zeiss order number	600331-0001	602030-0018
D (mm)	18	18
L (mm)	10	12
Weight (g)	12	10
Price	\$34	\$25



Conical holder, stainless steel

Part number	A-5555-0015	A-5555-0016	A-5555-0017
Zeiss order number	602030-8350	602030-8351	602030-8352
DS (mm)	2	3.5	6
L (mm)	24	24	24
DG (mm)	19	19	19
Weight (g)	29	29	29
Price	\$64	\$60	\$57



M5 styli for Zeiss probing systems

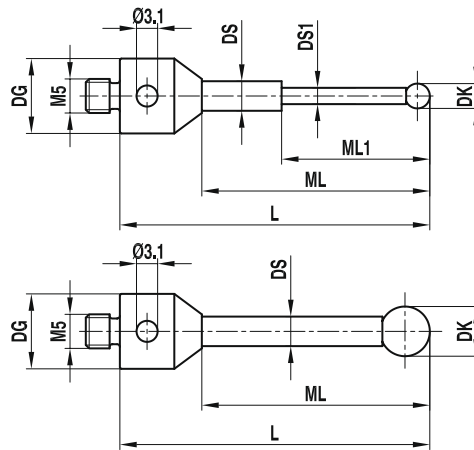
Tungsten carbide styli, titanium base, tungsten carbide stem, ruby ball

Schematics not shown to scale

Part number	A-5555-0018	A-5555-0019	A-5555-0020	A-5555-0021	A-5555-0022	A-5555-0023	A-5555-0024	A-5555-0025
Zeiss order number	602030-9010	600342-8020	602030-9011	600342-8021	600342-8025	602030-9012	602030-9013	600342-8022
DK (mm)	3	3	3	3	4	4	5	5
L (mm)	25	33.5	50	58	33.5	64	50	53
DG (mm)	11	11	11	11	11	11	11	11
ML (mm)	15	23.5	40	48	23.5	54	40	43
DS (mm)	2	2	2	2	2	2	3.5	3.5
Weight (g)	4	4.5	5.2	5.5	4.5	5.9	9	9.8
Price	\$45	\$45	\$45	\$45	\$57	\$60	\$53	\$50

Part number	A-5555-0026	A-5555-0027	A-5555-0028	A-5555-0029	A-5555-0030	A-5555-0031	A-5555-0032	A-5555-0033
Zeiss order number	602030-9015	600342-8026	600342-8027	600342-8023	600342-8123	602030-9014	602030-9016	602030-9017
DK (mm)	5	6	7	8	8	8	8	8
L (mm)	75	54	55	63.5	63.5	74	75	100
DG (mm)	11	11	11	11	19	11	11	11
ML (mm)	65	44	45	50.5	41.5	61	62	87
DS (mm)	3.5	3.5	3.5	6	6	6	6	6
Weight (g)	12.5	10	10	24.8	36.7	29.5	30	40
Price	\$57	\$57	\$60	\$64	\$69	\$66	\$66	\$66

Part number	A-5555-0034	A-5555-0035	A-5555-0036	A-5555-0037	A-5555-0038	A-5555-0039	A-5555-0040
Zeiss order number	600342-8024	600342-8124	600342-8028	600342-8128	600342-8029	600342-8129	602030-9018
DK (mm)	8	8	9	9	10	10	10
L (mm)	114.5	114.5	64.5	64.5	65.5	65.5	118
DG (mm)	11	19	11	19	11	19	11
ML (mm)	101.5	92.5	51.5	42.5	52.5	43.5	105
DS (mm)	6	6	6	6	6	6	6
Weight (g)	45.8	57.5	26.3	36.8	25.8	37.5	47.3
Price	\$66	\$83	\$67	\$81	\$73	\$94	\$73



Tungsten carbide styli, titanium base, tungsten carbide stem, silicon nitride ball

Schematics not shown to scale

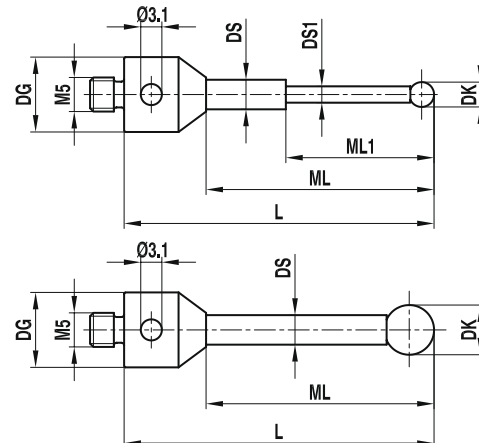
Part number	A-5555-3777	A-5555-3778	A-5555-3779	A-5555-3780	A-5555-3781	A-5555-3782	A-5555-3783	A-5555-3784
Zeiss order number	-	-	-	-	-	-	-	-
DK (mm)	1	1	1	1.5	2	2	2	2
L (mm)	20	25	30	30	20	25	30	40
DG (mm)	11	11	11	11	11	11	11	11
ML1 (mm)	5	5	5	8	-	-	-	-
ML (mm)	10	15	20	20	10	15	20	30
DS1 (mm)	0.8	0.8	0.8	1	-	-	-	-
DS (mm)	1	1	1	1.5	1	1	1.5	1.5
Weight (g)	3.5	3.5	3.8	3.5	3.5	3.5	3.8	4
Price	\$52	\$52	\$52	\$52	\$52	\$52	\$52	\$52

Part number	A-5555-3785	A-5555-3786	A-5555-3787	A-5555-3734	A-5555-3788	A-5555-3789
Zeiss order number	626115-0303-025	626115-0300-033	626115-0302-050	626115-0300-058	626115-0400-034	6262115-0401-064
DK (mm)	3	3	3	3	4	4
L (mm)	25	33.5	50	58	33.5	64
DG (mm)	11	11	11	11	11	11
ML (mm)	15	23.5	40	48	23.5	54
DS (mm)	2	2	2	2	2	2
Weight (g)	4	4.5	5.3	5.5	4.5	5.9
Price	\$53	\$53	\$53	\$53	\$54	\$64

Part number	A-5555-3790	A-5555-3791	A-5555-3792	A-5555-3793	A-5555-3794	A-5555-3795
Zeiss order number	-	626115-0501-050	626115-0501-053	626115-0500-075	-	-
DK (mm)	5	5	5	5	5	6
L (mm)	30	50	53	75	100	54
DG (mm)	11	11	11	11	11	11
ML (mm)	20	40	43	65	90	44
DS (mm)	3.5	3.5	3.5	3.5	3.5	3.5
Weight (g)	8	9	9.8	12.5	18	10
Price	\$62	\$64	\$64	\$67	\$76	\$66

Part number	A-5555-3796	A-5555-3797	A-5555-3798	A-5555-3799	A-5555-3800	A-5555-3801
Zeiss order number	-	626115-0800-064	626115-0800-075	626115-0801-100	626115-0800-115	-
DK (mm)	7	8	8	8	8	9
L (mm)	55	63.5	75	100	114.5	64.5
DG (mm)	11	11	11	11	11	11
ML (mm)	45	50.5	62	87	101.5	51.5
DS (mm)	3.5	6	6	6	6	6
Weight (g)	10	36.6	29.4	39.9	45.7	26.3
Price	\$74	\$74	\$85	\$89	\$94	\$87

Part number	A-5555-3802	A-5555-3803	A-5555-3804
Zeiss order number	-	-	-
DK (mm)	10	10	10
L (mm)	65.5	118	150
DG (mm)	11	11	11
ML (mm)	52.5	105	135
DS (mm)	6	6	6
Weight (g)	25.8	47.3	60
Price	\$97	\$108	\$111

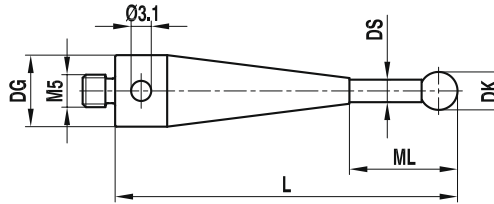


M5 styli for Zeiss probing systems

Reference styli (red dot), high-strength stainless steel base and stem, ruby ball

Schematics not shown to scale

Part number	A-5555-3805
Zeiss order number	600342-8023-010
DK (mm)	8
L (mm)	63.5
DG (mm)	11
ML (mm)	50.5
DS (mm)	6
Weight (g)	24.8
Price	\$106



Thermo stable carbon fiber styli, titanium base, thermo stable carbon fiber stem, ruby ball

Part number	A-5555-1916	A-5555-1847	A-5555-0730	A-5555-3806	A-5555-1917	A-5555-0731
Zeiss order number	626105-0300-025	626105-0300-033	626105-0300-050	626105-0300-058	626105-0400-033	626105-0400-064
DK (mm)	3	3	3	3	4	4
L (mm)	25	33.5	50	58	33.5	64
DG (mm)	11	11	11	11	11	11
ML (mm)	15	23.5	40	48	23.5	54
DS (mm)	2	2	2	2	2	2
Weight (g)	4	4.2	4.5	4.9	4.2	4.6
Price	\$69	\$71	\$73	\$83	\$76	\$92

Part number	A-5555-0732	A-5555-2013	A-5555-0735	A-5555-0410	A-5555-0733	A-5555-0734
Zeiss order number	626105-0510-050	–	626105-0510-075	626105-0510-100	626105-0610-054	626105-0710-055
DK (mm)	5	5	5	5	6	7
L (mm)	50	53	75	100	54	55
DG (mm)	11	11	11	11	11	11
ML (mm)	40	43	65	90	44	45
DS (mm)	3.5	3.5	3.5	3.5	3.5	3.5
Weight (g)	4.8	4.9	5	5.4	4.9	4.9
Price	\$85	\$85	\$87	\$104	\$90	\$104

Part number	A-5555-3807	A-5555-2011	A-5555-1918	A-5555-3808	A-5555-9361	A-5555-1112
Zeiss order number	626105-0820-063	626105-0820-075	626105-0820-100	626105-0820-114	626105-0820-150	626105-0820-200
DK (mm)	8	8	8	8	8	8
L (mm)	63.5	75	100	114.5	150	200
DG (mm)	11	11	11	11	11	11
ML (mm)	50.5	62	87	101.5	137	187
DS (mm)	6	6	6	6	6	6
Weight (g)	7	7.3	7.5	9.5	11	13
Price	\$111	\$115	\$120	\$124	\$157	\$173

Part number	A-5555-3809	A-5555-3810	A-5555-3811	A-5555-0643	A-5555-0644
Zeiss order number	–	626105-1020-065	626105-1020-118	626105-1020-150	626105-1020-200
DK (mm)	9	10	10	10	10
L (mm)	64.5	65.5	118	150	200
DG (mm)	11	11	11	11	11
ML (mm)	51.5	52.5	105	137	187
DS (mm)	6	6	6	6	6
Weight (g)	7.2	8	14.5	16	19
Price	\$117	\$133	\$150	\$185	\$205

Thermo stable carbon fiber styli, titanium base, thermo stable carbon fiber stem, silicon nitride ball

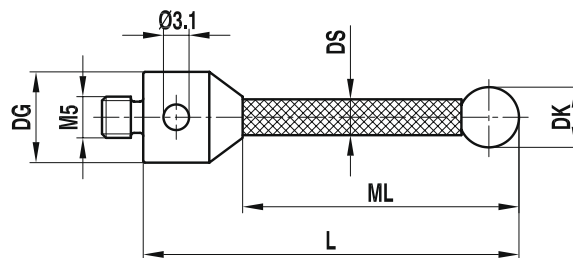
Schematics not shown to scale

Part number	A-5555-3812	A-5555-1828	A-5555-3813	A-5555-3814	A-5555-3815	A-5555-3816
Zeiss order number	-	626105-0301-033	-	626103-0301-058	-	-
DK (mm)	3	3	3	3	4	4
L (mm)	25	33.5	50	58	33.5	64
DG (mm)	11	11	11	11	11	11
ML (mm)	15	23.5	40	48	23.5	54
DS (mm)	2	2	2	2	2	2
Weight (g)	4	4.2	4.5	4.9	4.2	4.6
Price	\$96	\$97	\$99	\$110	\$115	\$118

Part number	A-5555-3817	A-5555-0759	A-5555-2012	A-5555-9045	A-5555-3818	A-5555-3819
Zeiss order number	626105-0511-050	-	626105-0511-075	626105-0511-100	-	-
DK (mm)	5	5	5	5	6	7
L (mm)	50	53	75	100	54	55
DG (mm)	11	11	11	11	11	11
ML (mm)	40	43	65	90	44	45
DS (mm)	3.5	3.5	3.5	3.5	3.5	3.5
Weight (g)	4.8	4.9	5	5.4	4.9	4.9
Price	\$111	\$111	\$113	\$131	\$117	\$131

Part number	A-5555-0720	A-5555-2010	A-5555-3820	A-5555-3821	A-5555-1169	A-5555-1179
Zeiss order number	626105-0821-063	-	626105-0821-100	626105-0821-114	626105-0821-150	626105-0821-200
DK (mm)	8	8	8	8	8	8
L (mm)	63.5	75	100	114.5	150	200
DG (mm)	11	11	11	11	11	11
ML (mm)	50.5	62	87	101.5	137	187
DS (mm)	6	6	6	6	6	6
Weight (g)	7	7.3	7.5	9.5	11	13
Price	\$140	\$141	\$147	\$150	\$184	\$199

Part number	A-5555-3822	A-5555-3823	A-5555-3824	A-5555-3825	A-5555-1171
Zeiss order number	-	-	626105-1021-118	626105-1021-150	626105-1021-200
DK (mm)	9	10	10	10	10
L (mm)	64.5	65.5	118	150	200
DG (mm)	11	11	11	11	11
ML (mm)	51.5	52.5	105	137	187
DS (mm)	6	6	6	6	6
Weight (g)	7.2	8	14.5	16	19
Price	\$143	\$159	\$177	\$212	\$231



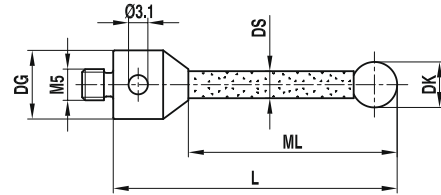
M5 styli for Zeiss probing systems

Ceramic styli, titanium base, ruby ball

Schematics not shown to scale

Part number	A-5555-0041	A-5555-0042	A-5555-0043	A-5555-0044	A-5555-0045	A-5555-0046	A-5555-0047	A-5555-0048
Zeiss order number	600342-8013	600342-8016	600342-8017	600342-8014	600342-8018	600342-8118	600342-8019	600342-8119
DK (mm)	5	6	7	8	9	9	10	10
L (mm)	53	54	55	63.5	64.5	64.5	65.5	65.5
DG (mm)	11	11	11	11	11	19	11	19
ML (mm)	43	44	45	50.5	51.5	42.5	52.5	43.5
DS (mm)	3.5	3.5	3.5	6	6	6	6	6
Weight (g)	4.6	4.7	5	8.3	8.4	21	9	38
Price	\$52	\$57	\$64	\$69	\$71	\$80	\$80	\$87

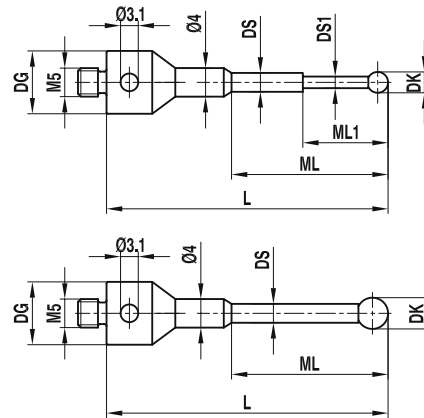
Part number	A-5555-0049	A-5555-0050	A-5555-0051
Zeiss order number	600342-8114	600342-8015	600342-8115
DK (mm)	8	8	8
L (mm)	63.5	114.5	114.5
DG (mm)	19	11	19
ML (mm)	41.5	101.5	92.5
DS (mm)	6	6	6
Weight (g)	33	11.8	38
Price	\$71	\$80	\$81



Small ball styli, stepped stem, stainless steel base, tungsten carbide stem, ruby ball

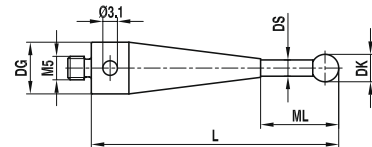
Part number	A-5555-0052	A-5555-0053	A-5555-0054	A-5555-0055	A-5555-0056	A-5555-0057	A-5555-0058	A-5555-0059
Zeiss order number	602030-8060	602030-8061	602030-8062	602030-8063	602030-8064	602030-8065	602030-8066	602030-8067
DK (mm)	0.8	1	1.35	1.35	1.5	1.5	2	2
L (mm)	32	32	32	44	32	44	32	44
DG (mm)	11	11	11	11	11	11	11	11
ML (mm)	12	12	12	19	12	19	12	19
ML1 (mm)	4.8	5.0	-	-	-	-	-	-
DS (mm)	1	1	1	1	1	1	1.5	1.5
DS1 (mm)	0.6	0.8	-	-	-	-	-	-
Weight (g)	6.8	6.8	6.9	7.5	6.5	7.5	7.3	8
Price	\$78	\$67	\$66	\$69	\$66	\$69	\$66	\$69

Part number	A-5555-0060	A-5555-0061	A-5555-0062	A-5555-0063
Zeiss order number	602030-8068	602030-8069	602030-8070	602030-8071
DK (mm)	2	2.5	2.5	2.5
L (mm)	58	32	44	58
DG (mm)	11	11	11	11
ML (mm)	33	12	19	33
DS (mm)	1.5	1.5	1.5	1.5
Weight (g)	8	7.3	8	8
Price	\$67	\$66	\$69	\$73



Small ball styli, titanium base, tungsten carbide stem, ruby ball

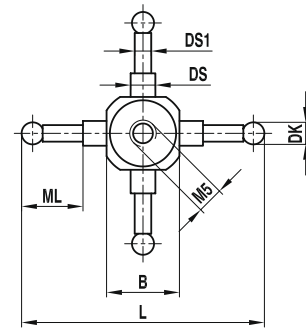
Part number	A-5555-0064	A-5555-0065	A-5555-0066	A-5555-0067	A-5555-0068
Zeiss order number	602030-9019	602030-9020	602030-9021	602030-9022	602030-9023
DK (mm)	1	1.5	2	2.5	3.5
L (mm)	55	55	55	55	55
DG (mm)	11	11	11	11	11
ML (mm)	5	5	5	5	10
DS (mm)	0.8	1	1.5	2	2.5
Weight (g)	11.9	11.9	11.9	11.9	11.9
Price	\$140	\$131	\$127	\$131	\$131



Cube star, titanium base, tungsten carbide stem, ruby ball

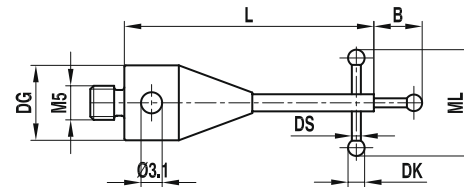
Schematics not shown to scale

Part number	A-5555-0069	A-5555-0070	A-5555-0071	A-5555-0072	A-5555-0073
Zeiss order number	602030-9024	602030-9025	602030-9026	602030-9027	602030-9028
DK (mm)	1	1.5	2	2.5	3.5
L (mm)	45	45	45	45	45
ML (mm)	7	7.5	7.5	8	15
DS (mm)	2	2	2	2	2
DS1 (mm)	0.8	1	1.5	1.5	-
B (mm)	15	15	15	15	15
Weight (g)	17.3	17.3	17.3	17.3	17.3
Price	\$191	\$191	\$191	\$207	\$222



Styli for thread measurement, stainless steel base, tungsten carbide stem, ruby ball

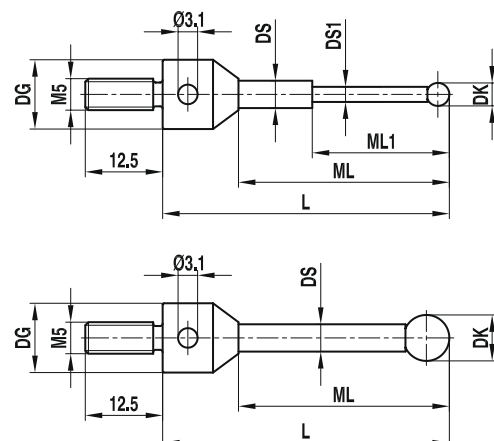
Part number	A-5555-0074	A-5555-0075	A-5555-0076	A-5555-0077
Zeiss order number	602030-9070	602030-9071	602030-9072	602030-9073
DK (mm)	1.35	2.3	1.8	0.8
L (mm)	40	40	40	40
DG (mm)	11	11	11	11
ML (mm)	9	12	10	5
DS (mm)	1	1	1	0.6
B (mm)	2	2.5	2	1.9
Weight (g)	11	13	12	7
Price	\$103	\$124	\$134	\$199



Long threaded styli, thread length 12.5 mm, stainless steel base, tungsten carbide stem, ruby ball

Part number	A-5555-0078	A-5555-0079	A-5555-0080	A-5555-0081	A-5555-0082	A-5555-0083	A-5555-0084
Zeiss order number	600342-8200	600342-8201	600342-8202	600342-8203	600342-8221	600342-8222	600342-8250
DK (mm)	1.35	1.5	2	2.5	3	5	0.3
L (mm)	32.85	33	33.5	34	34.5	43.5	21.8
DG (mm)	11	11	11	11	19	19	11
ML (mm)	23.85	24	24.5	25	16.5	25.5	12.8
ML1 (mm)	-	-	-	-	-	-	2.3
DS (mm)	1	1	1.5	1.5	2	3.5	1
DS1 (mm)	-	-	-	-	-	-	0.2
Weight (g)	6	7	7	7	20	23	6
Price	\$46	\$46	\$41	\$43	\$55	\$64	\$80

Part number	A-5555-0085	A-5555-0086	A-5555-0087	A-5555-0088
Zeiss order number	600342-8251	600342-8252	600342-8253	600342-8254
DK (mm)	0.5	0.6	0.8	1
L (mm)	22	22.1	22.3	22.5
DG (mm)	11	11	11	11
ML (mm)	13	13.1	13.3	13.5
ML1 (mm)	2.5	4.6	4.8	5.0
DS (mm)	1	1	1	1
DS1 (mm)	0.3	0.4	0.6	0.8
Weight (g)	6	6	6	6
Price	\$64	\$64	\$62	\$55



M5 styli for Zeiss probing systems

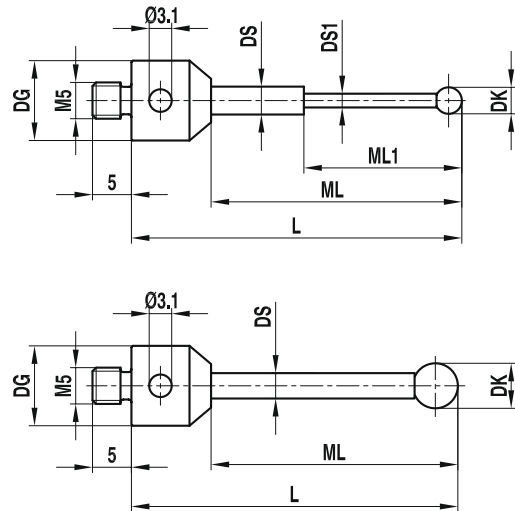
Long threaded styli, thread length 5 mm, stainless steel base, tungsten carbide stem, ruby ball

Schematics not shown to scale

Part number	A-5555-0799	A-5555-9324	A-5555-3826	A-5555-3827	A-5555-0686	A-5555-3828
Zeiss order number	626115-0140-033	626115-0150-033	626115-0200-034	–	626115-0250-034	–
DK (mm)	1.35	1.5	2	2.5	2.5	3
L (mm)	32.85	33	33.5	34	34	25.5
DG (mm)	11	11	11	11	11	11
ML (mm)	23.85	24	24.5	25	25	16.5
DS (mm)	1	1	1.5	1	1.5	2
Weight (g)	6	7	7	7	7	9
Price	\$46	\$46	\$41	\$41	\$43	\$52

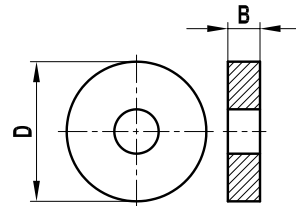
Part number	A-5555-3829	A-5555-0331	A-5555-1157	A-5555-1842	A-5555-1844	A-5555-1843
Zeiss order number	–	626115-0030-022	626115-0050-022	626115-0060-022	626115-0080-022	626115-0100-022
DK (mm)	5	0.3	0.5	0.6	0.8	1
L (mm)	34.5	21.8	22	22.1	22.3	22.5
DG (mm)	11	11	11	11	11	11
ML (mm)	25.5	12.8	13	13.1	13.3	13.5
ML1 (mm)	–	2.3	2.5	4.6	4.8	1.5
DS (mm)	3.5	1	1	1	1	1
DS1 (mm)	–	0.2	0.3	0.4	0.6	0.8
Weight (g)	9	6	6	6	6	6
Price	\$60	\$80	\$64	\$64	\$62	\$55

Part number	A-5555-1873
Zeiss order number	–
DK (mm)	1.5
L (mm)	33
DG (mm)	11
ML (mm)	24
ML1 (mm)	7
DS (mm)	1.5
DS1 (mm)	1
Weight (g)	7
Price	\$62



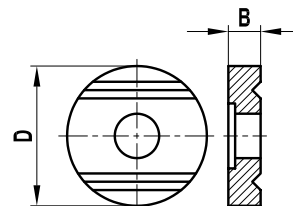
Flat washer for star styli, stainless steel

Part number	A-5555-0089	A-5555-0090
Zeiss order number	600341-0140	600341-0141
D (mm)	11	19
B (mm)	1.5	2
Weight (g)	1	4
Price	\$15	\$16



Grooved washer for star styli, stainless steel

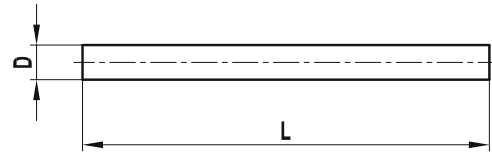
Part number	A-5555-0091	A-5555-0092
Zeiss order number	600341-0150	600341-0151
D (mm)	11	19
B (mm)	2	4
Weight (g)	1	7
Price	\$46	\$48



Tungsten carbide pin for star styli

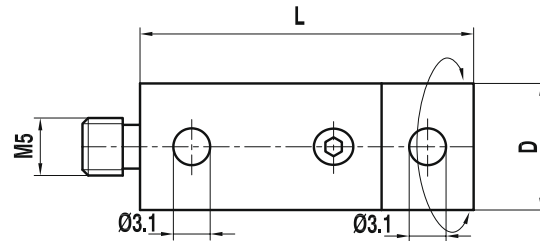
Part number	A-5555-0093	A-5555-0094	A-5555-0095	A-5555-0096
Zeiss order number	600341-0520	600341-0521	600341-0522	600341-0523
L (mm)	10	10	18	18
D (mm)	1	1.5	2	3.5
Weight (g)	1	1	1	3
Price	\$6	\$6	\$8	\$8

Schematics not shown to scale



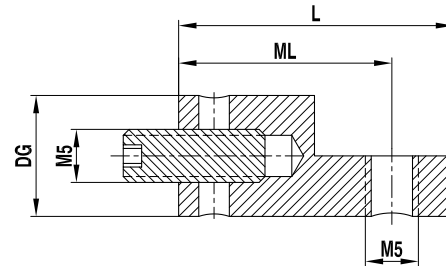
Rotary adaptor, titanium

Part number	A-5555-0099	A-5555-0713
Zeiss order number	602030-9095	612030-9737
L (mm)	30	29
D (mm)	18	11
Weight (g)	43	13
Price	\$170	\$170



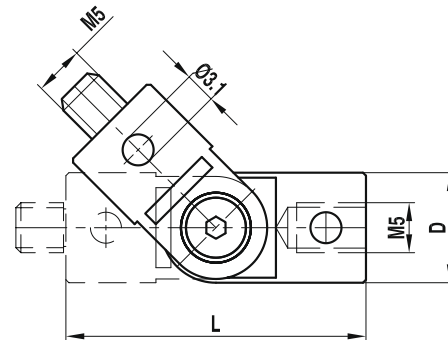
Holder, 90 degree offset, titanium

Part number	A-5555-1097
Zeiss order number	626105-6901-001
ML (mm)	17
DG (mm)	11
L (mm)	22.5
Weight (g)	6
Price	\$53



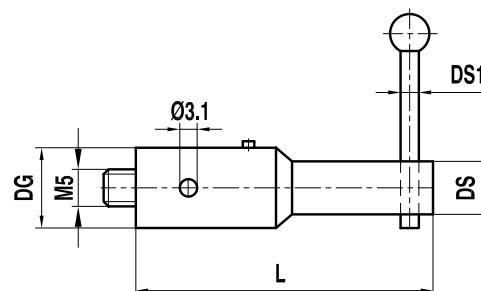
Rotary knuckle, slewing range 360 degrees, swing range 180 degrees, titanium

Part number	A-5003-5278	A-5555-3841
Zeiss order number	-	-
L (mm)	51	58
D (mm)	11	18
Weight (g)	19	58
Price	\$247	\$291



Holder, 90 degrees, stainless steel

Part number	A-5555-0104
Zeiss order number	600341-8160
DS1 (mm)	1-1.5
L (mm)	45
DG (mm)	11
DS (mm)	6
Weight (g)	16
Price	\$64



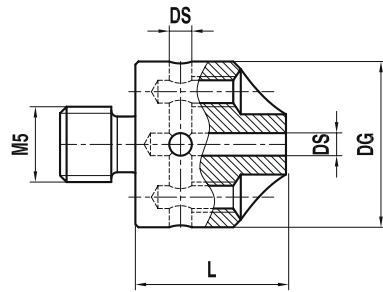
Fits with styli A-5555-0107 to A-5555-0115

M5 styli for Zeiss probing systems

5-way holder, stainless steel

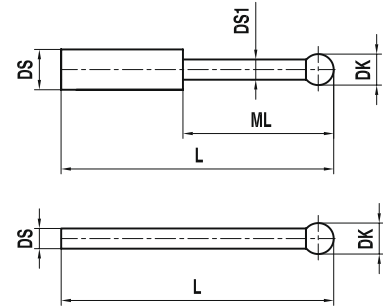
Part number	A-5555-0105	A-5555-0106	A-5555-1245
Zeiss order number	600341-8367	600341-8368	626115-5000-199
DS (mm)	1	1.5	2
L (mm)	10	10	10
DG (mm)	11	11	11
Weight (g)	3.2	3.2	3.2
Price	\$64	\$64	\$64

Schematics not shown to scale



Styli for holder, tungsten carbide stem, ruby ball

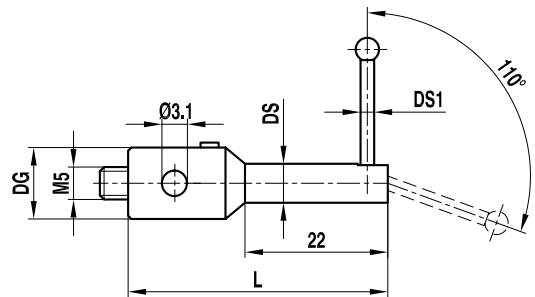
Part number	A-5555-0107	A-5555-0108	A-5555-0109	A-5555-0110	A-5555-0111
Zeiss order number	600341-8454	600341-8450	600341-8451	600341-8452	600341-8453
DK (mm)	1	0.3	0.5	0.6	0.8
L (mm)	16	15.3	15.5	15.6	15.8
DS (mm)	1	1	1	1	1
DS1 (mm)	0.8	0.2	0.3	0.4	0.6
ML (mm)	5	2.3	2.5	4.6	4.8
Weight (g)	1	1	1	1	1
Price	\$48	\$64	\$165	\$48	\$46



Part number	A-5555-0112	A-5555-0113	A-5555-0114	A-5555-0115	A-5555-0116	A-5555-0117
Zeiss order number	600341-8500	600341-8501	600341-8502	600341-8503	600341-8510	600341-8511
DK (mm)	1.35	1.5	2	2.5	3	5
L (mm)	26.35	26.5	27	27.5	38	45
DS (mm)	1	1	1.5	1.5	2	3.5
Weight (g)	1	1	1	1	2	6
Price	\$48	\$39	\$45	\$46	\$45	\$50

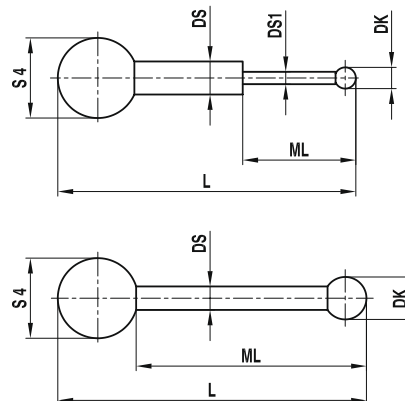
Holder for swivel styli, stainless steel

Part number	A-5555-0118
Zeiss order number	600341-8180
L (mm)	40
DG (mm)	11
DS (mm)	6
DS1 (mm)	1-1.5
Weight (g)	15
Price	\$80



Styli for swiveling components, S4 steel ball, tungsten carbide stem, ruby ball

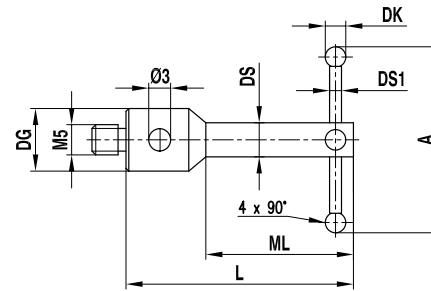
Part number	A-5555-0119	A-5555-0120
Zeiss order number	600341-8183	600341-8185
DK (mm)	1	2
L (mm)	17.5	28.5
DS (mm)	1	1.5
DS1 (mm)	0.8	-
ML (mm)	5	24.5
Weight (g)	1	1
Price	\$69	\$66



Star styli, stainless steel base, tungsten carbide stem, ruby ball

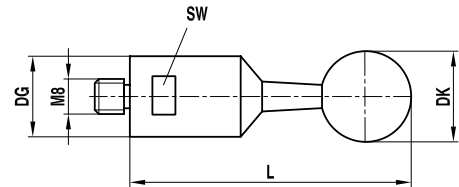
Part number	A-5555-1153	A-5555-1135	A-5555-3839
Zeiss order number	-	-	-
DK (mm)	0.6	0.8	1
L (mm)	40	40	40
DG (mm)	11	11	11
DS (mm)	4	4	4
DS1 (mm)	0.4	0.6	0.8
ML (mm)	30	30	30
A (mm)	8	8	8
Weight (g)	9	9	9
Price	\$701	\$631	\$573

Schematics not shown to scale



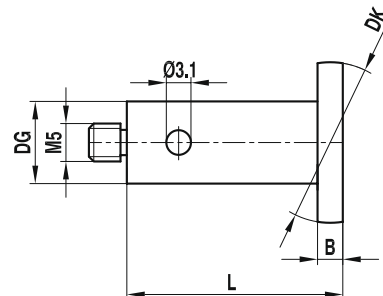
Reference sphere with stem, M8 thread, stainless steel, ceramic ball including certificate

Part number	A-5555-3842	A-5555-3843	A-5555-3844	A-1034-0124
Zeiss order number	-	-	-	-
DK (mm)	15	20	25	30
L (mm)	130	135	140	145
DG (mm)	24	24	24	24
SW (mm)	22	22	22	22
Price	\$397	\$502	\$525	\$550



Spherical disk styli, aluminum base, high-strength steel disk

Part number	A-5555-0121	A-5555-0122	A-5555-0123	A-5555-0124
Zeiss order number	600341-8090	600341-8095	602030-8091	000000-1165-629
DK (mm)	10	15	20	15
L (mm)	21.5	21.5	60	40
DG (mm)	7	10	7	7
B (mm)	1.5	1.5	1	1
Weight (g)	3	6	8	5
Price	\$166	\$168	\$247	\$212



M5 styli for Zeiss probing systems

Extensions

Schematics not shown to scale

Aluminum, stainless steel ends

Part number	A-5555-0125	A-5555-0126	A-5555-0127	A-5555-0128	A-5555-0129	A-5555-0130	A-5555-0131	A-5555-0132
Zeiss order number	600341-8420	600341-8421	600341-8422	600341-8423	600341-8424	600341-8425	600341-8265	600341-8264
L (mm)	200	150	100	80	60	40	120	100
D (mm)	20	20	20	20	20	20	11	11
Weight (g)	84.7	67.4	50.7	44.8	37.7	29	30.9	25.6
Price	\$92	\$81	\$73	\$71	\$71	\$67	\$48	\$46

Part number	A-5555-0133	A-5555-0134	A-5555-0135
Zeiss order number	600341-8263	600341-8262	600341-8261
L (mm)	80	60	40
D (mm)	11	11	11
Weight (g)	20.6	15.4	10.3
Price	\$45	\$41	\$39

Stainless steel

Part number	A-5555-0136	A-5555-0137	A-5555-0138	A-5555-0139	A-5555-0140	A-5555-0141	A-5555-0142
Zeiss order number	600341-0260	600341-0258	600341-0256	600341-0254	600341-0252	600341-0251	600341-0250
L (mm)	100	80	60	40	20	15	10
D (mm)	11	11	11	11	11	11	11
Weight (g)	73	58	42	28	13	9	6
Price	\$29	\$29	\$27	\$25	\$25	\$25	\$25

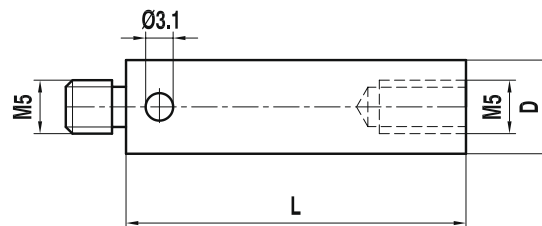
Titanium

Part number	A-5555-0143	A-5555-0144	A-5555-0145	A-5555-0146	A-5555-0147	A-5555-0148	A-5555-0149	A-5555-0150
Zeiss order number	602030-9044	602030-9045	602030-9046	602030-9047	602030-9048	602030-9049	602030-9050	602030-9051
L (mm)	10	15	20	25	25	40	40	50
D (mm)	11	11	11	11	18	11	18	11
Weight (g)	3.9	5.7	7.5	9.5	24.6	12.6	31.5	13.2
Price	\$30	\$34	\$36	\$37	\$39	\$39	\$48	\$62

Part number	A-5555-0151	A-5555-0152	A-5555-0153	A-5555-0154	A-5555-0155	A-5555-0156	A-5555-0157	A-5555-0158
Zeiss order number	602030-9052	602030-9053	602030-9054	602030-9055	602030-9056	602030-9057	602030-9058	602030-9059
L (mm)	50	60	60	75	75	80	80	90
D (mm)	18	11	18	11	18	11	18	11
Weight (g)	33.3	14.2	35.1	15.3	37.9	15.6	38.8	16.5
Price	\$71	\$64	\$74	\$67	\$78	\$73	\$80	\$73

Part number	A-5555-0159	A-5555-0160	A-5555-0161	A-5555-0162	A-5555-0163	A-5555-0164	A-5555-0165	A-5555-0166
Zeiss order number	602030-9060	602030-9061	602030-9062	602030-9063	602030-9064	602030-9065	602030-9066	602030-9067
L (mm)	90	100	100	120	120	150	150	200
D (mm)	18	11	18	11	18	11	18	18
Weight (g)	40.6	17.2	42.5	19.8	46.1	22.5	51.6	61
Price	\$85	\$73	\$89	\$78	\$97	\$85	\$106	\$115

Part number	A-5555-0167	A-5555-0168
Zeiss order number	602030-9068	602030-9069
L (mm)	250	300
D (mm)	18	18
Weight (g)	70	79
Price	\$127	\$143



Black thermo stable carbon fiber, titanium ends

Schematics not shown to scale

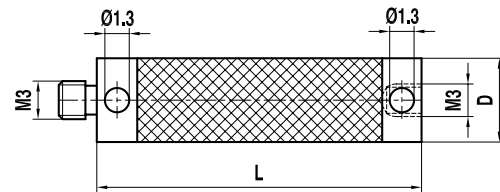
Part number	A-5555-0647	A-5555-0648	A-5555-0649	A-5555-0623	A-5555-0650	A-5555-0651
Zeiss order number	626107-1040-100	626107-1050-100	626107-1060-100	626107-1070-100	626107-1080-100	626107-1090-100
L (mm)	40	50	60	70	80	90
D (mm)	11	11	11	11	11	11
Weight (g)	9	10	11	10	12	13
Price	\$157	\$159	\$162	\$166	\$170	\$182

Part number	A-5555-0652	A-5555-0425	A-5555-0424	A-5555-0653	A-5555-0654	A-5555-0655
Zeiss order number	626107-1100-100	626107-1120-100	626107-1150-100	626107-1180-100	626107-1200-100	626107-1250-100
L (mm)	100	120	150	180	200	250
D (mm)	11	11	11	11	11	11
Weight (g)	14	15	17	19	21	24
Price	\$187	\$191	\$201	\$208	\$221	\$238

Part number	A-5555-0642	A-5555-0656	A-5555-0620	A-5555-0657	A-5555-0658	A-5555-0621
Zeiss order number	626107-1300-100	626107-1400-100	626107-2040-100	626107-2050-100	626107-2060-100	626107-2080-100
L (mm)	300	400	40	50	60	80
D (mm)	11	11	21	20	21	21
Weight (g)	27	34	26	28	29	32
Price	\$280	\$333	\$154	\$159	\$162	\$170

Part number	A-5555-0659	A-5555-0661	A-5555-0663	A-5555-0427	A-5555-0664	A-5555-0665
Zeiss order number	626107-2100-100	626107-2150-100	626107-2200-100	626107-2250-100	626107-2300-100	626107-2400-100
L (mm)	100	150	200	250	300	400
D (mm)	21	21	21	21	21	20
Weight (g)	34	41	48	55	62	75
Price	\$192	\$214	\$238	\$266	\$298	\$349

Part number	A-5555-0667	A-5555-0668
Zeiss order number	626107-2500-100	626107-2600-100
L (mm)	500	600
D (mm)	20	20
Weight (g)	89	103
Price	\$420	\$280



M5 styli for Zeiss probing systems

Adaptor plate extension for MT/VAST. Black thermo stable carbon fiber, titanium cube and plate adaptor

Schematics not shown to scale

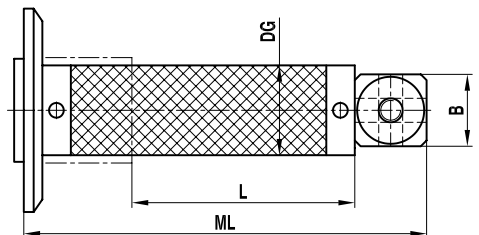
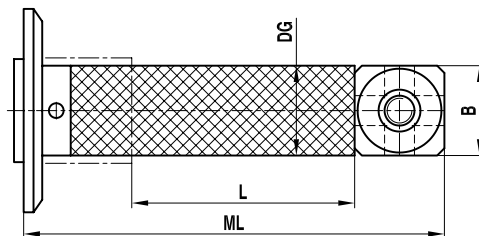
Part number	A-5555-3845	A-5555-3846	A-5555-3847	A-5555-3848	A-5555-3849	A-5555-3850
Zeiss order number	-	-	-	-	-	-
L (mm)	25	40	50	60	80	100
DG (mm)	11	11	11	11	11	11
ML (mm)	66.5	81.5	91.5	101.5	121.5	141.5
B (mm)	15	15	15	15	15	15
Weight (g)	60	62	64	66	68	70
Price	\$259	\$266	\$273	\$282	\$298	\$309

Part number	A-5555-3851	A-5555-3740	A-5555-3852	A-5555-0699	A-5555-1985	A-5555-1986
Zeiss order number	-	-	-	625107-2025-130	625107-2040-130	625107-2050-130
L (mm)	120	150	200	25	40	50
DG (mm)	11	11	11	20	20	20
ML (mm)	161.5	191.5	241.5	66.5	81.5	91.5
B (mm)	15	15	15	15	15	15
Weight (g)	72	77	84	60	62	64
Price	\$321	\$361	\$374	\$277	\$284	\$291

Part number	A-5555-1987	A-5555-0700	A-5555-1988	A-5555-1989	A-5555-0701	A-5555-1990
Zeiss order number	626107-2060-130	626107-2080-130	626107-2100-130	625107-2120-130	625107-2150-130	625107-2200-130
L (mm)	60	80	100	120	150	200
DG (mm)	20	20	20	20	20	20
ML (mm)	101.5	121.5	141.5	161.5	191.5	241.5
B (mm)	15	15	15	15	15	15
Weight (g)	66	68	70	72	77	84
Price	\$300	\$317	\$335	\$349	\$376	\$418

Part number	A-5555-1979	A-5555-1980	A-5555-1855	A-5555-1981	A-5555-1982	A-5555-1983
Zeiss order number	626107-2025-110	626107-2040-110	626107-2050-110	625107-2060-110	625107-2080-110	625107-2100-110
L (mm)	25	40	50	60	80	100
DG (mm)	20	20	20	20	20	20
ML (mm)	71.5	86.5	96.6	106.5	126.5	146.5
B (mm)	20	20	20	20	20	20
Weight (g)	74	76	78	80	82	84
Price	\$265	\$284	\$293	\$302	\$319	\$337

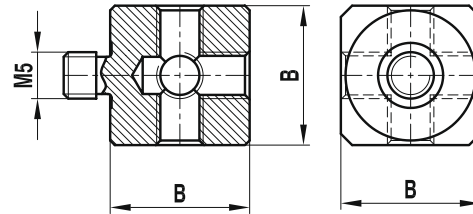
Part number	A-5555-1938	A-5555-1937	A-5555-1984
Zeiss order number	626107-2120-110	626107-2150-110	626107-2200-110
L (mm)	120	150	200
DG (mm)	20	20	20
ML (mm)	166.5	196.5	246.5
B (mm)	20	20	20
Weight (g)	86	91	98
Price	\$349	\$376	\$418



Cube, titanium

Schematics not shown to scale

Part number	A-5555-0189	A-5555-0190
Zeiss order number	600341-8361	600341-8002
B (mm)	15	20
Weight (g)	12.6	31.5
Price	\$50	\$60

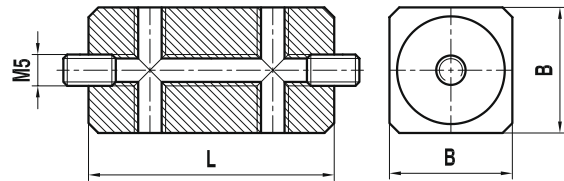


Cube, aluminum

Part number	A-5555-0191	A-5555-0192
Zeiss order number	602030-8363	602030-8362
B (mm)	15	20
Weight (g)	7.5	20
Price	\$69	\$87

Double cube (titanium)

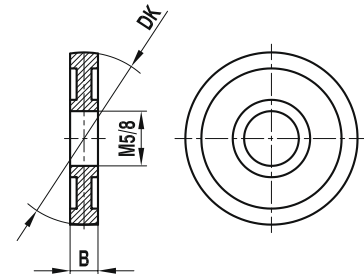
Part number	A-5555-0194
Zeiss order number	600342-8103
B (mm)	20
L (mm)	40
Weight (g)	64
Price	\$108



Spherical disk, high-strength steel

Part number	A-5555-0196	A-5555-0197	A-5555-0198	A-5555-0199	A-5555-0200	A-5555-0201	A-5555-0203
Zeiss order number	602030-0004	602030-0005	602030-0006	602030-0007	602030-0008	602030-0009	602030-0011
B (mm)	4	4	4	5	5	5	4
DK (mm)	15	20	30	40	50	60	20
M5/8 (mm)	M5	M5	M5	M5	M5	M5	8
Weight (g)	5	9	21	42	64	89	8
Price	\$134	\$134	\$136	\$145	\$145	\$148	\$147

Part number	A-5555-0204	A-5555-0205	A-5555-0206	A-5555-0207	A-5555-0208
Zeiss order number	600341-0200	600341-0203	600341-0204	600341-0205	600341-0206
B (mm)	2	4	4	5	6
DK (mm)	20	30	40	50	60
M5/8 (mm)	8	8	8	8	8
Weight (g)	4	10	21	36	59
Price	\$138	\$138	\$140	\$154	\$159

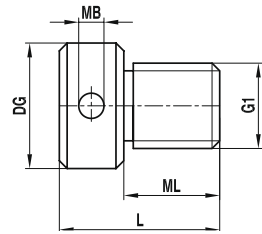


M5 styli for Zeiss probing systems

Hole location gage, stainless steel

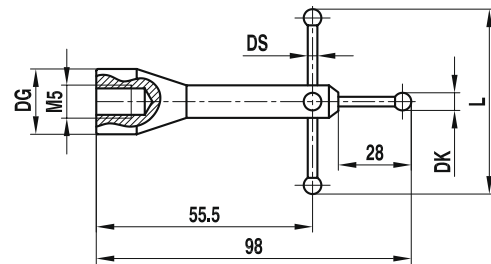
Schematics not shown to scale

Part number	A-5555-0209	A-5555-0210	A-5555-0211	A-5555-0212	A-5555-0213	A-5555-0214
Zeiss order number	602030-0012	602030-0013	600203-0014	602030-0015	602030-0016	600203-0017
G1	M4	M5	M6	M8	M10	M12
L (mm)	16	16	18	20	25	25
DG (mm)	10	10	12	15	18	20
ML (mm)	10	10	12	12	15	15
MB (mm)	1.8	1.8	1.8	3	3	3
Weight (g)	4	4	7	13	25	33
Price	\$73	\$73	\$71	\$74	\$74	\$76



