DIMENSIONAIR I AIR GAGING INSTRUMENTS
DIMENTRON I PRECISION BORE GAGES

Mahr FEDERAL

EXACTLY

Experience with Gaging Technology

Technical innovation and quality-oriented thinking are the core competencies of successful businesses. Both competencies are not possible without metrology. Measurement instruments verify research and development results and document product quality. Without continuous advancement of metrology there would be no technical progress.

Mahr Federal has been an innovator of precision hole gaging since the first air gaging was introduced in the 1940's. Mahr Federal has perfected the Single Master Air Gage system that out performs other systems with its accuracy and linearity. The quality is built into the tooling and display units.

Over this period of time Mahr Federal has designed 100,000's of air gages - from the most basic air plug to complex automated air gaging systems. All capable of measuring the most demanding manufactured pieces - critical for today's automotive, medical and aerospace requirements.

Recently Mahr Federal as further advanced its leadership with a new line of the most universal Dimensionair systems that allow for unmatched performance from adjustable magnification air gaging systems. Our breakthrough products bring easy to use and high performance to any air gaging system.

There are precision hole applications where mechanical fixed plugs may best fit the application. In the 1970's Mahr Federal again was an innovator in fixed plug gaging with the introduction of the Dimentron Plug in the 1970's. Again through the subsequent years thousands of successful Dimentron plug solutions have been employed in the manufacturing environment.

Engineering Solutions to these tough measuring application demands is done all within Mahr Federal. From the initial concept, through engineering design, precision manufacturing and finally assembling and test are all performed in house. We take full responsibility and accountability for the gages produced - right until they are delivered and performing on your shop floor.

To be a Metrology Supplier - one has to know and understand metrology. Mahr Federal has built one of the best Precision Measurement facilities in the country. Mahr Federal's calibration system is certified to ISO-9001:2000 by NQA, USA and accredited to ISO 17025 NVLAP Lab Code 200605-0.

We are committed to Metrology and to bringing the best metrology solutions to you.

Dimentron® Plug Gages

The Need for Fixed Plug Gaging

Fixed Plug Gaging is the inspection tool that allows you to measure many jobs faster, more conveniently, and more accurately than by other gaging methods. In the measurement of all hole conditions, the Dimentron System is unsurpassed for speed and accuracy. In standard applications it offers sufficient magnification and reliability to measure tolerances well beyond the scope of mechanical gages. For critical dimension applications special designs can be implemented to enhance the performance for some of the most demanding requirements

Easy to Use

Production workers do not require special training to use Dimentron Plugs. To check a hole, for instance, it is not necessary to develop skill in rocking the gage to find the true diameter, merely insert the air plug in the hole and read the meter. It is as simple as that.

Fixed Size I.D. Gaging

- Designed for high production I.D. gaging.
- Chromed, hardened steel bodies ground precisely for specified size measurement.
- Plug tooling interchangeable for quick changeover.
- Measurement is easy – just insert plug into diameter and read. No rocking needed.
- Set to nominal dimension with a single master ring.
- Long life: tungsten carbide contacts and vee rod insure durable motion transfer.
- Three styles of plugs available – Thru-hole, Blind-hole and Super-blind hole.
- Open design rinses clean easily.
- Explore bores for taper, barrel-shape, bell-mouth and 2-point out-of-round.
- Stop Collars available for all standard sizes.
- Captive vee rod design.
- Easy entry lead makes for part entry with even the tightest tolerances.

Economical

Once the basic gage readout is purchased, whether it be a digital indicator or electronic amplifier is purchased, additional tooling for a wide variety of jobs can be used with it. It is not necessary to buy a complete gage for each new dimension that requires checking. Because of its adaptability, Dimentron Gaging often becomes the primary measuring system in a complete quality control program.

Versatile

Dimentron Plugs effectively measure precision holes. Because of the differential nature of the two contact measuring system the plug can be used to explore the dimension for variances due to out of round, taper, barrel or bell mouth conditions

The simple and proven operating characteristics of the Dimentron plug make them particularly useful for checking a wide variety of hole configurations. A full list of optional configurations allow for measuring of virtually any hole requirements.