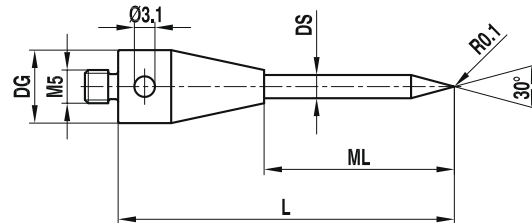
Star stylus, stainless steel base, tungsten carbide stem, ruby ball

Part number	A-5555-0215
Zeiss order number	600331-8093
DK (mm)	5
L (mm)	80
DG (mm)	19
DS (mm)	3.5
Weight (g)	70
Price	\$437



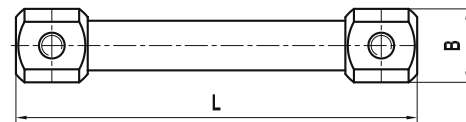
Pointed stylus, titanium base, tungsten carbide stem

Part number	A-5555-0216
Zeiss order number	600342-8051
L (mm)	61
DG (mm)	11
ML (mm)	39
DS (mm)	3.5
Weight (g)	12
Price	\$69



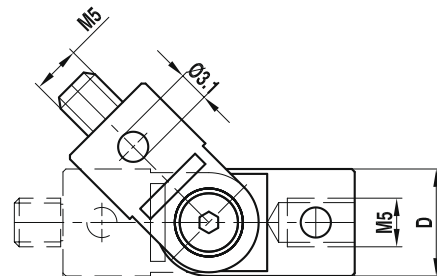
Cube extension, titanium

Part number	A-5555-0217
Zeiss order number	602030-0019
L (mm)	120
B (mm)	20
Weight (g)	87
Price	\$265



Knuckle, swing range 180 degrees, titanium

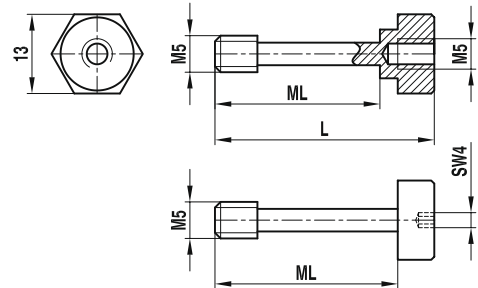
Part number	A-5555-0218	A-5555-0219
Zeiss order number	600342-9002	600342-9003
L (mm)	30	36
D (mm)	11	18
Weight (g)	11.2	37.2
Price	\$122	\$140



Bolts for spherical disk and cube, stainless steel

Schematics not shown to scale

Part number	A-5555-0221	A-5555-0222	A-5555-0223
Zeiss order number	600341-0210	600341-0211	600341-0212
L (mm)	35	30	17.5
ML (mm)	26	21	9
Weight (g)	9	9	7
Price	\$19	\$17	\$15

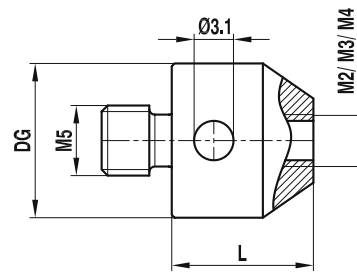


Bolts for cubes, stainless steel

Part number	A-5555-0224	A-5555-0225
Zeiss order number	600341-0220	600341-0221
ML (mm)	26	21
Weight (g)	4	3
Price	\$9	\$9

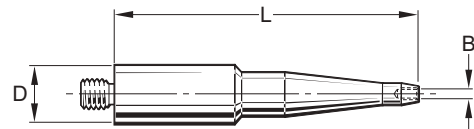
Adaptor, stainless steel

Part number	A-5555-0226	A-5555-0227	A-5555-0228
Zeiss order number	602030-0215	602030-0315	602030-0318
Threads	M5/M2	M5/M3	M5/M4
L (mm)	10	10	10
DG (mm)	11	11	11
Weight (g)	5.2	5.2	5.2
Price	\$20	\$20	\$20



Holder for digitalization styli, stainless steel

Part number	A-5555-0231	A-5555-0232
Zeiss order number	602030-9113	602030-9115
L (mm)	119	127
D (mm)	15.81	9.52
B	M2	M2
Weight (g)	126	87
Price	\$268	\$302

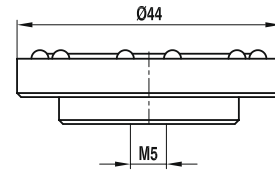


Adaptor plates for Zeiss probe heads

Adaptor plate for dynamic systems (ST), aluminum

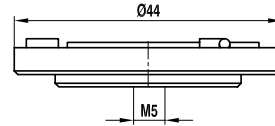
Part number	A-5555-0322	A-5555-0251
Zeiss order number	600660-8240	600660-8251
Quantity in kit	1	2
Weight (g)	72	144
Price	\$300	\$599

Schematics not shown to scale



Adaptor plate for Prismo dynamic systems (ST), aluminum

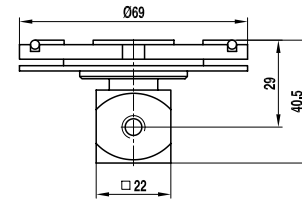
Part number	A-5555-0253	A-5555-3900
Zeiss order number	620660-8251-000	–
Quantity in kit	2	1
Weight (g)	144	72
Price	\$599	\$300



Adaptor plate for measuring systems MT/Vast, aluminum, with active ID chip

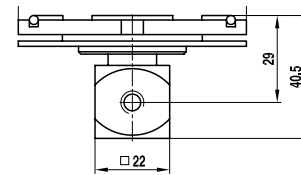
Part number	A-5555-0255	A-5555-0256	A-5555-0258*
Zeiss order number	600667-9601	600667-9611	600667-8571
Quantity in kit	1	2	1
Weight (g)	153	306	130
Price	\$441	\$881	\$441

* adaptor plate without cube



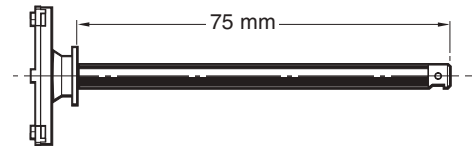
Adaptor plate for XXT TL1, reference plate for XXT TL1

Part number	A-5555-1235	A-5555-1236
Zeiss order number	620161-8055-000	620161-8058-000
Weight (g)	4.6	4.6
Price	\$390	\$312



Adaptor plate for VAST XXT TL2, reference plate for XXT TL2

Part number	A-5555-1237	A-5555-1238
Zeiss order number	620161-8065-000	620161-8068-000
Weight (g)	5.4	5.4
Price	\$369	\$369



Adaptor plate for VAST XXT TL3, reference plate for XXT TL3

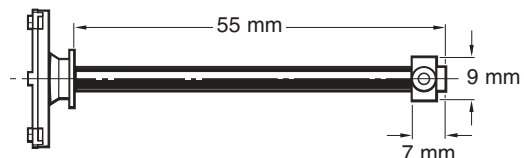
Part number	A-5555-1239	A-5555-1240
Zeiss order number	620161-8075-000	620161-8078-000
Weight (g)	4.6	4.6
Price	\$369	\$369

VAST XXT TL1 with star adaptor

Part number	A-5555-1241
Zeiss order number	626103-8031-055
Weight (g)	6.3
Price	\$340

VAST XXT TL3 with star adaptor

Part number	A-5555-1242
Zeiss order number	626103-8033-055
Weight (g)	6.3
Price	\$340



M3 styli, adaptors and accessories for Zeiss analog probe systems

Schematics not shown to scale

Carbide styli XXT, titanium base, tungsten carbide stem, ruby ball

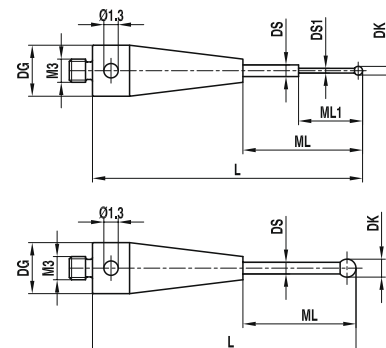
Part number	A-5004-3176	A-5004-2185	A-5004-1702	A-5004-2186	A-5555-3853	A-5004-3179
Zeiss order number	626113-0030-013	626113-0030-020	626113-0050-013	626113-0050-020	626113-0060-014	626113-0060-020
DK (mm)	0.3	0.3	0.5	0.5	0.6	0.6
L (mm)	13	20	13	20	14	20
DG (mm)	5	5	5	5	5	5
ML (mm)	4	11	4	11	5	1
ML1 (mm)	2.3	2.3	2.3	2.3	4.6	4.6
DS (mm)	1	1	1	1	1	1
DS1 (mm)	0.2	0.2	0.3	0.3	0.4	0.4
Weight (g)	0.62	0.69	0.61	0.69	0.61	0.68
Price	\$167	\$73	\$73	\$73	\$57	\$60

Part number	A-5004-3273	A-5004-3274	A-5004-1883	A-5004-3187	A-5555-3854	A-5004-1863
Zeiss order number	626113-0080-014	626113-0080-020	626113-0080-034	626113-0100-014	626113-0101-020	626113-0100-020
DK (mm)	0.8	0.8	0.8	1	1	1
L (mm)	14	20	34	14	20	20
DG (mm)	5	5	5	5	5	5
ML (mm)	5	11	25	5	11	11
ML1 (mm)	-	4.8	4.1	-	5.1	5
DS (mm)	0.6	1	1	0.8	1	1
DS1 (mm)	-	0.6	0.6	-	0.6	0.8
Weight (g)	0.62	0.69	0.8	0.63	0.7	0.69
Price	\$57	\$57	\$69	\$59	\$64	\$60

Part number	A-5004-3519	A-5004-3427	A-5555-9341	A-5004-3272	A-5004-1862	A-5555-9339
Zeiss order number	626113-0130-020	626113-0100-030	626113-0100-040	626113-0150-014	626113-0150-020	626113-0151-030
DK (mm)	1	1	1	1.5	1.5	1.5
L (mm)	20	30	40	14	20	30
DG (mm)	5	5	5	5	5	5
ML (mm)	11	21	31	5	11	21
ML1 (mm)	-	5	5	-	-	-
DS (mm)	0.8	1	1	1	1	1
DS1 (mm)	-	0.8	0.8	-	-	-
Weight (g)	0.7	0.8	1.5	0.65	0.72	0.84
Price	\$54	\$64	\$66	\$57	\$60	\$62

Part number	A-5555-9340	A-5004-1779	A-5004-3188	A-5004-1861	A-5004-0656	A-5555-3855
Zeiss order number	626113-0150-030	626113-0151-040	626113-0200-014	626113-0200-020	626113-0200-030	626113-0021-040
DK (mm)	1.5	1.5	2	2	2	2
L (mm)	30	40	14	20	30	40
DG (mm)	5	5	5	5	5	5
ML (mm)	22.5	31	5	11	21	31
DS (mm)	1	1	1	1	1	1.5
Weight (g)	0.9	1.6	0.66	0.72	0.83	1.7
Price	\$67	\$69	\$59	\$62	\$60	\$64

Part number	A-5555-3856	A-5555-3857	A-5004-3428
Zeiss order number	626113-0250-020	626113-0250-030	626113-0250-040
DK (mm)	2.5	2.5	2.5
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	1.5	1.5	1.5
Weight (g)	1	1.5	2
Price	\$60	\$62	\$64

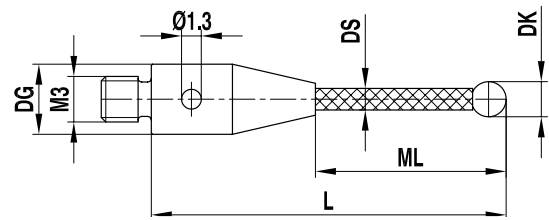


M3 styli for Zeiss probing systems

Reference styli **XXT (red dot)**, titanium base, thermo stable carbon fiber stem, ruby ball

Schematics not shown to scale

Part number	A-5555-2033	A-5555-3858
Zeiss order number	626103-0501-030	626103-0501-050
DK (mm)	5	5
L (mm)	30	50
DG (mm)	5	5
ML (mm)	21	41
DS (mm)	3.5	3.5
Weight (g)	1.1	1.4
Price	\$110	\$106



Thermo stable carbon fiber styli XXT, titanium base, thermo stable carbon fiber stem, ruby ball

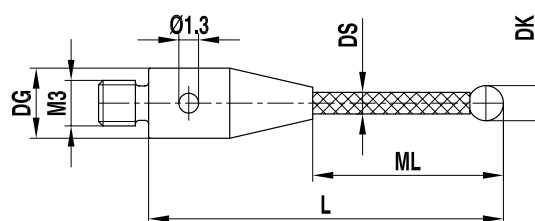
Schematics not shown to scale

Part number	A-5555-3859	A-5004-0802	A-5555-1251	A-5004-1884	A-5004-0803	A-5555-3860
Zeiss order number	626103-0300-025	626103-0300-033	626103-0300-040	626103-0300-042	626103-0300-050	626103-0300-058
DK (mm)	3	3	3	3	3	3
L (mm)	25	33	40	42	50	58
DG (mm)	5	5	5	5	5	5
ML (mm)	16	24	31	33	41	49
DS (mm)	2	2	2	2	2	2
Weight (g)	0.65	0.7	0.8	0.8	0.8	1
Price	\$89	\$97	\$96	\$99	\$99	\$106

Part number	A-5555-3861	A-5555-3862	A-5004-2786	A-5004-2108	A-5003-0062	A-5004-0806
Zeiss order number	626103-0300-059	626103-0300-075	626103-0401-050	626103-0500-030	626103-0500-040	626103-0500-050
DK (mm)	3	3	4	5	5	5
L (mm)	59	75	50	30	40	50
DG (mm)	5	5	5	5	5	5
ML (mm)	50	66	41	21	31	41
DS (mm)	2	2	2	3.5	3.5	3.5
Weight (g)	1	1	1	1.1	1.2	1.4
Price	\$106	\$108	\$99	\$106	\$74	\$106

Part number	A-5555-3864	A-5555-1114	A-5004-3429	A-5555-3865	A-5555-1115	A-5555-3866
Zeiss order number	626103-0500-060	626103-0501-075	626103-0600-050	626103-0610-070	626103-0600-100	626103-0800-030
DK (mm)	5	5	6	6	6	8
L (mm)	60	75	50	70	100	30
DG (mm)	5	5	5	5	5	5
ML (mm)	51	66	40	61	91	30
DS (mm)	3.5	3.5	3.5	3.5	3.5	5
Weight (g)	1.5	1.8	1.5	1.8	2.4	1.86
Price	\$108	\$113	\$126	\$127	\$129	\$138

Part number	A-5555-3867	A-5555-3868	A-5555-3869	A-5004-0808
Zeiss order number	626103-0830-050	626103-0830-070	626103-0830-100	626103-0800-125
DK (mm)	8	8	8	8
L (mm)	50	70	100	125
DG (mm)	5	5	5	5
ML (mm)	50	70	100	125
DS (mm)	5	5	5	5
Weight (g)	2.1	2.6	2.7	2.9
Price	\$148	\$154	\$159	\$162

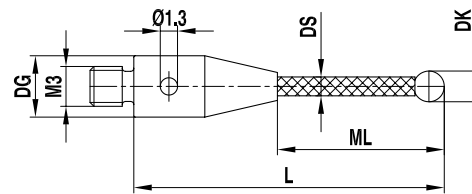


M3 styli for Zeiss probing systems

Thermo stable carbon fiber styli XXT, titanium base, thermo stable carbon fiber stem, silicon nitride ball

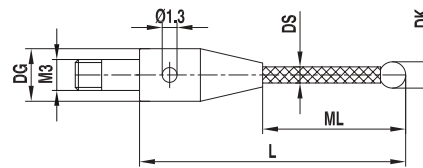
Schematics not shown to scale

Part number	A-5555-3870	A-5555-3871	A-5555-3872	A-5004-1858	A-5555-3873	A-5555-3874
Zeiss order number	626103-0301-033	626103-0301-050	626103-0502-050	626103-0500-075	626103-0801-070	626103-0801-125
DK (mm)	3	3	5	5	8	8
L (mm)	33	50	50	75	70	125
DG (mm)	5	5	5	5	5	5
ML (mm)	24	41	41	66	70	125
DS (mm)	2	2	3.5	3.5	5	5
Weight (g)	0.7	0.8	1.4	1.8	2.6	2.9
Price	\$122	\$126	\$134	\$138	\$205	\$212



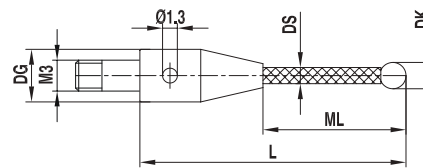
Thermo stable carbon fiber clamping styli XXT, titanium base, thermo stable carbon fiber stem, ruby ball

Part number	A-5555-3875	A-5555-3876	A-5004-3282
Zeiss order number	626103-0301-020	626103-0301-030	626103-0301-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	0.7	0.75	0.8
Price	\$99	\$104	\$110



Thermo stable carbon fiber clamping styli XXT, titanium base, thermo stable carbon fiber stem, silicon nitride ball

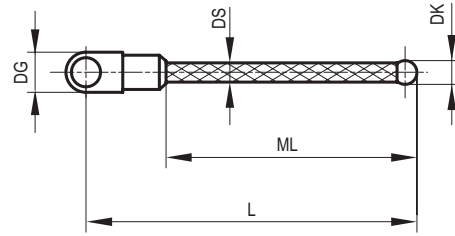
Part number	A-5555-3877	A-5555-3878	A-5555-3879
Zeiss order number	626103-0311-020	626103-0311-030	626103-0311-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	0.7	0.75	0.8
Price	\$104	\$110	\$113



¼ star styli, thermo stable carbon fiber XXT, titanium base, thermo stable carbon fiber stem, ruby ball

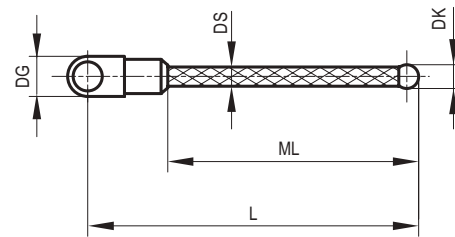
Schematics not shown to scale

Part number	A-5555-1273	A-5555-1274	A-5555-1275
Zeiss order number	626103-0302-020	626103-0302-030	626103-0302-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	0.8	0.9	1
Price	\$157	\$162	\$168



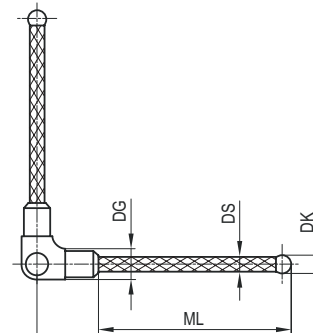
¼ star styli, thermo stable carbon fiber XXT, titanium base, thermo stable carbon fiber stem, silicon nitride ball

Part number	A-5555-3880	A-5555-3881	A-5555-3901
Zeiss order number	626103-0312-020	626103-0312-030	626103-0312-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	0.8	0.9	1
Price	\$157	\$162	\$168



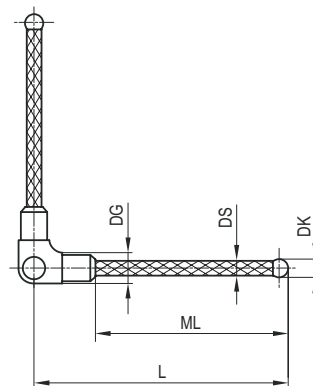
½ star styli, thermo stable carbon fiber XXT, 90 degrees, titanium base, thermo stable carbon fiber stem, ruby ball

Part number	A-5555-3882	A-5555-3883	A-5004-3284
Zeiss order number	626103-0303-020	626103-0303-030	626103-0303-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	1.4	1.5	1.6
Price	\$309	\$314	\$319



½ star styli, thermo stable carbon fiber XXT, 90 degrees, titanium base, thermo stable carbon fiber stem, silicon nitride ball

Part number	A-5555-3884	A-5555-3885	A-5555-3886
Zeiss order number	626103-0313-020	626103-0313-030	626103-0313-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	1.4	1.5	1.6
Price	\$309	\$314	\$319

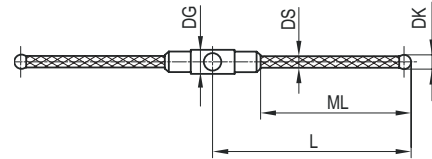


M3 styli for Zeiss probing systems

½ star styli, thermo stable carbon fiber XXT, 180 degrees, titanium base, thermo stable carbon fiber stem, ruby ball

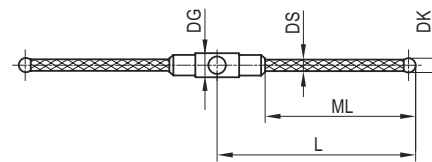
Schematics not shown to scale

Part number	A-5555-3887	A-5555-3888	A-5004-0654
Zeiss order number	626103-0304-020	626103-0304-030	626103-0304-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	1.4	1.5	1.6
Price	\$309	\$314	\$235



½ star styli, thermo stable carbon fiber XXT, 180 degrees, titanium base, thermo stable carbon fiber stem, silicon nitride ball

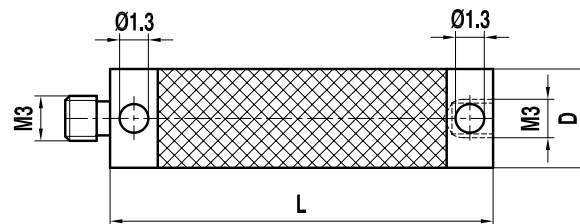
Part number	A-5555-3889	A-5555-3890	A-5555-3891
Zeiss order number	626103-0314-020	626103-0314-030	626103-0314-040
DK (mm)	3	3	3
L (mm)	20	30	40
DG (mm)	5	5	5
ML (mm)	11	21	31
DS (mm)	2	2	2
Weight (g)	1.4	1.5	1.6
Price	\$309	\$314	\$319



Extension XXT, thermo stable black carbon fiber, titanium ends

Part number	A-5555-3892	A-5555-1947	A-5004-3430	A-5555-3893	A-5004-0002	A-5555-3894
Zeiss order number	626103-5020-000	626103-5025-000	626103-5030-000	626103-5040-000	626103-5050-000	626103-5060-000
D (mm)	5	5	5	5	5	5
L (mm)	20	25	30	40	50	60
Weight (g)	1.2	1.25	1.3	1.4	1.5	1.7
Price	\$73	\$78	\$81	\$71	\$99	\$106

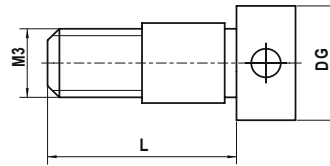
Part number	A-5555-1948	A-5004-2001	A-5004-1859	A-5555-3895	A-5555-1276
Zeiss order number	626103-5075-000	626103-5080-000	626103-5100-000	626103-5130-000	626103-5150-000
D (mm)	5	5	5	5	5
L (mm)	75	80	100	130	150
Weight (g)	1.7	1.8	2	2.5	2.7
Price	\$120	\$124	\$140	\$166	\$182



Clamping screw XXT, titanium

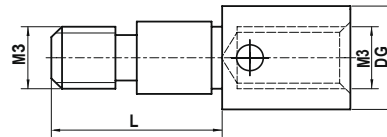
Schematics not shown to scale

Part number	A-5004-1856
Zeiss order number	626103-6110-004
DG (mm)	5
L (mm)	8
Weight (g)	0.5
Price	\$18



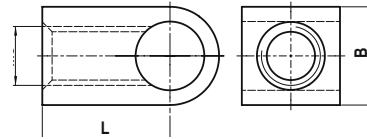
Clamping screw XXT with internal M3 thread, titanium

Part number	A-5004-1857
Zeiss order number	626103-6110-005
DG (mm)	5
L (mm)	8
Weight (g)	0.7
Price	\$18



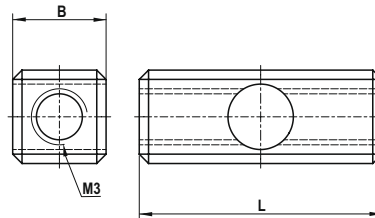
Cube XXT 90 degrees, 1 way, titanium

Part number	A-5004-3437
Zeiss order number	626103-6110-001
B (mm)	5
L (mm)	6.5
Weight (g)	0.64
Price	\$71



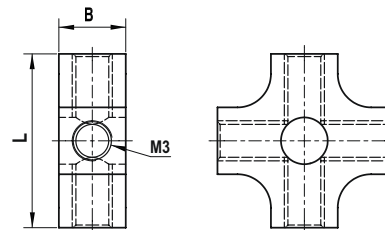
Cube XXT 180 degrees, 2 way, titanium

Part number	A-5555-3896
Zeiss order number	626103-6110-002
B (mm)	5
L (mm)	13
Weight (g)	1.05
Price	\$81



Cube star XXT, titanium

Part number	A-5555-3897
Zeiss order number	626103-6110-003
B (mm)	5
L (mm)	13
Weight (g)	1.8
Price	\$90

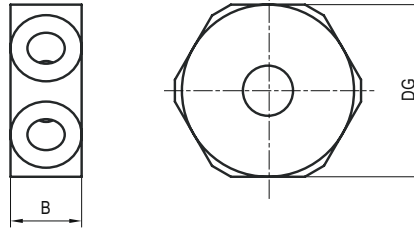


M3 styli for Zeiss probing systems

Cube XXT, 6 star, titanium

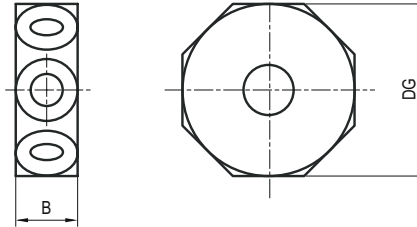
Schematics not shown to scale

Part number	A-5555-3898
Zeiss order number	626103-6110-006
B (mm)	5
DG (mm)	12
Weight (g)	1.8
Price	\$113



Cube XXT, 8 star, titanium

Part number	A-5555-3899
Zeiss order number	626103-6110-007
B (mm)	5
DG (mm)	14
Weight (g)	2.3
Price	\$131



Knuckle XXT, titanium

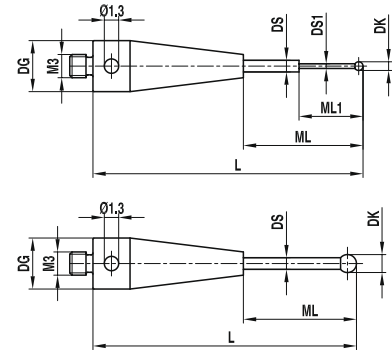
Part number	A-5004-3285
Zeiss order number	626103-6180-001
B (mm)	5
L (mm)	10
Weight (g)	1.65
Price	\$168

Tungsten carbide styli, stainless steel base, tungsten carbide stem, ruby ball

Schematics not shown to scale

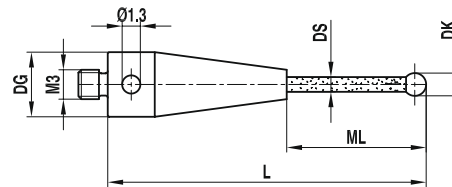
Part number	A-5555-0261	A-5555-0263	A-5555-0265	A-5555-0267	A-5555-0268	A-5555-0269	A-5555-0270	A-5555-0271
Zeiss order number	602030-8104	602030-8113	602030-8112	602030-8115	602030-8116	602030-8117	602030-8118	602030-8119
DK (mm)	2	3	4	0.5	0.6	0.8	1	1.5
L (mm)	22	40	33	22	22	22	22	22
DG (mm)	4	5.5	4	4	4	4	4	4
ML (mm)	9	21.5	23	9	9	9	9	9
ML1 (mm)	-	-	-	2.5	4.6	4.8	5	-
DS (mm)	1	2	2.5	1	1	1	1	1
DS1 (mm)	-	-	-	0.3	0.4	0.6	0.8	-
Weight (g)	1	4	2.5	1	1	1	1	1
Price	\$32	\$43	\$43	\$55	\$55	\$52	\$48	\$41

Part number	A-5555-0272	A-5555-0273	A-5555-0274	A-5555-0276	A-5555-0277
Zeiss order number	602030-8120	602030-8121	602030-8023	602030-8021	602030-8106
DK (mm)	1	0.3	2	3	3
L (mm)	10.5	22	21	21.5	21
DG (mm)	4	4	4	4	4
ML (mm)	5.5	9	15	15.5	13
ML1 (mm)	5	2.3	-	-	-
DS (mm)	10	1	1	1.5	2
DS1 (mm)	0.8	.02	-	-	-
Weight (g)	1	1	1	1	1
Price	\$53	\$74	\$36	\$41	\$39



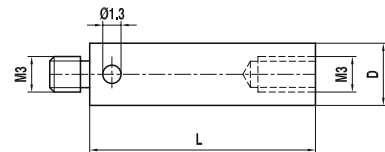
Ceramic styli, stainless steel base, ceramic stem, ruby ball

Part number	A-5555-0264	A-5555-0266	A-5555-0275
Zeiss order number	602030-8102	602030-8101	602030-8020
DK (mm)	4	5	6
L (mm)	32	32	13
DG (mm)	4	4	4
ML (mm)	26	19	9
DS (mm)	2	2	2
Weight (g)	1	1	1
Price	\$43	\$45	\$48



Stainless steel extensions

Part number	A-5004-7609	A-5004-7583	A-5555-0286	A-5555-0287	A-5555-0288
Zeiss order number	602030-8301	602030-8302	602030-8303	602030-8304	602030-8305
L (mm)	10	20	30	40	50
D (mm)	4	4	4	4	4
Weight (g)	0.7	1.6	2.6	3.7	4.7
Price	\$13	\$15	\$18	\$23	\$23

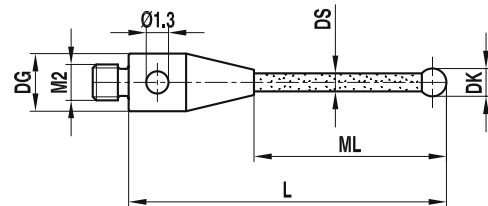


M2 styli, adaptors and accessories for Zeiss analog probe systems

Schematics not shown to scale

Ceramic styli, stainless steel base, ceramic stem, ruby ball

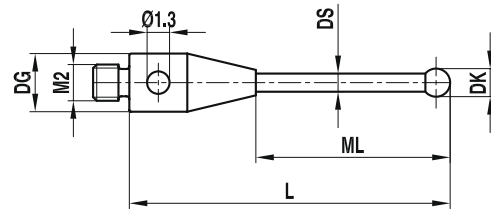
Part number	A-5555-0278	A-5555-0279
Zeiss order number	602030-8002	602030-8004
DK (mm)	6	5
L (mm)	13	22.5
DG (mm)	3	3
ML (mm)	9	16.5
DS (mm)	2	2
Weight (g)	1	1
Price	\$48	\$55



Tungsten carbide styli, stainless steel base, tungsten carbide stem, ruby ball

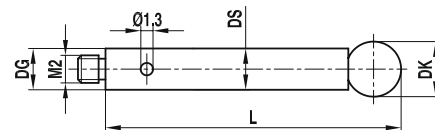
Part number	A-5555-0308	A-5555-0309	A-5555-0282	A-5555-0310	A-5555-0311	A-5003-3822	A-5003-0938	A-5555-0312
Zeiss order number	602030-8006	602030-8007	602030-8001	602030-8008	602030-8009	602030-8005	602030-8003	602030-8015
DK (mm)	1	1	2	2	2	2	3	4
L (mm)	10.5	15.5	11	11	16	21	21.5	12
DG (mm)	3	3	3	3	3	3	3	3
ML (mm)	6.5	11.5	5	7	12	15	15.5	8
DS (mm)	0.8	0.8	1	1	1	1	1.5	2.5
Weight (g)	0.3	0.3	1	1	1	1	1	1
Price	\$36	\$36	\$25	\$27	\$27	\$27	\$78	\$34

Part number	A-5555-0313	A-5555-0283
Zeiss order number	602030-8016	602030-8034
DK (mm)	4	5
L (mm)	22	22.5
DG (mm)	3	3
ML (mm)	18	16.5
DS (mm)	2.5	2
Weight (g)	1	1
Price	\$36	\$50



Steel styli, stainless steel base and stem, ruby ball

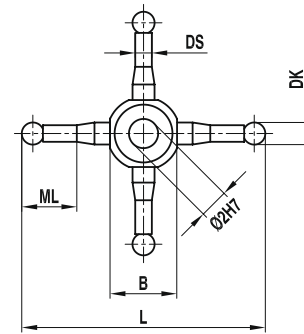
Part number	A-5555-0314	A-5555-0315	A-5555-0316
Zeiss order number	602030-8017	602030-8018	602030-8019
DK (mm)	6	6	8
L (mm)	13	28	13
DS (mm)	3	3	3
DG (mm)	3	3	3
Weight (g)	0.9	1.8	2
Price	\$45	\$46	\$66



Star styli, stainless steel cube base and stem, ruby ball

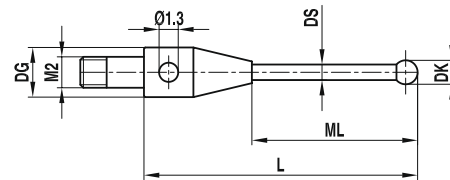
Schematics not shown to scale.

Part number	A-5555-0294	A-5555-0295
Zeiss order number	602030-8011	602030-8010
DK (mm)	2	2
L (mm)	32	22
ML (mm)	9.5	4.5
DS (mm)	1.4	1.4
B (mm)	5.5	5.5
Weight (g)	1	1
Price	\$126	\$133



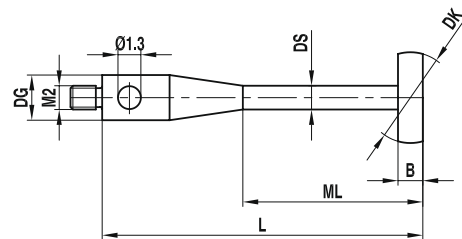
Styli for star configuration, stainless steel base and stem, ruby ball

Part number	A-5555-0296
Zeiss order number	602030-8012
DK (mm)	2
L (mm)	19.5
DG (mm)	3
ML (mm)	13.5
DS (mm)	1.5
Weight (g)	1
Price	\$43



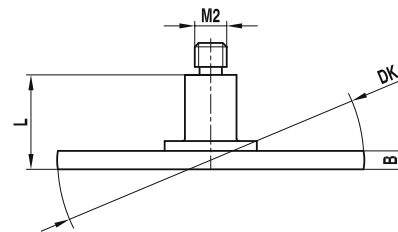
Spherical disk styli, stainless steel base, tungsten carbide stem, ceramic disk

Part number	A-5555-0297	A-5555-0298
Zeiss order number	602030-8201	602030-8202
DK (mm)	8	4
L (mm)	32	32
DG (mm)	3	3
ML (mm)	19	19
DS (mm)	1.5	1
B (mm)	1.5	1
Weight (g)	1	1
Price	\$117	\$87



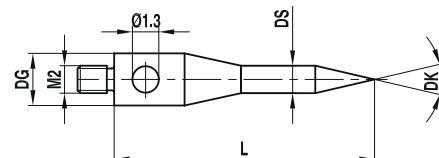
Spherical disk styli, stainless steel base and stem, ceramic disk

Part number	A-5555-0299	A-5555-0300
Zeiss order number	602030-8203	602030-8204
DK (mm)	14	20
L (mm)	5.5	5.5
B (mm)	2	2.5
Weight (g)	1	3
Price	\$157	\$187



Pointer styli, stainless steel base, cone point, tungsten carbide

Part number	A-5555-0317	A-5555-0318
Zeiss order number	602030-8342	602030-8343
L (mm)	10	10
DG (mm)	3	3
DS (mm)	1.5	1.5
DK	30°	60°
Weight (g)	1	1
Price	\$28	\$28

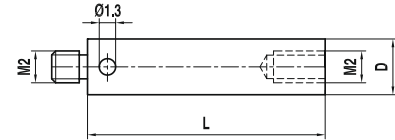


M2 styli for Zeiss probing systems

Stainless steel extension

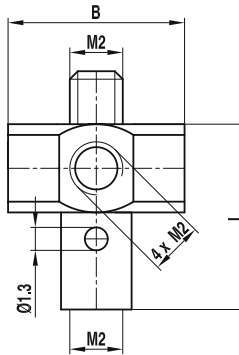
Schematics not shown to scale

Part number	A-5004-7610	A-5004-7585	A-5004-7586	A-5004-7591	A-5004-7611
Zeiss order number	602030-8321	602030-8322	602030-8323	602030-8324	602030-8325
L (mm)	5	10	20	30	40
D (mm)	3	3	3	3	3
Weight (g)	0.2	0.5	1	1.4	2.2
Price	\$12	\$13	\$15	\$17	\$19



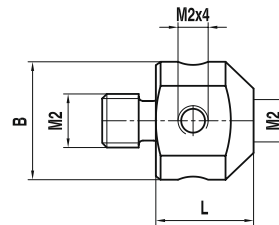
5-way holder, rotary, stainless steel

Part number	A-5000-3627
Zeiss order number	602030-8381
L (mm)	7.5
B (mm)	7
Weight (g)	1.2
Price	\$48



5-way holder, stainless steel

Part number	A-5555-0319	A-5555-0320
Zeiss order number	602030-9104	602030-9103
L (mm)	9.1	5.4
D (mm)	10.5	7
Weight (g)	3.4	1
Price	\$81	\$39



Renishaw tools and accessories for the assembly of M2, M3 and M5 styli to Zeiss measuring probe heads

Schematics not shown to scale

Stylus tool (M2 and M3 styli)

Part number	A-5555-0233
Zeiss order number	602030-0001
DK (mm)	1.2
L (mm)	23
Weight (g)	1
Price	\$10



Allen keys DIN 911

Part number	A-5555-0234	A-5555-0235	A-5555-0236
Zeiss order number	602030-0002	602030-0042	602030-0021
B (mm)	SW1.5	SW0.9	SW2.5
Weight (g)	1	1	2
Price	\$1	\$1	\$1



Tool kit

consisting of:

Part number	A-5555-0237
Zeiss order number	600341-8595
Price	\$30

	1 x offset screwdriver DIN 911-2	1 x offset screwdriver DIN 911-3	1 x offset screwdriver DIN 911-4	2 x pin-type spanner 2.9 mm	1 x single-headed spanner DIN 894
DK (mm)	–	–	–	2.9	–
L (mm)	–	–	–	70	–
D (mm)	–	–	–	5	–
B	SW2	SW3	SW4	–	SW13
Weight (g)	1	5	10	15 each	39

Stylus tool kit (2 x pin-type spanners 2.9 mm for M5)

Part number	A-5555-0238
Zeiss order number	600341-8596
DK (mm)	2.9
L (mm)	70
D (mm)	5
Weight (g)	15
Price	\$23

Stylus tool 1.7 mm for M5

Part number	A-5555-0239
Zeiss order number	602030-0027
DK (mm)	1.7
L (mm)	49
D (mm)	2.5
Weight (g)	1
Price	\$10

Styli tools for Zeiss probing systems

Pin-type spanner 2.9 mm for M5

Part number	A-5555-0240
Zeiss order number	602030-0222
DK (mm)	2.9
L (mm)	70
D (mm)	5
Weight (g)	7.5
Price	\$12

Assortment of screws

Part number	A-5555-0241
Zeiss order number	600341-8590
Weight (g)	27
Price	\$28

Includes:

10 spring-lock washers FS 5x7
2 cheese-head screws M5x12
2 cheese-head screws M5x20
4 grub screws 10 mm long
2 grub screws 25 mm long

Spring-lock washers

Part number	A-5555-0242
Zeiss order number	600341-0042
Price	\$5

Includes:

10 x FS 5.7 spring-lock washers

C spanners DIN 1810

Part number	A-5555-0243	A-5555-0244
Zeiss order number	602030-0045	602030-0044
DK (mm)	11	21
Price	\$14	\$17

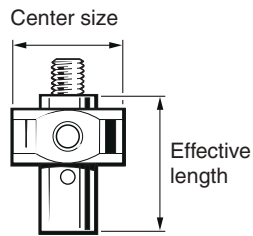
Accessories

Stylus knuckles

Part number	A-5000-7534	A-5003-4697	A-5000-9902 Rotary	A-5000-7616	A-5003-4686 Rotary	A-5003-4689 Rotary	* A-5003-5278 Rotary	A-5003-5279 Rotary
Thread size	M2	M2	M2	M3	M3	M4	M5	M5
Effective length mm (in.)	8.0 (0.32)	13.5 (0.54)	16.5 (0.65)	12.0 (0.48)	17.0 (0.67)	33.0 (1.30)	36.5 (1.44)	46.5 (1.84)
Center offset mm (in.)	4.5 (0.18)	N/A	N/A	6.0 (0.24)	N/A	N/A	N/A	N/A
Mass grams	1.6	1.1	1.3	3.7	1.5	9.8	16.5	64.9
Price	\$71	\$108	\$81	\$71	\$130	\$140	\$247	\$86

* Not for use with SP80






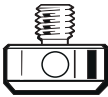


Stylus centers

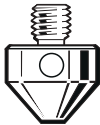


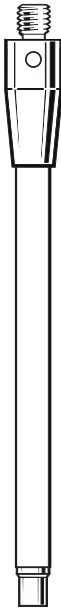


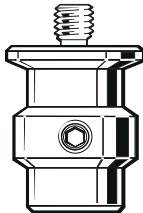
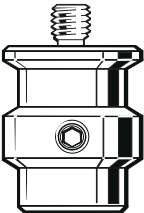


Part number	A-5000-8395 4-way	A-5000-3627 5-way	A-5000-7610 5-way	A-5000-7792 5-way
Thread size	M2	M2	M3	M4
Effective length mm (in.)	7.5 (0.30)	7.5 (0.30)	13.0 (0.52)	18.0 (0.71)
Center size mm (in.)	7.5 (0.30)	7.0 (0.28)	10.0 (0.40)	15.0 (0.60)
Mass grams	1.1	0.8	3.6	12.1
Price	\$64	\$48	\$50	\$60

Accessories

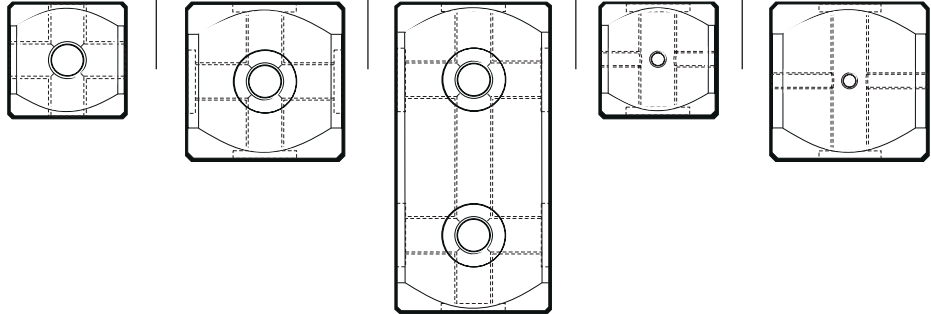
Adaptors

Part number	A-5004-7593 Stainless steel	A-5004-7592 Stainless steel	A-5004-7595 Stainless steel	A-5004-7597 Stainless steel	A-5004-7596 Stainless steel	A-5004-7613 Stainless steel	A-5003-0856 Stainless steel	A-5555-0227 Stainless steel
Male/female thread	M2/M3	M3/M2	M4/M2	M4/M3	M4/M3	M5/M4	M5/M4	M5/M3
Length mm (in.)	7.0 (0.28)	5.0 (0.20)	5.0 (0.20)	9.0 (0.36)	20.0 (0.79)	6.5 (0.26)	9.0 (0.36)	10.0 (0.40)
Mass grams	0.4	0.6	1.5	1.4	3.2	6.0	4.6	5.0
Price	\$12	\$14	\$32	\$32	\$20	\$32	\$29	\$20
								

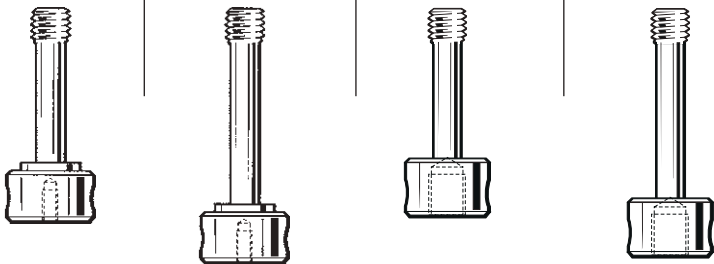
Part number	A-5555-0226 Stainless steel	A-5000-7751 Ceramic	A-5004-7612 Stainless steel	A-5000-7752 Ceramic	A-5000-7753 Ceramic	A-2054-4657 Stainless steel	A-5000-9302 Stainless steel	A-5000-9303 Stainless steel
Male/female thread	M5/M2	M4/M3	TF6/M3	M4/M3	M4/M3	M4/Ø4.5	M5/Ø8.0	M5/Ø10.0
Length mm (in.)	10.0 (0.40)	50.0 (1.97)	18.0 (0.71)	75.0 (2.96)	100.0 (3.94)	10.0 (0.40)	22.0 (0.87)	22.0 (0.87)
Mass grams	5.0	4.4	1.9	5.2	6.3	5.0	18.0	20.0
Price	\$20	\$60	\$35	\$91	\$104	\$34	\$62	\$62
								

Cubes and bolts

Part number	A-5555-0189 Titanium	A-5555-0190 Titanium	A-5555-0194 Titanium	A-5003-5683 Titanium	A-5003-5684 Titanium
Thread size	M5	M5	M5	M5 – M2	M5 – M2
Length mm (in.)	15.0 (0.60)	20.0 (0.79)	20.0 (0.79)	15.0 (0.60)	20.0 (0.79)
Width mm (in.)	15.0 (0.60)	20.0 (0.79)	40.0 (1.58)	15.0 (0.60)	20.0 (0.79)
Mass grams	12.85	32.55	63.50	13.75	35.18
Price	\$50	\$60	\$108	\$86	\$101

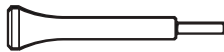


Part number	A-5003-5679 Stainless steel	A-5003-5678 Stainless steel	A-5003-5677 Stainless steel	A-5003-5676 Stainless steel
Thread size	M5 – M2	M5 – M2	M5	M5
Length mm (in.)	28.0 (1.11)	33.0 (1.30)	28.0 (1.11)	33.0 (1.30)
Mass grams	6.7	7.1	6.0	6.4
Price	\$18	\$18	\$18	\$18

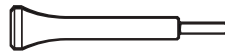


Stylus tools

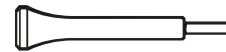
A-5004-7582
For M2 and M3
threaded styli
Price: \$9



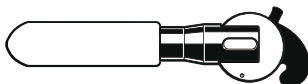
A-5004-7587
For M4
threaded styli
Price: \$12



A-5004-7614
For M5
threaded styli
Price: \$15



A-5003-2300
For the M2 carbon fiber
range of styli
Price: \$48



These tools are designed to fit styli to Renishaw probes without causing any internal damage.