Dimentron Plugs are readily adaptable to measuring parts in the machine. Their small gage heads make most dimensions accessible with portable displays that bring the measurement results right to the point of manufacture. Thus speeding the process and making it easier for the operator to make his critical measurements.

Thru-hole and Blind Hole Dimentron Plugs

Dimentron® Plug Gages

The Dimentron System - Built for Performance -

Dimentron Plug Assembly — shown with Maxμm® III Indicator, Housing and Handle

The Dimentron plug gage, which is formed by the plug body, the panto-assembly with contacts and the transfer rod, is the measuring system comprising the Dimentron plug. It can be interchanged by simply unscrewing it from the display assembly.

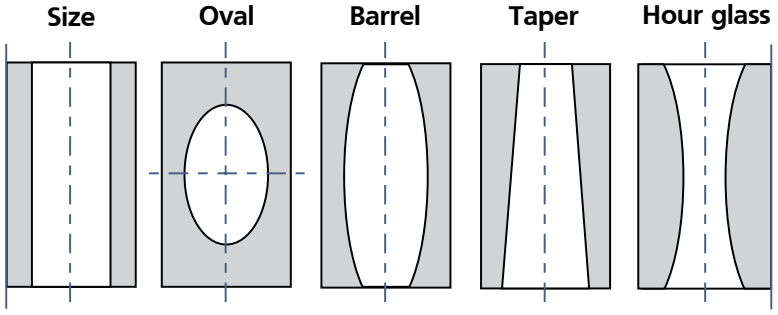
The **plug body** is made from through hardened 440 stainless steel, tempered and ground, with hardness 52-56 HRC, guides the plug gage; its easy entry guide facilitate introduction into the bore.

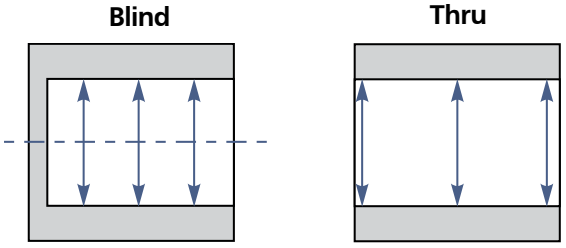
Standard **contacts** are made of tungsten carbide and based on the bore diameter range, come in two possible radii. Other contact materials are available based on the part being measured. Diamond, Ruby or hard-chrome-covered contacts are also available. Diamond or ruby contacts are suggested for soft aluminum or highly wearing applications; hard chromed ones (1000 HV) for aluminum and relevant alloys. Also based n the thickness of the surface available options cylindrical contacts may be ordered.

Either 2 or 4 steel spring assemblies **form panto-spring assemblies**. The design of the transfer assembly is determined by the diameter of the plug. This panto-design produces true straight-line transfer to the Vee-rod.

A **transfer rod**, with spherical tungsten carbide tip, slides on a tempered steel V-shaped guide and inclined plane, transferring the measurement to the display device. This unique floating system has been designed and tested to resist for over 10,000,000 measuring cycles.

Though designed for the toughest shop conditions, wear items do occasionally need replacement. Because of the individual components **service is fast and easy**. All parts are available separately from Mahr Federal and with standard tools, can be replaced in minutes to help maintain up time on the floor.





Dimentron® Plug Gages

Dimentron Plug Applications

Two-Point Gaging

Provides fast measurement of diameters. While exploring the part with the gage will help evaluate the part for ovality, taper, barrel or hour-glass conditions

Thru or Blind Hole Designs

Dimentron plugs are available in Thru, Blind, Super Blind and Super-Super Blind hold designs to assure that the part is inspected for the exact parameter desired.

Ordering Information

When ordering specify:
1. Diameter
2. Tolerance
3. Gaging depth
4. Plug style
5. Contact type – polished chrome steel or tungsten carbide
6. Stop collar

Gaging Range:
Dimentron Plugs are ground to one of four measuring ranges, based on part tolerance.