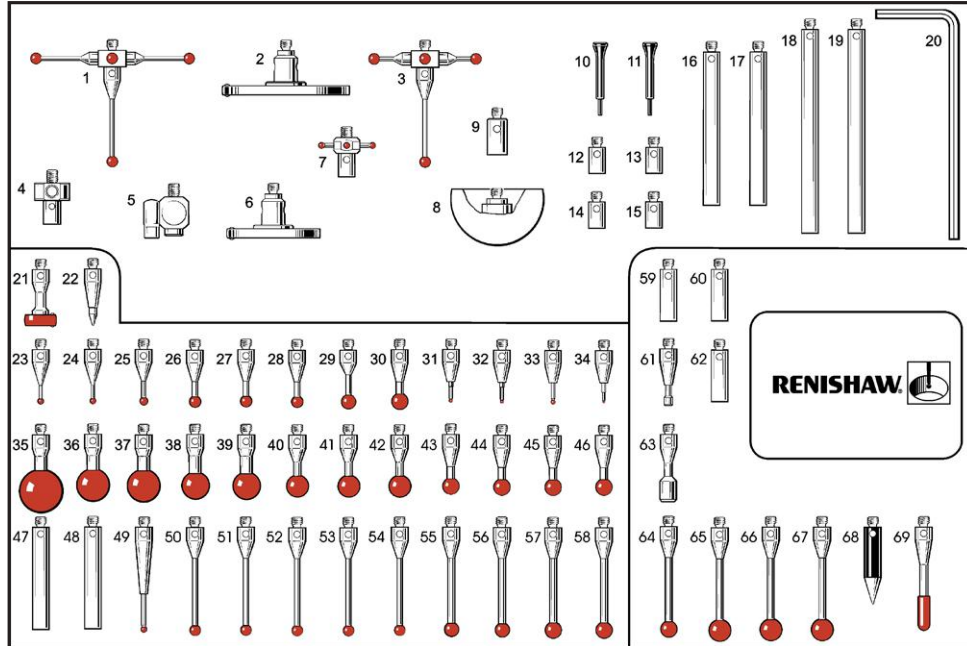
Stylus kits

M2 comprehensive stylus kit

A-5000-0001

Price: \$2,808

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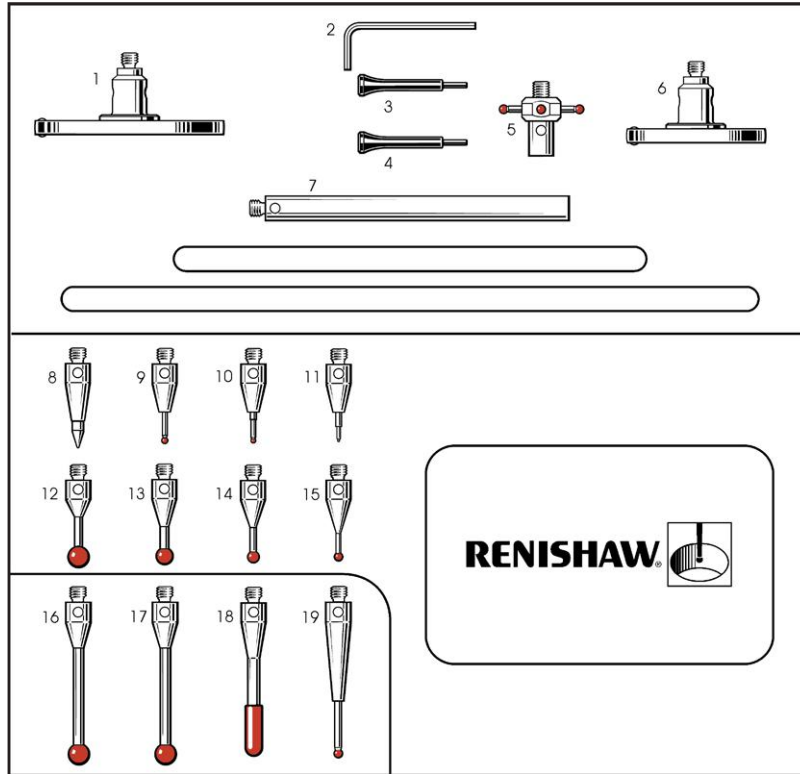
Position	Part number	Description
1	A-5000-3626	M2 STR D2 5BALL L19.2 S30
2	A-5000-7810	M2 DSC D25SLVS T1.5 L8.6 BR-Y2.5
3	A-5000-7629	M2 STR D2 5BALL L19.2 S18
4	A-5000-3627	M2 ACC CENTER 5WAY
5	A-5000-7534	M2 ACC KNUCKLE OFFSET
6	A-5000-7809	M2 DSC D18SLVS T1.5 L8.6 BR-Y2.5
7	A-5000-7811	M2 STR D1 4BALL L7.5T S10
8	A-5000-3614	M2 HEM D18CE
9	A-5004-7593	M2-M3 EXT L7SS
10-11	A-5004-7582	M2-M3 STYLUS TOOL
12-15	A-5004-7610	M2 EXT L5 D3SS
16-17	A-5004-7591	M2 EXT L30 D3SS
18-19	A-5004-7611	M2 EXT L40 D3SS
20	P-TL01-0150	S3 HEX WRENCH 1.5 MM A/F
21	A-5000-3611	M2 DSC D6R T1.2 L10 BR-Y2
22	A-5000-7813	M2 PNT D1.4TC 30DEG L10
23-24	A-5000-7806	M2 STY D1R L10 EWL4.5 D0.7SS
25	A-5000-7802	M2 STY D1.5R L10 EWL4.5 D0.7SS
26-28	A-5000-7807	M2 STY D2R L10 EWL6 D1SS
29	A-5000-7803	M2 STY D2.5R L10 EWL6 D1SS
30	A-5000-3604	M2 STY D3R L10 EWL7.5 D1.5SS
31-32	A-5000-7805	M2 STY D0.5R L10 EWL3 D0.4TC
33	A-5000-7801	M2 STY D0.7R L10 EWL4 D0.5TC
34	A-5000-7800	M2 STY D0.3R L10 EWL2 D0.2TC
35	A-5000-4158	M2 STY D8R L11 EWL11 D2.5SS
36-37	A-5000-4156	M2 STY D6R L10 EWL10 D2.5SS
38-39	A-5000-4155	M2 STY D5R L10 EWL10 D2.5SS
40-42	A-5000-4154	M2 STY D4R L10 EWL10 D1.5SS
43-46	A-5000-3604	M2 STY D3R L10 EWL7.5 D1.5SS
47-48	A-5004-7586	M2 EXT L20 D3SS
49	A-5000-7808	M2 STY D1R L20 EWL7 D0.7TC
50-54	A-5000-3603	M2 STY D2R L20 EWL14 D1.4SS
55-56	A-5000-7804	M2 STY D2.5R L20 EWL16.5 D1.4SS
57-58	A-5000-4160	M2 STY D3R L20 EWL17.5 D1.5SS
59-60	A-5004-7585	M2 EXT L10 D3SS
61	A-5004-7589	M2 CYL D1.5SLVS L11 EWL1.5
62	A-5004-7585	M2 EXT L10 D3SS
63	A-5004-7590	M2 CYL D3SLVS L13 EWL3.8
64	A-5000-4160	M2 STY D3R L20 EWL17.5 D1.5SS
65-67	A-5000-4161	M2 STY D4R L20 EWL20 D1.5SS
68	A-5004-7588	M2 PNT D3SLVS 30DEG L15
69	A-5000-7812	M2 SPH D2R L20 EWL7.2 SS

www.renishaw.com

M2 stylus enhancement kit

A-5000-0002

Price: \$1,032



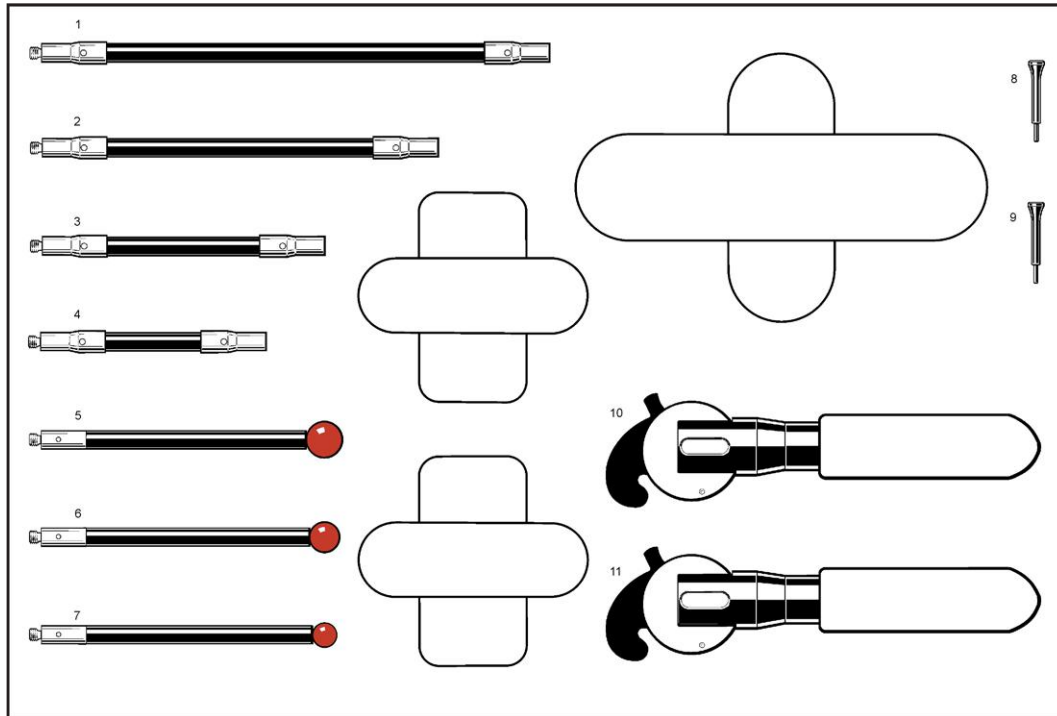
Position	Part number	Description
1	A-5000-7810	M2 DSC D25SLVS T1.5 L8.6 BR-Y2.5
2	P-TL01-0150	S3 HEX WRENCH 1.5 MM A/F
3-4	A-5004-7582	M2-M3 STYLUS TOOL
5	A-5000-7811	M2 STR D1 4BALL L7.5T S10
6	A-5000-7809	M2 DSC D18SLVS T1.5 L8.6 BR-Y2.5
7	A-5004-7611	M2 EXT L40 d3SS
8	A-5000-7813	M2 PNT D1.4TC 30deg L10
9	A-5000-7801	M2 STY D0.7R L10 EWL4 d0.5TC
10	A-5000-7805	M2 STY D0.5R L10 EWL3 d0.4TC
11	A-5000-7800	M2 STY D0.3R L10 EWL2 d0.2TC
12	A-5000-7803	M2 STY D2.5R L10 EWL6 d1SS
13	A-5000-7807	M2 STY D2R L10 EWL6 d1SS
14	A-5000-7802	M2 STY D1.5R L10 EWL4.5 d0.7SS
15	A-5000-7806	M2 STY D1R L10 EWL4.5 d0.7SS
16-17	A-5000-7804	M2 STY D2.5R L20 EWL16.5 d1.4SS
18	A-5000-7812	M2 SPH D2R L20 EWL7.2 SS
19	A-5000-7808	M2 STY D1R L20 EWL7 d0.7TC

M2 high performance kit

A-5003-2310

Price: \$710

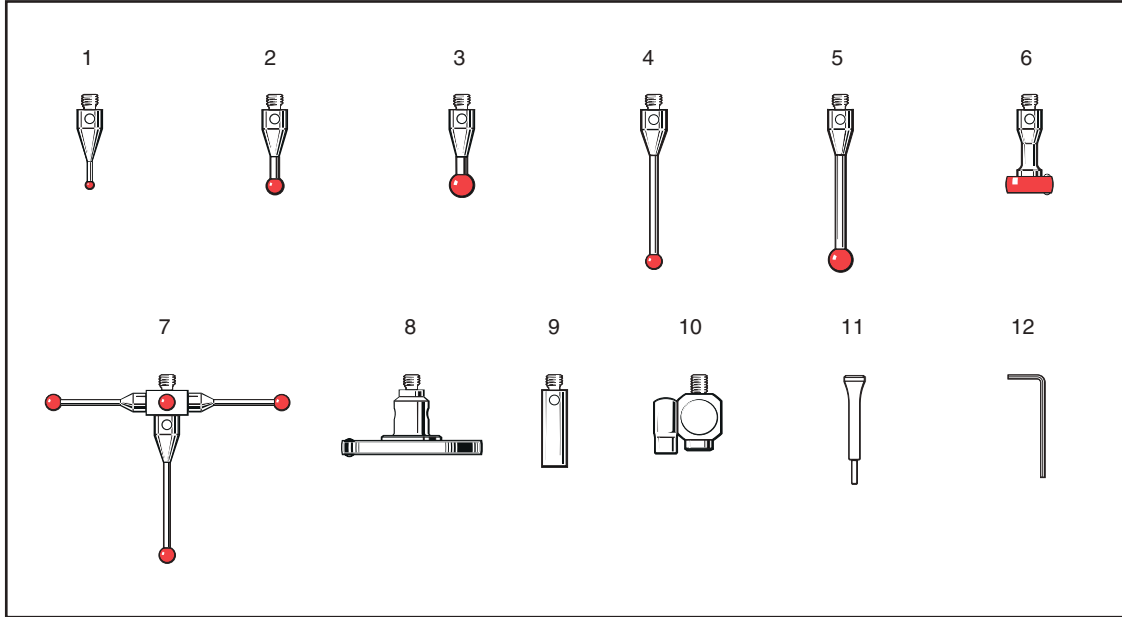
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Position	Part number	Description
1	A-5003-2283	M2 EXT L90 d3CF
2	A-5003-2282	M2 EXT L70 d3CF
3	A-5003-2281	M2 EXT L50 d3CF
4	A-5003-2280	M2 EXT L40 d3CF
5	A-5003-2287	M2 STY D6R L50 EWL50 d3CF
6	A-5003-2286	M2 STY D5R L50 EWL50 d3CF
7	A-5003-2285	M2 STY D4R L50 EWL50 d3CF
8-9	A-5004-7582	M2-M3 STYLUS TOOL
10-11	A-5003-2300	M2 STYLUS TOOL CF RANGE

Stylus kit 201 for M2 probes

Price: \$630

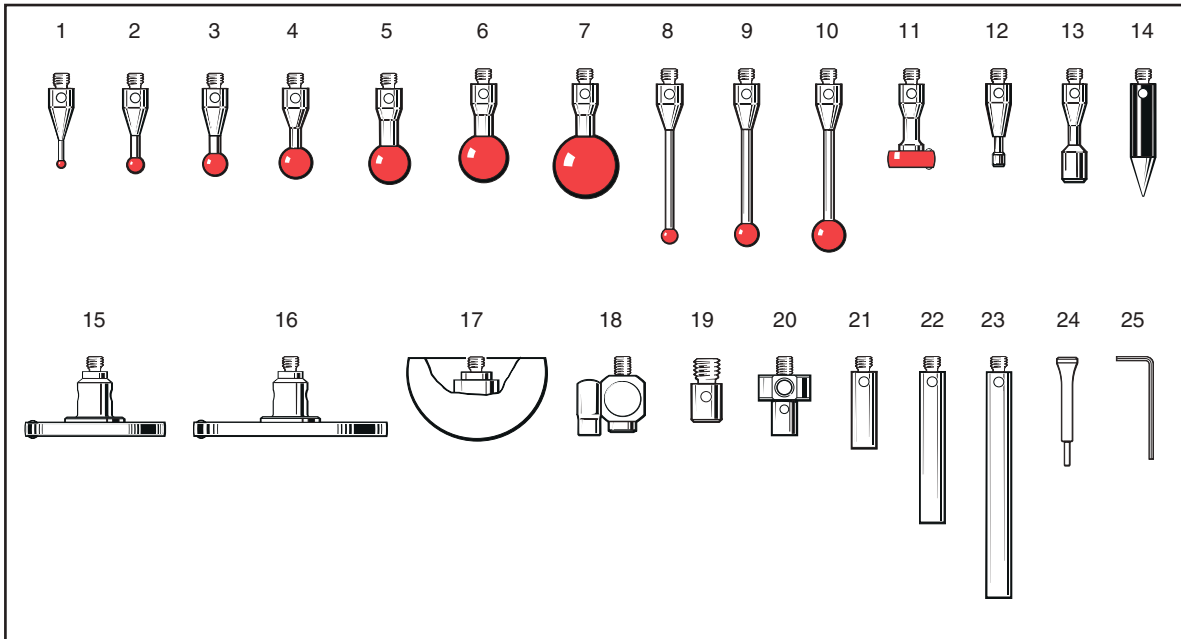


Position	Part number	Quantity	Description
1	A-5000-7806	1	M2 STY D1R L10 EWL4.5 d0.7SS
2	A-5000-7807	1	M2 STY D2R L10 EWL6 d1SS
3	A-5000-3604	1	M2 STY D3R L10 EWL7.5 d1.5SS
4	A-5000-3603	1	M2 STY D2R L20 EWL14 d1.4SS
5	A-5000-4160	1	M2 STY D3R L20 EWL17.5 d1.5SS
6	A-5000-3611	1	M2 DSC D6R T1.2 L10 BR-Y2
7	A-5000-3626	1	M2 STR D2 5BALL L19.2 S30
8	A-5000-7809	1	M2 DSC D18SLVS T1.5 L8.6 BR-Y2.5
9	A-5004-7585	2	M2 EXT L10 d3SS
10	A-5000-7534	1	M2 ACC KNUCKLE OFFSET
11	A-5004-7582	2	M2-M3 STYLUS TOOL
12	P-TL01-0150	1	S3 HEX WRENCH 1.5 MM A/F
13	M-5000-3541	1	S8 TP2 SPANNER (not pictured)
14	A-1015-7658	1	TP2 & STYLI BOX (not pictured)

Stylus kits

Stylus kit 204 for M2 probes

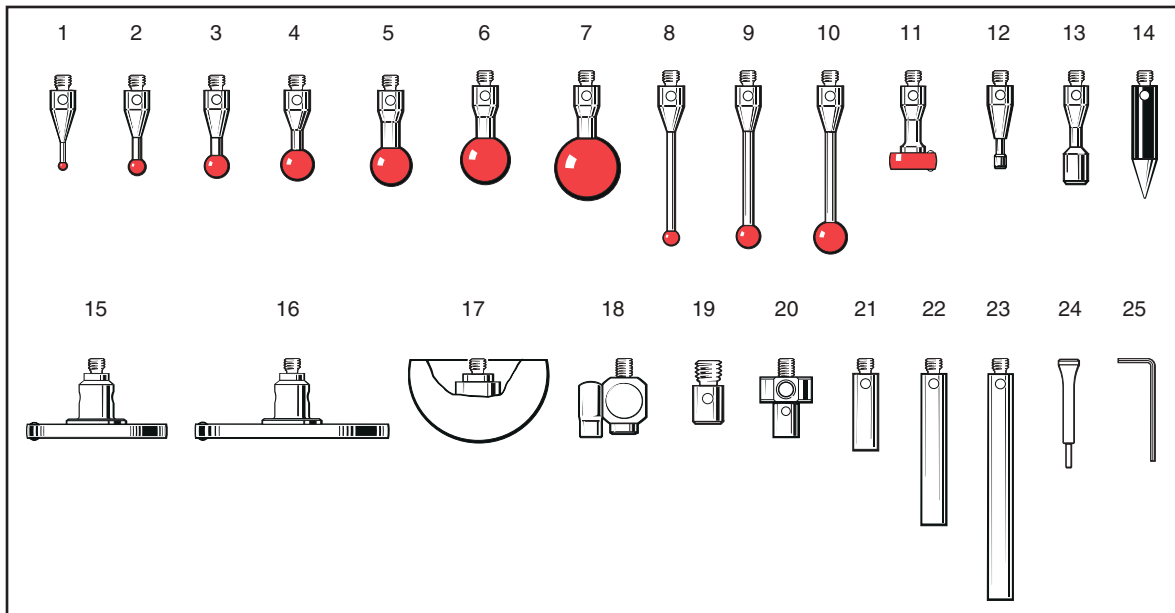
Price: \$1,290



Position	Part number	Quantity	Description
1	A-5000-7806	1	M2 STY D1R L10 EWL4.5 d0.7SS
2	A-5000-7807	1	M2 STY D2R L10 EWL6 d1SS
3	A-5000-3604	1	M2 STY D3R L10 EWL7.5 d1.5SS
4	A-5000-4154	1	M2 STY D4R L10 EWL10 d1.5SS
5	A-5000-4155	1	M2 STY D5R L10 EWL10 d2.5SS
6	A-5000-4156	1	M2 STY D6R L10 EWL10 d2.5SS
7	A-5000-4158	1	M2 STY D8R L11 EWL11 d2.5SS
8	A-5000-3603	1	M2 STY D2R L20 EWL14 d1.4SS
9	A-5000-4160	1	M2 STY D3R L20 EWL17.5 d1.5SS
10	A-5000-4161	1	M2 STY D4R L20 EWL20 d1.5SS
11	A-5000-3611	1	M2 DSC D6R T1.2 L10 BR-Y2
12	A-5004-7589	1	M2 CYL D1.5SLVS L11 EWL1.5
13	A-5004-7590	1	M2 CYL D3SLVS L13 EWL3.8
14	A-5004-7588	1	M2 PNT D3SLVS 30deg L15
15	A-5000-7809	1	M2 DSC D18SLVS T1.5 L8.6 BR-Y2.5
16	A-5000-7810	1	M2 DSC D25SLVS T1.5 L8.6 BR-Y2.5
17	A-5000-3614	1	M2 HEM D18CE
18	A-5000-7534	1	M2 ACC KNUCKLE OFFSET
19	A-5004-7592	1	M3-M2 EXT L5SS
20	A-5000-3627	1	M2 ACC Center 5WAY
21	A-5004-7585	2	M2 EXT L10 d3SS
22	A-5004-7586	2	M2 EXT L20 d3SS
23	A-5004-7591	2	M2 EXT L30 d3SS
24	A-5004-7582	2	M2-M3 STYLUS TOOL
25	P-TL01-0150	1	S3 HEX WRENCH 1.5 MM A/F
26	M-5000-3541	1	S8 TP2 SPANNER (not pictured)
27	A-1015-7749	1	COMP BOX ASSEMBLY (not pictured)

Stylus kit 206 for M2 probes

Price: \$1,972

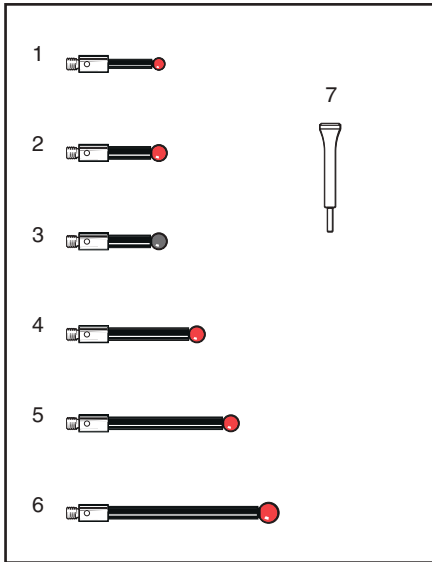


Position	Part number	Quantity	Description
1	A-5000-7806	5	M2 STY D1R L10 EWL4.5 d0.7SS
2	A-5000-7807	3	M2 STY D2R L10 EWL6 d1SS
3	A-5000-3604	5	M2 STY D3R L10 EWL7.5 d1.5SS
4	A-5000-4154	3	M2 STY D4R L10 EWL10 d1.5SS
5	A-5000-4155	2	M2 STY D5R L10 EWL10 d2.5SS
6	A-5000-4156	2	M2 STY D6R L10 EWL10 d2.5SS
7	A-5000-4158	1	M2 STY D8R L11 EWL11 d2.5SS
8	A-5000-3603	5	M2 STY D2R L20 EWL14 d1.4SS
9	A-5000-4160	3	M2 STY D3R L20 EWL17.5 d1.5SS
10	A-5000-4161	3	M2 STY D4R L20 EWL20 d1.5SS
11	A-5000-3611	1	M2 DSC D6R T1.2 L10 BR-Y2
12	A-5004-7589	1	M2 CYL D1.5SLVS L11 EWL1.5
13	A-5004-7590	1	M2 CYL D3SLVS L13 EWL3.8
14	A-5004-7588	1	M2 PNT D3SLVS 30deg L15
15	A-5000-7809	1	M2 DSC D18SLVS T1.5 L8.6 BR-Y2.5
16	A-5000-7810	1	M2 DSC D25SLVS T1.5 L8.6 BR-Y2.5
17	A-5000-3614	1	M2 HEM D18CE
18	A-5000-7534	1	M2 ACC KNUCKLE OFFSET
19	A-5004-7592	1	M3-M2 EXT L5SS
20	A-5000-3627	3	M2 ACC Center 5WAY
21	A-5004-7585	3	M2 EXT L10 d3SS
22	A-5004-7586	2	M2 EXT L20 d3SS
23	A-5004-7591	2	M2 EXT L30 d3SS
24	A-5004-7582	2	M2-M3 STYLUS TOOL
25	P-TL01-0150	1	S3 HEX WRENCH 1.5 MM A/F
26	M-5000-3541	1	S8 TP2 SPANNER (not pictured)
27	A-1015-7749	1	COMP BOX ASSEMBLY (not pictured)

Stylus kits

A-5003-6151 M3 stylus kit for SP25M/SM25-1/SH25-1

Price: \$435

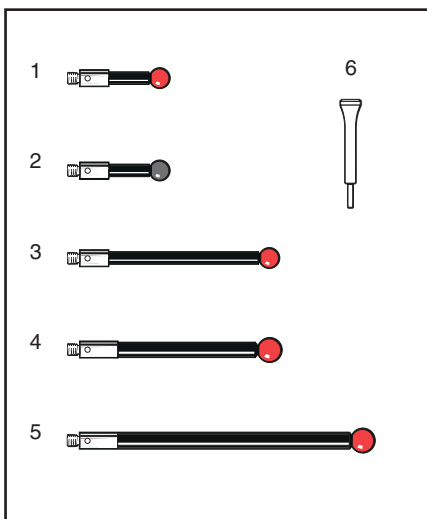


Position	Part number	Description
1	A-5003-5970	M3 STY D3R L21 EWL13.5 d2CF
2	A-5003-5971	M3 STY D4R L21 EWL13.5 d3CF
3	A-5003-5977	M3 STY D4SIN L21 EWL13.5 d3CF
4	A-5003-5972	M3 STY D4R L31 EWL23.5 d3CF
5	A-5003-5973	M3 STY D4R L40 EWL32.5 d3CF
6	A-5003-5974	M3 STY D5R L50 EWL42.5 d3CF
7	A-5004-7582	M2-M3 STYLUS TOOL

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A-5003-6152 M3 stylus kit for SP25M/SM25-2/SH25-2

Price: \$455

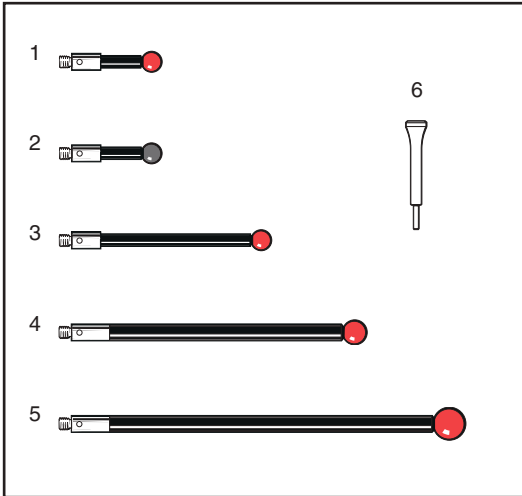


Position	Part number	Description
1	A-5003-5975	M3 STY D5R L21 EWL13.5 d3CF
2	A-5003-5978	M3 STY D5SIN L21 EWL13.5 d3CF
3	A-5003-5974	M3 STY D5F L50 EWL42.5 d3CF
4	A-5003-5976	M3 STY D6R L50 EWL50 d4CF
5	A-5003-4860	M3 STY D6R L75 EWL75 d4CF
6	A-5004-7582	M2-M3 STYLUS TOOL

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A-5003-6153 M3 stylus kit for SP25M/SM25-3/SH25-3

Price: \$515



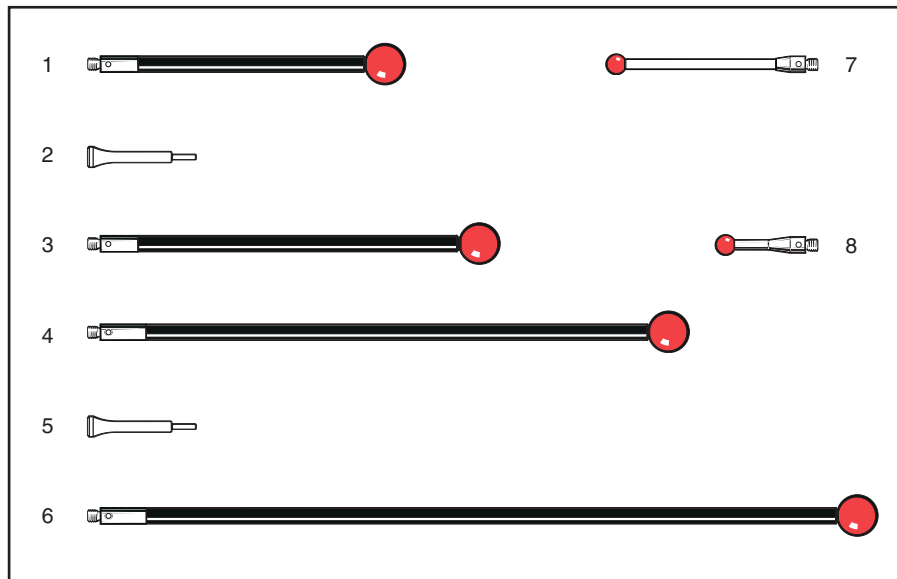
Position	Part number	Description
1	A-5003-5975	M3 STY D5R L21 EWL13.5 d3C/F
2	A-5003-5978	M3 STY D5SIN L21 EWL13.5 d3C/F
3	A-5003-5974	M3 STY D5R L50 EWL42.5 d3C/F
4	A-5003-4860	M3 STY D6R L75 EWL75 d4C/F
5	A-5003-4863	M3 STY D8R L100 EWL100 d4C/F
6	A-5004-7582	M2-M3 STYLUS TOOL

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Stylus kits

A-5003-8124 M3 stylus kit for SP25M/SM25-4/SH25-4

Price: \$1,200

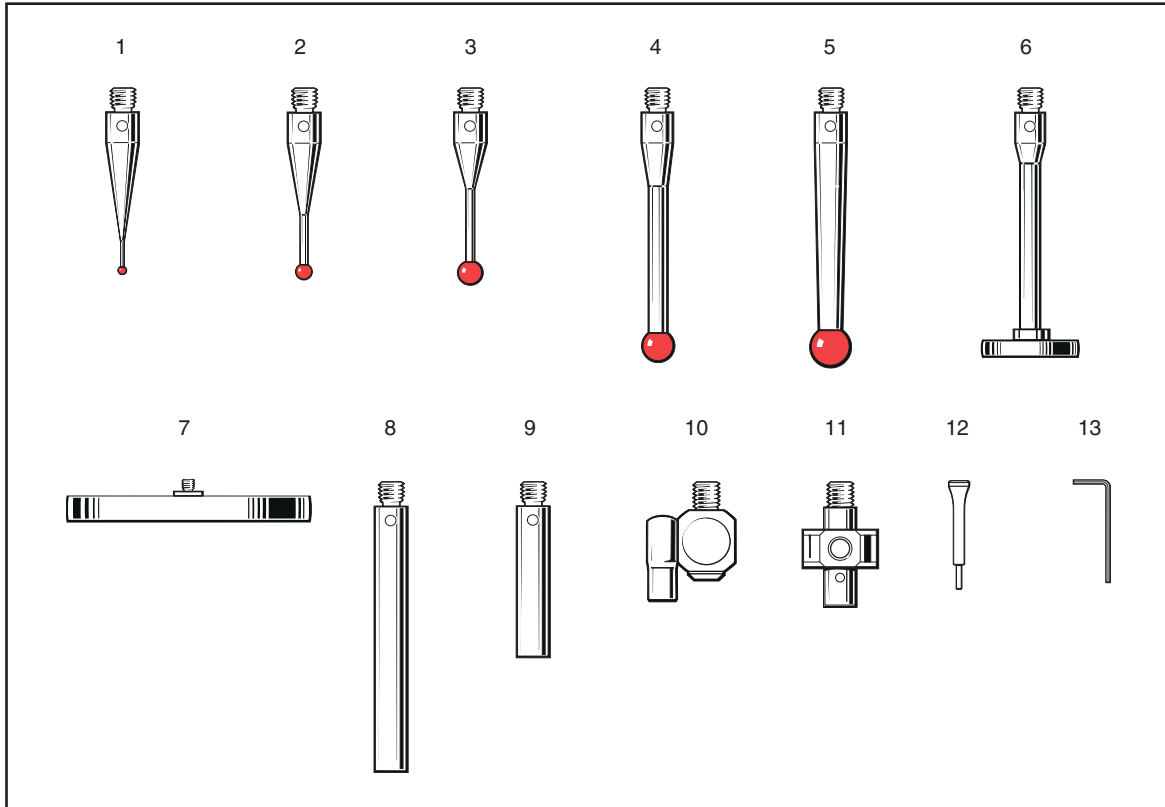


Position	Part number	Description
1	A-5003-7057	M3 STY D10R L25 EWL75 d4C/F
2	A-5004-7582	M2-M3 STYLUS TOOL
3	A-5003-7056	M3 STY D10R L100 EWL100 d4C/F
4	A-5003-7055	M3 STY D10R L150 EWL150 d4C/F
5	A-5004-7582	M2-M3 STYLUS TOOL
6	A-5003-7054	M3 STY D10R L200 EWL200 d4C/F
7	A-5003-0069	M3 STY D5R L50 EWL50 d2.5CER
8	A-5000-7630	M3 STY D5R L21 EWL21 d2.5SS

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Stylus kit 101 for M3 probes

Price: \$805



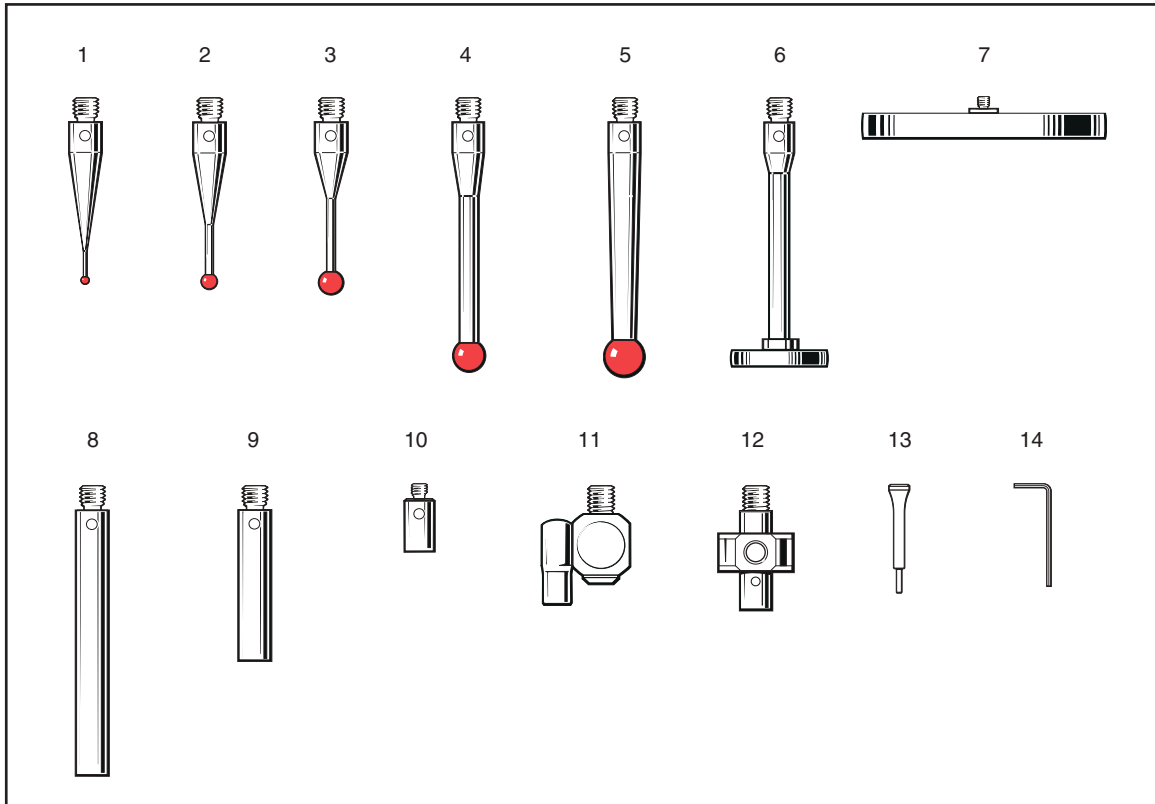
Position	Part number	Quantity	Description
1	A-5000-3551	1	M3 STY D1R L21 EWL4 d0.6SS
2	A-5000-3552	1	M3 STY D2R L21 EWL8 d1.4SS
3	A-5000-3553	1	M3 STY D3R L21 EWL12 d1.5SS
4	A-5000-3554	5	M3 STY D4R L31 EWL27 d2.5SS
5	A-5000-7648	1	M3 STY D5R L31 EWL31 d3.5SS
6	A-5000-3615	1	M3 DSC D12.7SLVS T2 L30.8 BR-N
7	A-5000-7669	1	M3 DSC D63.5CS T6 L4 BR-N
8	A-5004-7584	1	M3 EXT L35 d4SS
9	A-5004-7583	1	M3 EXT L20 d4SS
10	A-5000-7616	1	M3 ACC KNUCKLE OFFSET
11	A-5000-7610	1	M3 ACC Center 5WAY
12	A-5004-7582	2	M2-M3 STYLUS TOOL
13	P-TL01-0150	1	S3 HEX WRENCH 1.5 MM A/F
14	A-1041-7569	1	SA7 ADAPTOR (not pictured)
15	M-5000-3571	2	STYLUS SHANK ADAPTOR (not pictured)
16	A-1015-7650	1	TP1 STYLI BOX (not pictured)

Stylus kits

Stylus kit 102 for M3 probes



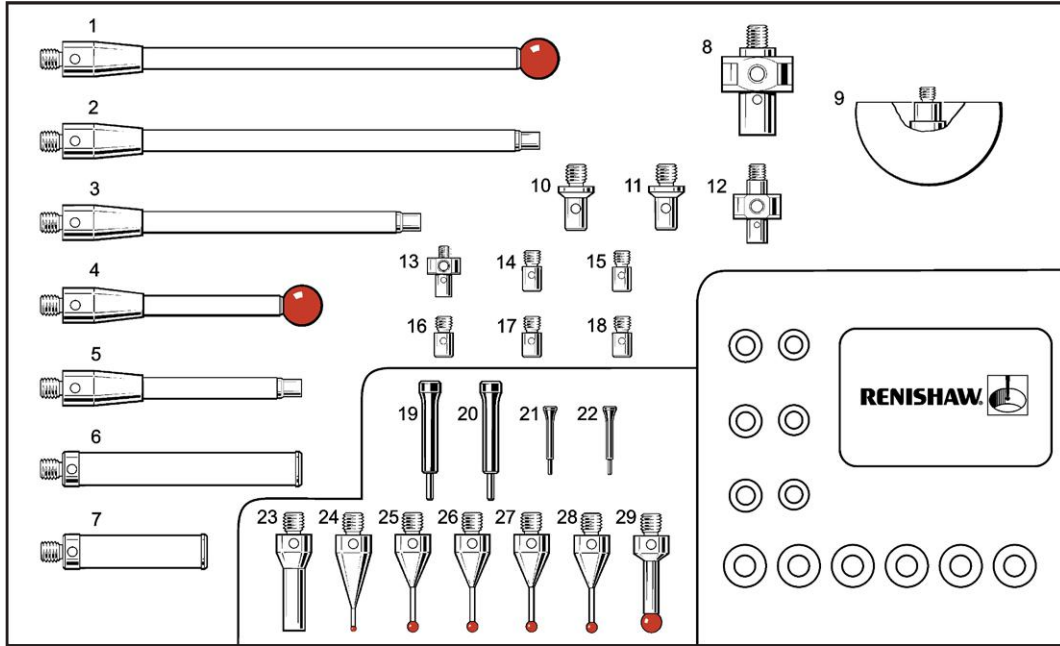
Price: \$1,209



Position	Part number	Quantity	Description
1	A-5000-3551	3	M3 STY D1R L21 EWL4 d0.6SS
2	A-5000-3552	5	M3 STY D2R L21 EWL8 d1.4SS
3	A-5000-3553	3	M3 STY D3R L21 EWL12 d1.5SS
4	A-5000-3554	7	M3 STY D4R L31 EWL27 d2.5SS
5	A-5000-7648	1	M3 STY D5R L31 EWL31 d3.5SS
6	A-5000-3615	1	M3 DSC D12.7SLVS T2 L30.8 BR-N
7	A-5000-7669	1	M3 DSC D63.5CS T6 L4 BR-N
8	A-5004-7584	2	M3 EXT L35 d4SS
9	A-5004-7583	2	M3 EXT L20 d4SS
10	A-5004-7593	1	M2-M3 EXT L7SS
11	A-5000-7616	1	M3 ACC KNUCKLE OFFSET
12	A-5000-7610	2	M3 ACC Center 5WAY
13	A-5004-7582	2	M2-M3 STYLUS TOOL
14	P-TL01-0150	1	S3 HEX WRENCH 1.5 MM A/F
15	A-1041-7569	1	SA7 ADAPTOR (not pictured)
16	M-5000-3571	2	STYLUS SHANK ADAPTOR (not pictured)
17	A-1015-7650	1	TP1 STYLUS BOX (not pictured)

A-5000-7829 M4 stylus kit (TP7M use)

Price: \$1,614



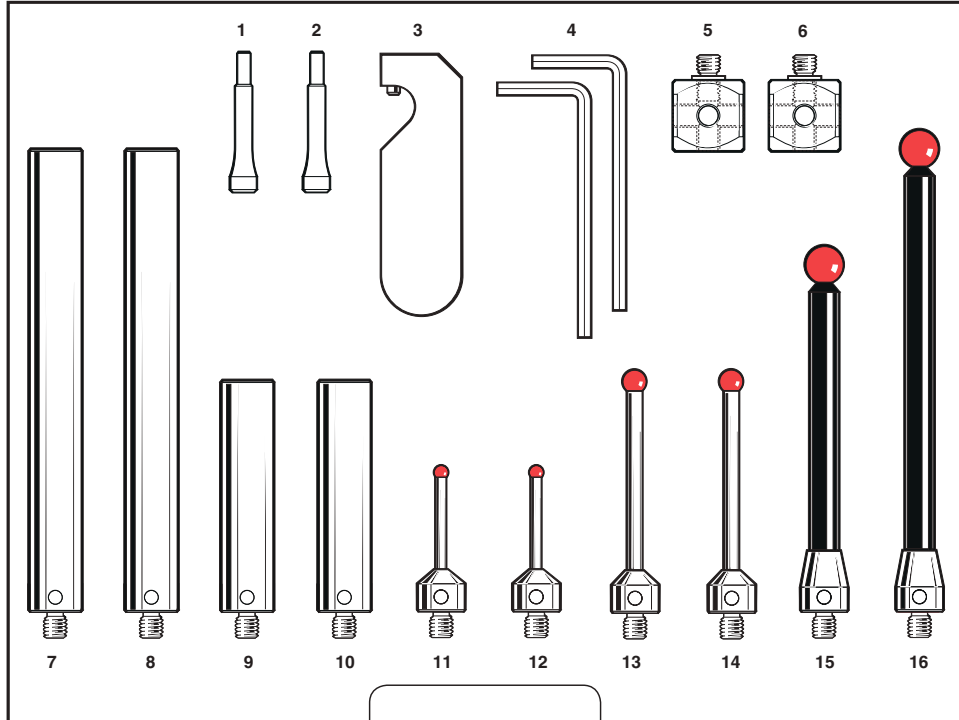
Position	Part number	Description
1	A-5000-7796	M4 STY D8R L100 EWL100 d4.5CE
2	A-5000-7753	M4-M3 EXT L100CE
3	A-5000-7752	M4-M3 EXT L75CE
4	A-5000-7795	M4 STY D8R L50 EWL50 d4.5CE
5	A-5000-7751	M4-M3 EXT L50C
6	A-5000-7755	M4 EXT L50 d7.4CE
7	A-5000-7754	M4 EXT L30 d7.4CE
8	A-5000-7792	M4 ACC Center 5WAY
9	A-5000-7814	M3 HEM D30CE
10-11	A-5004-7597	M4-M3 EXT L9SS
12	A-5000-7610	M3 ACC Center 5WAY
13	A-5000-3627	M2 ACC Center 5WAY
14-18	A-5004-7592	M3-M2 EXT L5SS
19-20	A-5004-7587	M4 STYLUS TOOL
21-22	A-5004-7582	M2-M3 STYLUS TOOL
23	A-5004-7596	M4-M3 EXT L20SS
24	A-5000-7545	M4 STY D1R L19.5 EWL4 d0.7SS
25-28	A-5000-7547	M4 STY D2R L19 EWL8 d1.4SS
29	A-5000-7551	M4 STY D4R L18 EWL13 d3SS

Stylus kits

A-5003-6168 M5 stylus kit SP80

Price: \$900

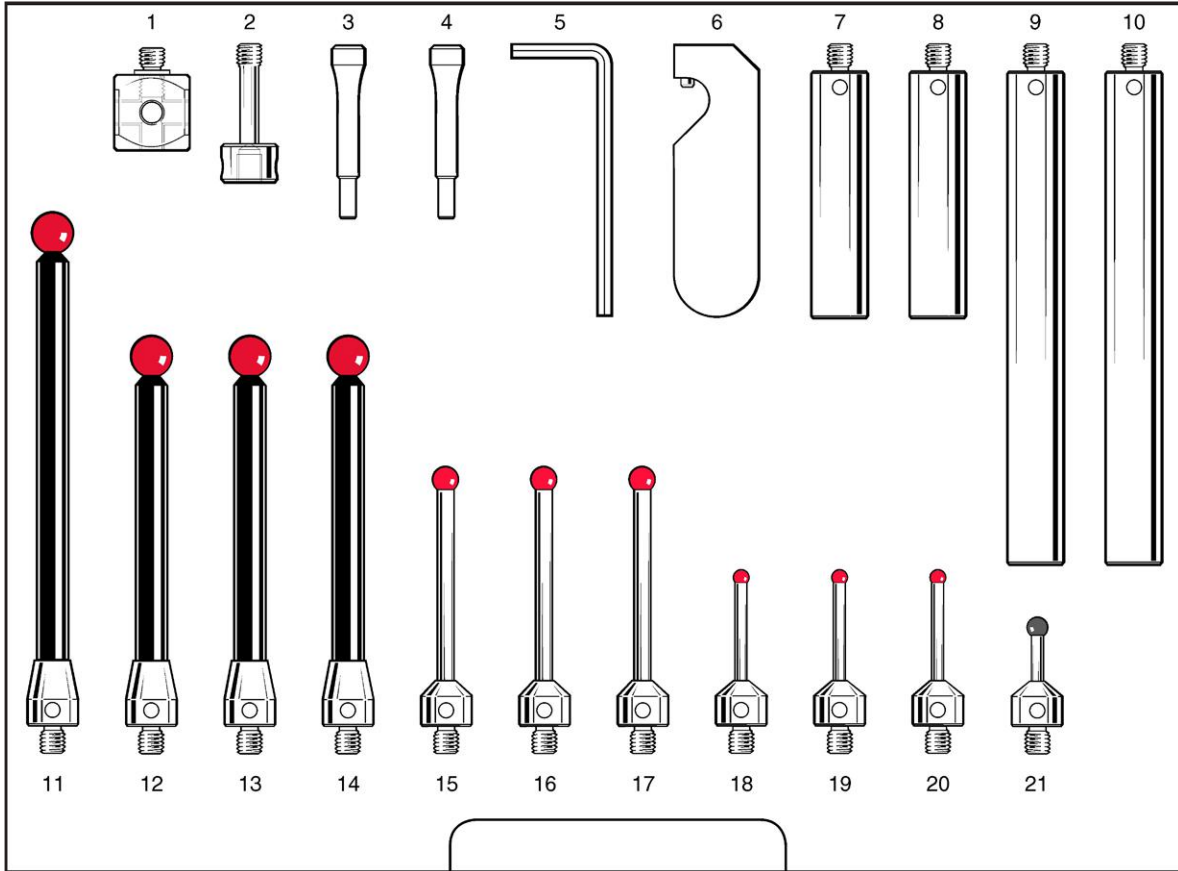
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Position	Part number	Description
1-2	A-5004-7614	M5 STYLUS TOOL
3	A-5003-6134	M5 ACC D11 EXTENSION TOOL
4	P-TL01-0250	S3 HEX WRENCH 2.5 MM A/F
5-6	A-5555-0189	M5 ACC 15X15 CUBE
7-8	A-5555-0136	M5 EXT L100 d11SS
9-10	A-5555-0670	M5 EXT L50 d11SS
11-12	A-5003-5218	M5 STY D3R L30 EWL21 d2TC
13-14	A-5003-5236	M5 STY D5R L50 EWL41 d3TC
15	A-5003-5251	M5 STY D8R L75 EWL62 d6CF
16	A-5003-5262	M5 STY D8R L100 EWL87 d6CF