Technical Data

Sizes above	To and include	Maximum Part Tolerance Metric M01 Inch 050	M02 100	M05 200	M08 400
3.18 mm/ ***.1250"***	3.62 mm/ ***.145"***	±0.025 mm/ ***±0010"***	±0.038 mm/ ***±0015"***		
3.62 mm/ ***.1426"***	5.52 mm/ ***.217"***	±0.025 mm/ ***±0010"***	±0.046 mm/ ***±0018"***	±0.076 mm/ ***±0030"***	
5.50 mm/ ***.2171"***	7.94 mm/ ***.312"***	±0.025 mm/ ***±0010"***	±0.046 mm/ ***±0018"***	±0.069 mm/ ***±0027"***	±0.102 mm/ ***±0040"***
7.94 mm/ ***.3125"***	9.5 mm/ ***.375"***	±0.030 mm/ ***±0012"***	±0.051 mm/ ***±0020"***	±0.069 mm/ ***±0027"***	±0.127 mm/ ***±0050"***
9.50 mm/ ***.3750"***	12.7 mm/ ***.50"***	±0.038 mm/ ***±0015"***	±0.058 mm/ ***±0023"***	±0.086 mm/ ***±0034"***	±0.137 mm/ ***±0054"***
12.7 mm/ ***.5000"***	19.05 mm/ ***.75"***	±0.038 mm/ ***±0015"***	±0.069 mm/ ***±0027"***	±0.102 mm/ ***±0040"***	±0.165 mm/ ***±0065"***
19.05 mm/ ***.750"***	25.4 mm/ ***1.00"***	±0.038 mm/ ***±0015"***	±0.076 mm/ ***±0030"***	±0.127 mm/ ***±0050"***	±0.180 mm/ ***±0071"***
25.4 mm/ ***1.000"***	38 mm/ ***1.50"***	±0.038 mm/ ***±0015"***	±0.076 mm/ ***±0030"***	±0.152 mm/ ***±0060"***	±0.221 mm/ ***±0087"***
38 mm/ ***1.500"***	114.3 mm/ ***4.5"***		±0.076 mm/ ***±0030"***	±0.152 mm/ ***±0060"***	±0.254 mm/ ***±0100"***
114.3 mm/ ***4.5"***	229 mm/ ***9.00"***			±0.152 mm/ ***±0060"***	±0.254 mm/ ***±0100"***

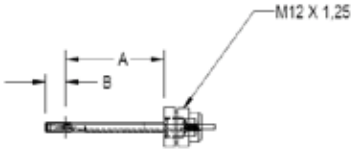
Order Maxμm Indicator and Accessories separately.

Accuracy Specification Dimentron Plugs

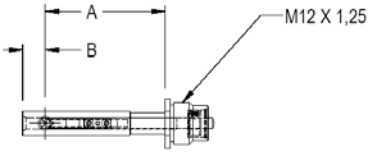
Hysteresis 0.5μm/ 20 μ"
Repeatability 0.5μm/ 20μ"
Linearity 2% of measuring range

Dimentron® Plug Gages

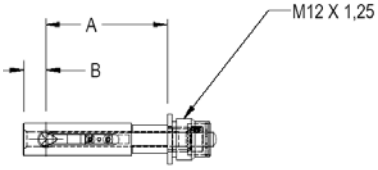
Through Hole Dimentron Plugs



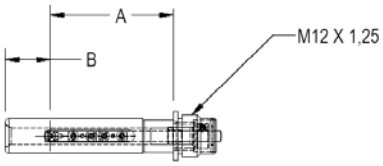
Size range: .1250 to .2170"



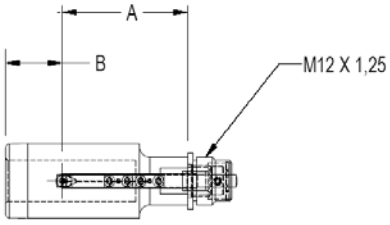
Size range: .2171 to .3220"



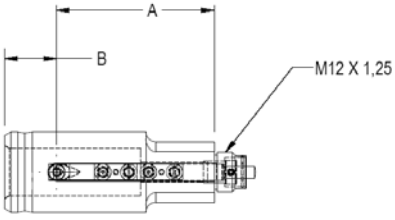
Size range: .3221 to .3750"



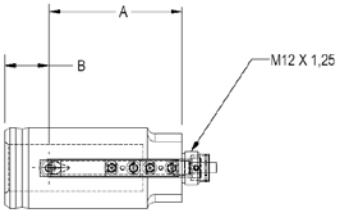
Size range: .3751 to .5000"