A-5003-5911 M5 stylus kit - standard

Price: \$1,236



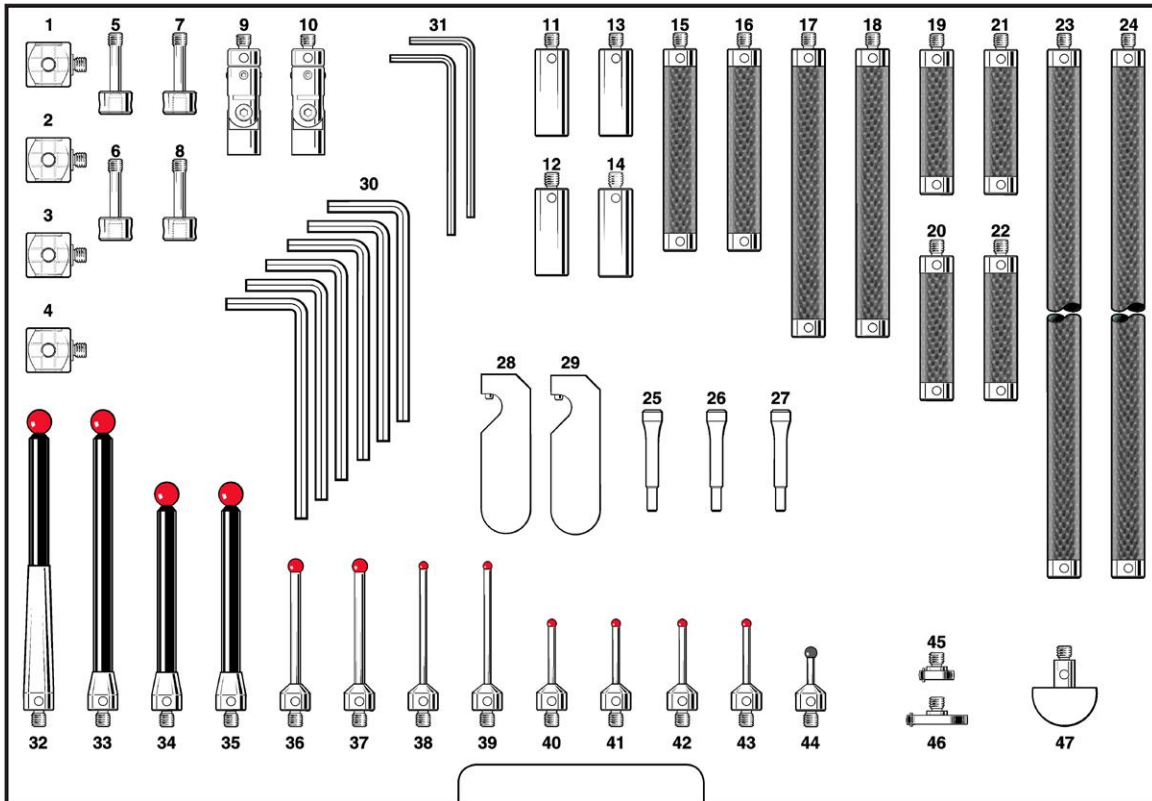
Position	Part number	Description
1	A-5555-0189	M5 ACC 15X15 CUBE
2	A-5003-5677	M5 ACC CUBE BOLT L28
3-4	A-5004-7614	M5 STYLUS TOOL
5	P-TL01-0250	S3 HEX WRENCH 2.5 MM A/F
6	A-5003-6134	M5 ACC D11 EXTENSION TOOL
7-8	A-5555-0670	M5 EXT L50 d11SS
9-10	A-5555-0136	M5 EXT L100 d11SS
11	A-5003-5262	M5 STY D8R L100 EWL87 d6CF
12-14	A-5003-5251	M5 STY D8R L75 EWL62 d6CF
15-17	A-5003-5236	M5 STY D5R L50 EWL41 d3TC
18-20	A-5003-5218	M5 STY D3R L30 EWL21 d2TC
21	A-5003-5733	M5 STY D4SN L20 EWL11 d2TC

Stylus kits

A-5003-5909 M5 stylus kit - comprehensive

Price: \$3,760

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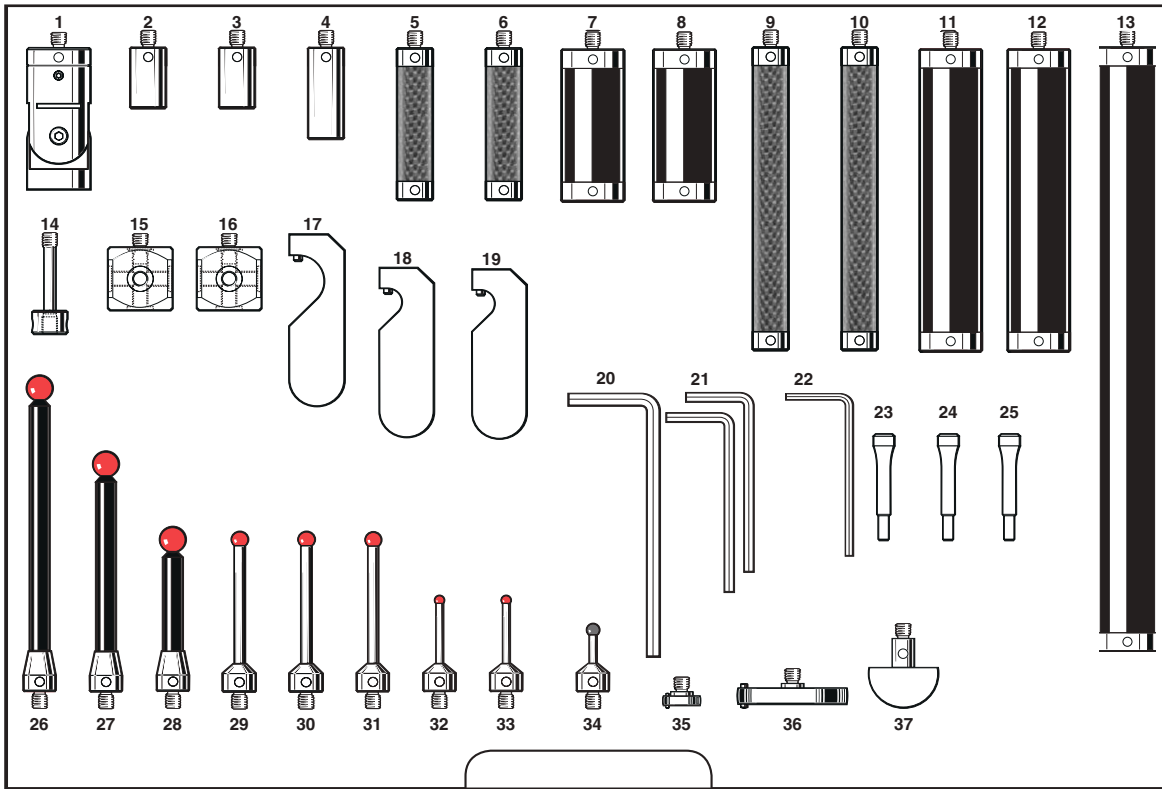


Position	Part number	Description
1-4	A-5555-0189	M5 ACC 15X15 CUBE
5-8	A-5003-5677	M5 ACC CUBE BOLT L28
9-10	A-5003-5278	M5 ACC KNUCKLE d11 ROTARY
11-14	A-5555-0669	M5 EXT L30 d11SS
15-16	A-5555-0623	M5 EXT L70 d11CF
17-18	A-5555-0652	M5 EXT L100 d11CF
19-22	A-5555-0648	M5 EXT L50 d11CF
23-24	A-5555-0654	M5 EXT L200 d11CF
25-27	A-5004-7614	M5 STYLUS TOOL
28-29	A-5003-6134	M5 ACC D11 EXTENSION TOOL
30	P-TL01-0250	S3 HEX WRENCH 2.5 MM A/F
31	P-TL01-0150	S3 HEX WRENCH 1.5 MM A/F
32	A-5003-5261	M5 STY D8R L100 EWL50 d6CF
33	A-5003-5262	M5 STY D8R L100 EWL87 d6CF
34-35	A-5003-5251	M5 STY D8R L75 EWL62 d6CF
36-37	A-5003-5236	M5 STY D5R L50 EWL41 d3TC
38-39	A-5003-5234	M5 STY D3R L50 EWL41 d2TC
40-43	A-5003-5218	M5 STY D3R L30 EWL21 d2TC
44	A-5003-5733	M5 STY D4SN L20 EWL11 d2TC
45	A-5003-5288	M5 DSC D12SLVS T3 L3 BR-Y5
46	A-5003-5289	M5 DSC D21SLVS T3 L3 BR-Y5
47	A-5003-5276	M5 HEM D22CE d7SS

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A-5003-5910 M5 stylus kit - general purpose

Price: \$2,575



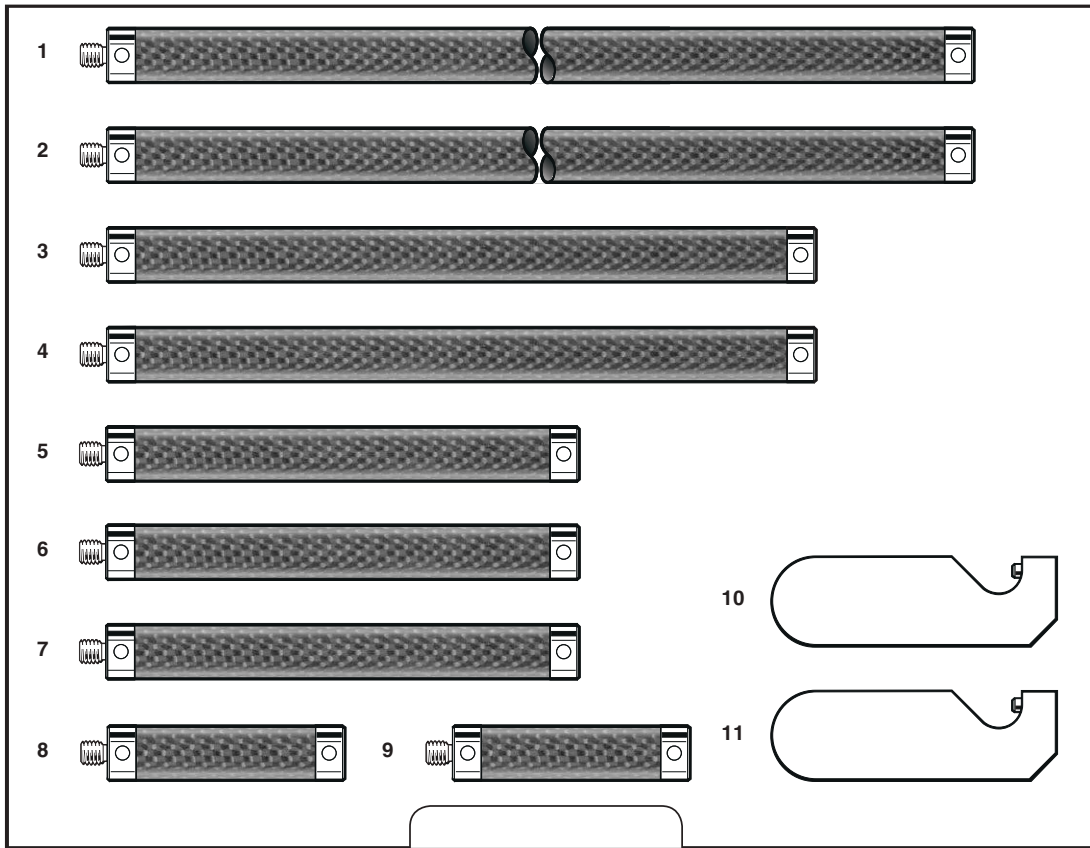
Position	Part number	Description
1	A-5003-5279	M5 ACC KNUCKLE d20 ROTARY
2-3	A-5555-0140	M5 EXT L20 d11SS
4	A-5555-0669	M5 EXT L30 d11SS
5-6	A-5555-0648	M5 EXT L50 d11CF
7-8	A-5555-0671	M5 EXT L50 d20AL
9-10	A-5555-0652	M5 EXT L100 d11CF
11-12	A-5555-0127	M5 EXT L100 d20AL
13	A-5555-0125	M5 EXT L200 d20AL
14	A-5003-5676	M5 ACC CUBE BOLT L33
15-16	A-5555-0190	M5 ACC 20X20 CUBE
17	A-5003-6135	M5 ACC D20 EXTENSION TOOL
18-19	A-5003-6134	M5 ACC D11 EXTENSION TOOL
20	P-TL01-0300	S3 HEX WRENCH 3.0 MM A/F
21	P-TL01-0250	S3 HEX WRENCH 2.5 MM A/F
22	P-TL01-0150	S3 HEX WRENCH 1.5 MM A/F
23-25	A-5004-7614	M5 STYLUS TOOL
26	A-5003-5262	M5 STY D8R L100 EWL87 d6CF
27	A-5003-5251	M5 STY D8R L75 EWL62 d6CF
28	A-5003-5238	M5 STY D8R L50 EWL37 d6CF
29-31	A-5003-5236	M5 STY D5R L50 EWL41 d3TC
32-33	A-5003-5218	M5 STY D3R L30 EWL21 d2TC
34	A-5003-5733	M5 STY D4SN L20 EWL11 d2TC
35	A-5003-5288	M5 DSC D12SLVS T3 L3 BR-Y5
36	A-5003-5290	M5 DSC D35SLVS T5 L4 BR-Y8
37	A-5003-5276	M5 HEM D22CE d7SS

Stylus kits

A-5003-5912 M5 stylus extension kit - 11 mm



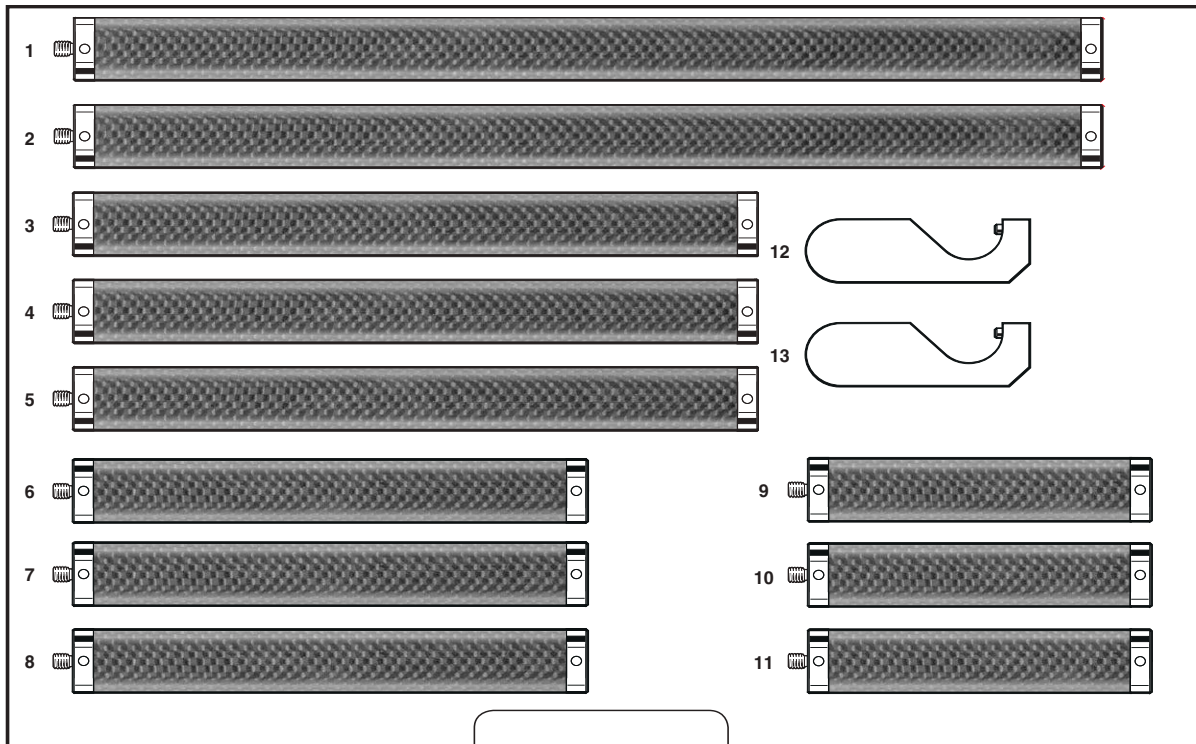
Price: \$1,475



Position	Part number	Description
1-2	A-5555-0654	M5 EXT L200 d11CF
3-4	A-5555-0424	M5 EXT L150 d11CF
5-7	A-5555-0652	M5 EXT L100 d11CF
8-9	A-5555-0648	M5 EXT L50 d11CF
10-11	A-5003-6134	M5 ACC D11 EXTENSION TOOL

A-5003-5913 M5 stylus extension kit - 20 mm

Price: \$2,065

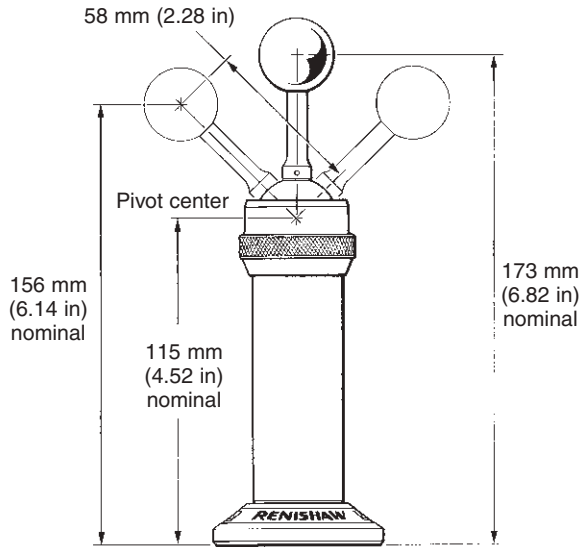


Position	Part number	Description
1-2	A-5555-0664	M5 EXT L300 d20CF
3-5	A-5555-0663	M5 EXT L200 d20CF
6-8	A-5555-0661	M5 EXT L150 d20CF
9-11	A-5555-0659	M5 EXT L100 d20CF
12-13	A-5003-6135	M5 ACC D20 EXTENSION TOOL

Accessories

Datum balls

Datum spheres are made from hard-wearing tungsten carbide and come supplied with individual certificates stating ball diameter and roundness. All sphere measurements are performed on equipment traceable to UK (NPL) standards. Grade 3 sphericity balls are used.



Datum sphere kit	Part number	Price
Ø12 mm datum ball	A-1034-0028	\$545
Ø19 mm datum ball	A-1034-0027	\$545
Ø25 mm datum ball	A-1034-0026	\$545
Ø¾ in datum ball	A-1034-0031	\$545
Ø1 in datum ball	A-1034-0035	\$545

Fixing stud – a fixing stud is required with each kit to attach the pillar to the table surface

Thread size	Part number	Price
M6 x 1	A-1034-0352	\$27
M8 x 1.25	A-1034-0351	\$27
M10 x 1.5	A-1034-0350	\$27
5/16 - 18 x UNC	A-1034-0354	\$27
3/8 - 16 x UNC	A-1034-0353	\$27

Optional extras

Datum ball	Part number	Price
Ø12 mm	A-1034-0005	\$335
Ø19 mm	A-1034-0023	\$335
Ø25 mm	A-1034-0002	\$335
Ø¾ in	A-1034-0032	\$335
Ø1 in	A-1034-0036	\$335

Adaptors/extension	Part number	Price
2 way adaptor	A-1034-0356	\$82
3 way adaptor	A-1034-0357	\$186
Pillar extension 75 mm (2.96 in) long	A-1034-0355	\$82

Gram gage

The gram gage allows the optimum trigger force to be set to maximize probe performance on all standard Renishaw touch trigger probes.

Part number: P-GA01-0001 **Price:** \$374



Overall length	95 mm
Needle length	41 mm
Depth	27 mm
Width	43 mm
Range	4 gram to 35 gram range with 1 gram graduations

Custom stylus fax back form

Fax to: (847) 286 9974

Please fill in your stylus requirements in the space provided and fax back to us. Our design team will carry out a feasibility study and present you with a solution to your application problem.

Thread size	Length	EWL	Ball diameter	Ball material	Stem material	Quantity required

Thread size	Length	EWL	Cylinder diameter	Cylinder material	Quantity required

Thread size	Length	Disk diameter	Disk thickness	Disk material	Disk roller Y or N?	Quantity required

Notes

Probe head: _____ Probing orientation: _____

Application (what are you measuring?) _____

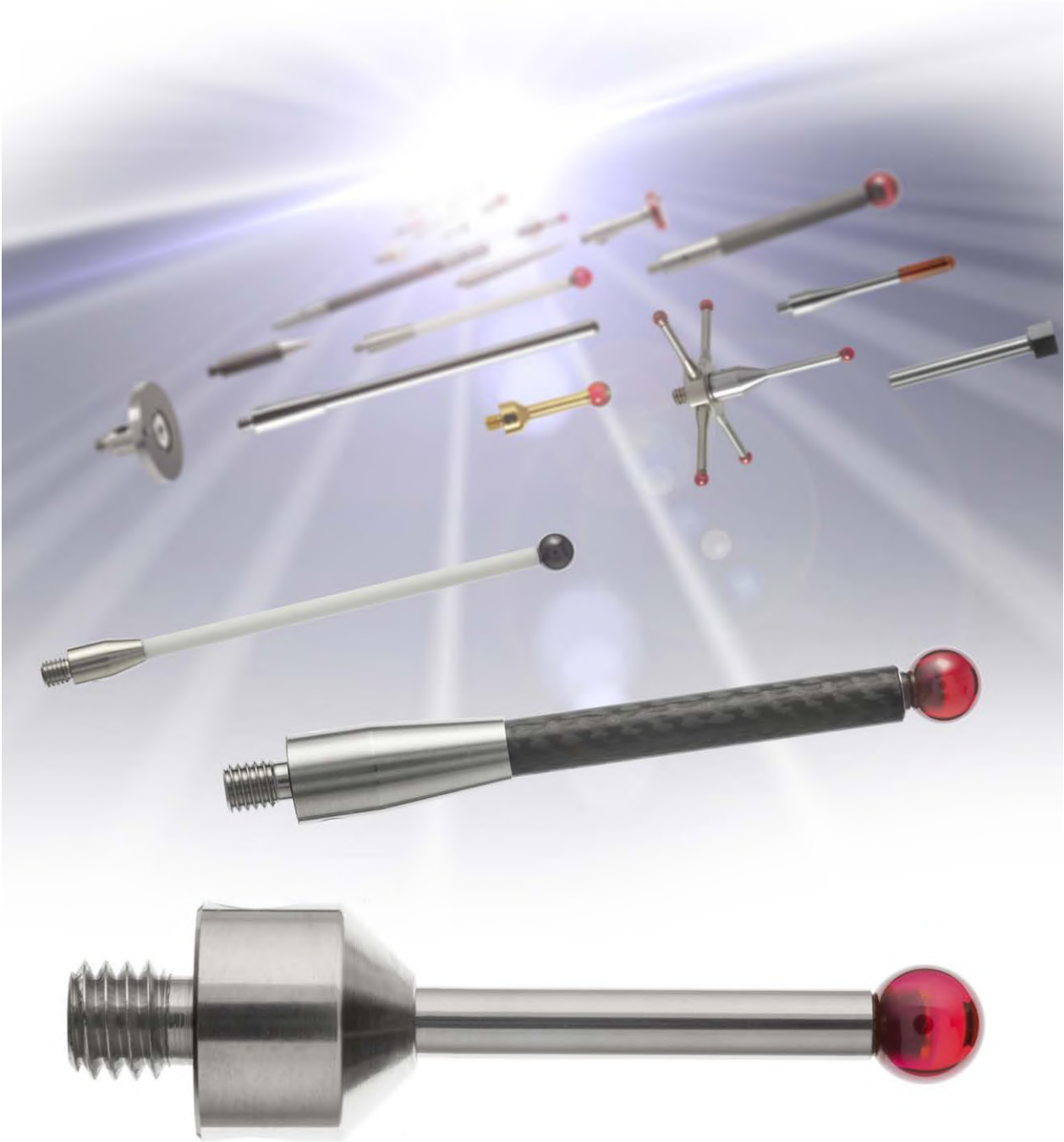
Company name: _____ Date: _____

Address: _____

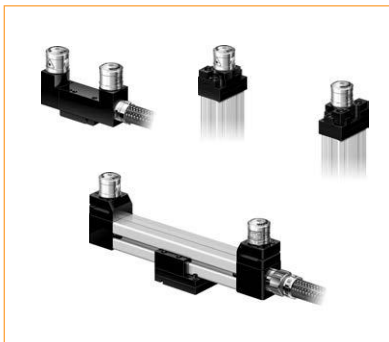
Telephone: _____

Contact name: _____ Fax: _____

Department: _____ Email: _____



Repair services



Repair services

Renishaw repair services

Services offered

Repair

Your product is repaired to factory performance specifications, and carries a 3-month warranty.

Repair By Exchange (RBE)

Your product is replaced by a refurbished or as new product, shipped to you once we have received your failed product.

RBEs carry a 6-month warranty.

Advance RBE

Your product is replaced by a refurbished or as new product, shipped to you on the same day that you report a fault. Advance RBEs carry a 6-month warranty.

Replace new

Your product is replaced by a new product, carrying a new factory warranty.

Please note:

The services offered on each product vary – please consult the detailed list that follows.

On Advance RBE, in order to get you a replacement product as soon as possible, it is necessary to charge a small additional premium on top of the price of the product to cover additional administration.

Available repair services for Specials are quoted per job.

All the following prices are for guidance only. When units are received with excessive wear and tear, or obsolete product is returned for repair, Renishaw reserves the right to quote a different service/replacement charge.

Advance replacements

Advance replacement is a Renishaw premium service aimed at minimizing your downtime. This service is only available on products where a Repair By Exchange (RBE) service is offered. Through this service we ship an RBE in advance of receipt of your inoperative product.

Please note:

- 1) A \$95 charge applies to each advance replacement.
- 2) Your inoperative product must be returned to Renishaw within 14 working days of receipt of the advance replacement.
- 3) Failure to do so will result in an issuance of a non-return invoice in the amount of the difference between the RBE price and the new list price.
- 4) Return of your inoperative product after the issuance of the non-return invoice will not result in a credit of the non-return invoice, and your inoperative product will be returned to you.
- 5) Advance replacements sent out under a warranty claim will not be credited if the returned product is damaged, or no fault is found with the returned product.
- 6) Returns of advance replacements will be accepted if:
 - a) they are returned unused, and in the original packaging, within ten working days of invoice date, and
 - b) the return has been pre-approved by Renishaw through the issuance of a Return Goods Authorization (RGA) number, and
 - c) the return passes Renishaw inspection, and
 - d) a re-stocking fee of \$95 or 20% is applied, whichever is the greater.

Coordinate Measuring Machine products

Manual probe heads

Description	Check and test	Repair	Repair by exchange	RBE part number
MH20	\$100	N/A	\$1,095	A-4043-0024-RBE
MH20i	\$100	N/A	\$1,395	A-4099-0022-RBE
MH8	\$100	N/A	\$760	A-1332-0002-RBE
MIH	\$225	\$980	\$1,975	A-1070-0003-RBE
PH1	\$100	N/A	\$550	A-1049-1795-RBE
PH5	\$100	N/A	N/A	Replace at new list price
PH6	\$100	N/A	N/A	Replace at new list price

Motorized and servo positioning heads

Description	Check and test	Calibration	Minor repair	Major repair	Repair by exchange	RBE part number
REVO®	\$480				\$9,320	A-3060-0040-RBE
REVO2	\$480				\$10,350	A-5759-1000-RBE
PH20	\$480				\$4,125	A-5669-0001-RBE
PH9/PH9A	Obsolete				Call for upgrade options to PH10 system	
PH10M	\$480	\$595	\$1,095	\$2,340	\$5,120	A-1025-6050-RBE
PH10MQ	\$480	\$595	\$1,095	\$2,340	\$5,120	A-1036-6001-RBE
PH10MQH	\$480	\$595	\$1,095	\$2,340	\$5,120	A-1036-0100-RBE
PH10T	\$480	\$595	\$1,095	\$2,340	\$5,120	A-1025-7526-RBE
PH10M Plus	\$480	\$595	\$1,095	\$2,340	\$5,120	A-5863-1000-RBE
PH10T Plus	\$480	\$595	\$1,095	\$2,340	\$5,120	A-5863-2000-RBE
PH10MQ Plus	\$480	\$595	\$1,095	\$2,340	\$5,120	A-5863-3000-RBE
Description	Upgrade	Upgrade part number	Repair by exchange	RBE part number		
PHS-2 RBE			\$12,613	A-5795-0001-RBE		
PHS (upgrade to PHS-2)	\$19,609	A-5795-0001-UPG				

Controllers

Description	Calibration	Repair	Repair by exchange	RBE part number
ACC2 (upgrade to ACC2-3)	N/A	N/A	\$1,110	A-6299-0100-RBE
ACC2-2 (upgrade to ACC2-3)	N/A	N/A	\$1,110	A-6299-0100-RBE
ACC2-3	N/A	M/A	\$1,100	A-6299-0100-RBE
PHC9/RS232	Obsolete		Call for upgrade options to PH10 system	
PHC9/IEEE	Obsolete		Call for upgrade options to PH10 system	
PHC10/RS232 (upgrade to PHC10-3 Plus)	N/A	N/A	\$1,110	A-5863-0100-RBE
PHC10-2/RS232 (upgrade to PHC10-3 Plus)	N/A	N/A	\$1,110	A-5863-0100-RBE
PHC10-3 Plus	\$280	N/A	\$1,110	A-5863-0100-RBE
PHS PC card	N/A	N/A	\$1,460	A-2150-0824-RBE
PHS PC card (B&S)	N/A	N/A	\$1,460	A-2150-1360-RBE

Probes

Description	Price			
Probe recertification (check and test)	\$100			
Description	Repair	Repair by exchange	RBE part number	
SP25M probe body	N/A	\$1,745	A-2237-1000-RBE	
SM25-1 module	N/A	\$1,245	A-2237-1111-RBE	
SM25-2 module	N/A	\$1,245	A-2237-1112-RBE	
SM25-3 module	N/A	\$1,245	A-2237-1113-RBE	
SM25-4 module	N/A	\$1,420	A-2237-1114-RBE	
SM25-5 module	N/A	\$1,860	A-2237-1115-RBE	
TM25-20 module	N/A	\$690	A-2237-1200-RBE	
SP600M	N/A	\$4,120	A-2098-0104-RBE	
TP1S	N/A	\$925	A-1041-7540-RBE	
TP1SM	N/A	\$925	A-1041-7541-RBE	

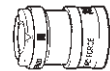
Repair services

Probes continued

Description	Repair	Repair by exchange	RBE part number
TP2-5W	N/A	\$930	A-1042-1890-RBE
TP6	N/A	\$925	A-1039-0001-RBE
TP6A	N/A	\$925	A-1039-0028-RBE
TP7M	N/A	\$1,290	A-1073-0121-RBE
TPES	N/A	\$730	A-1311-0033-RBE
TP20 low force probe module only	N/A	\$900	A-1371-0392-RBE
TP20 standard force probe module only	N/A	\$900	A-1371-0270-RBE
TP20 medium force probe module only	N/A	\$900	A-1371-0271-RBE
TP20 extended force probe module only	N/A	\$900	A-1371-0272-RBE
TP20 6-way probe module only	N/A	\$1,000	A-1371-0419-RBE
EM1 TP20 extension module	N/A	\$1,000	A-1371-0430-RBE
EM2 TP20 extension module	N/A	\$1,000	A-1371-0431-RBE
TP20 body only	N/A	\$690	A-1371-0275-RBE
TP20 body (non-inhibit)	N/A	\$690	A-1371-0636-RBE



TP200 stylus module	N/A	N/A	Replace at new list price
TP200 probe sensor	N/A	\$1,100	A-1207-0020-RBE
TP200B probe sensor	N/A	\$1,100	A-1207-0046-RBE



Description	Check and test	Minor repair	Major repair	Repair by exchange	RBE part number
SP80	\$145	\$1,875	\$3,040	\$5,060	A-2238-0101-RBE
SP80H	\$145	\$1,875	\$3,040	\$5,060	A-2238-0414-RBE

Interfaces

Description	Repair	Repair by exchange	RBE part number
PI7-3	N/A	N/A	Replace at new list price
PI200-3	N/A	N/A	Replace at new list price

Machine checking gage

Description	Calibration
Small checking gage set (includes arms, pivot and stylus; excludes needed replacement items)	\$438
Large checking gage set (includes arms, pivot and stylus; excludes needed replacement items)	\$479
(The machine checking gage is sent to the UK for calibration.)	

Changing systems

Description	Calibration	Minor repair	Major repair	Repair by exchange	RBE part number
ACR1	\$450	\$910	\$1,940	\$5,050	A-1051-1300-RBE
ACR2	N/A	N/A	N/A	\$1,990	A-1383-0003-RBE
ACR3	N/A	\$405 (port replacement only)	N/A	\$2,925	A-5036-0005-RBE
FCR25	N/A	\$360 (port replacement only)	N/A	\$695	A-2237-1401-RBE
(for use with MRS)					
FCR25-L3	N/A	\$360 (port replacement only)	N/A	\$1,040	A-2237-1403-RBE
MCR20	N/A	\$440 (port replacement only)	N/A	\$1,095	A-1371-0163-RBE
SCR600	N/A	N/A	N/A	\$2,065	A-2098-0724-RBE
SCR200	N/A	\$1,160	N/A	\$2,065	A-1085-0370-RBE

Machine Tool products

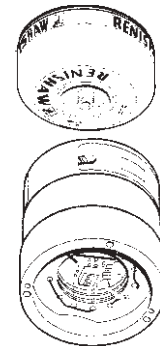
Inspection probes for machining centers

Description	Price		
Recertification (check and test)	\$100		
Description	Repair	Repair by exchange	RBE part number
CP1 probe	Obsolete	Call for upgrade options	
MP1/R probe	Obsolete	Call for upgrade options	
MP1/S probe	Obsolete	Call for upgrade options	
MP3 probe	N/A	\$785	A-2053-5358-RBE
MP3 wide angle OMP short arm	Obsolete	Call for upgrade options to RMP60	
MP3 wide angle OMP long arm	Obsolete	Call for upgrade options to RMP60	
MP3 360° OMP	Obsolete	Call for upgrade options to RMP60	
MP12 probe	Obsolete	Call for upgrade options	
MP16 (RMP2)	N/A	Call for upgrade options to RMP60	
MP15	N/A	\$880	A-2116-0621-RBE
MP15F	N/A	\$880	A-2116-0685-RBE

MP700 probe module Obsolete Call for upgrade options

MP700 OMP 35° Obsolete Call for upgrade options

MP700 OMP 70° Obsolete Call for upgrade options



OMP40	N/A	\$1,210	Legacy: A-4071-0001-RBE Modulated: A-4071-2001-RBE
OMP400	N/A	\$1,720	Legacy: A-5069-0001-RBE Modulated: A-5069-2001-RBE
OMP60	N/A	\$1,210	Legacy: A-4038-0001-RBE Modulated: A-4038-2001-RBE
OMP600	N/A	\$1,650	A-5180-2001-RBE
RMP40	N/A	\$1,545	A-5480-0001-RBE
RMP60	N/A	\$1,610	A-4113-0001-RBE
RMP60Q	N/A	\$1,610	A-5742-0001-RBE
RMP60MQ	N/A	\$965	A-5742-1003-RBE
RMP600	N/A	\$1,930	A-5312-0001-RBE
OMP60M/RMP60M probe module	N/A	\$910	A-4038-1002-RBE
OMP60M transmission module	N/A	\$750	A-4038-1003-RBE

Description	Check test	Minor repair	Medium repair	Major repair	Repair by exchange	RBE part number
MSP80 rear exit	\$430	\$1,120	\$4,475	\$6,950	\$12,500	A-2238-1255-RBE
MSP80 side exit	\$430	\$1,120	\$4,475	\$6,950	\$12,500	A-2238-1270-RBE

Repair services

Tool setting probes for machining centers

Description	Repair	Upgrade	Upgrade part number
MP4 side exit (obsolete, upgrade to TS34 side exit)	N/A	\$2,291	RI-2197-3000
MP4 rear exit (obsolete, upgrade to TS34 rear exit)	N/A	\$2,291	RI-2197-2100
MP6 base only	N/A	N/A	Replace at new list price

Description	Rewire	Repair by exchange	RBE part number
TS27R	\$210	\$890	A-2008-0368-RBE
TS34 rear exit	N/A	\$1,015	A-2197-2100-RBE
TS34 side exit	N/A	\$1,015	A-2197-3000-RBE

Description	Repair	Repair by exchange	RBE part number
NC4 generic TX (separate)	N/A	\$1,055	A-4114-5200-RBE
NC4 generic RX (separate)	N/A	\$1,055	A-4114-5300-RBE
NC4 TX separate with connector	N/A	\$1,055	A-4114-2345-RBE
NC4 RX separate with connector	N/A	\$1,055	A-4114-2346-RBE
NC4F95 compact	N/A	\$2,100	A-5299-5210-RBE
NC4F115 compact	N/A	\$2,100	A-5299-5010-RBE
NC4F145 compact	N/A	\$2,100	A-5299-5310-RBE
NC4F230 compact	N/A	\$2,100	A-5299-5110-RBE
NC4F300 compact	N/A	\$2,100	A-5299-5710-RBE
NC4F300 modular	N/A	\$2,100	A-4114-5100-RBE
NCPCB	N/A	N/A	Replace at new list price
OTS	N/A	\$1,000	A-5401-2001-RBE
OTS (AA)	N/A	\$1,080	A-5514-2001-RBE
TRS2	N/A	\$675	A-5450-0400-RBE(TRS2)
RTS	N/A	\$1,640	A-5646-0001-RBE

Inspection probes for turning centers

Description	Repair	Repair by exchange	RBE part number
LP2 probe	N/A	\$795	A-2063-6098-RBE
LP2DD probe	N/A	\$795	A-2063-8020-RBE
LP2H probe	N/A	\$795	A-2064-0002-RBE
LTO2	Obsolete	Call for upgrade options	
LTO2S	Obsolete	Call for upgrade options	
LTO2T (25 mm shank)	Obsolete	Call for upgrade options	
LTO2T (1 in shank)	Obsolete	Call for upgrade options	
LTO3T (25 mm shank)	Obsolete	Call for upgrade options	
LTO3T (1 in shank)	Obsolete	Call for upgrade options	
MP250	N/A	\$1,080	A-5500-1600-RBE
OLP40	N/A	\$1,205	A-5625-2001-RBE
OMP40M	N/A	\$770	A-5626-2001-RBE
RLP40	N/A	\$1,650	A-5627-0001-RBE
RMP40M	N/A	\$965	A-5628-0001-RBE

Tool setting arms

Description	Repair	Repair by exchange	RBE part number
HPRA 6 in with RP3	N/A	\$1,540	A-2176-0691-RBE
HPRA 8 in with RP3	N/A	\$1,540	A-2176-0692-RBE
HPRA 10 in with RP3	N/A	\$1,540	A-2176-0693-RBE
HPRA 12 in with RP3	N/A	\$1,540	A-2176-0694-RBE
HPRA 15 in with RP3	N/A	\$1,540	A-2176-0695-RBE
HPRA 18 in with RP3	N/A	\$1,540	A-2176-0697-RBE
HPRA 24 in with RP3	N/A	\$1,540	A-2176-0698-RBE
HPPA 6 in rear exit with RP3	N/A	\$1,820	A-2275-0181-RBE
HPPA 8 in rear exit with RP3	N/A	\$1,820	A-2275-0182-RBE
HPPA 10 in rear exit with RP3	N/A	\$1,820	A-2275-0183-RBE
HPPA 12 in rear exit with RP3	N/A	\$1,820	A-2275-0184-RBE
HPPA 15 in rear exit with RP3	N/A	\$1,820	A-2275-0185-RBE
HPPA 18 in rear exit with RP3	N/A	\$1,820	A-2275-0186-RBE
HPMA 6 in rear exit with RP3	N/A	\$2,050	A-2181-0645-RBE
HPMA 8 in rear exit with RP3	N/A	\$2,050	A-2181-0646-RBE
HPMA 10 in rear exit with RP3	N/A	\$2,050	A-2181-0647-RBE
HPMA 12 in rear exit with RP3	N/A	\$2,050	A-2181-0648-RBE
HPMA 15 in rear exit with RP3	N/A	\$2,050	A-2181-0649-RBE
HPMA 18 in rear exit with RP3	N/A	\$2,050	A-2181-0650-RBE
HPMA 24 in rear exit with RP3	N/A	\$2,050	A-2181-0651-RBE
HPGA (side exit)	N/A	\$1,985	A-5616-0352-RBE

Repair services

Tool setting probes for turning centers

Description	Repair	Repair by exchange	RBE part number
RP1 probe	N/A	\$765	A-2154-0007-RBE
RP2 probe	N/A	\$765	A-2116-0149-RBE
RP3 probe	N/A	\$765	A-2197-0049-RBE
TS20 probe	N/A	N/A	Replace at new list price

Interfaces, receivers and inductive systems

Description	Repair	Repair by exchange	RBE part number
HSI	N/A	N/A	Replace at new list price
IMM (inductive module machine)	N/A	N/A	Call for availability
IMP (inductive module probe) assembly	N/A	N/A	Call for availability
MI5	Obsolete	N/A	Call for details
MI8	N/A	N/A	Replace with HSI interface at list price
MI12	Obsolete	N/A	Call for upgrade options
NCi interface	N/A	N/A	Replace at new list price
OMI	Obsolete		Call for upgrade options
OMI-2	N/A	\$845	A-5191-0050-RBE
OMI-2T	N/A	\$845	A-5439-0050-RBE
OMM	Obsolete		Call for upgrade options
OMM-2	N/A	\$675	A-5492-0051-RBE
RMI	Obsolete	\$1,000	Replace with A-5687-0050-RBE
RMI-Q	N/A	\$1,000	A-5687-0050-RBE
SSR converter board	Obsolete	N/A	Replace with HSI interface at list price
TSi interface	N/A	N/A	Replace at new list price

Gaging systems

Description	Minor repair	Medium repair	Major repair	Repair by exchange	RBE part number
Equator™ 300 machine	\$824	\$3,193	\$4,738	\$9,975	A-5504-0040-RBE
Equator™ 300 extended height machine	\$824	\$3,193	\$4,738	\$10,500	A-5504-0050-RBE
Equator™ controller	N/A	N/A	N/A	\$3,000	A-5696-0101-RBE
SP25M body	N/A	N/A	N/A	\$1,745	A-2237-1000-RBE
SM25-2 module	N/A	N/A	N/A	\$1,245	A-2237-1112-RBE
Equator™ 500 machine	Call for repair options and pricing				

Calibration systems

Renishaw recommends the following calibration frequencies:	XM-60	Every 1-2 years
	ML10/ML10X/XL-80	Every 2-3 years
	EC10/XC-80	Every 12 months
	Ballbar	Every 12 months
	RX10	Every 2-3 years
	XR20-W	Every 1-3 years

Check and test \$315

Repair prices

Description	Repair	Repair by exchange	RBE part number
XC-80	\$2,168	N/A	N/A
XL-80	\$2,168	N/A	N/A
QC10 ballbar (mechanical assembly only)	N/A	N/A	Call for upgrade options
RX10	\$6,534	N/A	N/A
QC20-W (mechanical assembly only)	N/A	\$3,210	A-8014-1520-RBE
XL-80 tripod	\$377	N/A	N/A
XR20-W**	\$3,911	N/A	N/A
XM-60	Call for pricing	N/A	N/A

Calibration prices

	Standard calibration	Express calibration
ML10/ML10X	\$1,037	\$1,178
EC10 *	\$1,037	\$1,178
QC10 (includes calibrator)	\$817	\$927
XC-80 *	\$1,037	\$1,178
XL-80	\$1,037	\$1,178
Calibrator 50 mm (glass only)	\$278	\$388
Calibrator 300 mm (glass only)	\$315	\$425
Calibrator 50 mm (for QC10) with replacement of center ball, tool cup (2) and center cups	\$655	\$765
Calibrator 50 mm (for QC20) with replacement of center ball	\$404	\$514
RX10	\$1,618	N/A
XR20-W**	\$1,435	N/A
QC20 (includes calibrator)	\$817	\$927
Copy of calibration certificate	\$137	
XM-60/XM-600	\$4,131	N/A

* Price includes one air sensor and up to three material sensors. Each additional sensor \$273. Please send in your sensors with your EC10 and XC-80.

** XR20-W must be shipped in proper packaging. Failure to do so could damage unit and delay return after service. Alternative packaging solutions other than the XR20-W case are available for purchase which provide protection for your unit and save transport costs. XR20W-CAL-BOX is an economic and safe alternative to shipping XR20-W in its case. The packaging is reusable and can be purchased for \$70.

A "standard" calibration will take a maximum of five working days and an "express" calibration will take a maximum of two working days. Express calibrations must be scheduled by calling the Renishaw Service Center at: 847/286-9953 extension 62123.

Ballbar calibration includes ballbar and calibrator calibration, and replacement of ball and mount assembly, center cup assembly, center ball assembly, and tool cup assembly. A new cleaning kit will also be supplied.

Traceable calibration certificates will be issued at the time of calibration and enclosed with the returned units.