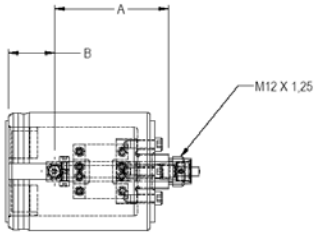
Size range: .5001 to .7500"



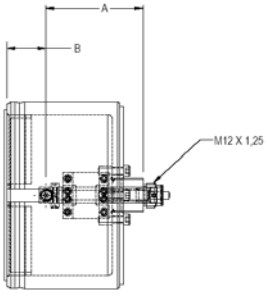
Size range: .7501 to 1.000"



Size range: 1.0001 to 1.5000"



Size range: 1.5001 to 2.5000"

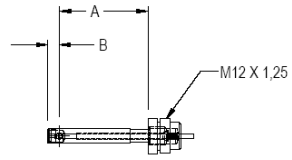


Size range: 2.5001 to 4.5000"

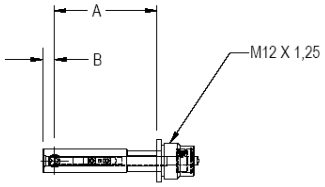
Sizes above	To and include	A	B	Group*
3.2mm/ *.125"*	5.5mm/ *.217"*	31.2mm/ *1.23"*	6.4mm/ *.25"*	no group**
5.5mm/ *.217"*	8.2mm/ *.322"*	34.8mm/ *1.37"*	6.5mm/ *.256"*	5
8.2mm/ *.322"*	9.5mm/ *.375"*	34.8mm/ *1.37"*	6.5mm/ *.256"*	6
9.5mm/ *.375"*	12.7mm/ *.50"*	35.3mm/ *1.39"*	13mm/ *.512"*	8
12.7mm/ *.50"*	19.05mm/ *.75"*	35.3mm/ *1.39"*	13mm/ *.512"*	8
19.05mm/ *.75"*	25.40mm/ *1.0"*	48.3mm/ *1.90"*	16mm/ *.63"*	12
25.40mm/ *1.0*"	38.10mm/ *1.5*"	48.3mm/ *1.90*"	16mm/ *.63*"	12
38mm/ *1.50"*	63mm/ *2.50"*	46.7mm/ *1.84"*	19mm/ *.748"*	12
63mm/ *2.50"*	114.3mm/ *4.5"*	46.7mm/ *1.84"*	19mm/ *.748"*	12
114.3mm/ *4.50"*	228.6mm/ *9.0"*	46.7mm/ *1.84"*	9.5mm/ *.375"*	12

Dimentron® Plug Gages

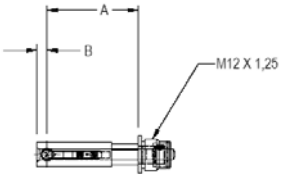
Blind-Hole Dimentron Plugs



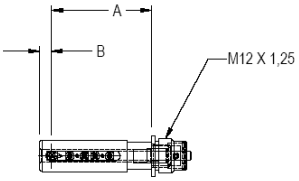
Size range: .1250 to .2170"



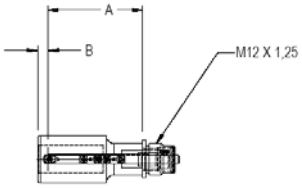
Size range: .2171 to .3220"



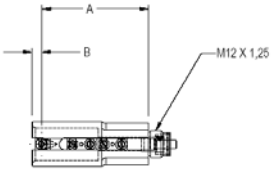
Size range: .3221 to .3750"



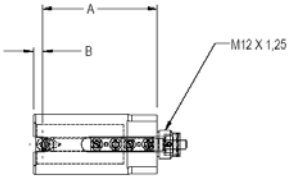
Size range: .3751 to .5000"



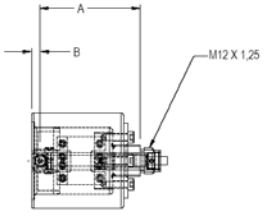
Size range: .5001 to .7500"



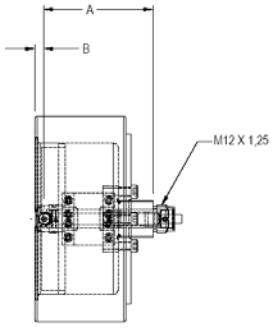
Size range: .7501 to 1.000"



Size range: 1.0001 to 1.5000"



Size range: 1.5001 to 2.5000"



Size range: 2.5001 to 4.500"

Blind-Hole Plugs***
Use Dimension "A" below. Dimension "B" is 4mm/ **.157 in.**

Super-Blind Plugs
Use Dimension "A" Below. Dimension "B" is 2mm/**.08 in** for 5.5mm/**.217 in** and up.

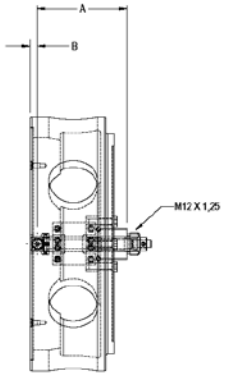
Super-Super Blind Plugs
Use Dimension "A" Below. Dimension "B" is 0.79mm/**.031 in**
(**4.5000 in to 9.00 in** not avilable with this model)

Sizes above	To and include	A	Group*
3.2mm/ ***.125"***	5.5mm/ ***.217"***	31.2mm/ ***1.23"***	no group**
5.5mm/ ***.217"***	8.2mm/ ***.322"***	34.8mm/ ***1.37"***	5
8.2mm/ ***.322"***	9.5mm/ ***.375"***	34.8mm/ ***1.37"***	6
9.5mm/ ***.375"***	12.7mm/ ***.50"***	35.3mm/ ***1.39"***	8
12.7mm/ ***.50"***	19.05mm/ ***.75"***	35.3mm/ ***1.39"***	8
19.05mm/ ***.75"***	25.40mm/ ***1.0"***	48.3mm/ ***1.90"***	12
25.40mm ***.1.0***"	38.1mm/ ***1.50***"	48.3mm/ ***1.90"***	12
38.1mm/ ***1.50"***	63.5mm/ ***2.50"***	46.7mm/ ***1.84"***	12
63.5mm/ ***2.50"***	114.3mm/ ***4.50***	46.7mm/ ***1.84"***	12
114.3mm/ ***4.50"***	228.6mm/ ***9.00"***	46.7mm/ ***1.84"***	12

** Group number specifies thread size on gaging plugs. Threaded bushings are provided with each plug to allow mounting to Maxμm® Adaptor or Electronic Handle Assembly.*

*** Only available as Thru- and Blind-Hole Small Bore Probe. For larger or smaller plugs, alternate contact materials, extended gaging depths, more clearance, or other plug modifications, contact Mahr Federal for assistance.*

**** A Blind-hole Dimentron® Plug Gage with μMaxμm® Digital Electronic Indicator makes a compact, lightweight, portable hand tool.*



Size range: 4.5001" Up

Dimentron® Plug Gages

Options for Dimentron Plugs

Extended Range

Plug measuring range can be extended to have a measuring range of nearly ±0.38mm / ±0.015".
Used for applications where plug centralizing errors are a small portion of the part tolerance.

Extra Body Length Plugs

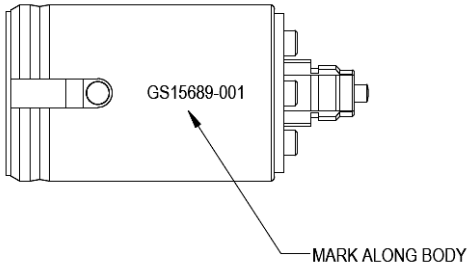
Normally when using a Dimentron plug in a deep hole extensions are combined with the plug to reach the bottom of the bore. In some cases lands and interruptions can interfere with plug movement. In these case a non-relieved plug can be specified. Here the plug is made to a specific length (in 1inch increments) so the land will help guide the plug through the part.

Toleranced Contact Length

For certain blind hole (and parts with lands) the location of the contacts are critical to measuring the diameters at precisely the location as called out on the part print. By reviewing the print special contact locations can be specified for the application.