Repair services

Replacement parts

Description	Part number	Price
ACR1 short port replacement kit	A-5036-0049	\$285
ACR1 long port replacement kit	A-1051-7077	\$275
ACR1 mixed port replacement kit	A-1051-7076	\$275
MP8 shank switch assembly	Obsolete	Call for upgrade options
MP3/MP6 probe outer diaphragm kit	A-2053-8156	\$105
LP2 service kit	A-2063-7542	\$80
Ballbar center cup assembly	A-8014-0522	\$184
Ballbar center ball assembly	A-8014-0141	\$163
Ballbar magnetic tool cup	A-8014-0521	\$147
Transducer ball	A-8014-0182	\$163
Ballbar cleaning kit	A-8014-0423	\$21
Ballbar service kit	A-8014-0786	\$529
MP7/MP8/MP9/MP10 battery cap seal	M-2107-0115	\$30
MP7/MP8/MP9/MP10 battery cap screw	P-SC08-0335	\$5
OMP40 pull-up cone assembly	A-4071-0094	\$45
OMP40 round battery cap seal	A-4071-1157	\$25
OMP40 round battery cap	A-4071-0096	\$105
OMP40 rectangular battery cassette	A-4071-1166	\$135
OMP40/OMP60/RMP60 battery cassette seal	A-4038-0301	\$30
OMP60/RMP60 battery cassette	A-4038-0300	\$204
OMP60/RMP60 outer diaphragm kit	A-4038-0302	\$79
OMP60/RMP60 shank switch bobbin	A-4038-0303	\$185
OMP60/RMP60 new type shank switch	A-4038-0177	\$190
OLP40/RLP40 eyelid service kit	A-5625-0005	\$30
OLP40/RLP40 metal battery cassette	A-5625-1166	\$160
OTS/RTS battery cap	A-5401-0301	\$180
TS27R front cover	A-2008-1015	\$95
OTS/RTS front cover kit	A-5401-8512	\$135
TS34 chip shield	A-2008-6007	\$135

Part number	Description	Price	Page number
A11-SMA-NC	Capps-NC software maintenance SMA rate	Call for details	2-52
A-1004-0110	PL15 cable	\$71	1-47
A-1007-0006	MCG kit (small)	\$3,606	5-14
A-1007-0056	MCG kit (large)	\$4,521	5-14
A-1014-1720	PK1 knuckle joint	\$633	1-49
A-1015-7650	SB2 mahogany box	\$128	8-99, 8-100
A-1015-7658	SB3 mahogany box	\$128	8-93
A-1015-7674	Probe head box	\$207	1-60
A-1015-7686	Probe head box	\$142	1-60
A-1015-7694	Extension bar box	\$118	1-60
A-1015-7698	Probe head box	\$113	1-60
A-1015-7725	Probe head box	\$105	1-60
A-1015-7727	Probe head box	\$105	1-60
A-1015-7731	Probe head box	\$105	1-60
A-1015-7749	Mahogany box	\$125	8-94, 8-95
A-1015-7761	Extension bar box	\$137	1-60
A-1015-7765	Probe head box	\$118	1-60
A-1015-7869	Probe head box	\$141	1-60
A-1016-0001	PL4(T) cable	\$102	1-47
A-1016-0003	PL14 cable	\$113	1-47
A-1016-0004	PL1(T) cable	\$102	1-47
A-1016-0006	PL2(T) cable	\$102	1-47
A-1016-0012	PL3(T) cable	\$102	1-47
A-1016-0120	PL25(T) cable	\$158	1-48
A-1016-0121	PL24 cable	\$158	1-48
A-1016-6370	PL27(T) cable	\$60	1-47
A-1016-6440	PL27(T) cable	\$60	1-47
A-1016-7129	PL156 cable	\$104	1-41
A-1016-7132	PL157 cable	\$125	1-41
A-1016-7133	PL158 cable	\$264	1-41
A-1016-7563	PLM7(T) cable	\$163	1-47
A-1016-7564	PLM6(T) cable	\$163	1-47
A-1016-7624	PL42V cable	\$723	1-47
A-1016-7625	PL38V cable	\$900	1-47
A-1016-7626	PL56V cable	\$652	1-47
A-1016-7627	PL44V cable	\$580	1-47
A-1016-7628	PL46V cable	\$462	1-47
A-1016-7629	PL45V cable	\$391	1-47
A-1016-7630	PL63S cable (5 m)	\$109	1-34
A-1016-7631	PL64S cable (10 m)	\$125	1-34
A-1016-7632	PL65S cable (20 m)	\$163	1-34
A-1016-7634	PL70(V) cable	\$379	1-48
A-1016-7637	PL72 cable	\$158	1-48
A-1016-7643	PL76(S) cable	\$179	1-48
A-1016-7644	PL75V cable	\$179	1-47
A-1016-7660	PL97(S) cable	\$237	1-48
A-1016-7672	PL5(U) cable	\$284	1-47
A-1016-7673	PL6(U) cable	\$284	1-47
A-1016-7674	PL12(U) cable	\$249	1-47

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A-1016-7675	PL13(U) cable	\$249	1-47
A-1016-7676	PL93(U) cable	\$284	1-47
A-1016-7677	PLM8(U) cable	\$163	1-47
A-1016-7678	PLM9(U) cable	\$163	1-47
A-1016-8098	PL163 cable	\$186	1-11
A-1016-8099	PL164 cable	\$287	1-11
A-1016-8100	PL171 cable	\$483	1-11
A-1018-0123	Blanking panel kit	\$31	1-52
A-1018-0124	Rack mount panel kit	\$24	1-52
A-1018-0173	Mounting kit	\$48	1-52
A-1018-0179	Mounting panel kit	\$23	1-52
A-1018-0189	Mounting kit	\$35	1-52
A-1023-7024	PL17(T) cable	\$255	1-47
A-1023-7025	PL18(T) cable	\$255	1-47
A-1023-7056	PL33(U) cable	\$326	1-47
A-1025-1800	PH10M-iQ PLUS	\$25,897	1-9
A-1025-6050-RBE	PH10M head RBE	\$5,120	9-3
A-1025-7526-RBE	PH10T head RBE	\$5,120	9-3
A-1026-0320	AM1 adjustment module	\$817	1-10
A-1029-0111	PL10 cable	\$89	1-48
A-1029-0166	PL7 cable	\$60	1-47
A-1029-0182	PL9 cable	\$60	1-48
A-1032-0025	REVO® to REVO-2 upgrade kit	\$29,250	1-17
A-1034-0002	Datum ball (25 mm)	\$335	1-59, 8-108
A-1034-0005	Datum ball (12 mm)	\$335	1-59, 8-108
A-1034-0023	Datum ball (19 mm)	\$335	1-59, 8-108
A-1034-0026	Datum sphere kit (25 mm ball)	\$545	1-14, 1-59, 8-108
A-1034-0027	Datum sphere kit (19 mm ball)	\$545	1-59, 8-108
A-1034-0028	Datum sphere kit (12 mm ball)	\$545	1-59, 8-108
A-1034-0031	Datum sphere kit (¾ in ball)	\$545	1-59, 8-108
A-1034-0032	Datum ball (¾ in)	\$335	1-59, 8-108
A-1034-0035	Datum sphere kit (1 in ball)	\$545	1-59, 8-108
A-1034-0036	Datum ball (1 in)	\$335	1-59, 8-108
A-1034-0124	Reference sphere for Zeiss	\$550	8-65
A-1034-0350	Datum sphere fixing stud M10 × 1.5	\$27	1-59, 8-108
A-1034-0351	Datum sphere fixing stud M8 × 1.25	\$27	1-59, 8-108
A-1034-0352	Datum sphere fixing stud M6 × 1	\$27	1-59, 8-108
A-1034-0353	Datum sphere fixing stud 3/8-16 UNC	\$27	1-59, 8-108
A-1034-0354	Datum sphere fixing stud 5/16-18 UNC	\$27	1-59, 8-108
A-1034-0355	Datum sphere pillar extension	\$82	1-59, 8-108
A-1034-0356	Datum sphere 2 way adaptor	\$82	1-59, 8-108
A-1034-0357	Datum sphere 3 way adaptor	\$186	1-59, 8-108
A-1036-0080	AM2 adjustment module	\$817	1-10
A-1036-0100-RBE	PH10MQH head RBE	\$5,120	9-3
A-1036-6001-RBE	PH10MQ head RBE	\$5,120	9-3
A-1039-0001-RBE	TP6 probe RBE	\$925	9-4
A-1039-0001	TP6 probe	\$3,689	1-30
A-1039-0028-RBE	TP6A probe RBE	925	9-4
A-1039-0028	TP6A probe	\$3,814	1-30

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A-1039-0041	TK7 tool kit	\$28	1-62
A-1041-7041	TK4 tool kit	\$24	1-62
A-1041-7113	MS17 CMM probe shank	\$225	1-44
A-1041-7114	MS1(S) CMM probe shank	\$158	1-44
A-1041-7540-RBE	TP1S probe RBE	\$925	9-3
A-1041-7540	TP1S probe	\$3,474	1-24
A-1041-7541-RBE	TP1SM probe RBE	\$925	9-3
A-1041-7541	TP1SM probe	\$3,474	1-24
A-1041-7569	M3/Ø4.5 stylus adaptor	\$17	8-99, 8-100
A-1042-1486	C spanner	\$20	1-61
A-1042-1890-RBE	TP2 5-way probe RBE	\$930	9-4
A-1042-1890	TP2 5-way probe	\$3,814	1-30
A-1042-7030	TK5 tool kit	\$62	1-62
A-1042-7031	TK6 tool kit	\$7	1-62
A-1046-5094	PH6 head (PL4 cable)	\$500	1-2
A-1046-5096	PH6 head (PL14 cable)	\$500	1-2
A-1046-5097	PH6 head (PL1 cable)	\$500	1-2
A-1046-5098	PH6 head (PL2 cable)	\$500	1-2
A-1046-5099	PH6 head (PL3 cable)	\$500	1-2
A-1047-3484	PEL1 extension bar	\$297	1-49, 1-60
A-1047-3485	PEL2 extension bar	\$362	1-49, 1-60
A-1047-3486	PEL3 extension bar	\$380	1-49, 1-60
A-1047-3487	PEL4 extension bar	\$480	1-49
A-1047-3932	S9 double-ended spanner	\$15	1-60, 1-61
A-1047-7005	Probe extension kit EKL	\$1,041	1-60
A-1047-7064	PECF2 extension bar	\$645	1-49
A-1047-7065	PECF1 extension bar	\$598	1-49
A-1047-7066	PECF3 extension bar	\$715	1-49
A-1049-1795	PH1 head	\$1,848	1-2
A-1049-1795-RBE	PH1 head RBE	\$550	9-3
A-1051-0012	PH6A head	\$752	1-2
A-1051-0040	S10 joint key	\$18	1-60, 1-61
A-1051-0045	PL20 10 m cable	\$369	1-54
A-1051-0102	PL21 15 m cable	\$483	1-54
A-1051-0199	PL19 5 m cable	\$222	1-54
A-1051-0394	PAACF autojoint extension bar	\$1,794	1-49
A-1051-0417	PAA1 autojoint extension bar	\$370	1-49
A-1051-0418	PAA2 autojoint extension bar	\$472	1-49
A-1051-0419	PAA3 autojoint extension bar	\$574	1-49
A-1051-0440	ACR1 adjustable rack base	\$330	1-54
A-1051-0441	ACR1 horizontal mounting kit	\$385	1-53
A-1051-0443	PEMCF2 autojoint extension bar	\$1,267	1-49
A-1051-0488	PAACF2 autojoint extension bar	\$1,028	1-49
A-1051-0490	PEMCF1 autojoint extension bar	\$801	1-49
A-1051-0491	PEMCF3 autojoint extension bar	\$1,506	1-49
A-1051-0493	PAACF3 autojoint extension bar	\$1,078	1-49
A-1051-0513	PAACF autojoint extension bar	\$1,722	1-49
A-1051-1132	PEMCF autojoint extension bar	\$1,440	1-49
A-1051-1300	ACR1 autochange rack	\$19,931	1-53

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A-1051-1300-RBE	ACR1 autochange rack RBE	\$5,050	9-4
A-1051-1308	ACR1 vertical mounting kit	\$91	1-53
A-1051-7076	ACR1 mixed port replacement kit	\$275	1-54, 9-10
A-1051-7077	ACR1 long port replacement kit	\$275	1-54, 9-10
A-1054-0002	PL40 30 m cable	\$942	1-54
A-1054-0003	PL37 cable	\$60	1-47
A-1057-0131	PL22 cable	\$60	1-48
A-1057-0132	PL26(T) cable	\$102	1-47
A-1057-0133	PL23(T) cable	\$89	1-48
A-1070-0003	MIH head	\$7,098	1-3
A-1070-0003-RBE	MIH head RBE	\$1,975	9-3
A-1071-0001	Manual autojoint probe stand	\$233	1-58
A-1073-0121-RBE	TP7M probe RBE	\$1,290	9-4
A-1073-0121	TP7M probe kit	\$5,625	1-31
A-1073-0261	TP7M enhanced performance probe kit	\$6,973	1-31
A-1074-0020	PH6M head	\$1,776	1-2
A-1076-0070	PEM1 autojoint extension bar	\$1,018	1-49, 1-60
A-1076-0071	PEM2 autojoint extension bar	\$1,255	1-49, 1-60
A-1076-0072	PEM3 autojoint extension bar	\$1,492	1-49, 1-60
A-1076-0073	PEM4 autojoint extension bar	\$1,551	1-49
A-1076-0100	PEM extension kit	\$3,462	1-60
A-1085-0005	SCR200 mounting kit	\$20	1-34
A-1085-0016	Cleaning kit	\$19	1-28, 1-33
A-1085-0370-RBE	SCR200 rack RBE	\$2,065	9-4
A-1085-0370	SCR200 rack	\$7,181	1-34
A-1207-0001	TP200 probe (SF)	\$4,731	1-33
A-1207-0002	TP200 probe (LF)	\$4,731	1-33
A-1207-0010	TP200 stylus module (SF)	\$710	1-33
A-1207-0011	TP200 stylus module (LF)	\$710	1-33
A-1207-0020-RBE	TP200 probe sensor RBE	\$1,100	9-4
A-1207-0030	SCR200 kit (SF modules)	\$9,105	1-34
A-1207-0046-RBE	TP200B probe sensor RBE	\$1,100	9-4
A-1207-0055	TP200B probe with SF module	\$4,731	1-33
A-1207-0070	SCR200 kit (LF modules)	\$9,105	1-34
A-1311-0033-RBE	TPES probe RBE	\$730	9-4
A-1327-0100	IS1-2 interface	\$2,960	1-51
A-1332-0002	MH8 head	\$3,546	1-3
A-1332-0002-RBE	MH8 head RBE	\$760	9-3
A-1333-0026	MCU docking port for wired joystick	\$87	3-7
A-1333-0174	CMM optics mounting kit	\$888	5-22
A-1371-0163-RBE	MCR20 rack RBE	\$1,095	9-4
A-1371-0261	MCR20 rack kit 1	\$5,513	1-29
A-1371-0262	MCR20 rack kit 2	\$5,513	1-29
A-1371-0263	MCR20 rack kit 3	\$5,513	1-29
A-1371-0264	MCR20 rack kit 4	\$5,513	1-29
A-1371-0265	MCR20 rack kit 5	\$5,513	1-29
A-1371-0266	MCR20 rack kit 6	\$5,513	1-29
A-1371-0270-RBE	TP20 SF probe module RBE	\$900	9-4
A-1371-0270	TP20 SF probe module	\$1,015	1-28

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A-1371-0271-RBE	TP20 MF probe module RBE	\$900	9-4
A-1371-0271	TP20 MF probe module	\$1,015	1-28
A-1371-0272-RBE	TP20 EF probe module RBE	\$900	9-4
A-1371-0272	TP20 EF probe module	\$1,015	1-28
A-1371-0275-RBE	TP20 body RBE	\$690	9-4
A-1371-0290	TP20 probe kit 1	\$4,059	1-27
A-1371-0291	TP20 probe kit 2	\$4,059	1-27
A-1371-0292	TP20 probe kit 3	\$4,059	1-27
A-1371-0293	TP20 probe kit 4	\$4,059	1-27
A-1371-0294	TP20 probe kit 5	\$4,059	1-27
A-1371-0295	TP20 probe kit 6	\$4,059	1-27
A-1371-0347	MSR1 rack	\$423	1-58
A-1371-0392-RBE	TP20 LF probe module RBE	\$900	9-4
A-1371-0392	TP20 LF probe module	\$1,015	1-28
A-1371-0418	TP20 probe kit 7	\$4,397	1-27
A-1371-0419-RBE	TP20 6-way probe module RBE	\$1,000	9-4
A-1371-0419	TP20 6-way probe module	\$1,353	1-28
A-1371-0430-RBE	TP20 EM1 module kit RBE	\$1,000	9-4
A-1371-0430	TP20 EM1 module kit	\$1,229	1-28
A-1371-0431-RBE	TP20 EM2 module kit RBE	\$1,000	9-4
A-1371-0431	TP20 EM2 module kit	\$1,269	1-28
A-1371-0432	TP20 EM1/EM2 kit	\$2,255	1-28
A-1371-0636-RBE	TP20 body (non-inhibit) RBE	\$690	9-4
A-1371-0640	TP20 non-inhibit probe kit 1	\$4,059	1-27
A-1371-0641	TP20 non-inhibit probe kit 2	\$4,059	1-27
A-1371-0642	TP20 non-inhibit probe kit 3	\$4,059	1-27
A-1371-0643	TP20 non-inhibit probe kit 4	\$4,059	1-27
A-1371-0644	TP20 non-inhibit probe kit 5	\$4,059	1-27
A-1371-0645	TP20 non-inhibit probe kit 6	\$4,059	1-27
A-1371-1001	Rack for PH20	\$2,237	1-14
A-1383-0003-RBE	ACR2 RBE	\$1,990	9-4
A-1520-0101	ACC2-2 autochange controller	\$3,100	1-53
A-2008-0368-RBE	TS27R probe RBE	\$890	9-6
A-2008-0368	TS27R probe, stylus and holder kit	\$1,190	2-21
A-2008-0382	OTS/RTS/TS27R stylus	\$111	2-21, 8-33
A-2008-0384	OTS/RTS/TS27R stylus	\$260	2-21, 8-33
A-2008-0389	OTS/RTS/TS27R stylus holder	\$25	2-21, 8-33
A-2008-0448	OTS/RTS/TS27R stylus conversion kit	\$120	2-21, 8-33
A-2008-0601	TS20 replacement stylus kit	\$116	2-38, 8-34
A-2008-0602	TS20 replacement stylus kit	\$116	2-38, 8-34
A-2008-0603	TS20 replacement stylus kit	\$116	2-38, 8-34
A-2008-1015	TS27R front cover	\$95	9-10
A-2008-6007	TS34 chip shield	\$135	9-10
A-2027-7046	TK3 tool kit	\$38	1-62
A-2030-0211	25 mm straight shank	\$228	2-16
A-2030-0252	1 in straight shank	\$228	2-16
A-2033-0830	Receiver mounting bracket	\$125	2-4, 2-6, 2-8, 2-11, 2-12, 2-13, 2-15, 2-19, 2-20, 2-26, 2-27, 2-28, 2-29

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A-2045-0243	½ in straight shank	\$228	2-16
A-2048-2050	Tool datuming stylus	\$137	8-34
A-2048-2051	Tool datuming stylus	\$137	8-34
A-2053-5358	MP3 probe	\$3,245	2-9, 2-14
A-2053-5358-RBE	MP3/MP6 probe RBE	\$785	9-5
A-2053-6468	Shorting cover	\$144	2-9, 2-14
A-2053-7531	TK1 tool kit	\$38	1-62, 2-31
A-2053-8156	Outer diaphragm replacement kit	\$105	9-10
A-2054-4657	M4/Ø4.5 stylus adaptor	\$34	8-88
A-2063-5308	FS3 single axis adjustable holder	\$249	2-32
A-2063-5431	FS2 fixed female socket	\$142	2-32
A-2063-6098	LP2 probe	\$3,102	2-9, 2-14, 2-27, 2-29, 2-30
A-2063-6098-RBE	LP2 probe RBE	\$795	9-7
A-2063-6697	FS1 adjustable female socket	\$142	2-32
A-2063-7001	LPE1 extension	\$299	2-9, 2-14, 2-27, 2-29, 2-32
A-2063-7002	LPE2 extension	\$299	2-9, 2-14, 2-27, 2-29, 2-32
A-2063-7003	LPE3 extension	\$299	2-9, 2-14, 2-27, 2-29, 2-32
A-2063-7542	LP2 service kit	\$80	2-31, 9-10
A-2063-7587	C spanner	\$18	2-31
A-2063-7600	MA4 90° adaptor	\$486	2-9, 2-14, 2-27, 2-29, 2-32
A-2063-8020	LP2DD probe	\$3,102	2-30
A-2063-8020-RBE	LP2DD probe RBE	\$795	9-7
A-2063-8030	LP2DD diaphragm replacement kit	\$42	2-31
A-2063-8326	LP2 straight shank (0.75 in)	\$1,281	2-32
A-2063-8328	LP2 straight shank (1 in)	\$1,281	2-32
A-2063-8366	LP2 straight shank (22 mm)	\$1,281	2-32
A-2064-0002	LP2H probe	\$3,102	2-30
A-2064-0002-RBE	LP2H probe RBE	\$795	9-7
A-2098-0104-RBE	SP600M probe RBE	\$4,120	9-3
A-2098-0105	SP600M probe	\$11,543	1-42
A-2098-0255	SCR600 rack	\$5,356	1-42
A-2098-0284	Stylus module SH600 standard	\$480	1-42
A-2098-0724-RBE	SCR600 rack RBE	\$2,065	9-4
A-2098-0890	SP600Q kit	\$11,543	1-42
A-2098-0933	SCP600 stylus change port	\$1,467	1-55
A-2098-1000	AC1 analog converter PC card	\$2,425	1-42
A-2098-1036	Stylus module SH600 extended	\$653	1-42
A-2116-0140	Tool datuming stylus	\$109	8-34
A-2116-0141	Tool datuming stylus	\$127	8-34
A-2116-0142	Tool datuming stylus	\$158	8-34
A-2116-0149-RBE	RP2 probe RBE	\$765	9-8
A-2116-0149	RP2 probe	\$1,540	2-39
A-2116-0150	RP2 DD probe	\$1,540	2-39
A-2116-0621-RBE	MP15 probe RBE	\$880	9-5
A-2116-0685-RBE	MP15F probe RBE	\$880	9-5
A-2116-1802	MP15 hard-wired probe kit	\$2,214	2-2
A-2150-0824-RBE	PHS PC card RBE	\$1,460	9-3
A-2150-1360-RBE	PHS PC card (B&S) RBE	\$1,460	9-3
A-2154-0007-RBE	RP1 probe RBE	\$765	9-8

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A-2154-0007	RP1 probe and tool kit	\$1,540	2-39
A-2154-0008	RP1 DD probe and tool kit	\$1,540	2-39
A-2172-0001	AC2 analog converter PC card	\$2,820	1-42
A-2176-0010	TSi2 interface	\$194	2-43
A-2176-0019	HPRA storage stand	\$311	2-35
A-2176-0025	HPRA rear exit base	\$784	2-35
A-2176-0187	HPRA side exit base	\$784	2-35
A-2176-0636	HPRA/HPPA/HPMA break stem	\$27	2-35, 2-38
A-2176-0639	HPRA/HPPA/HPMA break stem	\$27	2-35, 2-38
A-2176-0691-RBE	HPRA 6 in with RP3 RBE	\$1,540	9-7
A-2176-0692-RBE	HPRA 8 in with RP3 RBE	\$1,540	9-7
A-2176-0693-RBE	HPRA 10 in with RP3 RBE	\$1,540	9-7
A-2176-0694-RBE	HPRA 12 in with RP3 RBE	\$1,540	9-7
A-2176-0695-RBE	HPRA 15 in with RP3 RBE	\$1,540	9-7
A-2176-0697-RBE	HPRA 18 in with RP3 RBE	\$1,540	9-7
A-2176-0698-RBE	HPRA 24 in with RP3 RBE	\$1,540	9-7
A-2176-0883	HPRA 6 in chuck with RP3 kit	\$3,706	2-34
A-2176-0884	HPRA 8 in chuck with RP3 kit	\$3,706	2-34
A-2176-0885	HPRA 10 in chuck with RP3 kit	\$3,706	2-34
A-2176-0886	HPRA 12 in chuck with RP3 kit	\$3,706	2-34
A-2176-0887	HPRA 15 in chuck with RP3 kit	\$3,706	2-34
A-2176-0888	HPRA 18 in chuck with RP3 kit	\$3,706	2-34
A-2176-0889	HPRA 24 in chuck with RP3 kit	\$3,706	2-34
A-2176-1152	TSi2-C interface	\$194	2-43
A-2181-0465	TSi3 interface	\$237	2-43
A-2181-0645	HPMA 6 in R/E with RP3 kit	\$4,942	2-37
A-2181-0645-RBE	HPMA 6 in with RP3 RBE	\$2,050	9-7
A-2181-0646	HPMA 8 in R/E with RP3 kit	\$4,942	2-37
A-2181-0646-RBE	HPMA 8 in with RP3 RBE	\$2,050	9-7
A-2181-0647	HPMA 10 in R/E with RP3 kit	\$4,942	2-37
A-2181-0647-RBE	HPMA 10 in with RP3 RBE	\$2,050	9-7
A-2181-0648	HPMA 12 in R/E with RP3 kit	\$4,942	2-37
A-2181-0648-RBE	HPMA 12 in with RP3 RBE	\$2,050	9-7
A-2181-0649	HPMA 15 in R/E with RP3 kit	\$4,942	2-37
A-2181-0649-RBE	HPMA 15 in with RP3 RBE	\$2,050	9-7
A-2181-0650	HPMA 18 in R/E with RP3 kit	\$4,942	2-37
A-2181-0650-RBE	HPMA 18 in with RP3 RBE	\$2,050	9-7
A-2181-0651	HPMA 24 in R/E with RP3 kit	\$4,942	2-37
A-2181-0651-RBE	HPMA 24 in with RP3 RBE	\$2,050	9-7
A-2181-0652	HPMA 6 in S/E with RP3 kit	\$4,942	2-37
A-2181-0653	HPMA 8 in S/E with RP3 kit	\$4,942	2-37
A-2181-0654	HPMA 10 in S/E with RP3 kit	\$4,942	2-37
A-2181-0655	HPMA 12 in S/E with RP3 kit	\$4,942	2-37
A-2181-0656	HPMA 15 in S/E with RP3 kit	\$4,942	2-37
A-2181-0657	HPMA 18 in S/E with RP3 kit	\$4,942	2-37
A-2181-0658	HPMA 24 in S/E with RP3 kit	\$4,942	2-37
A-2181-1080	HPMA R/E cable (2 meters)	\$105	2-38
A-2181-1085	HPMA R/E cable (5 meters)	\$131	2-38
A-2181-1090	HPMA R/E cable (10 meters)	\$178	2-38

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A-2181-2239	TSi3-C interface	\$237	2-43
A-2197-0049-RBE	RP3 probe RBE	\$765	9-8
A-2197-0049	RP3 probe	\$1,540	2-39
A-2197-0157	Arm stylus kit (16 mm tooling)	\$116	2-35, 2-38, 8-34
A-2197-0158	Arm stylus kit (20 mm tooling)	\$116	2-35, 2-38, 8-34
A-2197-0159	Arm stylus kit (25 mm tooling)	\$116	2-35, 2-38, 8-34
A-2197-0160	Arm stylus kit (32 mm tooling)	\$116	2-35, 2-38, 8-34
A-2197-0161	Arm stylus kit (40 mm tooling)	\$116	2-35, 2-38, 8-34
A-2197-0162	Arm stylus kit (50 mm tooling)	\$116	2-35, 2-38, 8-34
A-2197-2100-RBE	TS34 rear exit RBE	\$1,015	9-6
A-2197-2100	TS34 probe, stylus and holder kit	\$3,524	2-22
A-2197-3000-RBE	TS34 side exit RBE	\$1,015	9-6
A-2197-3000	TS34 probe, stylus and holder kit	\$3,524	2-22
A-2237-0682	Equator™ rack set-up tool	\$50	3-6
A-2237-1000-RBE	SP25M probe body RBE	\$1,745	9-3, 9-8
A-2237-1001	SP25M scanning probe kit #1	\$10,854	1-36
A-2237-1002	SP25M scanning probe kit #2	\$10,854	1-36
A-2237-1003	SP25M scanning probe kit #3	\$10,854	1-36
A-2237-1004	SP25M scanning probe kit #4	\$12,768	1-36
A-2237-1015	SP25M full combination kit	\$18,786	1-35
A-2237-1101	SP25M-1 scanning module kit	\$4,991	1-36
A-2237-1102	SP25M-2 scanning module kit	\$4,991	1-36
A-2237-1103	SP25M-3 scanning module kit	\$4,991	1-36
A-2237-1104	SP25M-4 full module kit	\$8,124	1-37
A-2237-1105	SM25-5 scanning module kit	\$6,302	1-37
A-2237-1108	SP25M-4 entry level module kit	\$6,373	1-37
A-2237-1109	SP25M-4 basic module kit	\$6,895	1-37
A-2237-1111-RBE	SM25-1 scanning module RBE	\$1,245	9-3
A-2237-1111	SM25-1 scanning module	\$4,643	1-37
A-2237-1112-RBE	SM25-2 scanning module RBE	\$1,245	9-3, 9-8
A-2237-1112	SM25-2 scanning module	\$4,643	1-37
A-2237-1113-RBE	SM25-3 scanning module RBE	\$1,245	9-3
A-2237-1113	SM25-3 scanning module	\$4,643	1-37
A-2237-1114-RBE	SM25-4 scanning module RBE	\$1,420	9-3
A-2237-1114	SM25-4 scanning module	\$5,431	1-37
A-2237-1115-RBE	SM25-5 scanning module RBE	\$1,860	9-3
A-2237-1115	SM25-5 scanning module	\$6,002	1-37
A-2237-1200-RBE	TM25-20 TTP module RBE	\$690	9-3
A-2237-1200	TM25-20 TTP module adaptor	\$3,553	1-37
A-2237-1201	TM25-20 TTP module adaptor kit #1	\$4,991	1-37
A-2237-1301	SH25-1 stylus holder	\$208	1-37
A-2237-1302	SH25-2 stylus holder	\$314	1-37
A-2237-1303	SH25-3 stylus holder	\$383	1-37
A-2237-1304	SH25-4 stylus holder	\$507	1-37
A-2237-1305	SH25-5 stylus holder	\$270	1-37
A-2237-1401	FCR25 flexible change rack	\$2,670	1-38
A-2237-1401-RBE	FCR25 flexible change rack RBE	\$695	9-4
A-2237-1403	FCR25-L3 change rack unit	\$3,947	1-38
A-2237-1403-RBE	FCR25-L3 change rack unit RBE	\$1,040	9-4

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A-2237-1406	FCR25-L6 change rack unit	\$6,616	1-38
A-2237-1408	FCR25 TC	\$3,030	1-38
A-2237-1414	Equator™ rack port inserts for 6 off SH25	\$163	3-6
A-2237-1415	FCR25 port adaptor insert kit	\$383	1-38
A-2237-1601	AC3 interface card	\$3,483	1-37
A-2238-0020	KM6080 quill mount plate	\$189	1-41
A-2238-0101-RBE	SP80 RBE	\$5,060	9-4
A-2238-0414-RBE	SP80H RBE	5,060	9-4
A-2238-0419	SP80H probe kit 1	\$17,644	1-40
A-2238-0430	SH80K stylus holder	\$609	1-41
A-2238-0700	SP80 probe kit 1	\$17,644	1-39
A-2238-0703	KM80 quill mount plate	\$189	1-41
A-2238-0704	SM80 shank mount plate	\$944	1-41
A-2238-0705	SH80 stylus holder	\$567	1-41
A-2238-0706	SCP80 stylus change port	\$1,127	1-41
A-2238-0720	IU80 interpolator unit	\$907	1-41
A-2238-0726	SCP80V rack port	\$1,212	1-41
A-2238-0732	SP80 probe kit 2	\$21,738	1-39
A-2238-0733	SP80 probe kit 3	\$22,103	1-39
A-2238-0734	SP80 probe kit 4	\$22,537	1-39
A-2238-0735	SP80 probe kit 5	\$23,098	1-39
A-2238-0736	SP80 probe kit 6	\$24,015	1-39
A-2238-0737	SP80 probe kit 7	\$24,951	1-39
A-2238-1255-RBE	MSP80 rear exit	\$12,500	9-5
A-2238-1270-RBE	MSP80 side exit RBE	\$12,500	9-5
A-2253-5120	Air regulator kit	\$464	2-18, 2-24
A-2275-0181	HPPA 6 in R/E with RP3 kit	\$4,380	2-37
A-2275-0181-RBE	HPPA 6 in with RP3 RBE	\$1,820	9-7
A-2275-0182	HPPA 8 in R/E with RP3 kit	\$4,380	2-37
A-2275-0182-RBE	HPPA 8 in with RP3 RBE	\$1,820	9-7
A-2275-0183	HPPA 10 in R/E with RP3 kit	\$4,380	2-37
A-2275-0183-RBE	HPPA 10 in with RP3 RBE	\$1,820	9-7
A-2275-0184	HPPA 12 in R/E with RP3 kit	\$4,380	2-37
A-2275-0184-RBE	HPPA 12 in with RP3 RBE	\$1,820	9-7
A-2275-0185	HPPA 15 in R/E with RP3 kit	\$4,380	2-37
A-2275-0185-RBE	HPPA 15 in with RP3 RBE	\$1,820	9-7
A-2275-0186	HPPA 18 in R/E with RP3 kit	\$4,380	2-37
A-2275-0186-RBE	HPPA 18 in with RP3 RBE	\$1,820	9-7
A-2275-0187	HPPA 24 in R/E with RP3 kit	\$4,380	2-37
A-2275-0188	HPPA 6 in S/E with RP3 kit	\$4,380	2-37
A-2275-0189	HPPA 8 in S/E with RP3 kit	\$4,380	2-37
A-2275-0190	HPPA 10 in S/E with RP3 kit	\$4,380	2-37
A-2275-0191	HPPA 12 in S/E with RP3 kit	\$4,380	2-37
A-2275-0192	HPPA 15 in S/E with RP3 kit	\$4,380	2-37
A-2275-0193	HPPA 18 in S/E with RP3 kit	\$4,380	2-37
A-2275-0194	HPPA 24 in S/E with RP3 kit	\$4,380	2-37
A-3007-1715	PH20 shank adaptor	\$201	1-14
A-3007-1716	PH20 small quill adaptor	\$201	1-14
A-3007-1717	PH20 large quill adaptor	\$201	1-14

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A-3007-1720	PH20 PH10MQ quill adaptor	\$35	1-14
A-3060-0021	REVO® RSH250 stylus holder kit	\$1,162	1-16
A-3060-0022	REVO® RSH350 stylus holder kit	\$1,258	1-16
A-3060-0023	REVO® RSH500 stylus holder kit	\$1,354	1-16
A-3060-0024	REVO® RSH175 stylus holder kit	\$1,165	1-16
A-3060-0026	REVO® RSH450 stylus holder kit	\$1,306	1-16
A-3060-0028	REVO® RSP2 V2 probe	\$4,838	1-16
A-3060-0040-RBE	REVO® RBE	\$9,320	9-3
A-3060-0331	RSP3-1 REVO® probe kit	\$6,773	1-16
A-3060-0332	RSP3-2 REVO® probe kit	\$6,773	1-16
A-3060-0333	RSP3-3 REVO® probe kit	\$6,773	1-17
A-3060-0334	RSP3-4 REVO® probe kit	\$7,934	1-17
A-3061-0320	REVO® RCP TC-3 high force rack port	\$1,807	1-23
A-3061-2521	RSH3-1	\$208	1-17
A-3061-2522	RSH3-2	\$314	1-17
A-3061-2523	RSH3-3	\$383	1-17
A-3061-2524	RSH3-4	\$507	1-17
A-4007-1400	Productivity+™ Active Editor Pro	\$5,232	2-48
A-4007-5100	Fanuc Macro B post processor	\$1,571	2-48
A-4007-5200	Haas post processor	\$1,571	2-48
A-4007-5300	Hitachi Seicos post processor	\$1,571	2-48
A-4007-5400	Makino post processor	\$1,571	2-48
A-4007-5500	Mazak post processor	\$1,571	2-48
A-4007-5600	Mitsubishi Meldas post processor	\$1,571	2-48
A-4007-5700	Yasnac post processor	\$1,571	2-48
A-4007-5900	Brother post processor	\$1,571	2-48
A-4007-6000	Heidenhain i530 post processor	\$1,571	2-48
A-4007-6300	Okuma post processor	\$1,571	2-48
A-4007-6600	Mori Seiki post processor	\$1,571	2-48
A-4007-6700	Siemens 840D/810D post processor	\$1,571	2-48
A-4007-6800	Hurco Winmax post processor	\$1,571	2-48
A-4007-6900	Heidenhain 426/430 post processor	\$1,571	2-48
A-4007-7100	Mazak Integrex post processor	\$1,571	2-48
A-4007-7200	Heidenhain 6xx post processor	\$1,571	2-48
A-4007-8999	Productivity+™ 90-day trial	FOC	2-48
A-4012-0516	Inspection Plus software	\$1,127	2-44
A-4012-0528	Tool setting software	\$451	2-46
A-4012-0541	Inspection software	\$902	2-46
A-4012-0584	Tool setting software	\$451	2-45
A-4012-0779	Tool setting software	\$451	2-46
A-4012-0820	Tool setting software	\$677	2-45
A-4012-0834	Inspection software	\$1,127	2-46
A-4012-0874	Inspection software	\$902	2-46
A-4012-0877	Tool setting software	\$451	2-46
A-4012-0880	Inspection Plus software	\$1,127	2-44
A-4012-0886	Tool setting software	\$451	2-45
A-4012-0890	Inspection Plus software	\$1,127	2-44
A-4012-0895	Tool setting software	\$677	2-45
A-4012-0904	Tool setting software	\$677	2-45

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A-4012-0908	Inspection Plus software	\$1,127	2-44
A-4012-0936	Inspection Plus software	\$1,127	2-44
A-4012-0949	Inspection Plus software	\$1,127	2-44
A-4012-0953	Tool setting software	\$677	2-45
A-4012-1007	Tool setting software	\$451	2-45
A-4012-1016	Inspection software	\$1,127	2-46
A-4012-1028	Inspection Plus software	\$1,127	2-44
A-4012-1035	Tool setting software	\$677	2-45
A-4012-1074	Inspection software	\$1,127	2-46
A-4012-1092	Inspection software	\$1,127	2-46
A-4012-1301	Inspection software	\$1,127	2-46
A-4012-1309	Inspection software	\$902	2-46
A-4012-1511	Inspection software	\$1,127	2-46
A-4012-1555	Tool setting software	\$451	2-45
A-4013-0023	Inspection Plus software	\$1,127	2-44
A-4013-0036	Tool setting software	\$451	2-45
A-4013-0040	Inspection Plus software	\$1,127	2-44
A-4013-0062	Tool setting software	\$677	2-45
A-4013-0071	Inspection software	\$902	2-46
A-4013-0083	Inspection software	\$1,127	2-46
A-4013-0088	Tool setting software	\$677	2-45
A-4013-0092	Tool setting software	\$677	2-45
A-4013-0106	Inspection software	\$1,127	2-46
A-4013-0112	Inspection Plus software	\$1,127	2-44
A-4013-0119	Tool setting software	\$677	2-45
A-4013-0123	Tool setting software	\$677	2-45
A-4013-0133	Tool setting software	\$451	2-45
A-4013-0250	Tool setting software	\$451	2-46
A-4013-0254	Tool setting software	\$451	2-46
A-4013-1309	Inspection software	\$902	2-46
A-4014-0011	Inspection software	\$902	2-46
A-4014-0018	Tool setting software	\$451	2-45
A-4014-0020	Tool setting software	\$677	2-45
A-4014-0025	Tool setting software	\$677	2-45
A-4014-0070	Inspection Plus software	\$1,127	2-44
A-4014-0104	Inspection Plus software	\$1,127	2-44
A-4014-0130	Tool setting software	\$451	2-46
A-4014-0137	Inspection software	\$902	2-46
A-4014-0356	Inspection Plus software	\$1,127	2-44
A-4014-0396	Tool setting software	\$451	2-45
A-4014-0401	Tool setting software	\$677	2-45
A-4016-0043	Tool setting software	\$451	2-45
A-4016-0061	Tool setting software	\$677	2-45
A-4016-0071	Tool setting software	\$1,127	2-44
A-4016-0078	Tool setting software	\$451	2-45
A-4016-1021	Tool setting software	\$677	2-45
A-4016-1035	Inspection Plus software	\$1,127	2-44
A-4016-1039	Tool setting software	\$451	2-45
A-4016-1071	Tool setting software	\$451	2-45

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A-4038-0001	OMP60 probe kit (legacy)	\$3,984	2-7
A-4038-0001-RBE	OMP60 probe RBE	\$1,210	9-5
A-4038-0177	OMP60/RMP60 new type shank switch	\$190	9-10
A-4038-0212	OMP60M/RMP60M LP2 adaptor	\$647	2-9, 2-14
A-4038-0300	OMP60/RMP60 battery cassette	\$204	9-10
A-4038-0301	OMP40/OMP60/RMP60 battery cassette seal	\$30	9-10
A-4038-0302	OMP60/RMP60 outer diaphragm kit	\$79	9-10
A-4038-0303	OMP60/RMP60 shank switch bobbin	\$185	9-10
A-4038-1002	OMP60M/RMP60M probe module	\$3,201	2-9, 2-14
A-4038-1002-RBE	OMP60/RMP60 probe module RBE	\$910	9-5
A-4038-1003	OMP60M transmission module	\$1,226	2-9
A-4038-1003-RBE	OMP60 transmission module RBE	\$750	9-5
A-4038-1010	OMP60M/RMP60M 100 mm extension	\$647	2-9, 2-14
A-4038-1027	OMP60M/RMP60M 150 mm extension	\$839	2-9, 2-14
A-4038-1028	OMP60M/RMP60M 200 mm extension	\$872	2-9, 2-14
A-4038-2001	OMP60 probe kit (modulated)	\$3,984	2-7
A-4038-2001-RBE	OMP60 probe RBE	\$1,210	9-5
A-4043-0000	MH20 head (LF)	\$4,284	1-4
A-4043-0024-RBE	MH20 head RBE	\$1,095	9-3
A-4043-0100	MH20 head (SF)	\$4,284	1-4
A-4043-0200	MH20 head (MF)	\$4,284	1-4
A-4043-0300	MH20 head (EF)	\$4,284	1-4
A-4068-0400	CC6 counter card	\$1,634	1-41
A-4071-0001	OMP40 probe kit (legacy)	\$3,984	2-3
A-4071-0001-RBE	OMP40 probe RBE	\$1,210	9-5
A-4071-0031	OMP60/RMP60 style shank adaptor	\$179	2-3
A-4071-0060	Ballbar TRACE tool kit	\$11	5-8
A-4071-0094	OMP40 pull-up-cone assembly	\$45	9-10
A-4071-0096	OMP40 round battery cap	\$105	9-10
A-4071-1157	OMP40 round battery cap seal	\$25	9-10
A-4071-1166	OMP40 rectangular battery cassette	\$135	9-10
A-4071-2001	OMP40 probe kit (modulated)	\$3,984	2-3
A-4071-2001-RBE	OMP40 probe RBE	\$1,210	9-5
A-4099-0000	MH20i head (LF)	\$4,986	1-5
A-4099-0022-RBE	MH20i head RBE	\$1,395	9-3
A-4099-0100	MH20i head (SF)	\$4,986	1-5
A-4099-0200	MH20i head (MF)	\$4,986	1-5
A-4099-0300	MH20i head (EF)	\$4,986	1-5
A-4113-0001-RBE	RMP60 probe RBE	\$1,610	9-5
A-4113-0306	Sealtite conduit	\$36	2-4, 2-6, 2-8, 2-11, 2-12, 2-13, 2-15, 2-19, 2-20, 2-26, 2-27, 2-28, 2-29
A-4113-0771	OMP60M/RMP60M probe module adaptor	\$741	2-9, 2-14
A-4113-0784	OMP60M/RMP60M 3-way adaptor	\$1,307	2-9, 2-14
A-4114-0082	NC4 access panel 0.2	\$23	2-18
A-4114-0084	NC4 access panel 0.4	\$23	2-18
A-4114-0086	NC4 access panel 0.6	\$23	2-18
A-4114-2345-RBE	NC4 TX separate RBE	\$1,055	9-6
A-4114-2346-RBE	NC4 RX separate RBE	\$1,055	9-6

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A-4114-3100	NC4 adjuster pack	\$239	2-18
A-4114-4110	NC4 tool kit	\$45	2-18
A-4114-4400	NC4 spacer plate	\$95	2-18
A-4114-5060	NC4 S800 with NCi-6 kit	\$4,972	2-17
A-4114-5065	NC4 S1500 with NCi-6 kit	\$4,972	2-17
A-4114-5070	NC4 S2000 with NCi-6 kit	\$4,972	2-17
A-4114-5075	NC4 S3000 with NCi-6 kit	\$4,972	2-17
A-4114-5080	NC4 S5000 with NCi-6 kit	\$4,972	2-17
A-4114-5100-RBE	NC4F300 modular RBE	\$2,100	9-6
A-4114-5200-RBE	NC4 generic TX RBE	\$1,055	9-6
A-4114-5300-RBE	NC4 generic RX RBE	\$1,055	9-6
A-4114-8000	NC4 set-up tool	\$358	2-18
A-4178-0440	TRS2 replacement air cap	\$30	2-24
A-4192-0001	MRS kit 1	\$1,262	1-55
A-4192-0002	MRS kit 2	\$1,353	1-55
A-4192-0003	MRS kit 3	\$1,467	1-55
A-4192-0014	MRS spacer kit	\$81	1-56
A-4192-0020	MRS heavy duty leg kit	\$381	1-56
A-4192-0050	MRS 400 mm rail	\$215	1-55
A-4192-0051	MRS 600 mm rail	\$282	1-55
A-4192-0052	MRS 1000 mm rail	\$394	1-55
A-4192-0053	MRS 125 mm leg	\$107	1-56
A-4192-0055	MRS leg and foot adaptor	\$158	1-56
A-4192-0056	MRS fixed foot	\$158	1-56
A-4192-0058	MRS step back adaptor	\$158	1-56
A-4192-0061	MRS 62.5 mm leg	\$90	1-56
A-4192-0702	MRS adjustable foot plate	\$394	1-56
A-5000-0001	M2 comprehensive stylus kit	\$2,808	8-90
A-5000-0002	M2 stylus enhancement kit	\$1,032	8-91
A-5000-3212	M4 tool datuming stylus	\$107	8-33
A-5000-3551	M3 ruby stylus	\$32	8-21, 8-99, 8-100
A-5000-3552	M3 ruby stylus	\$32	8-21, 8-99, 8-100
A-5000-3553	M3 ruby stylus	\$32	8-21, 8-99, 8-100
A-5000-3554	M3 ruby stylus	\$32	8-21, 8-99, 8-100
A-5000-3603	M2 ruby stylus	\$25	8-13, 8-90, 8-93, 8-94, 8-95
A-5000-3604	M2 ruby stylus	\$22	8-13, 8-90, 8-93, 8-94, 8-95
A-5000-3609	M2 star stylus center	\$71	8-18
A-5000-3611	M2 disk stylus	\$70	8-18, 8-90, 8-93, 8-94, 8-95
A-5000-3613	M2 disk stylus	\$105	8-18
A-5000-3614	M2 hemispherical stylus	\$279	8-20, 8-90, 8-94, 8-95
A-5000-3615	M3 disk stylus	\$74	8-26, 8-99, 8-100
A-5000-3626	M2 star stylus	\$133	8-17, 8-90, 8-93
A-5000-3627	M2 5-way stylus center	\$48	8-84, 8-87, 8-90, 8-94, 8-95, 8-101
A-5000-3709	M4 ruby stylus	\$97	8-28
A-5000-3712	M4 ruby stylus	\$109	8-29
A-5000-4154	M2 ruby stylus	\$22	8-13, 8-90, 8-94, 8-95
A-5000-4155	M2 ruby stylus	\$36	8-13, 8-90, 8-94, 8-95
A-5000-4156	M2 ruby stylus	\$39	8-13, 8-90, 8-94, 8-95
A-5000-4158	M2 ruby stylus	\$72	8-13, 8-90, 8-94, 8-95

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A-5000-4160	M2 ruby stylus	\$25	8-13, 8-90, 8-93, 8-94, 8-95
A-5000-4161	M2 ruby stylus	\$25	8-13, 8-90, 8-94, 8-95
A-5000-4187	M2 disk stylus	\$99	8-18
A-5000-5302	Cranked stylus	\$122	8-32
A-5000-5307	Cranked stylus	\$122	8-32
A-5000-6350	M4 ruby stylus	\$70	8-27
A-5000-6351	M4 disk stylus	\$165	8-31
A-5000-6352	M4 ruby stylus	\$70	8-27
A-5000-6403	M4 tool datuming stylus	\$107	8-33
A-5000-6462	M4 star stylus	\$94	8-31
A-5000-6620	Cranked stylus	\$122	8-32
A-5000-6701	M4 tool datuming stylus	\$107	8-33
A-5000-6713	M4 tool datuming stylus	\$128	8-33
A-5000-6731	M4 ruby stylus	\$70	8-27
A-5000-7098	M4 star stylus	\$89	8-31
A-5000-7521	M4 ruby stylus	\$70	8-28
A-5000-7522	M4 ruby stylus	\$79	8-29
A-5000-7523	M4 ruby stylus	\$88	8-29
A-5000-7534	M2 stylus knuckle	\$71	8-87, 8-90, 8-93, 8-94, 8-95
A-5000-7545	M4 ruby stylus	\$87	8-27, 8-101
A-5000-7547	M4 ruby stylus	\$76	8-27, 8-101
A-5000-7549	M4 ruby stylus	\$45	8-27
A-5000-7551	M4 ruby stylus	\$45	8-27, 8-101
A-5000-7553	M4 ruby stylus	\$45	8-27
A-5000-7555	M4 ruby stylus	\$48	8-27
A-5000-7557	M4 ruby stylus	\$67	8-27
A-5000-7580	Cranked stylus	\$52	8-32
A-5000-7596	M4 disk stylus	\$114	8-31
A-5000-7597	M4 disk stylus	\$109	8-31
A-5000-7598	M4 disk stylus	\$119	8-31
A-5000-7606	M3 ruby stylus	\$32	8-21
A-5000-7610	M3 5-way stylus center	\$50	8-87, 8-99, 8-100, 8-101
A-5000-7612	M3 disk stylus	\$126	8-26
A-5000-7616	M3 stylus knuckle	\$71	8-87, 8-99, 8-100
A-5000-7629	M2 star stylus	\$139	8-17, 8-90
A-5000-7630	M3 ruby stylus	\$32	8-21, 8-98
A-5000-7632	M3 ruby stylus	\$98	8-21
A-5000-7648	M3 ruby stylus	\$32	8-21, 8-99, 8-100
A-5000-7669	M3 disk stylus	\$134	8-26, 8-99, 8-100
A-5000-7670	M4 tungsten carbide stylus	\$70	8-36
A-5000-7671	M4 tungsten carbide stylus	\$79	8-36
A-5000-7672	M4 tungsten carbide stylus	\$88	8-36
A-5000-7727	M4 stylus extension	\$154	8-35
A-5000-7751	M4/M3 stylus adaptor	\$60	8-88, 8-101
A-5000-7752	M4/M3 stylus adaptor	\$91	8-88, 8-101
A-5000-7753	M4/M3 stylus adaptor	\$104	8-88, 8-101
A-5000-7754	M4 stylus extension	\$51	8-35, 8-101
A-5000-7755	M4 stylus extension	\$60	8-35, 8-101
A-5000-7792	M4 5-way stylus center	\$60	8-87, 8-101

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A-5000-7796	M4 ruby stylus	\$135	8-29, 8-101
A-5000-7800	M2 ruby stylus	\$111	8-13, 8-90, 8-91
A-5000-7801	M2 ruby stylus	\$84	8-13, 8-90, 8-91
A-5000-7802	M2 ruby stylus	\$22	8-13, 8-90, 8-91
A-5000-7803	M2 ruby stylus	\$22	8-13, 8-90, 8-91
A-5000-7804	M2 ruby stylus	\$25	8-13, 8-90, 8-91
A-5000-7805	M2 ruby stylus	\$90	8-13, 8-90, 8-91
A-5000-7806	M2 ruby stylus	\$32	8-13, 8-90, 8-91, 8-93, 8-94, 8-95
A-5000-7807	M2 ruby stylus	\$22	8-13, 8-90, 8-91, 8-93, 8-94, 8-95
A-5000-7808	M2 ruby stylus	\$49	8-14, 8-90, 8-91
A-5000-7809	M2 disk stylus	\$89	8-18, 8-90, 8-91, 8-93, 8-94, 8-95
A-5000-7810	M2 disk stylus	\$89	8-18, 8-90, 8-91, 8-94, 8-95
A-5000-7811	M2 star stylus	\$138	8-17, 8-90, 8-91
A-5000-7812	M2 cylinder stylus	\$147	1-34, 8-18, 8-90, 8-91
A-5000-7813	M2 pointer stylus	\$67	8-20, 8-90, 8-91
A-5000-7814	M4 hollow ball stylus	\$343	8-26, 8-101
A-5000-7829	M4 stylus kit (TP7M use)	\$1,614	8-101
A-5000-8156	M4 ruby stylus	\$170	8-29
A-5000-8395	M2 4-way stylus center	\$64	8-87
A-5000-8663	M2 ruby stylus	\$84	8-14
A-5000-8876	M2 cylinder stylus	\$185	8-18
A-5000-8877	M2 cylinder stylus	\$270	8-18
A-5000-9302	M5/Ø8.0 stylus adaptor	\$62	8-88
A-5000-9303	M5/Ø10.0 stylus adaptor	\$62	8-88
A-5000-9685	M4 tungsten carbide stylus	\$159	8-36
A-5000-9697	M4 tungsten carbide stylus	\$147	8-36
A-5000-9724	Adaptor	\$172	8-37
A-5000-9761	M4 ruby stylus	\$150	8-29
A-5000-9860	Walter stylus	\$129	8-37
A-5000-9902	M2 rotary stylus knuckle	\$81	8-87
A-5003-0033	M2 ruby stylus	\$55	8-14
A-5003-0034	M2 ruby stylus	\$55	8-14
A-5003-0035	M2 ruby stylus	\$38	8-14
A-5003-0036	M2 ruby stylus	\$44	8-14
A-5003-0037	M2 ruby stylus	\$49	8-15
A-5003-0038	M2 ruby stylus	\$44	8-14
A-5003-0039	M2 ruby stylus	\$49	8-15
A-5003-0040	M2 ruby stylus	\$44	8-14
A-5003-0041	M2 ruby stylus	\$49	8-15
A-5003-0042	M2 ruby stylus	\$44	8-15
A-5003-0043	M2 ruby stylus	\$44	8-14
A-5003-0044	M2 ruby stylus	\$49	8-15
A-5003-0045	M2 ruby stylus	\$49	8-15
A-5003-0046	M2 ruby stylus	\$44	8-14
A-5003-0047	M2 ruby stylus	\$49	8-14
A-5003-0048	M2 ruby stylus	\$53	8-15
A-5003-0049	M2 ruby stylus	\$53	8-15
A-5003-0050	M3 ruby stylus	\$44	8-21