Marking on Plugs

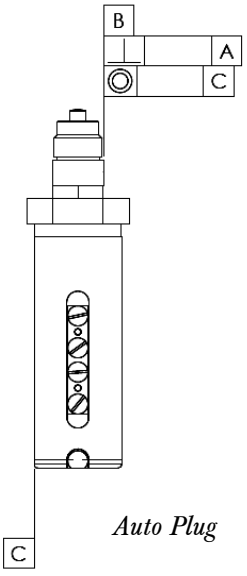
Often tooling is purchased as a package for specific application. Kits can be created that include the Dimentron plug and masters contained in a storage box. Each individual item may be marked with it's own specific part number, operation it's to be used on and reference drawing number.



Reduced Body Clearance

For extremely tight tolerances such as on can dies, Dimentron plugs can be modified to reduce the clearance between the plug and the part to be measured. This allows for the best fit and alignment of the plug to the part and therefore reduces variability and increases performance. These plugs are then often mounted in fixtures to even further reduce operator error.

Contact Mahr Federal for tight tolerance applications.



Auto Plug

Dimentron® Plug Gages

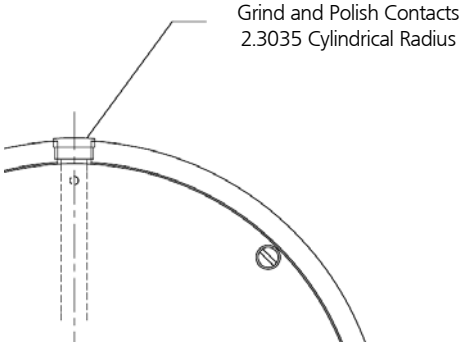
Dimentron Plug Application Available Configurations

Contact Shapes

Dimentron Plug contact points can be made to various shapes and from different materials depending on the application:

The Big Foot Contact - For spanning rough or interrupted surfaces.

Cylindrical ground contacts - for checking thin walled parts or rotor laminators.



Optional Contact Materials

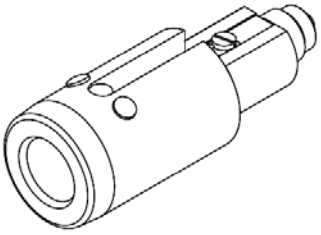
Diamond contacts - used when gaging abrasive materials or for extremely high usage applications.

Polished chrome plated contacts - used when checking soft, porous materials such as aluminum.

Ruby contacts - used when part marring must be prevented.

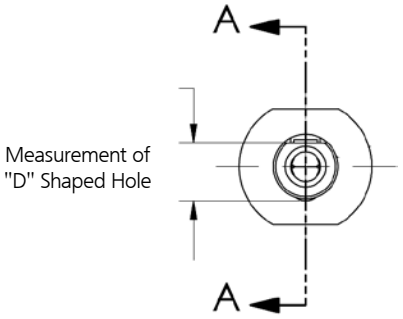
Plugs with guide pins for axial grooves

For rifle bores or specific part orientation grooves may be incorporated into the part. Guide pins can be attached to the plug to guide the plug and orient the jets to assure fast easy plug alignment to the surface to be gaged.



Plugs with special shapes

Dimentron plugs for bores is by far the most common measurement application. However Dimentron plugs can be configured to meet virtually any gaging requirement. These may include square plugs or plugs to get into slot grooves. Send us your application.



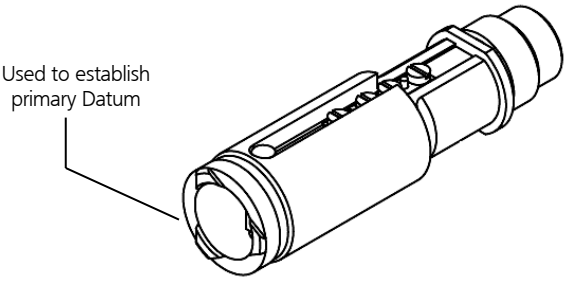
Plugs from special materials

Dimentron plugs are normally furnished in High Chrome contain stainless steel or can be flashed chromed for extra protection. Mahr Federal can manufacture air plugs in other materials for extreme use applications. Materials can include CPM-10, Ferrotic, Tungsten carbide ware strips and others are available to get the most from your hole gage tooling.