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A-5003-0052	M3 ruby stylus	\$44	8-21
A-5003-0053	M3 ruby stylus	\$49	8-22
A-5003-0054	M3 ruby stylus	\$44	8-21
A-5003-0055	M3 ruby stylus	\$44	8-21
A-5003-0056	M3 ruby stylus	\$49	8-22
A-5003-0057	M3 ruby stylus	\$44	8-21
A-5003-0058	M3 ruby stylus	\$49	8-22
A-5003-0059	M3 ruby stylus	\$53	8-22
A-5003-0060	M3 ruby stylus	\$44	8-22
A-5003-0061	M3 ruby stylus	\$53	8-22
A-5003-0062	M3 ruby stylus	\$74	8-22, 8-75
A-5003-0063	M3 ruby stylus	\$53	8-22
A-5003-0064	M2 ruby stylus	\$70	8-16
A-5003-0065	M2 ruby stylus	\$70	8-16
A-5003-0066	M2 ruby stylus	\$90	8-16
A-5003-0067	M3 ruby stylus	\$70	8-22
A-5003-0068	M3 ruby stylus	\$70	8-22
A-5003-0069	M3 ruby stylus	\$70	8-22, 8-98
A-5003-0070	M2 stylus extension	\$58	8-19
A-5003-0071	M2 stylus extension	\$58	8-19
A-5003-0072	M2 stylus extension	\$60	8-19
A-5003-0073	M2 cylinder stylus	\$130	8-18
A-5003-0074	M2 parallel stylus	\$87	8-19
A-5003-0075	M3 stylus extension	\$58	8-25
A-5003-0076	M3 star stylus	\$140	8-26
A-5003-0077	M3 star stylus	\$140	8-26
A-5003-0233	M4 ruby stylus	\$70	8-28
A-5003-0235	M4 ruby stylus	\$82	8-28
A-5003-0236	M4 ruby stylus	\$86	8-28
A-5003-0470	M2 ruby stylus	\$86	8-16
A-5003-0577	M2 ruby stylus	\$107	8-14
A-5003-0587	M4 stylus extension	\$165	8-35
A-5003-0661	Crash protection device	\$25	2-21, 8-32
A-5003-0856	M5/M4 stylus adaptor	\$29	8-88
A-5003-0938	M2 ruby stylus	\$78	8-14, 8-82
A-5003-1029	M2 ruby stylus	\$78	8-14
A-5003-1075	M4 ruby stylus	\$289	8-30
A-5003-1208	M2 parallel stylus	\$220	8-19
A-5003-1210	M2 parallel stylus	\$190	8-19
A-5003-1218	M2 parallel stylus	\$160	8-19
A-5003-1219	M2 parallel stylus	\$85	8-19
A-5003-1228	M2 parallel stylus	\$85	8-19
A-5003-1255	M4 ruby stylus	\$274	8-30
A-5003-1258	M2 parallel stylus	\$155	8-19
A-5003-1325	M2 ruby stylus	\$77	8-13
A-5003-1345	M2 ruby stylus	\$105	8-14
A-5003-1358	M4 ruby stylus	\$145	8-30
A-5003-1370	M2 ruby stylus	\$50	8-15

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A-5003-1448	Adaptor	\$172	8-37
A-5003-1699	Walter stylus	\$259	8-37
A-5003-1730	M2 silicon nitride stylus	\$76	8-13
A-5003-1896	M2 ruby stylus	\$72	8-14
A-5003-2020	M2 silicon nitride stylus	\$169	8-13
A-5003-2043	M3 zirconia stylus	\$104	8-22
A-5003-2138	M2 silicon nitride stylus	\$69	8-13
A-5003-2186	M2 zirconia stylus	\$78	8-13
A-5003-2280	M2 stylus extension	\$97	8-20, 8-92
A-5003-2281	M2 stylus extension	\$101	8-20, 8-92
A-5003-2282	M2 stylus extension	\$105	8-20, 8-92
A-5003-2283	M2 stylus extension	\$110	8-20, 8-92
A-5003-2285	M2 ruby stylus	\$105	8-16, 8-92
A-5003-2286	M2 ruby stylus	\$110	8-16, 8-92
A-5003-2287	M2 ruby stylus	\$115	8-16, 8-92
A-5003-2289	M2 ruby stylus	\$154	8-17
A-5003-2290	M2 ruby stylus	\$163	8-17
A-5003-2291	M2 ruby stylus	\$172	8-17
A-5003-2300	S20 stylus tool	\$48	1-61, 8-89, 8-92
A-5003-2310	M2 high performance stylus kit	\$710	1-33, 8-92
A-5003-2764	M4 ruby stylus	\$103	8-28
A-5003-2932	M4 ruby stylus	\$86	8-27
A-5003-3042	Walter stylus	\$259	8-37
A-5003-3045	Walter stylus	\$172	8-37
A-5003-3461	M4 ruby stylus	\$430	8-29
A-5003-3680	M4 ruby stylus	\$96	8-28
A-5003-3814	Walter stylus	\$259	8-37
A-5003-3822	M2 ruby stylus	\$27	8-14, 8-82
A-5003-4011	M2 star stylus	\$249	8-17
A-5003-4177	M2 ruby stylus	\$84	8-15
A-5003-4241	M2 ruby stylus	\$100	8-15
A-5003-4686	M3 rotary stylus knuckle	\$130	8-87
A-5003-4689	M4 rotary stylus knuckle	\$140	8-87
A-5003-4697	M2 stylus knuckle	\$108	8-87
A-5003-4779	M2 ruby stylus	\$86	8-15
A-5003-4780	M2 ruby stylus	\$92	8-15
A-5003-4781	M2 ruby stylus	\$104	8-15
A-5003-4782	M2 ruby stylus	\$109	8-15
A-5003-4784	M2 ruby stylus	\$135	8-17
A-5003-4785	M2 ruby stylus	\$144	8-17
A-5003-4786	M2 ruby stylus	\$152	8-17
A-5003-4787	M2 star stylus	\$264	8-17
A-5003-4788	M2 star stylus	\$221	8-17
A-5003-4789	M2 star stylus center	\$125	8-18
A-5003-4790	M2 star stylus center	\$163	8-18
A-5003-4791	M2 star stylus center	\$125	8-18
A-5003-4792	M4 ruby stylus	\$77	8-27
A-5003-4793	M4 ruby stylus	\$86	8-27

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A-5003-4795	M4 ruby stylus	\$92	8-27
A-5003-4796	M4 ruby stylus	\$92	8-27
A-5003-4797	M4 ruby stylus	\$92	8-28
A-5003-4799	M4 ruby stylus	\$96	8-28
A-5003-4800	M4 ruby stylus	\$100	8-28
A-5003-4801	M4 ruby stylus	\$100	8-28
A-5003-4802	M4 ruby stylus	\$115	8-28
A-5003-4860	M3 ruby stylus	\$158	8-23, 8-96, 8-97
A-5003-4861	M3 ruby stylus	\$168	8-23
A-5003-4862	M3 ruby stylus	\$180	8-23
A-5003-4863	M3 ruby stylus	\$190	8-23, 8-97
A-5003-4864	M3 stylus extension	\$102	8-25
A-5003-4865	M3 stylus extension	\$110	8-25
A-5003-5061	M3 silicon nitride stylus	\$69	8-21
A-5003-5171	OTS/RTS/TS27R retrofit stylus kit	\$35	2-21
A-5003-5201	M5 ruby stylus	\$92	8-38
A-5003-5202	M5 ruby stylus	\$79	8-38
A-5003-5203	M5 ruby stylus	\$79	8-38
A-5003-5204	M5 ruby stylus	\$71	8-39
A-5003-5205	M5 ruby stylus	\$61	8-39
A-5003-5206	M5 ruby stylus	\$61	8-39
A-5003-5207	M5 ruby stylus	\$61	8-39
A-5003-5208	M5 ruby stylus	\$61	8-39
A-5003-5209	M5 ruby stylus	\$67	8-39
A-5003-5210	M5 ruby stylus	\$67	8-39
A-5003-5211	M5 ruby stylus	\$96	8-38
A-5003-5212	M5 ruby stylus	\$86	8-38
A-5003-5213	M5 ruby stylus	\$86	8-38
A-5003-5214	M5 ruby stylus	\$77	8-39
A-5003-5215	M5 ruby stylus	\$46	8-39
A-5003-5216	M5 ruby stylus	\$67	8-39
A-5003-5217	M5 ruby stylus	\$67	8-39
A-5003-5218	M5 ruby stylus	\$67	8-39, 8-102, 8-103, 8-104, 8-105
A-5003-5219	M5 ruby stylus	\$72	8-39
A-5003-5220	M5 ruby stylus	\$77	8-39
A-5003-5221	M5 ruby stylus	\$96	8-39
A-5003-5222	M5 ruby stylus	\$86	8-39
A-5003-5223	M5 ruby stylus	\$86	8-39
A-5003-5224	M5 ruby stylus	\$86	8-39
A-5003-5225	M5 ruby stylus	\$125	8-38
A-5003-5226	M5 ruby stylus	\$115	8-38
A-5003-5227	M5 ruby stylus	\$115	8-38
A-5003-5228	M5 ruby stylus	\$109	8-40
A-5003-5229	M5 ruby stylus	\$105	8-40
A-5003-5230	M5 ruby stylus	\$96	8-40
A-5003-5231	M5 ruby stylus	\$77	8-40
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A-5003-5236	M5 ruby stylus	\$86	8-40, 8-102, 8-103, 8-104, 8-105
A-5003-5237	M5 ruby stylus	\$96	8-40
A-5003-5238	M5 ruby stylus	\$105	8-40, 8-105
A-5003-5239	M5 ruby stylus	\$115	8-40
A-5003-5240	M5 ruby stylus	\$134	8-38
A-5003-5241	M5 ruby stylus	\$125	8-38
A-5003-5242	M5 ruby stylus	\$115	8-38
A-5003-5243	M5 ruby stylus	\$115	8-41
A-5003-5244	M5 ruby stylus	\$105	8-41
A-5003-5248	M5 ruby stylus	\$96	8-41
A-5003-5249	M5 ruby stylus	\$105	8-41
A-5003-5250	M5 ruby stylus	\$125	8-41
A-5003-5251	M5 ruby stylus	\$115	8-41, 8-102, 8-103, 8-104, 8-105
A-5003-5252	M5 ruby stylus	\$125	8-41
A-5003-5253	M5 ruby stylus	\$125	8-42
A-5003-5254	M5 ruby stylus	\$144	8-43
A-5003-5255	M5 ruby stylus	\$125	8-42
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A-5003-5259	M5 ruby stylus	\$134	8-43
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A-5003-5261	M5 ruby stylus	\$144	8-42, 8-104
A-5003-5262	M5 ruby stylus	\$163	8-43, 8-102, 8-103, 8-104, 8-105
A-5003-5263	M5 ruby stylus	\$153	8-43
A-5003-5264	M5 ruby stylus	\$173	8-43
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A-5003-5266	M5 ruby stylus	\$249	8-44
A-5003-5267	M5 ruby stylus	\$269	8-44
A-5003-5268	M5 ruby stylus	\$326	8-44
A-5003-5269	M5 ruby stylus	\$345	8-44
A-5003-5270	M5 ruby stylus	\$364	8-44
A-5003-5271	M5 ruby stylus	\$422	8-45
A-5003-5272	M5 ruby stylus	\$441	8-45
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A-5003-5275	M5 hemispherical stylus	\$225	8-52
A-5003-5276	M5 hemispherical stylus	\$225	8-52, 8-104, 8-105
A-5003-5277	M5 hemispherical stylus	\$300	8-52
A-5003-5278	M5 rotary stylus knuckle	\$247	8-63, 8-87, 8-104
A-5003-5279	M5 rotary stylus knuckle	\$86	8-87, 8-105
A-5003-5288	M5 disk stylus	\$125	8-52, 8-104, 8-105
A-5003-5289	M5 disk stylus	\$134	8-52, 8-104
A-5003-5290	M5 disk stylus	\$144	8-52, 8-105
A-5003-5291	M5 disk stylus	\$163	8-52
A-5003-5676	M5 stylus bolt	\$18	8-89, 8-105
A-5003-5677	M5 stylus bolt	\$18	8-89, 8-103, 8-104
A-5003-5678	M5 - M2 stylus bolt	\$18	8-89

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A-5003-5683	M5 - M2 stylus cube	\$86	8-89
A-5003-5684	M5 - M2 stylus cube	\$101	8-89
A-5003-5723	M3 silicon nitride stylus	\$69	8-21
A-5003-5724	M3 silicon nitride stylus	\$86	8-21
A-5003-5725	M3 silicon nitride stylus	\$103	8-22
A-5003-5726	M3 silicon nitride stylus	\$129	8-23
A-5003-5727	M3 silicon nitride stylus	\$147	8-23
A-5003-5728	M4 silicon nitride stylus	\$71	8-27
A-5003-5729	M4 silicon nitride stylus	\$63	8-27
A-5003-5730	M4 silicon nitride stylus	\$221	8-30
A-5003-5731	M4 silicon nitride stylus	\$240	8-30
A-5003-5732	M5 silicon nitride stylus	\$86	8-39
A-5003-5733	M5 silicon nitride stylus	\$94	8-39, 8-103, 8-104, 8-105
A-5003-5734	M5 silicon nitride stylus	\$134	8-40
A-5003-5735	M5 silicon nitride stylus	\$188	8-43
A-5003-5736	M3 zirconia stylus	\$84	8-21
A-5003-5737	M3 zirconia stylus	\$84	8-21
A-5003-5738	M3 zirconia stylus	\$104	8-21
A-5003-5739	M3 zirconia stylus	\$125	8-22
A-5003-5740	M3 zirconia stylus	\$157	8-23
A-5003-5741	M3 zirconia stylus	\$178	8-23
A-5003-5742	M4 zirconia stylus	\$71	8-27
A-5003-5743	M4 zirconia stylus	\$63	8-27
A-5003-5744	M4 zirconia stylus	\$221	8-30
A-5003-5745	M4 zirconia stylus	\$240	8-30
A-5003-5746	M5 zirconia stylus	\$86	8-39
A-5003-5747	M5 zirconia stylus	\$94	8-39
A-5003-5748	M5 zirconia stylus	\$134	8-40
A-5003-5749	M5 zirconia stylus	\$188	8-43
A-5003-5909	M5 stylus kit - comprehensive	\$3,760	8-104
A-5003-5910	M5 stylus kit - general purpose	\$2,575	8-105
A-5003-5911	M5 stylus kit - standard	\$1,236	8-103
A-5003-5912	M5 stylus extension kit 11 mm	\$1,475	8-106
A-5003-5913	M5 stylus extension kit 20 mm	\$2,065	8-107
A-5003-6120	M2 silicon nitride stylus	\$69	8-13
A-5003-6134	M5 stylus tool	\$21	8-46, 8-102, 8-103, 8-104, 8-105, 8-106
A-5003-6135	M5 stylus tool	\$21	8-46, 8-105, 8-107
A-5003-6151	M3 stylus kit	\$435	8-96
A-5003-6152	M2 stylus kit	\$455	8-96
A-5003-6153	M3 stylus kit	\$515	8-97
A-5003-6168	M5 stylus kit SP80	\$900	8-102
A-5003-6257	M3 silicon nitride stylus	\$69	8-21
A-5003-6510	M4 ruby stylus	\$145	2-6, 2-11, 8-30
A-5003-6511	M4 ruby stylus	\$274	2-6, 2-11, 8-30
A-5003-6512	M4 ruby stylus	\$289	2-6, 2-11, 8-30
A-5003-6691	M2 silicon nitride stylus	\$73	8-13
A-5003-6695	M3 silicon nitride stylus	\$78	8-21

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A-5003-6767	M3 zirconia stylus	\$104	8-22
A-5003-6768	M3 zirconia stylus	\$104	8-22
A-5003-6771	M3 zirconia stylus	\$178	8-23
A-5003-6778	M3 zirconia stylus	\$188	8-23
A-5003-7054	M3 ruby stylus	\$301	8-24, 8-98
A-5003-7055	M3 ruby stylus	\$301	8-24, 8-98
A-5003-7056	M3 ruby stylus	\$275	8-24, 8-98
A-5003-7057	M3 ruby stylus	\$275	8-24, 8-98
A-5003-7098	M3 disk stylus	\$300	8-26
A-5003-7261	M2 zirconia stylus	\$69	8-13
A-5003-7269	M2 silicon nitride stylus	\$143	8-15
A-5003-7306	M4 ruby stylus	\$128	2-6, 2-11, 8-30
A-5003-7445	M3 ruby stylus	\$275	8-24
A-5003-7446	M3 ruby stylus	\$301	8-24
A-5003-7447	M3 ruby stylus	\$301	8-24
A-5003-7573	M2 silicon nitride stylus	\$86	8-14
A-5003-7665	M3 zirconia stylus	\$115	8-22
A-5003-7672	M2 zirconia stylus	\$165	8-13
A-5003-7673	Stylus for Faro arms	\$325	8-53
A-5003-7674	Stylus for Faro arms	\$325	8-53
A-5003-7675	Stylus for Faro arms	\$325	8-53
A-5003-7676	Stylus for Faro arms	\$225	8-53
A-5003-7677	Stylus for Faro arms	\$225	8-53
A-5003-7678	Stylus for Faro arms	\$225	8-53, 8-54
A-5003-7679	Stylus for Faro arms	\$225	8-53, 8-54
A-5003-7723	M2 zirconia stylus	\$69	8-13
A-5003-7757	M2 zirconia stylus	\$69	8-13
A-5003-8091	M3 silicon nitride stylus	\$86	8-21
A-5003-8124	M3 stylus kit	\$1,200	8-98
A-5003-9190	Faro probe kit	\$1,034	8-54
A-5003-9495	M3 zirconia stylus	\$355	8-24
A-5003-9500	M3 zirconia stylus	\$94	8-21
A-5003-9524	M2 silicon nitride stylus	\$69	8-13
A-5004-0002	M3 stylus extension for Zeiss	\$99	8-78
A-5004-0165	M2 zirconia stylus	\$69	8-13
A-5004-0210	M2 silicon nitride stylus	\$53	8-13
A-5004-0236	M2 silicon nitride stylus	\$69	8-13
A-5004-0237	M2 silicon nitride stylus	\$78	8-13
A-5004-0264	M2 zirconia stylus	\$86	8-14
A-5004-0435	M2 zirconia stylus	\$86	8-14
A-5004-0437	M2 zirconia stylus	\$86	8-14
A-5004-0618	M2 zirconia stylus	\$121	8-15
A-5004-0654	M3 star stylus for Zeiss	\$235	8-78
A-5004-0656	M3 stylus for Zeiss	\$60	8-73
A-5004-0802	M3 stylus for Zeiss	\$97	8-75
A-5004-0803	M3 stylus for Zeiss	\$99	8-75
A-5004-0806	M3 stylus for Zeiss	\$106	8-75
A-5004-0808	M3 stylus for Zeiss	\$162	8-75

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A-5004-1017	M2 silicon nitride stylus	\$86	8-14
A-5004-1021	M2 silicon nitride stylus	\$86	8-14
A-5004-1057	M2 zirconia stylus	\$69	8-13
A-5004-1058	M2 zirconia stylus	\$86	8-14
A-5004-1059	M2 zirconia stylus	\$86	8-15
A-5004-1195	M3 silicon nitride stylus	\$86	8-22
A-5004-1198	M3 silicon nitride stylus	\$86	8-21
A-5004-1199	M3 silicon nitride stylus	\$86	8-22
A-5004-1201	M3 silicon nitride stylus	\$95	8-22
A-5004-1329	M2 zirconia stylus	\$121	8-16
A-5004-1330	M2 zirconia stylus	\$112	8-16
A-5004-1331	M2 zirconia stylus	\$103	8-16
A-5004-1387	M2 disk stylus	\$103	8-18
A-5004-1395	M2 disk stylus	\$121	8-18
A-5004-1396	M2 disk stylus	\$121	8-18
A-5004-1508	M2 silicon nitride stylus	\$86	8-14
A-5004-1519	M2 silicon nitride stylus	\$115	8-16
A-5004-1702	M3 stylus for Zeiss	\$73	8-73
A-5004-1711	M2 zirconia stylus	\$86	8-14
A-5004-1714	M2 zirconia stylus	\$104	8-14
A-5004-1718	M3 silicon nitride stylus	\$103	8-22
A-5004-1779	M3 stylus for Zeiss	\$69	8-73
A-5004-1856	Clamping screw for Zeiss	\$18	8-79
A-5004-1857	Clamping screw for Zeiss	\$18	8-79
A-5004-1858	M3 stylus for Zeiss	\$138	8-76
A-5004-1859	M3 stylus extension for Zeiss	\$140	8-78
A-5004-1861	M3 stylus for Zeiss	\$62	8-73
A-5004-1862	M3 stylus for Zeiss	\$60	8-73
A-5004-1863	M3 stylus for Zeiss	\$60	8-73
A-5004-1865	Crash protection device (pack of 10)	\$165	8-32
A-5004-1867	Crash protection device (pack of 10)	\$165	8-32
A-5004-1869	Crash protection device (pack of 10)	\$165	8-32
A-5004-1883	M3 stylus for Zeiss	\$69	8-73
A-5004-1884	M3 stylus for Zeiss	\$99	8-75
A-5004-1918	M2 silicon nitride stylus	\$69	8-13
A-5004-1920	M2 silicon nitride stylus	\$69	8-13
A-5004-1921	M2 silicon nitride stylus	\$78	8-13
A-5004-1922	M2 silicon nitride stylus	\$112	8-13
A-5004-1923	M2 silicon nitride stylus	\$69	8-13
A-5004-1925	M2 silicon nitride stylus	\$86	8-14
A-5004-1928	M2 silicon nitride stylus	\$86	8-14
A-5004-1929	M2 silicon nitride stylus	\$86	8-14
A-5004-1930	M2 silicon nitride stylus	\$95	8-14
A-5004-1931	M2 silicon nitride stylus	\$86	8-14
A-5004-1932	M2 silicon nitride stylus	\$86	8-14
A-5004-1933	M2 silicon nitride stylus	\$86	8-14
A-5004-1944	M2 silicon nitride stylus	\$86	8-14
A-5004-1945	M2 silicon nitride stylus	\$95	8-14
A-5004-1946	M2 silicon nitride stylus	\$103	8-15

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A-5004-1952	M2 silicon nitride stylus	\$103	8-15
A-5004-1953	M2 silicon nitride stylus	\$112	8-15
A-5004-1954	M2 silicon nitride stylus	\$121	8-15
A-5004-1955	M2 silicon nitride stylus	\$103	8-15
A-5004-1956	M2 silicon nitride stylus	\$112	8-15
A-5004-1957	M2 silicon nitride stylus	\$121	8-15
A-5004-1959	M2 silicon nitride stylus	\$86	8-15
A-5004-1960	M2 silicon nitride stylus	\$86	8-15
A-5004-1961	M2 silicon nitride stylus	\$86	8-15
A-5004-1962	M2 silicon nitride stylus	\$95	8-15
A-5004-1963	M2 silicon nitride stylus	\$86	8-15
A-5004-1964	M2 silicon nitride stylus	\$86	8-15
A-5004-1965	M2 silicon nitride stylus	\$95	8-15
A-5004-1967	M2 silicon nitride stylus	\$103	8-16
A-5004-1968	M2 silicon nitride stylus	\$112	8-16
A-5004-1969	M2 silicon nitride stylus	\$201	8-16
A-5004-1970	M2 silicon nitride stylus	\$103	8-16
A-5004-1971	M2 silicon nitride stylus	\$112	8-16
A-5004-1972	M2 silicon nitride stylus	\$121	8-16
A-5004-1973	M2 silicon nitride stylus	\$121	8-17
A-5004-1974	M2 silicon nitride stylus	\$121	8-17
A-5004-1975	M2 silicon nitride stylus	\$121	8-17
A-5004-1976	M2 silicon nitride stylus	\$121	8-17
A-5004-1977	M2 silicon nitride stylus	\$121	8-17
A-5004-1978	M2 silicon nitride stylus	\$138	8-17
A-5004-1979	M3 silicon nitride stylus	\$69	8-21
A-5004-1980	M3 silicon nitride stylus	\$69	8-21
A-5004-1981	M3 silicon nitride stylus	\$78	8-21
A-5004-1982	M3 silicon nitride stylus	\$86	8-21
A-5004-1983	M3 silicon nitride stylus	\$86	8-21
A-5004-1984	M3 silicon nitride stylus	\$86	8-21
A-5004-1985	M3 silicon nitride stylus	\$86	8-22
A-5004-1986	M3 silicon nitride stylus	\$86	8-22
A-5004-1987	M3 silicon nitride stylus	\$86	8-22
A-5004-1988	M3 silicon nitride stylus	\$86	8-22
A-5004-1989	M3 silicon nitride stylus	\$103	8-22
A-5004-1990	M3 silicon nitride stylus	\$112	8-22
A-5004-1991	M3 silicon nitride stylus	\$147	8-23
A-5004-1992	M3 silicon nitride stylus	\$293	8-24
A-5004-1993	M3 silicon nitride stylus	\$293	8-24
A-5004-1994	M3 silicon nitride stylus	\$293	8-24
A-5004-1995	M3 silicon nitride stylus	\$293	8-24
A-5004-1996	M3 silicon nitride stylus	\$310	8-24
A-5004-1997	M3 silicon nitride stylus	\$310	8-24
A-5004-1998	M3 silicon nitride stylus	\$310	8-24
A-5004-2001	M3 stylus extension for Zeiss	\$124	8-78
A-5004-2016	M2 silicon nitride stylus	\$189	8-13
A-5004-2018	M2 silicon nitride stylus	\$69	8-13
A-5004-2019	M2 silicon nitride stylus	\$169	8-14

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A-5004-2021	M2 silicon nitride stylus	\$86	8-14
A-5004-2022	M2 silicon nitride stylus	\$86	8-14
A-5004-2023	M3 silicon nitride stylus	\$323	8-21
A-5004-2108	M3 stylus for Zeiss	\$106	8-75
A-5004-2182	PH20 calibration stylus	\$43	1-14
A-5004-2185	M3 stylus for Zeiss	\$73	8-73
A-5004-2186	M3 stylus for Zeiss	\$73	8-73
A-5004-2203	M2 zirconia stylus	\$78	8-13
A-5004-2632	M2 zirconia stylus	\$210	8-13
A-5004-2786	M3 stylus for Zeiss	\$99	8-75
A-5004-2913	M2 zirconia stylus	\$69	8-13
A-5004-2914	M2 zirconia stylus	\$69	8-13
A-5004-2915	M2 zirconia stylus	\$112	8-13
A-5004-2916	M2 zirconia stylus	\$69	8-13
A-5004-2917	M2 zirconia stylus	\$69	8-13
A-5004-2918	M2 zirconia stylus	\$69	8-13
A-5004-2919	M2 zirconia stylus	\$191	8-13
A-5004-2920	M2 zirconia stylus	\$217	8-14
A-5004-2921	M2 zirconia stylus	\$86	8-14
A-5004-2922	M2 zirconia stylus	\$86	8-14
A-5004-2923	M2 zirconia stylus	\$86	8-14
A-5004-2924	M2 zirconia stylus	\$86	8-14
A-5004-2925	M2 zirconia stylus	\$86	8-14
A-5004-2926	M2 zirconia stylus	\$95	8-14
A-5004-2927	M2 zirconia stylus	\$104	8-14
A-5004-2928	M2 zirconia stylus	\$86	8-14
A-5004-2929	M2 zirconia stylus	\$86	8-14
A-5004-2930	M2 zirconia stylus	\$95	8-14
A-5004-2931	M2 zirconia stylus	\$103	8-15
A-5004-2932	M2 zirconia stylus	\$103	8-15
A-5004-2933	M2 zirconia stylus	\$112	8-15
A-5004-2934	M2 zirconia stylus	\$121	8-15
A-5004-2935	M2 zirconia stylus	\$164	8-15
A-5004-2936	M2 zirconia stylus	\$112	8-15
A-5004-2937	M2 zirconia stylus	\$86	8-15
A-5004-2938	M2 zirconia stylus	\$86	8-15
A-5004-2939	M2 zirconia stylus	\$86	8-15
A-5004-2940	M2 zirconia stylus	\$95	8-15
A-5004-2942	M2 zirconia stylus	\$86	8-15
A-5004-2943	M2 zirconia stylus	\$86	8-15
A-5004-2944	M2 zirconia stylus	\$95	8-15
A-5004-2945	M2 zirconia stylus	\$103	8-16
A-5004-2946	M2 zirconia stylus	\$103	8-16
A-5004-2947	M2 zirconia stylus	\$112	8-16
A-5004-2948	M2 zirconia stylus	\$121	8-16
A-5004-2949	M2 zirconia stylus	\$121	8-17
A-5004-2950	M2 zirconia stylus	\$121	8-17
A-5004-2951	M2 zirconia stylus	\$121	8-17
A-5004-2952	M2 zirconia stylus	\$121	8-17

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A-5004-2953	M2 zirconia stylus	\$121	8-17
A-5004-2954	M2 zirconia stylus	\$138	8-17
A-5004-2955	M3 zirconia stylus	\$84	8-21
A-5004-2956	M3 zirconia stylus	\$84	8-21
A-5004-2957	M3 zirconia stylus	\$84	8-21
A-5004-2958	M3 zirconia stylus	\$94	8-21
A-5004-2959	M3 zirconia stylus	\$230	8-21
A-5004-2960	M3 zirconia stylus	\$104	8-21
A-5004-2961	M3 zirconia stylus	\$104	8-21
A-5004-2962	M3 zirconia stylus	\$104	8-21
A-5004-2963	M3 zirconia stylus	\$104	8-21
A-5004-2964	M3 zirconia stylus	\$104	8-22
A-5004-2965	M3 zirconia stylus	\$104	8-22
A-5004-2966	M3 zirconia stylus	\$115	8-22
A-5004-2968	M3 zirconia stylus	\$104	8-22
A-5004-2969	M3 zirconia stylus	\$125	8-22
A-5004-2970	M3 zirconia stylus	\$136	8-22
A-5004-2972	M3 zirconia stylus	\$355	8-24
A-5004-2973	M3 zirconia stylus	\$355	8-24
A-5004-2974	M3 zirconia stylus	\$355	8-24
A-5004-2975	M3 zirconia stylus	\$376	8-24
A-5004-2976	M3 zirconia stylus	\$376	8-24
A-5004-2977	M3 zirconia stylus	\$376	8-24
A-5004-3176	M3 stylus for Zeiss	\$167	8-73
A-5004-3179	M3 stylus for Zeiss	\$60	8-73
A-5004-3187	M3 stylus for Zeiss	\$59	8-73
A-5004-3188	M3 stylus for Zeiss	\$59	8-73
A-5004-3272	M3 stylus for Zeiss	\$57	8-73
A-5004-3273	M3 stylus for Zeiss	\$57	8-73
A-5004-3274	M3 stylus for Zeiss	\$57	8-73
A-5004-3282	M3 stylus for Zeiss	\$110	8-76
A-5004-3284	M3 star stylus for Zeiss	\$319	8-77
A-5004-3285	Stylus knuckle for Zeiss	\$168	8-80
A-5004-3427	M3 stylus for Zeiss	\$64	8-73
A-5004-3428	M3 stylus for Zeiss	\$64	8-73
A-5004-3429	M3 stylus for Zeiss	\$126	8-75
A-5004-3430	M3 stylus extension for Zeiss	\$81	8-78
A-5004-3437	Stylus cube for Zeiss	\$71	8-79
A-5004-3519	M3 stylus for Zeiss	\$54	8-73
A-5004-5466	M3 silicon nitride stylus	\$155	8-23
A-5004-6723	HPRA/HPPA/HPMA break stem	\$25	8-32
A-5004-7582	M2-M3 stylus tool	\$9	8-89, 8-90, 8-91, 8-92, 8-93, 8-94, 8-95, 8-96, 8-97, 8-98, 8-99, 8-100, 8-101
A-5004-7583	M3 stylus extension	\$15	8-25, 8-81, 8-99, 8-100
A-5004-7584	M3 stylus extension	\$12	8-25, 8-99, 8-100
A-5004-7585	M2 stylus extension	\$13	8-19, 8-84
A-5004-7586	M2 stylus extension	\$15	8-19
A-5004-7587	M4 stylus tool	\$12	8-89, 8-101

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A-5004-7588	M2 pointer stylus	\$25	8-20
A-5004-7589	M2 cylinder stylus	\$26	8-18
A-5004-7590	M2 cylinder stylus	\$26	8-18
A-5004-7591	M2 stylus extension	\$17	8-19, 8-84
A-5004-7592	M3/M2 stylus adaptor	\$14	8-88, 8-94, 8-95, 8-101
A-5004-7593	M2/M3 stylus adaptor	\$12	8-88, 8-90, 8-100
A-5004-7595	M4/M2 stylus adaptor	\$32	8-88
A-5004-7596	M4/M3 stylus adaptor	\$20	8-88, 8-101
A-5004-7597	M4/M3 stylus adaptor	\$32	8-88, 8-101
A-5004-7598	Crash protection device	\$8	8-32
A-5004-7599	M4 stylus extension	\$36	8-35
A-5004-7600	M4 stylus extension	\$36	8-35
A-5004-7601	M4 stylus extension	\$36	8-35
A-5004-7602	M4 stylus extension	\$36	8-35
A-5004-7603	Crash protection device	\$5	8-32
A-5004-7604	Crash protection device	\$5	8-32
A-5004-7605	M4 stylus crank	\$57	8-31
A-5004-7606	M4 stylus crank	\$57	8-31
A-5004-7607	M4 swivel adaptor	\$50	8-31
A-5004-7608	M4 swivel adaptor	\$50	8-31
A-5004-7609	M3 stylus extension	\$13	8-25, 8-81
A-5004-7610	M2 stylus extension	\$12	8-19, 8-84
A-5004-7611	M2 stylus extension	\$19	8-19, 8-84
A-5004-7612	TF6/M3 stylus adaptor	\$35	8-88
A-5004-7613	M5/M4 stylus adaptor	\$32	8-88
A-5004-7614	M5 stylus tool	\$15	8-89, 8-102, 8-103, 8-104, 8-105
A-5004-7615	Crash protection device	\$60	8-37
A-5004-7616	TS20 break protect link	\$25	8-32
A-5004-7617	Stylus holder	\$95	8-33
A-5004-7618	TS20 break protect link	\$25	8-32
A-5004-7619	TS20 break protect link	\$25	8-32
A-5004-7620	HPRA/HPPA/HPMA M4 break stem	\$25	8-32
A-5004-7621	Crash protection device	\$25	8-32
A-5004-7622	TSA M4 break stem	\$25	8-32
A-5004-7624	HPRA/HPPA/HPMA break stem	\$25	8-32
A-5036-0005	ACR3 4 port rack	\$10,044	1-55
A-5036-0005-RBE	ACR3 4 port rack RBE	\$2,925	9-4
A-5036-0049	ACR1 short port replacement kit	\$285	1-54, 9-10
A-5069-0001	OMP400 probe kit (legacy)	\$4,781	2-5
A-5069-0001-RBE	OMP400 probe RBE	\$1,720	9-5
A-5069-2001	OMP400 probe kit (modulated)	\$4,781	2-5
A-5069-2001-RBE	OMP400 probe RBE	\$1,720	9-5
A-5103-3600-XC	XM-60 multi-axis calibration system	\$139,702	5-2
A-5103-3600	XM-60 multi-axis calibration system	\$129,625	5-2
A-5103-4330	Receiver beam shroud	\$62	5-3
A-5103-4340	Cable clip	\$315	5-3
A-5103-4360	System case	\$1,393	5-3
A-5103-4370	XM power supply kit	\$203	5-3
A-5103-4480	XM battery tray	\$688	5-3

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A-5103-4620	Fixture kit	\$3,370	5-3, 5-23
A-5103-4664	Vertical mount pin kit	\$95	5-3
A-5103-4700-XC	XM-600 multi-axis calibration system	\$267,717	5-2
A-5103-4700	XM-600 multi-axis calibration system	\$257,641	5-2
A-5121-0003	MCU5 joystick kit	\$2,171	1-11
A-5121-0077	MCU-W wireless joystick	\$3,749	1-11
A-5180-0001	OMP600 probe kit (legacy)	\$4,781	2-10
A-5180-2001	OMP600 probe kit (modulated)	\$4,781	2-10
A-5180-2001-RBE	OMP600 RBE	\$1,650	9-5
A-5191-0049	OMI-2 optical receiver/interface	\$1,657	2-4, 2-6, 2-8, 2-11, 2-19, 2-26, 2-27, 2-41
A-5191-0050	OMI-2 optical receiver/interface	\$1,743	2-4, 2-6, 2-8, 2-11, 2-19, 2-26, 2-41
A-5191-0050-RBE	OMI-2 RBE	\$845	9-8
A-5226-0007	Pro-E CAD importer	\$1,571	2-48
A-5226-0008	CATIA CAD importer	\$1,571	2-48
A-5226-0009	UG/NX CAD importer	\$1,571	2-48
A-5226-0010	ACIS CAD importer	\$1,048	2-48
A-5226-0011	SolidWorks® CAD importer	\$1,571	2-48
A-5226-0012	Inventor™ CAD importer	\$1,571	2-48
A-5226-0020	Productivity+™ CAD importers	\$2,095	2-48
A-5299-2933	Primo LTS solenoid kit	\$469	2-23
A-5299-5010-RBE	NC4F115 compact RBE	\$2,100	9-6
A-5299-5110-RBE	NC4F230 compact RBE	\$2,100	9-6
A-5299-5210-RBE	NC4F95 compact RBE	\$2,100	9-6
A-5299-5310-RBE	NC4F145 compact RBE	\$2,100	9-6
A-5299-5710-RBE	NC4F300 compact RBE	\$2,100	9-6
A-5312-0001-RBE	RMP600 RBE	\$1,930	9-5
A-5312-0001	RMP600 probe kit	\$7,333	2-15
A-5331-0015	MCUlite-2 joystick	\$724	1-11
A-5358-5016	Equator™ joystick cable	\$210	3-6
A-5378-0080	RVP probe	\$27,090	1-19
A-5378-0081	VPCP vision probe change port	\$1,838	1-19
A-5378-0082	VM10 vision module	\$5,805	1-19
A-5378-0083	VMCP vision module change port	\$1,838	1-19
A-5378-0085	VA10 calibration artefact	\$1,258	1-19
A-5378-0087	VM11 vision module	\$7,256	1-19
A-5378-9504	RVP combo kit	\$46,924	1-20
A-5378-9505	RVP VM10 kit	\$37,829	1-20
A-5378-9506	RVP VM11 kit	\$39,281	1-20
A-5381-0036	MCU-W 1 battery	\$202	1-11
A-5381-0095	MCU-W battery (2 pack)	\$385	1-11
A-5400-8###	RTP20 non-rack kit	\$6,300	1-6
A-5400-####	RTP20 rack kit	\$7,200	1-6
A-5401-0301	OTS/RTS battery cap	\$180	9-10
A-5401-2001	OTS ½ AA probe kit	\$2,379	2-19
A-5401-2001-RBE	OTS RBE	\$1,000	9-6
A-5401-8512	OTS/RTS front cover kit	\$135	9-10
A-5439-0049	OMI-2T optical receiver/interface (8 m cable)	\$1,657	2-4, 2-6, 2-8, 2-11, 2-19, 2-26, 2-27, 2-41

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A-5439-0050	OMI-2T optical receiver/interface (15 m cable)	\$1,743	2-4, 2-6, 2-8, 2-11, 2-19, 2-26, 2-41
A-5439-0050-RBE	OMI-2T RBE	\$845	9-8
A-5450-0400-RBE(TRS2)	TRS2 RBE	\$675	9-6
A-5450-0400	TRS2 probe only	\$2,103	2-24
A-5450-0480	NC4F air blast nozzle and bracket	\$319	2-18
A-5450-0490	Solenoid kit	\$890	2-18
A-5475-0001	Primo LTS kit	\$983	2-23
A-5475-0002	Primo LTS with adaptor block	\$1,063	2-23
A-5475-0060	Primo LTS tool kit	\$24	2-23
A-5475-0401	Primo LTS installation kit	\$94	2-23
A-5475-0402	Primo LTS Ø26 mm contact pad kit	\$205	2-23
A-5475-0403	Primo LTS air pipe	\$63	2-23
A-5475-0404	Primo LTS adaptor block (T-slot mounting)	\$82	2-23
A-5475-0405	Primo LTS riser block 50 mm	\$183	2-23
A-5475-0406	Primo LTS riser block 100 mm	\$290	2-23
A-5475-0407	Primo LTS conduit bulkhead kit	\$159	2-23
A-5475-0408	Primo LTS conduit extension kit 2 m	\$159	2-23
A-5475-0409	Primo LTS conduit extension kit 5 m	\$256	2-23
A-5480-0001-RBE	RMP40 RBE	\$1,545	9-5
A-5480-0001	RMP40 probe kit	\$5,363	2-12
A-5492-0051	OMM-2 optical receiver	\$1,033	2-4, 2-5, 2-8, 2-11, 2-19, 2-26, 2-27, 2-41
A-5492-0051-RBE	OMM-2 RBE	\$675	9-8
A-5492-2000	OSI interface	\$975	2-4, 2-6, 2-8, 2-11, 2-19, 2-26, 2-27, 2-40
A-5500-1000	HSI interface	\$207	2-2, 2-21, 2-22, 2-32, 2-40
A-5500-1600	MP250 probe kit	\$4,630	2-33
A-5500-1600-RBE	MP250 RBE	\$1,080	9-7
A-5500-1710	FS10 adjustable female socket for MP250	\$237	2-33
A-5500-1810	FS20 fixed female socket for MP250	\$237	2-33
A-5504-0040-RBE	Equator™ 300 RBE	\$9,975	9-8
A-5504-0050-RBE	Equator™ 300 extended height RBE	\$10,500	9-8
A-5504-0203	Equator™ fixturing plate spacer (50 mm)	\$695	3-7
A-5504-0205	Equator™ SP25-2 scanning kit	\$4,335	3-8
A-5504-0207	Equator™ fixturing plate spacer (150 mm)	\$695	3-7
A-5504-0209	Equator™ training block	\$675	3-9
A-5504-0210	Equator enclosure kit	\$4,340	3-7
A-5504-0211	Equator enclosure top unit	\$2,287	3-7
A-5504-0212	Equator enclosure base unit	\$1,906	3-7
A-5504-0250	Equator™ autochange rack	\$2,435	3-6
A-5504-0252	Equator™ full 5-sphere calibration artefact	\$440	3-7
A-5504-0255	Equator™ stop button	\$395	3-6
A-5504-0258	Equator™ joystick kit	\$730	3-6
A-5504-0274	Extended calibration artefact stem	\$105	3-7
A-5504-0281	Equator™ basic stylus kit	\$780	3-8
A-5504-0282	Equator™ intermediate stylus kit	\$1,455	3-8
A-5504-0283	Equator™ advanced stylus kit	\$2,851	3-8
A-5504-0955	Cleaning kit	\$88	3-7
A-5514-2001	OTS AA probe kit	\$2,379	2-19

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A-5514-2001-RBE	OTS (AA) RBE	\$1,080	9-6
A-5518-1095	REVO-2 head kit	\$46,993	1-16
A-5555-0001	M5 cone stylus for Zeiss	\$94	8-55
A-5555-0002	M5 cone stylus for Zeiss	\$96	8-55
A-5555-0003	M5 cone stylus for Zeiss	\$90	8-55
A-5555-0004	M5 cone stylus for Zeiss	\$143	8-55
A-5555-0005	M5 cone stylus for Zeiss	\$106	8-55
A-5555-0006	M5 cone stylus for Zeiss	\$101	8-55
A-5555-0007	M5 cone stylus for Zeiss	\$106	8-55
A-5555-0008	M5 cone stylus for Zeiss	\$140	8-55
A-5555-0009	M5 cone stylus for Zeiss	\$150	8-55
A-5555-0010	M5 cone stylus for Zeiss	\$150	8-55
A-5555-0011	M5 cone stylus for Zeiss	\$159	8-55
A-5555-0013	Cone adaptor for Zeiss	\$34	8-55
A-5555-0014	Cone adaptor for Zeiss	\$25	8-55
A-5555-0015	Conical holder for Zeiss	\$64	8-55
A-5555-0016	Conical holder for Zeiss	\$60	8-55
A-5555-0017	Conical holder for Zeiss	\$57	8-55
A-5555-0018	M5 stylus for Zeiss	\$45	8-56
A-5555-0019	M5 stylus for Zeiss	\$45	8-56
A-5555-0020	M5 stylus for Zeiss	\$45	8-56
A-5555-0021	M5 stylus for Zeiss	\$45	8-56
A-5555-0022	M5 stylus for Zeiss	\$57	8-56
A-5555-0023	M5 stylus for Zeiss	\$60	8-56
A-5555-0024	M5 stylus for Zeiss	\$53	8-56
A-5555-0025	M5 stylus for Zeiss	\$50	8-56
A-5555-0026	M5 stylus for Zeiss	\$57	8-56
A-5555-0027	M5 stylus for Zeiss	\$57	8-56
A-5555-0028	M5 stylus for Zeiss	\$60	8-56
A-5555-0029	M5 stylus for Zeiss	\$64	8-56
A-5555-0030	M5 stylus for Zeiss	\$69	8-56
A-5555-0031	M5 stylus for Zeiss	\$66	8-56
A-5555-0032	M5 stylus for Zeiss	\$66	8-56
A-5555-0033	M5 stylus for Zeiss	\$66	8-56
A-5555-0034	M5 stylus for Zeiss	\$66	8-56
A-5555-0035	M5 stylus for Zeiss	\$83	8-56
A-5555-0036	M5 stylus for Zeiss	\$67	8-56
A-5555-0037	M5 stylus for Zeiss	\$81	8-56
A-5555-0038	M5 stylus for Zeiss	\$73	8-56
A-5555-0039	M5 stylus for Zeiss	\$94	8-56
A-5555-0040	M5 stylus for Zeiss	\$73	8-56
A-5555-0041	M5 stylus for Zeiss	\$52	8-60
A-5555-0042	M5 stylus for Zeiss	\$57	8-60
A-5555-0043	M5 stylus for Zeiss	\$64	8-60
A-5555-0044	M5 stylus for Zeiss	\$69	8-60
A-5555-0045	M5 stylus for Zeiss	\$71	8-60
A-5555-0046	M5 stylus for Zeiss	\$80	8-60
A-5555-0047	M5 stylus for Zeiss	\$80	8-60
A-5555-0048	M5 stylus for Zeiss	\$87	8-60

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A-5555-0049	M5 stylus for Zeiss	\$71	8-60
A-5555-0050	M5 stylus for Zeiss	\$80	8-60
A-5555-0051	M5 stylus for Zeiss	\$81	8-60
A-5555-0052	M5 stylus for Zeiss	\$78	8-60
A-5555-0053	M5 stylus for Zeiss	\$67	8-60
A-5555-0054	M5 stylus for Zeiss	\$66	8-60
A-5555-0055	M5 stylus for Zeiss	\$69	8-60
A-5555-0056	M5 stylus for Zeiss	\$66	8-60
A-5555-0057	M5 stylus for Zeiss	\$69	8-60
A-5555-0058	M5 stylus for Zeiss	\$66	8-60
A-5555-0059	M5 stylus for Zeiss	\$69	8-60
A-5555-0060	M5 stylus for Zeiss	\$67	8-60
A-5555-0061	M5 stylus for Zeiss	\$66	8-60
A-5555-0062	M5 stylus for Zeiss	\$69	8-60
A-5555-0063	M5 stylus for Zeiss	\$73	8-60
A-5555-0064	M5 stylus for Zeiss	\$140	8-60
A-5555-0065	M5 stylus for Zeiss	\$131	8-60
A-5555-0066	M5 stylus for Zeiss	\$127	8-60
A-5555-0067	M5 stylus for Zeiss	\$131	8-60
A-5555-0068	M5 stylus for Zeiss	\$131	8-60
A-5555-0069	M5 star stylus for Zeiss	\$191	8-61
A-5555-0070	M5 star stylus for Zeiss	\$191	8-61
A-5555-0071	M5 star stylus for Zeiss	\$191	8-61
A-5555-0072	M5 star stylus for Zeiss	\$207	8-61
A-5555-0073	M5 star stylus for Zeiss	\$222	8-61
A-5555-0074	M5 stylus for Zeiss	\$103	8-61
A-5555-0075	M5 stylus for Zeiss	\$124	8-61
A-5555-0076	M5 stylus for Zeiss	\$134	8-61
A-5555-0077	M5 stylus for Zeiss	\$199	8-61
A-5555-0078	M5 stylus for Zeiss	\$46	8-61
A-5555-0079	M5 stylus for Zeiss	\$46	8-61
A-5555-0080	M5 stylus for Zeiss	\$41	8-61
A-5555-0081	M5 stylus for Zeiss	\$43	8-61
A-5555-0082	M5 stylus for Zeiss	\$55	8-61
A-5555-0083	M5 stylus for Zeiss	\$64	8-61
A-5555-0084	M5 stylus for Zeiss	\$80	8-61
A-5555-0085	M5 stylus for Zeiss	\$64	8-61
A-5555-0086	M5 stylus for Zeiss	\$64	8-61
A-5555-0087	M5 stylus for Zeiss	\$62	8-61
A-5555-0088	M5 stylus for Zeiss	\$55	8-61
A-5555-0089	Flat washer for Zeiss styli	\$15	8-62
A-5555-0090	Flat washer for Zeiss styli	\$16	8-62
A-5555-0091	Grooved washer for Zeiss styli	\$46	8-62
A-5555-0092	Grooved washer for Zeiss styli	\$48	8-62
A-5555-0093	Pin for Zeiss styli	\$6	8-63
A-5555-0094	Pin for Zeiss styli	\$6	8-63
A-5555-0095	Pin for Zeiss styli	\$8	8-63
A-5555-0096	Pin for Zeiss styli	\$8	8-63
A-5555-0099	Rotary adaptor for Zeiss	\$170	8-63

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A-5555-0104	Holder for Zeiss styli	\$64	8-63
A-5555-0105	Holder for Zeiss styli	\$64	8-64
A-5555-0106	Holder for Zeiss styli	\$64	8-64
A-5555-0107	M5 stylus for Zeiss	\$48	8-64
A-5555-0108	M5 stylus for Zeiss	\$64	8-64
A-5555-0109	M5 stylus for Zeiss	\$165	8-64
A-5555-0110	M5 stylus for Zeiss	\$48	8-64
A-5555-0111	M5 stylus for Zeiss	\$46	8-64
A-5555-0112	M5 stylus for Zeiss	\$48	8-64
A-5555-0113	M5 stylus for Zeiss	\$39	8-64
A-5555-0114	M5 stylus for Zeiss	\$45	8-64
A-5555-0115	M5 stylus for Zeiss	\$46	8-64
A-5555-0116	M5 stylus for Zeiss	\$45	8-64
A-5555-0117	M5 stylus for Zeiss	\$50	8-64
A-5555-0118	Holder for Zeiss swivel styli	\$80	8-64
A-5555-0119	Swivel stylus for Zeiss	\$69	8-64
A-5555-0120	Swivel stylus for Zeiss	\$66	8-64
A-5555-0121	Disk stylus for Zeiss	\$166	8-65
A-5555-0122	Disk stylus for Zeiss	\$168	8-65
A-5555-0123	Disk stylus for Zeiss	\$247	8-65
A-5555-0124	Disk stylus for Zeiss	\$212	8-65
A-5555-0125	M5 stylus extension	\$92	8-51, 8-66, 8-105
A-5555-0126	M5 stylus extension for Zeiss	\$81	8-66
A-5555-0127	M5 stylus extension	\$73	8-51, 8-66, 8-105
A-5555-0128	M5 stylus extension for Zeiss	\$71	8-66
A-5555-0129	M5 stylus extension for Zeiss	\$71	8-66
A-5555-0130	M5 stylus extension for Zeiss	\$67	8-66
A-5555-0131	M5 stylus extension for Zeiss	\$48	8-66
A-5555-0132	M5 stylus extension for Zeiss	\$46	8-66
A-5555-0133	M5 stylus extension for Zeiss	\$45	8-66
A-5555-0134	M5 stylus extension for Zeiss	\$41	8-66
A-5555-0135	M5 stylus extension for Zeiss	\$39	8-66
A-5555-0136	M5 stylus extension	\$29	8-50, 8-66, 8-102, 8-103
A-5555-0137	M5 stylus extension for Zeiss	\$29	8-66
A-5555-0138	M5 stylus extension for Zeiss	\$27	8-66
A-5555-0139	M5 stylus extension for Zeiss	\$25	8-66
A-5555-0140	M5 stylus extension	\$25	8-50, 8-66, 8-105
A-5555-0141	M5 stylus extension for Zeiss	\$25	8-66
A-5555-0142	M5 stylus extension	\$25	8-50, 8-66
A-5555-0143	M5 stylus extension for Zeiss	\$30	8-66
A-5555-0144	M5 stylus extension for Zeiss	\$34	8-66
A-5555-0145	M5 stylus extension for Zeiss	\$36	8-66
A-5555-0146	M5 stylus extension for Zeiss	\$37	8-66
A-5555-0147	M5 stylus extension for Zeiss	\$39	8-66
A-5555-0148	M5 stylus extension for Zeiss	\$39	8-66
A-5555-0149	M5 stylus extension for Zeiss	\$48	8-66
A-5555-0150	M5 stylus extension for Zeiss	\$62	8-66
A-5555-0151	M5 stylus extension for Zeiss	\$71	8-66
A-5555-0152	M5 stylus extension for Zeiss	\$64	8-66

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A-5555-0153	M5 stylus extension for Zeiss	\$74	8-66
A-5555-0154	M5 stylus extension for Zeiss	\$67	8-66
A-5555-0155	M5 stylus extension for Zeiss	\$78	8-66
A-5555-0156	M5 stylus extension for Zeiss	\$73	8-66
A-5555-0157	M5 stylus extension for Zeiss	\$80	8-66
A-5555-0158	M5 stylus extension for Zeiss	\$73	8-66
A-5555-0159	M5 stylus extension for Zeiss	\$85	8-66
A-5555-0160	M5 stylus extension for Zeiss	\$73	8-66
A-5555-0161	M5 stylus extension for Zeiss	\$89	8-66
A-5555-0162	M5 stylus extension for Zeiss	\$78	8-66
A-5555-0163	M5 stylus extension for Zeiss	\$97	8-66
A-5555-0164	M5 stylus extension for Zeiss	\$85	8-66
A-5555-0165	M5 stylus extension for Zeiss	\$106	8-66
A-5555-0166	M5 stylus extension for Zeiss	\$115	8-66
A-5555-0167	M5 stylus extension for Zeiss	\$127	8-66
A-5555-0168	M5 stylus extension for Zeiss	\$143	8-66
A-5555-0189	M5 stylus cube	\$50	8-69, 8-89, 8-102, 8-103, 8-104
A-5555-0190	M5 stylus cube	\$60	8-69, 8-89, 8-105
A-5555-0191	M5 stylus cube for Zeiss	\$69	8-69
A-5555-0192	M5 stylus cube for Zeiss	\$87	8-69
A-5555-0194	M5 double stylus cube	\$108	8-69, 8-89
A-5555-0196	Stylus disk for Zeiss	\$134	8-69
A-5555-0197	Stylus disk for Zeiss	\$134	8-69
A-5555-0198	Stylus disk for Zeiss	\$136	8-69
A-5555-0199	Stylus disk for Zeiss	\$145	8-69
A-5555-0200	Stylus disk for Zeiss	\$145	8-69
A-5555-0201	Stylus disk for Zeiss	\$148	8-69
A-5555-0203	Stylus disk for Zeiss	\$147	8-69
A-5555-0204	Stylus disk for Zeiss	\$138	8-69
A-5555-0205	Stylus disk for Zeiss	\$138	8-69
A-5555-0206	Stylus disk for Zeiss	\$140	8-69
A-5555-0207	Stylus disk for Zeiss	\$154	8-69
A-5555-0208	Stylus disk for Zeiss	\$159	8-69
A-5555-0209	Hole location gage for Zeiss	\$73	8-70
A-5555-0210	Hole location gage for Zeiss	\$73	8-70
A-5555-0211	Hole location gage for Zeiss	\$71	8-70
A-5555-0212	Hole location gage for Zeiss	\$74	8-70
A-5555-0213	Hole location gage for Zeiss	\$74	8-70
A-5555-0214	Hole location gage for Zeiss	\$76	8-70
A-5555-0215	Star stylus for Zeiss	\$437	8-70
A-5555-0216	Pointed stylus for Zeiss	\$69	8-70
A-5555-0217	Cube extension for Zeiss	\$265	8-70
A-5555-0218	Stylus knuckle for Zeiss	\$122	8-70
A-5555-0219	Stylus knuckle for Zeiss	\$140	8-70
A-5555-0221	Cube bolt for Zeiss	\$19	8-71
A-5555-0222	Cube bolt for Zeiss	\$17	8-71
A-5555-0223	Cube bolt for Zeiss	\$15	8-71
A-5555-0224	Cube bolt for Zeiss	\$9	8-71
A-5555-0225	Cube bolt for Zeiss	\$9	8-71

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A-5555-0226	M5/M2 stylus adaptor	\$20	8-71, 8-88
A-5555-0227	M5/M3 stylus adaptor	\$20	8-71, 8-88
A-5555-0228	Stylus adaptor for Zeiss	\$20	8-71
A-5555-0231	Stylus holder for Zeiss	\$268	8-71
A-5555-0232	Stylus holder for Zeiss	\$302	8-71
A-5555-0233	Stylus tool for Zeiss	\$10	8-85
A-5555-0234	Allen key	\$1	8-85
A-5555-0235	Allen key	\$1	8-85
A-5555-0236	Allen key	\$1	8-85
A-5555-0237	Tool kit for Zeiss	\$30	8-85
A-5555-0238	Stylus tool kit for Zeiss	\$23	8-85
A-5555-0239	Stylus tool for Zeiss	\$10	8-85
A-5555-0240	Stylus tool for Zeiss	\$12	8-86
A-5555-0241	Assortment of screws for Zeiss	\$28	8-86
A-5555-0242	Spring-lock washer kit for Zeiss	\$5	8-86
A-5555-0243	C spanner for Zeiss	\$14	8-86
A-5555-0244	C spanner for Zeiss	\$17	8-86
A-5555-0251	Adaptor plate for Zeiss	\$599	8-72
A-5555-0253	Adaptor plate for Zeiss	\$599	8-72
A-5555-0255	Adaptor plate for Zeiss	\$441	8-72
A-5555-0256	Adaptor plate for Zeiss	\$881	8-72
A-5555-0258	Adaptor plate for Zeiss	\$441	8-72
A-5555-0261	M3 stylus for Zeiss	\$32	8-81
A-5555-0263	M3 stylus for Zeiss	\$43	8-81
A-5555-0264	M3 stylus for Zeiss	\$43	8-81
A-5555-0265	M3 stylus for Zeiss	\$43	8-81
A-5555-0266	M3 stylus for Zeiss	\$45	8-81
A-5555-0267	M3 stylus for Zeiss	\$55	8-81
A-5555-0268	M3 stylus for Zeiss	\$55	8-81
A-5555-0269	M3 stylus for Zeiss	\$52	8-81
A-5555-0270	M3 stylus for Zeiss	\$48	8-81
A-5555-0271	M3 stylus for Zeiss	\$41	8-81
A-5555-0272	M3 stylus for Zeiss	\$53	8-81
A-5555-0273	M3 stylus for Zeiss	\$74	8-81
A-5555-0274	M3 stylus for Zeiss	\$36	8-81
A-5555-0275	M3 stylus for Zeiss	\$48	8-81
A-5555-0276	M3 stylus for Zeiss	\$41	8-81
A-5555-0277	M3 stylus for Zeiss	\$39	8-81
A-5555-0278	M2 stylus for Zeiss	\$48	8-82
A-5555-0279	M2 stylus for Zeiss	\$55	8-82
A-5555-0282	M2 stylus for Zeiss	\$25	8-82
A-5555-0283	M2 stylus for Zeiss	\$50	8-82
A-5555-0286	M3 stylus extension for Zeiss	\$18	8-81
A-5555-0287	M3 stylus extension for Zeiss	\$23	8-81
A-5555-0288	M3 stylus extension for Zeiss	\$23	8-81
A-5555-0294	M2 star stylus for Zeiss	\$126	8-83
A-5555-0295	M2 star stylus for Zeiss	\$133	8-83
A-5555-0296	M2 stylus for Zeiss	\$43	8-83
A-5555-0297	M2 disk stylus for Zeiss	\$117	8-83

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A-5555-0298	M2 disk stylus for Zeiss	\$87	8-83
A-5555-0299	M2 disk stylus for Zeiss	\$157	8-83
A-5555-0300	M2 disk stylus for Zeiss	\$187	8-83
A-5555-0308	M2 stylus for Zeiss	\$36	8-82
A-5555-0309	M2 stylus for Zeiss	\$36	8-82
A-5555-0310	M2 stylus for Zeiss	\$27	8-82
A-5555-0311	M2 stylus for Zeiss	\$27	8-82
A-5555-0312	M2 stylus for Zeiss	\$34	8-82
A-5555-0313	M2 stylus for Zeiss	\$36	8-82
A-5555-0314	M2 stylus for Zeiss	\$45	8-82
A-5555-0315	M2 stylus for Zeiss	\$46	8-82
A-5555-0316	M2 stylus for Zeiss	\$66	8-82
A-5555-0317	M2 pointed stylus for Zeiss	\$28	8-83
A-5555-0318	M2 pointed stylus for Zeiss	\$28	8-83
A-5555-0319	M2 5-way stylus holder for Zeiss	\$81	8-84
A-5555-0320	M2 5-way stylus holder for Zeiss	\$39	8-84
A-5555-0322	Adaptor plate for Zeiss	\$300	8-72
A-5555-0331	M5 stylus for Zeiss	\$80	8-62
A-5555-0410	M5 stylus for Zeiss	\$104	8-58
A-5555-0424	M5 stylus extension	\$201	8-47, 8-67, 8-106
A-5555-0425	M5 stylus extension	\$191	8-47, 8-67
A-5555-0427	M5 stylus extension	\$266	8-49, 8-67
A-5555-0620	M5 stylus extension	\$154	8-48, 8-67
A-5555-0621	M5 stylus extension	\$170	8-48, 8-67
A-5555-0623	M5 stylus extension	\$166	8-46, 8-67, 8-104
A-5555-0642	M5 stylus extension	\$280	8-47, 8-67
A-5555-0643	M5 stylus for Zeiss	\$185	8-58
A-5555-0644	M5 stylus for Zeiss	\$205	8-58
A-5555-0647	M5 stylus extension	\$157	8-46, 8-67
A-5555-0648	M5 stylus extension	\$159	8-46, 8-67, 8-104, 8-105, 8-106
A-5555-0649	M5 stylus extension	\$162	8-46, 8-67
A-5555-0650	M5 stylus extension	\$170	8-46, 8-67
A-5555-0651	M5 stylus extension	\$182	8-46, 8-67
A-5555-0652	M5 stylus extension	\$187	8-46, 8-67, 8-104, 8-105, 8-106
A-5555-0653	M5 stylus extension	\$208	8-47, 8-67
A-5555-0654	M5 stylus extension	\$221	8-47, 8-67, 8-104, 8-106
A-5555-0655	M5 stylus extension	\$238	8-47, 8-67
A-5555-0656	M5 stylus extension	\$333	8-47, 8-67
A-5555-0657	M5 stylus extension	\$159	8-48, 8-67
A-5555-0658	M5 stylus extension	\$162	8-48, 8-67
A-5555-0659	M5 stylus extension	\$192	8-48, 8-67, 8-107
A-5555-0660	M5 stylus extension	\$203	8-48
A-5555-0661	M5 stylus extension	\$214	8-48, 8-67, 8-107
A-5555-0662	M5 stylus extension	\$229	8-49
A-5555-0663	M5 stylus extension	\$238	8-49, 8-67, 8-107
A-5555-0664	M5 stylus extension	\$298	8-49, 8-67, 8-107
A-5555-0665	M5 stylus extension	\$349	8-49, 8-67
A-5555-0667	M5 stylus extension	\$420	8-49, 8-67
A-5555-0668	M5 stylus extension	\$280	8-49, 8-67

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A-5555-0669	M5 stylus extension	\$25	8-50, 8-104, 8-105
A-5555-0670	M5 stylus extension	\$27	8-50, 8-102, 8-103
A-5555-0671	M5 stylus extension	\$71	8-51, 8-105
A-5555-0686	M5 stylus for Zeiss	\$43	8-62
A-5555-0699	Adaptor plate extension for Zeiss	\$277	8-68
A-5555-0700	Adaptor plate extension for Zeiss	\$317	8-68
A-5555-0701	Adaptor plate extension for Zeiss	\$376	8-68
A-5555-0713	Rotary adaptor for Zeiss	\$170	8-63
A-5555-0720	M5 stylus for Zeiss	\$140	8-59
A-5555-0730	M5 stylus for Zeiss	\$73	8-58
A-5555-0731	M5 stylus for Zeiss	\$92	8-58
A-5555-0732	M5 stylus for Zeiss	\$85	8-58
A-5555-0733	M5 stylus for Zeiss	\$90	8-58
A-5555-0734	M5 stylus for Zeiss	\$104	8-58
A-5555-0735	M5 stylus for Zeiss	\$87	8-58
A-5555-0759	M5 stylus for Zeiss	\$111	8-59
A-5555-0799	M5 stylus for Zeiss	\$46	8-62
A-5555-1097	90° stylus holder for Zeiss	\$53	8-63
A-5555-1112	M5 stylus for Zeiss	\$173	8-58
A-5555-1114	M3 stylus for Zeiss	\$113	8-75
A-5555-1115	M3 stylus for Zeiss	\$129	8-75
A-5555-1135	Star stylus for Zeiss	\$631	8-65
A-5555-1153	Star stylus for Zeiss	\$701	8-65
A-5555-1157	M5 stylus for Zeiss	\$64	8-62
A-5555-1169	M5 stylus for Zeiss	\$184	8-59
A-5555-1171	M5 stylus for Zeiss	\$231	8-59
A-5555-1179	M5 stylus for Zeiss	\$199	8-59
A-5555-1235	Adaptor plate for Zeiss	\$390	8-72
A-5555-1236	Adaptor plate for Zeiss	\$312	8-72
A-5555-1237	Adaptor plate for Zeiss	\$369	8-72
A-5555-1238	Adaptor plate for Zeiss	\$369	8-72
A-5555-1239	Adaptor plate for Zeiss	\$369	8-72
A-5555-1240	Adaptor plate for Zeiss	\$369	8-72
A-5555-1241	Adaptor plate for Zeiss	\$340	8-72
A-5555-1242	Adaptor plate for Zeiss	\$340	8-72
A-5555-1245	Holder for Zeiss styli	\$64	8-64
A-5555-1251	M3 stylus for Zeiss	\$96	8-75
A-5555-1273	M3 star stylus for Zeiss	\$157	8-77
A-5555-1274	M3 star stylus for Zeiss	\$162	8-77
A-5555-1275	M3 star stylus for Zeiss	\$168	8-77
A-5555-1276	M3 stylus extension for Zeiss	\$182	8-78
A-5555-1828	M5 stylus for Zeiss	\$97	8-59
A-5555-1842	M5 stylus for Zeiss	\$64	8-62
A-5555-1843	M5 stylus for Zeiss	\$55	8-62
A-5555-1844	M5 stylus for Zeiss	\$62	8-62
A-5555-1847	M5 stylus for Zeiss	\$71	8-58
A-5555-1855	Adaptor plate extension for Zeiss	\$293	8-68
A-5555-1873	M5 stylus for Zeiss	\$62	8-62
A-5555-1916	M5 stylus for Zeiss	\$69	8-58

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A-5555-1917	M5 stylus for Zeiss	\$76	8-58
A-5555-1918	M5 stylus for Zeiss	\$120	8-58
A-5555-1937	Adaptor plate extension for Zeiss	\$376	8-68
A-5555-1938	Adaptor plate extension for Zeiss	\$349	8-68
A-5555-1947	M3 stylus extension for Zeiss	\$78	8-78
A-5555-1948	M3 stylus extension for Zeiss	\$120	8-78
A-5555-1979	Adaptor plate extension for Zeiss	\$265	8-68
A-5555-1980	Adaptor plate extension for Zeiss	\$284	8-68
A-5555-1981	Adaptor plate extension for Zeiss	\$302	8-68
A-5555-1982	Adaptor plate extension for Zeiss	\$319	8-68
A-5555-1983	Adaptor plate extension for Zeiss	\$337	8-68
A-5555-1984	Adaptor plate extension for Zeiss	\$418	8-68
A-5555-1985	Adaptor plate extension for Zeiss	\$284	8-68
A-5555-1986	Adaptor plate extension for Zeiss	\$291	8-68
A-5555-1987	Adaptor plate extension for Zeiss	\$300	8-68
A-5555-1988	Adaptor plate extension for Zeiss	\$335	8-68
A-5555-1989	Adaptor plate extension for Zeiss	\$349	8-68
A-5555-1990	Adaptor plate extension for Zeiss	\$418	8-68
A-5555-2010	M5 stylus for Zeiss	\$141	8-59
A-5555-2011	M5 stylus for Zeiss	\$115	8-58
A-5555-2012	M5 stylus for Zeiss	\$113	8-59
A-5555-2013	M5 stylus for Zeiss	\$85	8-58
A-5555-2033	M3 reference stylus for Zeiss	\$110	8-74
A-5555-3734	M5 stylus for Zeiss	\$53	8-57
A-5555-3740	Adaptor plate extension for Zeiss	\$361	8-68
A-5555-3777	M5 stylus for Zeiss	\$52	8-57
A-5555-3778	M5 stylus for Zeiss	\$52	8-57
A-5555-3779	M5 stylus for Zeiss	\$52	8-57
A-5555-3780	M5 stylus for Zeiss	\$52	8-57
A-5555-3781	M5 stylus for Zeiss	\$52	8-57
A-5555-3782	M5 stylus for Zeiss	\$52	8-57
A-5555-3783	M5 stylus for Zeiss	\$52	8-57
A-5555-3784	M5 stylus for Zeiss	\$52	8-57
A-5555-3785	M5 stylus for Zeiss	\$53	8-57
A-5555-3786	M5 stylus for Zeiss	\$53	8-57
A-5555-3787	M5 stylus for Zeiss	\$53	8-57
A-5555-3788	M5 stylus for Zeiss	\$54	8-57
A-5555-3789	M5 stylus for Zeiss	\$64	8-57
A-5555-3790	M5 stylus for Zeiss	\$62	8-57
A-5555-3791	M5 stylus for Zeiss	\$64	8-57
A-5555-3792	M5 stylus for Zeiss	\$64	8-57
A-5555-3793	M5 stylus for Zeiss	\$67	8-57
A-5555-3794	M5 stylus for Zeiss	\$76	8-57
A-5555-3795	M5 stylus for Zeiss	\$66	8-57
A-5555-3796	M5 stylus for Zeiss	\$74	8-57
A-5555-3797	M5 stylus for Zeiss	\$74	8-57
A-5555-3798	M5 stylus for Zeiss	\$85	8-57
A-5555-3799	M5 stylus for Zeiss	\$89	8-57
A-5555-3800	M5 stylus for Zeiss	\$94	8-57

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A-5555-3801	M5 stylus for Zeiss	\$87	8-57
A-5555-3802	M5 stylus for Zeiss	\$97	8-57
A-5555-3803	M5 stylus for Zeiss	\$108	8-57
A-5555-3804	M5 stylus for Zeiss	\$111	8-57
A-5555-3805	M5 reference stylus for Zeiss	\$106	8-58
A-5555-3806	M5 stylus for Zeiss	\$83	8-58
A-5555-3807	M5 stylus for Zeiss	\$111	8-58
A-5555-3808	M5 stylus for Zeiss	\$124	8-58
A-5555-3809	M5 stylus for Zeiss	\$117	8-58
A-5555-3810	M5 stylus for Zeiss	\$133	8-58
A-5555-3811	M5 stylus for Zeiss	\$150	8-58
A-5555-3812	M5 stylus for Zeiss	\$96	8-59
A-5555-3813	M5 stylus for Zeiss	\$99	8-59
A-5555-3814	M5 stylus for Zeiss	\$110	8-59
A-5555-3815	M5 stylus for Zeiss	\$115	8-59
A-5555-3816	M5 stylus for Zeiss	\$118	8-59
A-5555-3817	M5 stylus for Zeiss	\$111	8-59
A-5555-3818	M5 stylus for Zeiss	\$117	8-59
A-5555-3819	M5 stylus for Zeiss	\$131	8-59
A-5555-3820	M5 stylus for Zeiss	\$147	8-59
A-5555-3821	M5 stylus for Zeiss	\$150	8-59
A-5555-3822	M5 stylus for Zeiss	\$143	8-59
A-5555-3823	M5 stylus for Zeiss	\$159	8-59
A-5555-3824	M5 stylus for Zeiss	\$177	8-59
A-5555-3825	M5 stylus for Zeiss	\$212	8-59
A-5555-3826	M5 stylus for Zeiss	\$41	8-62
A-5555-3827	M5 stylus for Zeiss	\$41	8-62
A-5555-3828	M5 stylus for Zeiss	\$52	8-62
A-5555-3829	M5 stylus for Zeiss	\$60	8-62
A-5555-3839	Star stylus for Zeiss	\$573	8-65
A-5555-3841	Rotary knuckle for Zeiss	\$291	8-63
A-5555-3842	Reference sphere for Zeiss	\$397	8-65
A-5555-3843	Reference sphere for Zeiss	\$502	8-65
A-5555-3844	Reference sphere for Zeiss	\$525	8-65
A-5555-3845	Adaptor plate extension for Zeiss	\$259	8-68
A-5555-3846	Adaptor plate extension for Zeiss	\$266	8-68
A-5555-3847	Adaptor plate extension for Zeiss	\$273	8-68
A-5555-3848	Adaptor plate extension for Zeiss	\$282	8-68
A-5555-3849	Adaptor plate extension for Zeiss	\$298	8-68
A-5555-3850	Adaptor plate extension for Zeiss	\$309	8-68
A-5555-3851	Adaptor plate extension for Zeiss	\$321	8-68
A-5555-3852	Adaptor plate extension for Zeiss	\$374	8-68
A-5555-3853	M3 stylus for Zeiss	\$57	8-73
A-5555-3854	M3 stylus for Zeiss	\$64	8-73
A-5555-3855	M3 stylus for Zeiss	\$64	8-73
A-5555-3856	M3 stylus for Zeiss	\$60	8-73
A-5555-3857	M3 stylus for Zeiss	\$62	8-73
A-5555-3858	M3 reference stylus for Zeiss	\$106	8-74
A-5555-3859	M3 stylus for Zeiss	\$89	8-75

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Part number	Description	Price	Page number
A-5555-3860	M3 stylus for Zeiss	\$106	8-75
A-5555-3861	M3 stylus for Zeiss	\$106	8-75
A-5555-3862	M3 stylus for Zeiss	\$108	8-75
A-5555-3864	M3 stylus for Zeiss	\$108	8-75
A-5555-3865	M3 stylus for Zeiss	\$127	8-75
A-5555-3866	M3 stylus for Zeiss	\$138	8-75
A-5555-3867	M3 stylus for Zeiss	\$148	8-75
A-5555-3868	M3 stylus for Zeiss	\$154	8-75
A-5555-3869	M3 stylus for Zeiss	\$159	8-75
A-5555-3870	M3 stylus for Zeiss	\$122	8-76
A-5555-3871	M3 stylus for Zeiss	\$126	8-76
A-5555-3872	M3 stylus for Zeiss	\$134	8-76
A-5555-3873	M3 stylus for Zeiss	\$205	8-76
A-5555-3874	M3 stylus for Zeiss	\$212	8-76
A-5555-3875	M3 stylus for Zeiss	\$99	8-76
A-5555-3876	M3 stylus for Zeiss	\$104	8-76
A-5555-3877	M3 stylus for Zeiss	\$104	8-76
A-5555-3878	M3 stylus for Zeiss	\$110	8-76
A-5555-3879	M3 stylus for Zeiss	\$113	8-76
A-5555-3880	M3 star stylus for Zeiss	\$157	8-77
A-5555-3881	M3 star stylus for Zeiss	\$162	8-77
A-5555-3882	M3 star stylus for Zeiss	\$309	8-77
A-5555-3883	M3 star stylus for Zeiss	\$314	8-77
A-5555-3884	M3 star stylus for Zeiss	\$309	8-77
A-5555-3885	M3 star stylus for Zeiss	\$314	8-77
A-5555-3886	M3 star stylus for Zeiss	\$319	8-77
A-5555-3887	M3 star stylus for Zeiss	\$309	8-78
A-5555-3888	M3 star stylus for Zeiss	\$314	8-78
A-5555-3889	M3 star stylus for Zeiss	\$309	8-78
A-5555-3890	M3 star stylus for Zeiss	\$314	8-78
A-5555-3891	M3 star stylus for Zeiss	\$319	8-78
A-5555-3892	M3 stylus extension for Zeiss	\$73	8-78
A-5555-3893	M3 stylus extension for Zeiss	\$71	8-78
A-5555-3894	M3 stylus extension for Zeiss	\$106	8-78
A-5555-3895	M3 stylus extension for Zeiss	\$166	8-78
A-5555-3896	Stylus cube for Zeiss	\$81	8-79
A-5555-3897	Stylus cube for Zeiss	\$90	8-79
A-5555-3898	Stylus cube for Zeiss	\$113	8-80
A-5555-3899	Stylus cube for Zeiss	\$131	8-80
A-5555-3900	Adaptor plate for Zeiss	\$300	8-72
A-5555-3901	M3 star stylus for Zeiss	\$168	8-77
A-5555-9045	M5 stylus for Zeiss	\$131	8-59
A-5555-9324	M5 stylus for Zeiss	\$46	8-62
A-5555-9339	M3 stylus for Zeiss	\$62	8-73
A-5555-9340	M3 stylus for Zeiss	\$67	8-73
A-5555-9341	M3 stylus for Zeiss	\$66	8-73
A-5555-9361	M5 stylus for Zeiss	\$157	8-58
A-5567-1000	12U retrofit cabinet	\$2,620	1-11
A-5616-0352-RBE	HPGA (side exit) RBE	\$1,985	9-7

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A-5625-0001	OLP40 probe kit (legacy)	\$3,984	2-25
A-5625-0005	OMP40/RLP40 eyelide service kit	\$30	9-10
A-5625-1003	25 mm straight shank	\$228	2-16, 5-8
A-5625-1004	½ in straight shank	\$228	2-16, 5-8
A-5625-1007	1 in straight shank	\$228	2-16, 5-8
A-5625-1166	OLP40/RLP40 metal battery cassette	\$160	9-10
A-5625-2001	OLP40 probe kit (modulated)	\$3,984	2-25
A-5625-2001-RBE	OLP40 RBE	\$1,205	9-7
A-5626-0001	OMP40M transmission module (legacy)	\$1,383	2-27
A-5626-2001	OMP40M transmission module (modulated)	\$1,383	2-27
A-5626-2001-RBE	OMP40M RBE	\$770	9-7
A-5627-0001-RBE	RLP40 RBE	\$1,650	9-7
A-5627-0001	RLP40 probe kit	\$4,819	2-28
A-5628-0001-RBE	RMP40M	\$965	9-7
A-5628-0001	RMP40M transmission module	\$2,095	2-29
A-5639-0001	MODUST™ 3-axis and 5-axis touch-trigger	\$8,800	1-63
A-5639-0003	MODUST™ 3-axis scanning	\$12,800	1-63
A-5639-0005	MODUST™ 5-axis scanning	\$20,800	1-63
A-5639-0007	MODUST™ offline graphical reporting	\$1,600	1-63
A-5639-0101	MODUST™ offline 3-axis and 5-axis touch-trigger	\$4,400	1-63
A-5639-0103	MODUST™ offline 3-axis scanning	\$6,400	1-63
A-5639-0105	MODUST™ offline 5-axis scanning	\$10,400	1-63
A-5639-1700	MODUST™ training at Renishaw (3 days)	\$2,250	1-64
A-5639-1701	MODUST™ training at Renishaw (4 days)	\$3,000	1-64
A-5639-1702	MODUST™ training at Renishaw (2 days)	\$1,500	1-64
A-5639-1703	MODUST™ training at Renishaw (1 day)	\$750	1-64
A-5639-2500	MODUST™ training block	\$680	1-64
A-5639-3000	MODUST™ Equator™ dongle	\$4,200	3-6
A-5642-1000	AxiSet™ Check-Up Mazak Variaxis	\$2,620	2-47
A-5642-1005	AxiSet™ Check-Up Mazak Mark IV	\$2,620	2-47
A-5642-1009	AxiSet™ Check-Up Mazak eV/eH	\$2,620	2-47
A-5642-1100	AxiSet™ Check-Up Fanuc (Table-Table)	\$2,620	2-47
A-5642-1105	AxiSet™ Check-Up Hurco Winmax (Table-Table)	\$2,620	2-47
A-5642-1400	AxiSet™ Check-Up Mori Seiki NMV NMH	\$2,620	2-47
A-5642-1405	AxiSet™ Check-Up Mori Seiki NT	\$2,620	2-47
A-5642-1500	AxiSet™ Check-Up Siemens (Table-Table)	\$2,620	2-47
A-5642-1515	AxiSet™ Check-Up Siemens (Head-Head)	\$2,620	2-47
A-5642-1600	AxiSet™ Check-Up Haas	\$2,620	2-47
A-5646-0001-RBE	RTS RBE	\$1,640	9-6
A-5646-0001	RTS AA probe kit	\$3,092	2-20
A-5669-0001	PH20 head	\$17,179	1-13
A-5669-0001-RBE	PH20 RBE	\$4,125	9-3
A-5687-0049	RMI-Q radio machine interface	\$2,681	2-42
A-5687-0050-RBE	RMI-Q RBE	\$1,000	9-8
A-5687-0050	RMI-Q radio machine interface	\$2,681	2-12, 2-13, 2-15, 2-20, 2-28, 2-29, 2-42
A-5687-0303	RMI-Q 30 m replacement cable	\$396	2-42
A-5687-0304	RMI-Q 50 m replacement cable	\$539	2-42
A-5687-0305	RMI-Q antenna cover	\$125	2-42
A-5696-0101-RBE	EQUATOR™ controller RBE	\$3,000	9-8

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A-5707-0100	PI200-3 interface	\$817	1-51
A-5722-A46-CPNC-OP-INT	Capps-NC additional machine interface	\$1,950	2-51
A-5722-A418-CPNC-LM	Capps-NC License Manager	\$4,950	2-51
A-5722-A418-CPNC-OP_DT	Capps-NC 2nd spindle/turret	\$3,250	2-51
A-5722-A420-CPNC-LMCEM	Capps-NC License Manager discount	Call for details	2-51
A-5722-A420-CPNC-NCF	Capps-NC AAT NC-fit	\$12,500	2-51
A-5722-C1-CAD-C4	Capps-NC Catia4 import	\$4,551	2-51
A-5722-C2-CAD-C5	Capps-NC Catia5 input	\$4,551	2-51
A-5722-C3-CAD-PE	Capps-NC Pro-E import	\$4,551	2-51
A-5722-C4-CAD-UG	Capps-NC Unigraphics import	\$4,551	2-51
A-5722-C5-CAD-PS	Capps-NC Parasolid import	\$1,728	2-51
A-5722-C6-CAD-SW	Capps-NC SolidWorks import	\$1,728	2-51
A-5722-C7-CAD-VDA	Capps-NC VDA import	\$1,095	2-51
A-5722-CPNC-ADV-3A	Capps-NC Advanced - 3 axis	\$16,500	2-49
A-5722-CPNC-ADV-4A	Capps-NC Advanced - 4 axis	\$19,500	2-49
A-5722-CPNC-ADV-5A	Capps-NC Advanced - 5 axis	\$22,500	2-49
A-5722-CPNC-ADV-AX	Capps-NV Advanced additional axis	\$3,500	2-49
A-5722-CPNC-ADV-MT	Capps-NC Advanced Mill Turn	\$23,500	2-49
A-5722-CPNC-ADV-TO	Tool offset programming and feedback	\$4,950	2-49
A-5722-CPNC-ADV-TUR	Capps-NC Advanced additional turret	\$3,500	2-49
A-5722-CPNC-ADV-WO	Work offset programming and feedback	\$4,950	2-49
A-5722-CPNC-EM-3A	Capps-NC execution module - 3 axis	\$8,950	2-50
A-5722-CPNC-EM-4A	Capps-NC execution module - 4 axis	\$10,450	2-50
A-5722-CPNC-EM-5A	Capps-NC execution module - 5 axis	\$12,500	2-50
A-5722-CPNC-EM-AX	Capss-NC execution module additional axis	\$1,950	2-50
A-5722-CPNC-EM-MT	Capps-NC execution module Mill Turn	\$13,500	2-50
A-5722-CPNC-EM-TO	Tool offset execution module and feedback	\$2,950	2-50
A-5722-CPNC-EM-TUR	Capps-NC execution module additional turret	\$2,450	2-50
A-5722-CPNC-EM-WO	Work offset execution module and feedback	\$2,950	2-50
A-5722-CPNC-PS-3A	Capps-NC programming - 3 axis	\$10,500	2-50
A-5722-CPNC-PS-4A	Capps-NC programming - 4 axis	\$12,500	2-50
A-5722-CPNC-PS-5A	Capps-NC programming - 5 axis	\$14,500	2-50
A-5722-CPNC-PS-AX	Capps-NC programming additional axis	\$2,045	2-50
A-5722-CPNC-PS-MT	Capps-NC programming Mill Turn	\$15,000	2-50
A-5722-CPNC-PS-TO	Tool offset programming and feedback	\$2,250	2-50
A-5722-CPNC-PS-TUR	Capps-NC programming additional turret	\$2,045	2-50
A-5722-CPNC-PS-WO	Work offset programming and feedback	\$2,250	2-50
A-5722-SMAE-NC	Capps-NC maintenance each skipped year	Call for details	2-52
A-5726-0100	PI7-3 interface	\$1,170	1-50
A-5734-0100	MCU5-2 joystick kit	\$2,171	1-11
A-5734-0200	MCU-W2 wireless joystick kit (no batteries)	\$3,749	1-11
A-5742-0001-RBE	RMP60Q RBE	\$1,610	9-5
A-5742-0001	RMP60 probe kit	\$5,363	2-13
A-5742-1003-RBE	RMP60MP RBE	\$965	9-5
A-5742-1003	RMP60M transmission module	\$2,618	2-14
A-5759-0001	REVO® head only	\$44,492	1-16
A-5759-1000-RBE	REVO2 RBE	\$10,350	9-3
A-5764-0005-KIT	REVO® SFP2 base kit	\$27,471	1-22
A-5764-0010	REVO® SFP2 probe	\$23,780	1-22

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A-5764-0020	REVO® SFM-A1 (Straight, Type A Skid)	\$8,941	1-22
A-5764-0021	REVO® SFM-A2 (Crank, Type A Skid)	\$8,941	1-22
A-5764-0025	REVO® SFM-B1 (SM Straight, Type B Skid)	\$10,283	1-22
A-5764-0031	REVO® SFM-C2 (Straight, Type C Skid)	\$12,965	1-22
A-5764-0035	REVO® SFM-D1 (90°, Type D Skid)	\$10,283	1-22
A-5764-0060	REVO® SFA1 3.0 sin artefact	\$1,807	1-23
A-5764-0061	REVO® SFA2 0.5 sin artefact	\$1,807	1-23
A-5764-0062	REVO® SFA3 0.4 ST artefact	\$1,807	1-23
A-5764-0063	REVO® SF2 TFP probe kit (LF, PL24, styli)	\$4,280	1-23
A-5764-0070	REVO® single AF holder (SFAH-1, tools)	\$590	1-23
A-5764-0071	REVO® triple AF holder (SFAH-2, tools)	\$685	1-23
A-5764-0072	Single artefact kit (SFA1 and 1 AF holder)	\$2,397	1-23
A-5764-0073	Triple artefact kit (SFA1,2,3 and 3 AF holder)	\$6,106	1-23
A-5764-0080	REVO® SFH-1 module holder	\$1,332	1-23
A-5764-0081	REVO® SFH-2 module holder	\$1,522	1-23
A-5764-0090	REVO® SF2 system storage box	\$333	1-23
A-5764-0091	REVO® SF2 MST - module setting tool	\$190	1-23
A-5764-3142	REVO® OFA optical flat artefact	\$3,710	1-23
A-5795-0001-RBE	PHS-2 RBE	\$12,613	9-3
A-5795-0001-UPG	PHS upgrade to PHS-2	\$19,609	9-3
A-5863-0100	PHC10-3 PLUS controller	\$3,107	1-10
A-5863-0100-RBE	PHC10-3 PLUS controller RBE	\$1,110	9-3
A-5863-0200	PHC10-3 PLUS controller with internal PI200-3	\$3,928	1-10
A-5863-1000	PH10M PLUS head	\$22,920	1-8
A-5863-1000-RBE	PH10M PLUS head RBE	\$5,120	9-3
A-5863-2000	PH10T PLUS head	\$20,209	1-8
A-5863-2000-RBE	PH10T PLUS head RBE	\$5,120	9-3
A-5863-3000	PH10MQ PLUS head	\$22,920	1-9
A-5863-3000-RBE	PH10MQ PLUS head RBE	\$5,120	9-3
A-5882-0010	HCU2 hand control unit	\$802	1-10
A-5923-0050	Equator™ digital I/O box	\$5,200	3-7
A-5923-0259	Equator™ additional I/O box	\$1,155	3-7
A-5925-0200	Gage checker	\$875	3-7
A-6007-0620	MRS2 extrusion clamp plate kit	\$189	1-57
A-6007-0630	MRS2 spirit level	\$28	1-57
A-6007-0710	MRS2 4 × triangular end caps	\$46	1-57
A-6007-0720	MRS2 6 × square end caps	\$67	1-57
A-6007-0740	MRS2 4 × 40 mm bracket end caps	\$46	1-57
A-6007-0780	MRS2 4 × 80 mm bracket end caps	\$75	1-57
A-6007-0810	MRS2 10 × D-nuts and bolts	\$75	1-57
A-6007-1020	MRS2 leg kit 200 mm	\$733	1-57
A-6007-1040	MRS2 leg kit 400 mm	\$828	1-57
A-6007-1060	MRS2 leg kit 600 mm	\$1,108	1-57
A-6007-1080	MRS2 leg kit 800 mm	\$1,203	1-57
A-6007-2040	MRS2 rail kit 400 mm	\$225	1-57
A-6007-2060	MRS2 rail kit 600 mm	\$282	1-57
A-6007-2100	MRS2 rail kit 1000 mm	\$376	1-57
A-6007-3010	MRS2 front spacer kit	\$161	1-57
A-6007-4008	MRS2 back spacer kit	\$161	1-57

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A-6084-0001	RSP3-6 probe kit	\$10,643	1-17
A-6084-0006	REVO® RSH3-6-600 (600 mm straight)	\$1,016	1-17
A-6084-0007	REVO® RSH3-6-700 (700 mm straight)	\$1,064	1-17
A-6084-0008	REVO® RSH3-6-800 (800 mm straight)	\$1,161	1-17
A-6084-0015	REVO® RSH3-6C-500 (500 mm crank)	\$968	1-17
A-6084-0016	REVO® RSH3-6C-600 (600 mm crank)	\$1,016	1-17
A-6084-0017	MRS MPS1 port spacing tool	\$63	1-23
A-6088-0010	Button interface	\$875	3-6
A-6299-0100-RBE	ACC2-3 autochange controller RBE	\$1,110	9-3
A-6516-2000	NCi-6 interface	\$237	2-18, 2-40
A-6527-1000	HSI-C interface	\$241	2-33, 2-40
A-8003-0006	Additional day's calibration training on-site	\$2,235	5-33
A-8003-0008	Calibration training at Renishaw Inc	\$871	5-33
A-8003-0181	Angular reflector	\$2,115	5-28
A-8003-0186	Angular beam splitter	\$2,853	5-28
A-8003-0219	Linear reflector	\$712	5-28
A-8003-0262	Clamp block	\$276	5-4, 5-27
A-8003-0440	Linear optics kit	\$3,472	5-20
A-8003-0441	Angular optics kit	\$4,623	5-20
A-8003-0442	Flatness optics kit	\$3,737	5-21
A-8003-0443	Straightness kit short-range	\$6,206	5-21
A-8003-0444	Straightness kit long-range	\$6,206	5-21
A-8003-0447	Optics mounting kit	\$1,414	5-21
A-8003-0478	Alignment target	\$27	5-28
A-8003-0557	Linear beam splitter	\$2,755	5-28
A-8003-0576	Straightness accessory base	\$327	5-28
A-8003-0604	Large retroreflector	\$1,145	5-28
A-8003-0665	Squareness optics kit	\$6,206	5-21
A-8003-0979	M8 adaptor	\$124	5-28
A-8003-1304	Swivel mirror	\$1,520	5-22
A-8003-1325	Fixed turning mirror	\$987	5-22
A-8003-1998	Quarter wave plate	\$1,712	5-22
A-8003-2774	Linear/angular optics kit	\$5,288	5-20
A-8003-3072	Beam steerer LS350	\$1,801	5-22
A-8003-3244	Small linear accessory kit	\$1,910	5-20
A-8003-4209	Straightness shutter	\$881	5-22
A-8003-4270	Long-range linear optics	\$3,417	5-20
A-8003-4462	TB20 connector kit	\$151	5-25
A-8003-4475	TB20 universal kit	\$4,937	5-25
A-8003-4500	Locking screw pressure pad	\$9	5-27
A-8003-4501	Locking screw assembly	\$56	5-27
A-8003-BBTC	Ballbar training course	\$1,882	5-33
A-8003-BBVU	Ballbar training at Vincennes University	\$555	5-33
A-8003-LATC	Laser training course	\$1,882	5-33
A-8003-STAK	Straightness accessory kit	\$3,865	5-21
A-8014-0141	Ballbar center ball assembly	\$163	5-9, 5-11, 9-10
A-8014-0144	150 mm ballbar extension bar	\$267	5-9, 5-11
A-8014-0145	300 mm ballbar extension bar	\$362	5-9, 5-11
A-8014-0182	Transducer ball	\$163	5-9, 5-10, 9-10

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A-8014-0231	50 mm ballbar extension bar	\$222	5-9, 5-11
A-8014-0280	Glass calibrator	\$2,283	5-9, 5-10
A-8014-0417	VTL adaptor kit	\$342	5-7, 5-9
A-8014-0423	Ballbar cup cleaning kit	\$21	5-9, 5-12, 9-10
A-8014-0491	50 mm glass calibrator	\$766	5-9, 5-12
A-8014-0521	Tool cup assembly	\$147	5-9, 5-10, 9-10
A-8014-0522	Ballbar center cup assembly	\$184	5-9, 5-11, 9-10
A-8014-0551	Lathe adaptor kit	\$1,252	5-7
A-8014-0552	Cup screw assembly	\$180	5-9, 5-13
A-8014-0553	Spindle bar assembly	\$333	5-9, 5-13
A-8014-0670	USB to serial adaptor	\$152	5-29
A-8014-0786	Ballbar service kit	\$529	9-10
A-8014-1141	Spanner set	\$19	5-9, 5-11
A-8014-1272	30 mm small circle adaptor	\$230	5-12
A-8014-1281	Center pivot assembly	\$548	5-9, 5-11
A-8014-1510	QC20-W ballbar kit with glass calibrator	\$10,971	5-6
A-8014-1520-RBE	QC20-W (mechanical assembly only) RBE	\$3,210	9-9
A-8014-1540	Small circle accessory kit (SCAK)	\$1,076	5-7
A-8014-1560	Small circle adaptor	\$331	5-9, 5-12
A-8014-1565	Spherical adaptor	\$73	5-12
A-8014-1570	Setting ball	\$56	5-9, 5-11
A-8014-1592	Cover ring	\$28	5-9, 5-10
A-8014-1593	Battery end cap assembly	\$231	5-9, 5-10
A-8014-1610	Tool cup extension	\$48	5-9, 5-10
A-8014-BB-TRADEIN	QC-10 trade-in for QC20-W	\$7,369	5-6
A-8014-BBUG	QC20-W ballbar upgrade kit	\$5,019	5-6
A-8014-BTA1	Bluetooth® USB wireless adaptor	\$107	5-13
A-8014-CR2	Lithium battery for QC20-W	\$10	5-9, 5-13
A-8014-VCAR	Validation card (pack of 10)	\$7	5-9, 5-12
A-8014-VCHD	Validation card holder (pack of 10)	\$7	5-9, 5-12
A-9904-1636	Temperature sensor cable connector kit	\$69	5-29
A-9908-0286	USB cable	\$31	5-4, 5-29
A-9908-0295	Universal tripod	\$1,392	5-24
A-9908-0302	QuickView XL software	\$1,050	5-26
A-9908-0323	Spirit level circular	\$35	5-4
A-9908-0377	XL trigger cable	\$454	5-25
A-9908-0700	XL translation stage	\$1,077	5-24
A-9908-0750	Translation stage screws	\$27	5-29
A-9908-0760	Magnetic base adaptor	\$39	5-24
A-9908-0765	Tripod converter ML-XL	\$80	5-24
A-9908-0770	Tripod adaptor	\$34	5-24
A-9908-0780	Magnetic base	\$82	5-4, 5-21
A-9908-0932	XC-80 temperature sensor cable (5 m)	\$152	5-29
A-9908-1170	Pan and tilt adaptor	\$1,402	5-22
A-9908-ADV1	Advanced system kit	\$63,861	5-18
A-9908-ANG1	Linear/angular system kit	\$40,383	5-18
A-9908-LIN1	Linear system kit	\$35,760	5-18
A-9920-0270	Mounting ring adaptor	\$404	5-31
A-9920-0280	Chuck (lathe) adaptor	\$537	5-31

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A-9920-0304	Off Axis Rotary Software (OARS) package	\$1,381	5-31
A-9920-0320	Battery charger and cables	\$248	5-4, 5-32
A-9920-0330	Battery Li-polymer 3.7 V	\$104	5-4, 5-32
A-9920-0340	Centration aid	\$11	5-32
A-9920-0360	XR20 case	\$823	5-32
A-9920-0380	USB cover plug	\$9	5-32
A-9920-0390	Power USB cable	\$49	5-25
A-9920-0400	XR20-W rotary axis calibrator	\$25,115	5-30
A-9920-0430	Fixings kit	\$11	5-32
A-9920-0440	Mounting ring	\$644	5-31
A-9920-0450	USB power supply	\$53	5-25, 5-32
A-9920-0460	Battery cover	\$37	5-32
A-9920-0700	OARS bracket	\$3,776	5-31
A-9925-0200	XCAL View software (dual user)	\$1,004	5-26
A-9925-0202	Rotary software kit	\$1,644	5-31
A-9925-0203	XCAL View software (10 users)	\$4,013	5-26
A-9925-0208	XCAL View software (single user)	\$502	5-26
A-EH33-1J40	Equator™ ext height Operator's version	\$32,268	3-3
A-EH33-2J40	Equator™ ext height Programmer's version	\$35,733	3-3
A-EQ33-1J10	Equator™ Operator's version	\$30,505	3-3
A-EQ33-1J40	Equator™ Operator's version	\$30,882	3-3
A-EQ33-1S10	Equator™ Operator's version	\$31,581	3-3
A-EQ33-1S40	Equator™ Operator's version	\$30,457	3-3
A-EQ33-2J10	Equator™ Programmer's version	\$34,084	3-3
A-EQ33-2J40	Equator™ Programmer's version	\$34,347	3-3
CS-TRA-INHO-2DAY	EQUATOR™ MODUST™ advanced training	\$1,500	3-9
CS-TRA-INHO-4DAY	EQUATOR™ MODUST™ scanning training	\$3,000	3-9
CS-TRA-ONSI-11-2DAY	EQUATOR™ MODUST™ onsite advanced training	\$5,775	3-9
CS-TRA-ONSI-11-4DAY	EQUATOR™ MODUST™ onsite scanning training	\$9,625	3-9
FSC-CA-20	EQUATOR™ R&R component kit (¼-20 in)	\$744	3-8
FSC-MCA-20	EQUATOR™ R&R component kit (¼-20 in)	\$972	3-8
FSC-MCR-20	EQUATOR™ R&R component kit (¼-20 in)	\$2,615	3-8
M-1041-1088	MS11 CMM probe shank	\$158	1-44
M-1041-1650	MS2 CMM probe shank	\$158	1-44
M-1041-1652	MS5 CMM probe shank	\$158	1-44
M-1041-1653	MS6 CMM probe shank	\$158	1-44
M-1041-1654	MS7 CMM probe shank	\$158	1-44
M-1041-1656	MS3 CMM probe shank	\$158	1-44
M-1041-1657	MS8 CMM probe shank	\$158	1-44
M-1041-2146	MS1 CMM probe shank	\$158	1-44
M-1041-2153	MS15 CMM probe shank	\$158	1-44
M-1041-4843	MS9 CMM probe shank	\$158	1-44
M-1041-5348	MS13 CMM probe shank	\$158	1-44
M-1041-5981	MS14 CMM probe shank	\$158	1-44
M-1041-7068	MS12 CMM probe shank	\$158	1-44
M-1041-7132	MS7(S) CMM probe shank	\$202	1-44
M-1041-7507	MS10 CMM probe shank	\$158	1-44
M-1046-1120	MS2/T CMM probe shank	\$158	1-46
M-1046-1121	MS1/T CMM probe shank	\$225	1-46

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M-1046-1122	MS5/T CMM probe shank	\$158	1-46
M-1046-1123	MS6/T CMM probe shank	\$158	1-46
M-1046-1124	MS7/T CMM probe shank	\$158	1-46
M-1046-1126	MS3/T CMM probe shank	\$158	1-46
M-1046-1128	MS4/T CMM probe shank	\$158	1-46
M-1046-1802	MS8/T CMM probe shank	\$158	1-46
M-1046-2661	MS11/T CMM probe shank	\$158	1-46
M-1046-4545	MS9/T CMM probe shank	\$158	1-46
M-1046-7107	MS18/T CMM probe shank	\$158	1-46
M-1051-0147	ACR1 100 mm leg	\$14	1-54
M-1051-0148	ACR1 200 mm leg	\$25	1-54
M-1085-0301	MCR20/SCR200 location plate	\$10	1-29, 1-34
M-2008-0197	TS27 tool setting stylus	\$244	2-21
M-2008-0333	TS20 break protect link	\$25	2-38
M-2008-0604	TS20 break protect link	\$25	2-38
M-2008-0605	TS20 break protect link	\$25	2-38
M-2008-0866-RI-KIT	OTS/RTS/TS27R 100 mm riser	\$135	2-21
M-2045-0027	BT40 shank	\$385	2-16
M-2045-0038	BT45 shank	\$857	2-16
M-2045-0068	CAT30 shank	\$385	2-16
M-2045-0069	CAT40 shank	\$385	2-16
M-2045-0071	CAT50 shank	\$385	2-16
M-2045-0073	BT50 shank	\$385	2-16
M-2045-0077	BT30 shank	\$385	2-16
M-2045-0138	CAT45 shank	\$857	2-16
M-2045-0186	HSK A40	\$726	2-16
M-2045-0187	HSK A50	\$865	2-16
M-2045-0188	HSK A63	\$929	2-16
M-2045-0189	HSK A80	\$1,125	2-16
M-2045-0190	HSK A100	\$1,128	2-16
M-2045-0292	CAT60 shank	\$1,781	2-16
M-2045-0310	CAPTO C6 shank	\$708	2-16
M-2045-0311	CAPTO C8 shank	\$1,751	2-16
M-2045-0313	CAPTO C4 shank	\$786	2-16
M-2045-0335	KM63 shank	\$1,454	2-16
M-2045-0346	CAPTO C5 shank	\$1,042	2-16
M-2045-1831591	KM63Y (Mazak) shank	\$1,648	2-16
M-2048-2093	HPRA/HPPA/HPMA M4 break stem	\$25	2-38
M-2063-8003	Chip deflector	\$142	2-31
M-2107-0115	Battery cap seal	\$30	9-10
M-2116-1356	MP15/MP11 adaptor	\$236	2-2
M-2197-0150	HPRA/HPPA/HPMA break stem	\$25	2-35, 2-38
M-2197-0156	HPRA/HPPA/HPMA break stem	\$25	2-35, 2-38
M-2238-0443	SH80 removal tool	\$61	1-41
M-2253-0954	Calibration tool (CAT40 shank)	\$451	2-16
M-2253-0955	Calibration tool (CAT50 shank)	\$565	2-16
M-2253-1262	Calibration tool (BT50 shank)	\$565	2-16
M-2253-1263	Calibration tool (BT40 shank)	\$451	2-16
M-2253-1562	Calibration tool (BT30 shank)	\$730	2-16

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M-4071-0044	HSK E25 shank	\$505	2-16
M-4071-0045	HSK A32 shank	\$505	2-16
M-4071-0046	HSK A40 shank	\$505	2-16
M-4071-0047	HSK A50 shank	\$680	2-16
M-4071-0048	ISO30 DIN69871 shank	\$433	2-16
M-4071-0049	BT30 shank	\$445	2-16
M-4071-0050	CAT30 shank	\$433	2-16
M-4071-0054	HSK E40 shank	\$505	2-16
M-4071-0055	HSK E32 shank	\$505	2-16
M-4071-0057	BT40 shank	\$385	2-16
M-4071-0057-RI	BT40 shank kit	\$564	2-16
M-4071-0058	CAT40 shank	\$385	2-16
M-4071-0058-RI	CAT40 shank kit	\$564	2-16
M-4071-0065	KM63 shank	\$861	2-16
M-4071-0066	CAPTO C5 shank	\$861	2-16
M-4071-0067	CAPTO C6 shank	\$861	2-16
M-4071-0069	ISO40 DIN69871 shank	\$414	2-16
M-4071-0071	BT50 shank	\$385	2-16
M-4071-0072	CAT50 shank	\$385	2-16
M-4071-0129	HSK A63 shank	\$595	2-16
M-4071-0141	CAPTO C4 shank	\$829	2-16
M-5000-3540	S7 stylus tool	\$9	1-61
M-5000-3541	S8 spanner	\$12	8-93, 8-94, 8-95
M-5000-3571	SIP/M3 stylus adaptor	\$9	8-99, 8-100
M-5000-3647	M2 stylus extension	\$13	8-90, 8-93, 8-94, 8-95
M-5000-3648	M2 stylus extension	\$15	8-90, 8-94, 8-95
M-5000-3707	M4 stylus tool	\$12	1-61
M-5000-4150	M2 pointer stylus	\$25	8-20, 8-90, 8-94, 8-95
M-5000-4152	M2 cylinder stylus	\$26	8-90, 8-94, 8-95
M-5000-4153	M2 cylinder stylus	\$26	8-90, 8-94, 8-95
M-5000-4162	M2 stylus extension	\$17	8-90, 8-94, 8-95
M-5000-6460	M4 star stylus center	\$100	8-31
M-5000-7634	M2 stylus extension	\$12	8-90
M-5000-7779	M2 stylus extension	\$19	8-90, 8-91
M-5000-9304	M5 stylus tool	\$15	1-61
M-5003-1033	TS27 tool setting stylus	\$111	2-21
M-5358-2589	EQUATOR™ rack port clip	\$3	3-6
M-8003-0221	Short clamp screw	\$16	5-27
M-8003-0264	Long clamp screw	\$16	5-27
M-8003-0470	Mounting pillar	\$99	5-4, 5-8, 5-27
M-8003-1063	Swivel mirror clamp screw	\$17	5-27
M-8003-1070	Fixed turning mirror clamp screw	\$17	5-27
M-8003-1307	Optic adaptor plate	\$108	5-23
M-8003-3083	Beam steerer clamp screw	\$16	5-27
M-8014-1600	QC20-W system carrying case	\$374	5-6, 5-9
M-9908-0313	XL-80 base system case	\$850	5-24
M-9908-0314	XL-80 full system case	\$1,191	5-24
M-9908-0527	Universal tripod case	\$269	5-24
NC4-F115-kit	NC4 F115/55 with NCi-6 kit	\$5,094	2-17

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NC4-F115-S	NC4 fixed retrofit kit	Call for price	2-17
NC4-F145-kit	NC4 F145/85 with NCi-6 kit	\$5,094	2-17
NC4-F145-S	NC4 fixed retrofit kit	Call for price	2-17
NC4-F230-kit	NC4 F230/170 with NCi-6 kit	\$5,094	2-17
NC4-F230-S	NC4 fixed retrofit kit	Call for price	2-17
NC4-F300-kit	NC4 F300/240 with NCi-6 kit	\$5,094	2-17
NC4-F300-S	NC4 fixed retrofit kit	Call for price	2-17
NC4-S800-S	NC4 separate retrofit kit	Call for price	2-17
NC4-S1500-S	NC4 separate retrofit kit	Call for price	2-17
NC4-S2000-S	NC4 separate retrofit kit	Call for price	2-17
NC4-S3000-S	NC4 separate retrofit kit	Call for price	2-17
NC4-S5000-S	NC4 separate retrofit kit	Call for price	2-17
OARS-KIT1	Complete OARS kit	\$4,935	5-31
OLP40-NS-KIT	OLP40 hardware only kit	\$6,341	2-25
OLP40-NS-S	OLP40 retrofit kit	Call for price	2-25
OMP40M-NS-KIT	OMP40M hardware only kit	\$6,842	2-27
OMP40M-NS-S	OMP40M retrofit kit	Call for price	2-27
OMP40-NS-KIT	OMP40 hardware only kit	\$6,407	2-3
OMP40-NS-S	OMP40 retrofit kit	Call for price	2-3
OMP60-NS-KIT	OMP60 hardware only kit	\$6,407	2-7
OMP60-NS-S	OMP60 retrofit kit	Call for price	2-7
OMP400-NS-KIT	OMP400 hardware only kit	\$7,271	2-5
OMP400-NS-S	OMP400 retrofit kit	Call for price	2-5
OMP600-NS-KIT	OMP600 hardware only kit	\$7,271	2-10
OMP600-NS-S	OMP600 retrofit kit	Call for price	2-10
OTSAA-KIT	OTS hardware only kit (AA)	\$4,596	2-19
OTSAA-S	OTS retrofit kit (AA)	Call for price	2-19
OTS-KIT	OTS hardware only kit (½ AA)	\$4,596	2-19
OTS-S	OTS retrofit kit (½ AA)	Call for price	2-19
P-BT03-0007	½ AA battery (2 pack)	\$45	2-3
P-CA61-0068	NC4F 90° cable exit kit	\$23	2-18
P-CA61-0069	NC4F 90° cable exit kit	\$23	2-18
P-CA82-1009	HPPA R/E cable (5 meters)	\$54	2-38
P-CA82-1010	HPPA R/E cable (2 meters)	\$34	2-38
P-CA82-1011	HPPA R/E cable (10 meters)	\$76	2-38
PCR-501212-50-20	EQUATOR™ fixturing plate (¼-20 in)	\$578	3-6
PCR-13300300-10-4	EQUATOR™ fixturing plate (M4)	\$620	3-6
PCR-13300300-12-6	EQUATOR™ fixturing plate (M6)	\$550	3-6
PCR-13300300-15-8	EQUATOR™ fixturing plate (M8)	\$550	3-6
P-EQ33-MAINS	110 V mains power cable for EQUATOR™	\$16	3-6
P-FI01-S002	Air filter service kit	\$154	2-18, 2-24
P-GA01-0001	Gram gage	\$374	1-43, 8-108
P-HO01-0008	Steel sheath conduit	\$24	2-18
P-HO01-0011	Steel sheath conduit	\$24	2-18
P-NU18-0005	M8 T nut	\$14	1-56
P-PCO1-0045	Equator enclosure monitor bracket	\$154	3-7
P-SC08-0335	Battery cap screw	\$5	9-10
P-SC13-0403	OTS/RTS/TS27R stylus holder set screws	\$2	2-21
P-TL01-0089	S12 hex key	\$4	1-61

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P-TL01-0150	S3 hex key	\$4	1-61, 8-90, 8-91, 8-93, 8-94, 8-95, 8-99, 8-100, 8-104, 8-105
P-TL01-0200	S5 hex key	\$4	1-61
P-TL01-0250	S6 hex key	\$4	1-61, 8-102, 8-103, 8-104, 8-105
P-TL01-0300	S4 hex key	\$4	1-61, 8-105
R-AAS-4	M4 adaptor	\$8	4-24, 4-44
R-AAS-6	M adaptor	\$8	4-24, 4-44
R-AAS-8	M8 adaptor	\$11	4-24
R-AATK-6	M6 thumb screw	\$2	4-24, 4-44
R-AATS-14	M3 screw	\$6	4-24, 4-44
R-AATS-20	M3 screw	\$8	4-24, 4-44
R-AH-2545-6	M6 adjustable height stand	\$55	4-16, 4-38
R-AH-2545-8	M8 adjustable height stand	\$55	4-16
R-AJ-9-4	M4 adjustable jackstand	\$45	4-16, 4-38
R-AJ-13-6	M6 adjustable jackstand	\$40	4-16, 4-38
R-AJ-19-8	M8 adjustable jackstand	\$45	4-16
R-AJ-25-6	M6 adjustable jackstand	\$55	4-16, 4-38
R-AJ-25-8	M8 adjustable jackstand	\$56	4-16
R-AJS-35-8	M8 adjustable jackstand	\$88	4-16
R-APJ-6	M6 adjustable pivot joint	\$74	4-16, 4-38
R-APJ-8	M8 adjustable pivot joint	\$77	4-16
R-AS-30-4	M4 adjustable slide	\$28	4-16, 4-38
R-AS-45-4	M4 adjustable slide	\$31	4-16, 4-38
R-AS-45-6	M6 adjustable slide	\$28	4-16, 4-38
R-AS-45-8	M8 adjustable slide	\$30	4-16
R-AS-70-6	M6 adjustable slide	\$40	4-16, 4-38
R-AS-70-8	M8 adjustable slide	\$42	4-16
R-ASA-45-4	M4 adjustable slide (acrylic)	\$30	4-38
R-ASA-45-6	M6 adjustable slide (acrylic)	\$33	4-38
R-ASAE-4	M4 adjustable slide acrylic extension	\$87	4-39
R-ASM-4	M4 adjustable slide mirror	\$97	4-39
R-AT-6	M6 adjustable T-arm	\$65	4-24
R-ATS-4	M4 screw	\$8	4-24, 4-44
R-AVM-4	M4 micro adjustable V	\$132	4-39
R-AVP-2525-6	M6 adjustable V-post	\$39	4-16, 4-38
R-AVP-2525-8	M8 adjustable V-post	\$39	4-16
R-BC10	Component storage box	\$15	4-32, 4-48
R-CC-6	M4/M6 centers	\$186	4-19, 4-41
R-CC-13	M4/M6/M8 centers	\$223	4-19, 4-41
R-CC-25	M4/M6/M8 centers	\$274	4-19, 4-41
R-CES-10-6	M6 exposed suction cup	\$49	4-29
R-CES-20-6	M6 exposed suction cup	\$58	4-29
R-CES-30-6	M6 exposed suction cup	\$68	4-29
R-CES-50-6	M6 exposed suction cup	\$86	4-29
R-CH-89-6	M6 hold down clamp	\$77	4-21
R-CH-89-8	M8 hold down clamp	\$77	4-21
R-CH-133-6	M6 hold down clamp	\$73	4-21
R-CH-133-8	M8 hold down clamp	\$73	4-21
R-CJ-3	M6/M8 3-jaw clamp	\$374	4-20

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R-CJR-3	M4/M6 rotating 3-jaw clamp	\$291	4-20, 4-42
R-CMV-4	M4 mini vise	\$253	4-19, 4-42
R-CMV-6	M4 mini vise	\$253	4-19, 4-42
R-CMV-8	M8 mini vise	\$253	4-19
R-CP-4	M4 pusher clamp	\$79	4-19, 4-41
R-CP-6	M6 pusher clamp	\$79	4-19, 4-41
R-CPC-190	M8/M10/M12 CMM plate clamp	\$54	4-21
R-CPT-64-58-6	M6 positional tension clamp	\$63	4-21
R-CS-5-6	M6 suction cup	\$63	4-29
R-CS-10-6	M6 suction cup	\$62	4-29
R-CS-20-6	M6 suction cup	\$75	4-29
R-CS-30-6	M6 suction cup	\$88	4-29
R-CS-50-6	M6 suction cup	\$123	4-29
R-CSH-MP	9.5 mm diameter	\$7	4-30
R-CSH-MSC	6.4 mm diameter hose	\$13	4-30
R-CSM-6P	6-port manifold	\$197	4-30
R-CSM-10P	10-port manifold	\$267	4-30
R-CSP-6	M6 screw pusher clamp	\$81	4-19, 4-41
R-CSP-8	M8 screw pusher clamp	\$81	4-19
R-CSPS-1210-4	M4 spring pusher standoff clamp	\$45	4-20, 4-42
R-CSPS-1210-5	M5 spring pusher standoff clamp	\$46	4-20
R-CSPS-1925-6	M6 spring pusher standoff clamp	\$50	4-42
R-CSVP	Vacuum pump assembly	\$218	4-29
R-CT-40-25-4	M4 tension clamp	\$21	4-18, 4-40
R-CT-40-30-6	M6 tension clamp	\$23	4-18, 4-40
R-CT-40-30-8	M8 tension clamp	\$25	4-18
R-CT-40-70-6	M6 tension clamp	\$25	4-18, 4-40
R-CT-40-70-8	M8 tension clamp	\$27	4-18
R-CT-64-70-6	M6 tension clamp	\$26	4-18, 4-40
R-CT-64-70-8	M8 tension clamp	\$28	4-18
R-CT-95-83-6	M6 tension clamp	\$45	4-40
R-CT-95-83-8	M8 tension clamp	\$45	4-18
R-CT-95-86-6	M6 tension clamp	\$45	4-18
R-CT-100P-83-6	M6 tension clamp	\$57	4-18, 4-40
R-CT-100P-83-8	M8 tension clamp	\$57	4-18
R-CTB-25-6	M6 tension clamp bracket	\$62	4-20
R-CTB-25-8	M8 tension clamp bracket	\$63	4-20
R-CTT-40-25-4	M4 soft tip tension clamp	\$24	4-18, 4-40
R-CTT-40-30-6	M6 soft tip tension clamp	\$28	4-18, 4-40
R-CTT-40-30-8	M6 soft tip tension clamp	\$28	4-18
R-CTT-40-70-6	M6 soft tip tension clamp	\$30	4-18, 4-40
R-CTT-40-70-8	M8 soft tip tension clamp	\$30	4-18
R-CTT-64-70-6	M6 soft tip tension clamp	\$31	4-18, 4-40
R-CTT-64-70-8	M8 soft tip tension clamp	\$31	4-18
R-CTT-95-83-6	M6 soft tip tension clamp	\$50	4-18, 4-40
R-CTT-95-83-8	M8 soft tip tension clamp	\$50	4-18
R-CVM-4	M4 micro vise clamp	\$117	4-20, 4-42
R-CVM-6	M6 micro vise clamp	\$117	4-20, 4-42
R-CVM-B-4	M4 micro vise clamp	\$147	4-20, 4-42

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R-CVM-B-6	M6 micro vise clamp	\$147	4-20, 4-42
R-CVS-5-6	M6 suction V cup	\$81	4-29
R-CVS-10-6	M6 suction V cup	\$79	4-29
R-CVS-20-6	M6 suction V cup	\$96	4-29
R-CVS-30-6	M6 suction V cup	\$124	4-29
R-CVS-50-6	M6 suction V cup	\$171	4-29
R-CW-25-25-4	M4 spring wire clamp	\$28	4-18, 4-40
R-CW-25-25-6	M6 spring wire clamp	\$28	4-18, 4-40
R-CW-50-50-4	M4 spring wire clamp	\$32	4-18, 4-40
R-CW-50-50-6	M6 spring wire clamp	\$32	4-18, 4-40
R-CWT-25-25-4	M4 soft tip spring wire clamp	\$30	4-19, 4-41
R-CWT-25-25-6	M6 soft tip spring wire clamp	\$28	4-19, 4-41
R-CWT-50-50-4	M4 soft tip spring wire clamp	\$34	4-19, 4-41
R-CWT-50-50-6	M6 soft tip spring wire clamp	\$33	4-19, 4-41
R-FSC-CA-4	M4 CMM clamping kit A	\$929	4-3
R-FSC-CA-6	M6 CMM clamping kit A	\$805	4-4
R-FSC-CA-8	M8 CMM clamping kit A	\$789	4-10
R-FSC-CB-6	M6 CMM clamping kit B	\$2,054	4-5
R-FSC-CB-8	M8 CMM clamping kit B	\$2,153	4-11
R-FSC-CC-6	M6 CMM clamping kit C	\$3,545	4-6
R-FSC-CC-8	M8 CMM clamping kit C	\$3,534	4-12
R-FSC-MCA-6	M6 CMM magnetic and clamping kit A	\$1,033	4-7
R-FSC-MCA-8	M8 CMM magnetic and clamping kit A	\$992	4-13
R-FSC-MCB-6	M6 CMM magnetic and clamping kit B	\$2,333	4-8
R-FSC-MCB-8	M8 CMM magnetic and clamping kit B	\$2,470	4-14
R-FSC-MCC-6	M6 CMM magnetic and clamping kit C	\$3,827	4-9
R-FSC-MCC-8	M8 CMM magnetic and clamping kit C	\$3,850	4-15
RI-2197-2100	MP4 rear exit RBE	\$2,291	9-6
RI-2197-3000	MP4 side exit RBE	\$2,291	9-6
RI-4038-0001	OMP60 upgrade kit	\$1,992	2-7
RI-4038-1003	OMP60M upgrade kit	\$2,537	2-9
RI-4071-0001	OMP40 upgrade kit	\$1,992	2-3
RI-5069-0001	OMP400 upgrade kit	\$2,390	2-5
RI-5180-0001	OMP600 upgrade kit	\$2,390	2-10
RI-5312-0001	RMP600 upgrade kit	\$6,746	2-15
RI-5639-1700	MODUST™ on-site training (3 days)	\$7,700	1-64
RI-5639-1701	MODUST™ on-site training (4 days)	\$9,625	1-64
RI-5639-1702	MODUST™ on-site training (2 days)	\$5,775	1-64
RI-5639-1703	MODUST™ on-site training (1 day)	\$3,850	1-64
RI-5742-0001	RMP60 upgrade kit	\$5,447	2-13
RI-5742-1003	RMP60M upgrade kit	\$5,992	2-14
RI-6002-0001	CMM hourly labor	\$150/hour	1-65
RI-6002-0002	CMM hourly travel	\$75/hour	1-65
RI-6002-0003	CMM expenses	as incurred	1-65
RI-6002-0004	CMM in-house training	\$750/day	1-65
R-KC-C1A-4	M4 CMM clamping kit A	\$1,298	4-3
R-KC-C1A-6	M6 CMM clamping kit A	\$1,456	4-4
R-KC-C1A-8	M8 CMM clamping kit A	\$1,415	4-10
R-KC-C1B-6	M6 CMM clamping kit B	\$2,705	4-5

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R-KC-C1B-8	M8 CMM clamping kit B	\$2,779	4-11
R-KC-C1C-6	M6 CMM clamping kit C	\$4,196	4-6
R-KC-C1C-8	M8 CMM clamping kit C	\$4,160	4-12
R-KC-C2A-4	M4 CMM clamping kit A	\$1,690	4-3
R-KC-C2A-6	M6 CMM clamping kit A	\$1,901	4-4
R-KC-C2A-8	M8 CMM clamping kit A	\$1,810	4-10
R-KC-C2B-6	M6 CMM clamping kit B	\$3,150	4-5
R-KC-C2B-8	M8 CMM clamping kit B	\$3,174	4-11
R-KC-C2C-6	M6 CMM clamping kit C	\$4,641	4-6
R-KC-C2C-8	M8 CMM clamping kit C	\$4,555	4-12
R-KC-C3A-6	M6 CMM clamping kit A	\$2,801	4-4
R-KC-C3A-8	M8 CMM clamping kit A	\$2,570	4-10
R-KC-C3B-6	M6 CMM clamping kit B	\$4,050	4-5
R-KC-C3B-8	M8 CMM clamping kit B	\$3,934	4-11
R-KC-C3C-6	M6 CMM clamping kit C	\$5,541	4-6
R-KC-C3C-8	M8 CMM clamping kit C	\$5,315	4-12
R-KC-C4A-6	M6 CMM clamping kit A	\$3,400	4-4
R-KC-C4A-8	M8 CMM clamping kit A	\$3,239	4-10
R-KC-C4B-6	M6 CMM clamping kit B	\$4,649	4-5
R-KC-C4B-8	M8 CMM clamping kit B	\$4,603	4-11
R-KC-C4C-6	M6 CMM clamping kit C	\$6,140	4-6
R-KC-C4C-8	M8 CMM clamping kit C	\$5,984	4-12
R-KC-C5A-6	M6 CMM clamping kit A	\$3,905	4-4
R-KC-C5A-8	M8 CMM clamping kit A	\$3,784	4-10
R-KC-C5B-6	M6 CMM clamping kit B	\$5,154	4-5
R-KC-C5B-8	M8 CMM clamping kit B	\$5,148	4-11
R-KC-C5C-6	M6 CMM clamping kit C	\$6,645	4-6
R-KC-C5C-8	M8 CMM clamping kit C	\$6,529	4-12
R-KC-C6A-6	M6 CMM clamping kit A	\$5,605	4-4
R-KC-C6A-8	M8 CMM clamping kit A	\$5,284	4-10
R-KC-C6B-6	M6 CMM clamping kit B	\$6,854	4-5
R-KC-C6B-8	M8 CMM clamping kit B	\$6,648	4-11
R-KC-C6C-6	M6 CMM clamping kit C	\$8,345	4-6
R-KC-C6C-8	M8 CMM clamping kit C	\$8,029	4-12
R-KC-MC1A-6	M6 CMM magnetic and clamping kit A	\$1,684	4-7
R-KC-MC1A-8	M8 CMM magnetic and clamping kit A	\$1,618	4-13
R-KC-MC1B-6	M6 CMM magnetic and clamping kit B	\$2,984	4-8
R-KC-MC1B-8	M8 CMM magnetic and clamping kit B	\$3,096	4-14
R-KC-MC1C-6	M6 CMM magnetic and clamping kit C	\$4,478	4-9
R-KC-MC1C-8	M8 CMM magnetic and clamping kit C	\$4,476	4-15
R-KC-MC2A-6	M6 CMM magnetic and clamping kit A	\$2,129	4-7
R-KC-MC2A-8	M8 CMM magnetic and clamping kit A	\$2,013	4-13
R-KC-MC2B-6	M6 CMM magnetic and clamping kit B	\$3,429	4-8
R-KC-MC2B-8	M8 CMM magnetic and clamping kit B	\$3,491	4-14
R-KC-MC2C-6	M6 CMM magnetic and clamping kit C	\$4,923	4-9
R-KC-MC2C-8	M8 CMM magnetic and clamping kit C	\$4,871	4-15
R-KC-MC3A-6	M6 CMM magnetic and clamping kit A	\$3,029	4-7
R-KC-MC3A-8	M8 CMM magnetic and clamping kit A	\$2,773	4-13
R-KC-MC3B-6	M6 CMM magnetic and clamping kit B	\$4,329	4-8

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R-KC-MC3B-8	M8 CMM magnetic and clamping kit B	\$4,251	4-14
R-KC-MC3C-6	M6 CMM magnetic and clamping kit C	\$5,823	4-9
R-KC-MC3C-8	M8 CMM magnetic and clamping kit C	\$5,631	4-15
R-KC-MC4A-6	M6 CMM magnetic and clamping kit A	\$3,628	4-7
R-KC-MC4A-8	M8 CMM magnetic and clamping kit A	\$3,442	4-13
R-KC-MC4B-6	M6 CMM magnetic and clamping kit B	\$4,928	4-8
R-KC-MC4B-8	M8 CMM magnetic and clamping kit B	\$4,920	4-14
R-KC-MC4C-6	M6 CMM magnetic and clamping kit C	\$6,422	4-9
R-KC-MC4C-8	M8 CMM magnetic and clamping kit C	\$6,300	4-15
R-KC-MC5A-6	M6 CMM magnetic and clamping kit A	\$4,133	4-7
R-KC-MC5A-8	M8 CMM magnetic and clamping kit A	\$3,987	4-13
R-KC-MC5B-6	M6 CMM magnetic and clamping kit B	\$5,433	4-8
R-KC-MC5B-8	M8 CMM magnetic and clamping kit B	\$5,465	4-14
R-KC-MC5C-6	M6 CMM magnetic and clamping kit C	\$6,927	4-9
R-KC-MC5C-8	M8 CMM magnetic and clamping kit C	\$6,845	4-15
R-KC-MC6A-6	M6 CMM magnetic and clamping kit A	\$5,833	4-7
R-KC-MC6A-8	M8 CMM magnetic and clamping kit A	\$5,487	4-13
R-KC-MC6B-6	M6 CMM magnetic and clamping kit B	\$7,133	4-8
R-KC-MC6B-8	M8 CMM magnetic and clamping kit B	\$6,965	4-14
R-KC-MC6C-6	M6 CMM magnetic and clamping kit C	\$8,627	4-9
R-KC-MC6C-8	M8 CMM magnetic and clamping kit C	\$8,345	4-15
RLP40-NS-KIT	RLP40 hardware only kit	\$7,849	2-28
RLP40-NS-S	RLP40 retrofit kit	Call for price	2-28
R-M-6-4	M4 magnet	\$27	4-22, 4-43
R-M-13-4	M4 magnet	\$44	4-22, 4-43
R-M-13-6	M6 magnet	\$30	4-22, 4-43
R-M-13-8	M8 magnet	\$31	4-22
R-M-19-6	M6 magnet	\$33	4-22, 4-43
R-M-19-8	M8 magnet	\$34	4-22
R-M-25-6	M6 magnet	\$43	4-22, 4-43
R-M-25-8	M8 magnet	\$44	4-22
R-M-32-6	M6 magnet	\$53	4-22, 4-43
R-M-32-8	M8 magnet	\$56	4-22
R-MP-6-4	M4 pin magnet	\$59	4-22, 4-43
R-MP-13-4	M4 pin magnet	\$67	4-22, 4-43
R-MP-13-6	M6 pin magnet	\$59	4-22, 4-43
R-MP-13-8	M8 pin magnet	\$65	4-22
R-MP-19-6	M6 pin magnet	\$70	4-22, 4-43
R-MP-19-8	M8 pin magnet	\$76	4-22
R-MP-25-6	M6 pin magnet	\$74	4-22, 4-43
R-MP-25-8	M8 pin magnet	\$80	4-22
RMP40M-NS-KIT	RMP40M hardware only kit	\$8,227	2-29
RMP40M-NS-S	RMP40M retrofit kit	Call for price	2-29
RMP40-NS-KIT	RMP40 hardware only kit	\$8,459	2-12
RMP40-NS-S	RMP40 retrofit kit	Call for price	2-12
RMP60-NS-KIT	RMP60 hardware only kit	\$8,459	2-13
RMP60-NS-S	RMP60 retrofit kit	Call for price	2-13
RMP600-NS-KIT	RMP600 hardware only kit	\$10,496	2-15
RMP600-NS-S	RMP600 retrofit kit	Call for price	2-15

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R-MV-13-6	M6 V magnet	\$65	4-22, 4-43
R-MV-13-8	M8 V magnet	\$77	4-22
R-MV-19-6	M6 V magnet	\$78	4-22, 4-43
R-MV-19-8	M8 V magnet	\$87	4-22
R-MV-25-6	M6 V magnet	\$84	4-22, 4-43
R-MV-25-8	M8 V magnet	\$91	4-22
R-MV-32-6	M6 V magnet	\$103	4-22, 4-43
R-MV-32-8	M8 V magnet	\$115	4-22
R-MVB-13-6	M6 V magnet with base	\$116	4-23, 4-43
R-MVB-19-6	M6 V magnet with base	\$118	4-23, 4-43
R-MVB-19-8	M8 V magnet with base	\$134	4-23
R-MVB-25-6	M6 V magnet with base	\$121	4-23, 4-43
R-MVB-25-8	M8 V magnet with base	\$138	4-23
R-MVB-32-6	M6 V magnet with base	\$142	4-23, 4-43
R-MVB-32-8	M8 V magnet with base	\$167	4-23
R-PC-13150150-10-4	CMM base plate M4	\$369	4-2
R-PC-13300300-10-4	CMM base plate M4	\$761	4-2
R-PC-13300300-12-6	CMM base plate M6	\$651	4-2
R-PC-13300300-15-8	CMM base plate M8	\$626	4-2
R-PC-13450450-12-6	CMM base plate M6	\$1,096	4-2
R-PC-13450450-15-8	CMM base plate M8	\$1,021	4-2
R-PC-19600600-12-6	CMM base plate M6	\$1,996	4-2
R-PC-19600600-15-8	CMM base plate M8	\$1,781	4-2
R-PC-19750750-12-6	CMM base plate M6	\$2,595	4-2
R-PC-19750750-15-8	CMM base plate M8	\$2,450	4-2
R-PC-197501000-12-6	CMM base plate M6	\$3,100	4-2
R-PC-197501020-15-8	CMM base plate M8	\$2,995	4-2
R-PC-199001200-12-6	CMM base plate M6	\$4,800	4-2
R-PC-199001200-15-8	CMM base plate M8	\$4,495	4-2
R-PCA-135075-10-4	M4 adjustable angle plate	\$178	4-17, 4-39
R-PCA-135075-12-6	M6 adjustable angle plate	\$178	4-17, 4-39
R-PCV-507540-10-4	M4 vertical base plate	\$138	4-24, 4-44
R-PEC-13300300-6	EQUATOR™ fixturing plate (single ¼-20 hole)	\$260	3-7
R-PV-13150150-10-4	M4 multi-hole vision plate	\$333	4-37
R-PV-13150150-12-6	M6 multi-hole vision plate	\$333	4-37
R-PV-13200200-10-4	M4 multi-hole vision plate	\$438	4-37
R-PV-13250150-10-4	M4 multi-hole vision plate	\$428	4-37
R-PV-13250250-10-4	M4 multi-hole vision plate	\$518	4-37
R-PV-13250250-12-6	M6 multi-hole vision plate	\$458	4-37
R-PV-W-13200200-10-4	M4 multi-window vision plate	\$353	4-37
R-PV-W-13250150-10-4	M4 multi-window vision plate	\$343	4-37
R-PV-W-13250250-10-4	M4 multi-window vision plate	\$373	4-37
R-PV-W-13250250-12-6	M6 multi-window vision plate	\$343	4-37
R-PV-W-13400400-10-4	M4 multi-window vision plate	\$1,007	4-37
R-PV-W-13400400-12-6	M6 multi-window vision plate	\$1,002	4-37
R-RCA-6	M6 aluminum cone	\$26	4-23, 4-44
R-RCA-8	M8 aluminum cone	\$26	4-23
R-RCD-6	M6 Delrin® cone	\$9	4-23, 4-44
R-RCD-8	M8 Delrin® cone	\$9	4-23

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R-RCS-6	M6 steel cone	\$15	4-23, 4-44
R-RCS-8	M8 steel cone	\$11	4-23
R-RCS-25-8	M8 steel cone	\$28	4-23
R-RPA-4	M4 aluminum resting pin	\$10	4-23, 4-44
R-RPD-4	M4 Delrin® resting pin	\$16	4-23, 4-44
R-RPD-6	M65 Delrin® resting pin	\$16	4-23, 4-44
R-RPS-6	M65 steel resting pin	\$10	4-23, 4-44
R-S-65-4	M4 standoff	\$12	4-25, 4-45
R-S-95-4	M4 standoff	\$12	4-25, 4-45
R-S-95-6	M6 standoff	\$12	4-25, 4-45
R-S-125-4	M4 standoff	\$12	4-25, 4-45
R-S-610-4	M4 standoff	\$12	4-25, 4-45
R-S-610-6	M6 standoff	\$12	4-25, 4-45
R-S-615-4	M4 standoff	\$16	4-25, 4-45
R-S-620-4	M4 standoff	\$15	4-25, 4-45
R-S-625-4	M4 standoff	\$14	4-25, 4-45
R-S-625-6	M6 standoff	\$13	4-25, 4-45
R-S-910-4	M4 standoff	\$12	4-25, 4-45
R-S-910-6	M6 standoff	\$10	4-25, 4-45
R-S-915-4	M4 standoff	\$17	4-25, 4-45
R-S-915-6	M6 standoff	\$16	4-25, 4-45
R-S-920-4	M4 standoff	\$13	4-25, 4-45
R-S-920-6	M6 standoff	\$13	4-25, 4-45
R-S-925-4	M4 standoff	\$13	4-25, 4-45
R-S-925-6	M6 standoff	\$13	4-25, 4-45
R-S-950-4	M4 standoff	\$16	4-25, 4-45
R-S-1210-4	M4 standoff	\$13	4-25, 4-45
R-S-1215-4	M4 standoff	\$16	4-25, 4-45
R-S-1220-4	M4 standoff	\$15	4-25, 4-45
R-S-1225-4	M4 standoff	\$14	4-25, 4-45
R-S-1250-4	M4 standoff	\$17	4-25, 4-45
R-S-1310-6	M standoff	\$11	4-25, 4-45
R-S-1315-6	M6 standoff	\$12	4-25, 4-45
R-S-1315-8	M8 standoff	\$11	4-26
R-S-1320-6	M6 standoff	\$11	4-25, 4-45
R-S-1320-8	M8 standoff	\$11	4-26
R-S-1325-6	M6 standoff	\$11	4-25, 4-45
R-S-1325-8	M8 standoff	\$11	4-26
R-S-1350-2W-6	M6 2-way spring-loaded pin	\$121	4-27, 4-47
R-S-1350-4W-6	M6 4-way spring-loaded pin	\$109	4-27, 4-47
R-S-1350-6	M6 standoff	\$13	4-25, 4-45
R-S-1350-8	M8 standoff	\$11	4-26
R-S-1910-6	M6 standoff	\$12	4-25, 4-45
R-S-1915-6	M6 standoff	\$13	4-25, 4-45
R-S-1915-8	M8 standoff	\$12	4-26
R-S-1920-6	M6 standoff	\$12	4-25, 4-45
R-S-1920-8	M8 standoff	\$12	4-26
R-S-1925-6	M6 standoff	\$12	4-25, 4-45
R-S-1925-8	M8 standoff	\$14	4-26

Part number	Description	Price	Page number
R-S-1950-6	M6 standoff	\$15	4-25, 4-45
R-S-1950-8	M8 standoff	\$14	4-26
R-S-2515-6	M6 standoff	\$18	4-26, 4-46
R-S-2520-6	M6 standoff	\$14	4-26, 4-46
R-S-2520-8	M8 standoff	\$14	4-26
R-S-2525-6	M6 standoff	\$15	4-26, 4-46
R-S-2525-8	M8 standoff	\$14	4-26
R-S-2550-2W-6	M6 2-way spring-loaded pin	\$113	4-27, 4-47
R-S-2550-2W-8	M8 2-way spring-loaded pin	\$113	4-27
R-S-2550-4W-6	M6 4-way spring-loaded pin	\$103	4-27, 4-47
R-S-2550-4W-8	M8 4-way spring-loaded pin	\$103	4-27
R-S-2550-6	M6 standoff	\$16	4-26, 4-46
R-S-2550-8	M8 standoff	\$15	4-26
R-S-3825-6	M6 standoff	\$28	4-26, 4-46
R-S-3825-8	M8 standoff	\$33	4-26
R-S-3850-6	M6 standoff	\$30	4-26
R-S-3850-8	M8 standoff	\$36	4-26
R-S-13100-6	M6 standoff	\$20	4-25, 4-45
R-S-13100-8	M8 standoff	\$17	4-26
R-S-13150-6	M6 standoff	\$21	4-25, 4-45
R-S-19100-6	M6 standoff	\$16	4-25, 4-45
R-S-19100-8	M8 standoff	\$16	4-26
R-S-19150-6	M6 standoff	\$22	4-25, 4-45
R-S-19150-8	M8 standoff	\$23	4-26
R-S-25100-6	M6 standoff	\$18	4-26, 4-46
R-S-25100-8	M8 standoff	\$18	4-26
R-S-25150-6	M6 standoff	\$25	4-26, 4-46
R-S-25150-8	M8 standoff	\$25	4-26
R-S-38150-6	M6 standoff	\$43	4-26, 4-46
R-S-38150-8	M8 standoff	\$54	4-26
R-SA-4-6	M6 standoff adaptor	\$15	4-28, 4-47
R-SA-6-4	M4 standoff adaptor	\$15	4-28, 4-47
R-SA-6-8	M8 standoff adaptor	\$18	4-28, 4-47
R-SA-8-6	M6 standoff adaptor	\$17	4-28, 4-47
R-SD-610-4	M4 Delrin® standoff	\$13	4-26, 4-46
R-SD-910-4	M4 Delrin® standoff	\$15	4-26, 4-46
R-SD-925-6	M6 Delrin® standoff	\$15	4-26, 4-46
R-SD-1210-4	M4 Delrin® standoff	\$16	4-26, 4-46
R-SD-1325-6	M6 Delrin® standoff	\$14	4-26, 4-46
R-SD-1925-6	M6 Delrin® standoff	\$15	4-26, 4-46
R-SP-610-4	M4 pin standoff	\$14	4-27, 4-46
R-SP-610-6	M6 pin standoff	\$15	4-27, 4-46
R-SP-910-4	M4 pin standoff	\$14	4-27, 4-46
R-SP-910-6	M6 pin standoff	\$15	4-27, 4-46
R-SP-1210-4	M4 pin standoff	\$14	4-27, 4-46
R-SP-1325-6	M6 pin standoff	\$15	4-27, 4-46
R-SP-1325-8	M8 pin standoff	\$16	4-27
R-SP-1925-6	M6 pin standoff	\$26	4-27, 4-46
R-SP-2525-8	M8 pin standoff	\$30	4-27

Alpha-numeric price list

Part number	Description	Price	Page number
R-SPD-910-4	M4 Delrin® pin standoff	\$15	4-27, 4-46
R-SPD-1325-6	M6 Delrin® pin standoff	\$15	4-27, 4-46
R-SR-2525-6	M6 rotator standoff	\$67	4-28, 4-47
R-STB-13-6	M tooling ball	\$72	4-28
R-STB-13-8	M8 tooling ball	\$72	4-28
R-T-25150-6	M6 tower	\$166	4-31, 4-48
R-T-25150-8	M8 tower	\$166	4-31
R-T-25300-6	M6 tower	\$211	4-31
R-T-25300-8	M8 tower	\$217	4-31
R-T-35300-6	M6 tower	\$315	4-31
R-T-35300-8	M8 tower	\$368	4-31
R-T-35450-6	M6 tower	\$381	4-31
R-T-35450-8	M8 tower	\$433	4-31
R-T-50600-6	M tower	\$613	4-31
R-T-50600-8	M8 tower	\$650	4-31
R-T-50750-6	M6 tower	\$732	4-31
R-T-50750-8	M8 tower	\$759	4-31
R-TB-1619-4	M4 tower block with base	\$66	4-31, 4-48
R-TB-2025-6	M6 tower block with base	\$70	4-31, 4-48
R-TB-2530-8	M8 tower block with base	\$91	4-31
R-TC-300190-4	M4 small component tray	\$138	4-32, 4-48
R-TC-300190-6	M6 small component tray	\$148	4-32, 4-48
R-TC-300200	M6/M8 small component tray	\$148	4-32
R-TC-500200	M6/M8 medium component tray	\$152	4-32, 4-48
R-TC-560500	M6/M8 large component tray	\$338	4-32
R-TCS-300200	M6 suction cup tray	\$133	4-30
RTSAA-KIT	RTS hardware only kit	\$6,010	2-20
RTSAA-S	RTS retrofit kit	Call for price	2-20
S-8BBR-0052	Ballbar centering device	\$158	5-8
S-8LMS-2124	Linear diagonal measurement fixture kit	\$1,896	5-23
SEALTITE, 7455	Sealtite conduit	\$36	2-24
SYS-XL-UG2	General laser system to XL-80 upgrade	Call for price	5-19
SYS-XL-UPG	ML-10 to XL-80 upgrade	\$19,830	5-19
T-2000-1080-S	Calibration training on-site (1-2 days)	\$6,704	5-33
T-2000-1081-S	Calibration training on-site (4 days)	\$11,173	5-33
TRACE-1003	Ballbar TRACE kit with 25 mm straight shank	\$996	5-8
TRACE-1004	Ballbar TRACE kit with 1/2 in straight shank	\$996	5-8
TRACE-1007	Ballbar TRACE kit with 1 in straight shank	\$996	5-8
TRS2-KIT	TRS2 hardware kit	\$2,756	2-24
TRS2-S	TRS2 retrofit kit	Call for price	2-24
TS27R-KIT	TS27R hardware only kit	\$1,481	2-21
TS27R-S	TS27R retrofit kit	Call for price	2-21
UPG-TB10-SERV-1	TB20 upgrade from TB10	\$3,456	5-25
XL80-BASE-RENTAL-US	XL-80 linear rental	\$1,789/week	5-34
XL80-BASE	XL-80 laser base system kit	\$26,441	5-18
XL-80-LNAN-RENTAL-US	XL-80 linear and angular rental	\$2,020/week	5-34
XR20W-CAL-BOX	XR20-W packing case	\$70	9-9
XR20W-RENTAL-US	XR20-W rental with angular beam splitter	\$1,397/week	5-34
XR20W-UPG	XR20-W rotary axis calibrator upgrade	\$16,325	5-31