Special entry features

Measurement of
"D" Shaped Hole

The leading edge of the Dimentron plug is critical for either making entry into the part easy or aligning the part to the bore - as in the case of a shallow bore. Normally an easy entry nose cut out is provided for standard through hole applications. There are times when a straight entry lead is required. Prints provided at the time of requesting the quote will help in configuring these applications.



Dimentron® Plug Gages

Portable Plug Gaging Systems

This EDI-550P-50 is a compact and self-contained display system used with mechanical fixed plug gaging for evaluating high precision, high volume manufactured parts. The gage uses a µMaxµm as the readout, which makes the system ideal for the manufacturing environment.

The EDI-550P-50 features a dial that can be rotated through 270° for easy viewing. A built-in transducer assembly is prepositioned for use with Dimentron® gaging plugs. With use of optional adaptors, Series 844D and Diatest style plugs may be used.

The gage can be configured in multiple ways due to the interchangeability of the parts and can be used as a pistol grip or normal end mount. The gage can also be bench mounted using the optional bench kit. See accessory list.

The µMaxµm based gaging system incorporates the following features:

- Inch/Metric Operation
- Digital and Analog Display
- Bi and Unilateral tolerances with presets
- Absolute transducer - no travel errors
- Multiple data output formats
- Auto-zeroing
- Normal - Reverse settings for ID/OD measurements

The dial indicator version incorporates:

- Inch or metric dial indicator
- Shockproof movement
- Yellow (metric) or Green (inch) dial for easy reading

Technical Data

Description	Order No.
Inch Dial Indicator version .0001" graduations	**550P-10**
Metric Dial Indicator version .002mm graduations	**550P-20**
µMaxµm standard version with selectable 1µm/50µ" resolution	**EDI-550P-10***
µMaxµm HR version with selectable .5um/20µ" resolution	**EDI-550P-20**
Output cable - Digimatric	**2001025**
Serial output cable to DB-9 pin	**SCB-4**
Battery 3 volt Type CR-2450 (2 required)	**EBY-1018**
Connector (Data Output)	**ECN-1720**

** No data output*

Dimentron® Plug Gages

Adaptors, Handles and Accessories

EKT-1120- adaptors are required to mount the Digital or Dial Indicators to Dimentron Plugs. This adaptor kit includes mounting adaptor, hex wrench, and flat-end, carbide faced contact point for the Indicator.

Models include:

EKT-1120-W1- Maxμm III with .375" stem - 4-48 thread
EKT-1120-W2- Maxμm III with 8mm stem - 2.5mm thread
EKT-1120-W3- EDI/Dial .375" stem - 4-48 thread
EKT-1120-W4- EDI/Dial 8 mm stem - 2.5mm thread
EKT-1120-W6- 1002 - 1010 8mm stem - 2.5 thread

Right angle Adaptor offers added versatility to provide easy entry into narrow access opening*.

Order **AT-155**

** Not recommended for plugs over 1.500"/38.1mm*

Protective Housings

Protective Housings for Digital and Dial Indicators clamp over **EKT-1120-WX** adaptor

EHG-1172 For MaxμmIII Indicators without Output. Requires in-line or pistol style grip Handle (**HA-88** Handle and **AT-124** Adaptor).

EHG-1198 For MaxμmIII Indicators with Output. Requires pistol style grip Handle (**HA-88** and **AT-124** Adaptor).

B-12668 For MaxμmIII Indicators with Output. Complete with in-line style handle.

EHG-102 protective housing for AGD group 2 dial and digital indicators

AT-125 Bench Stand Adaptor permits the Maxμm Indicator in a Protective Housing to be clamped in **BA-26** Bench Stand.

With Electronic Gage Heads and Maxum Transducers

Gage heads are mounted to Dimentron Plugs using **HA-88** and **AD-140** Adaptor. Electronic Gage Heads can be ordered separately. The following Handle Assemblies include Adaptor, Wrenches and Gage Head:

Description	Order No.
Flat Contact, 3 m / 11 ft. coiled cable	**EHA-1146**
Flat Contact, 3 m / 5 ft. straight cable	**EHA-1145**

For 1" barrel Maxμm transducers **HA-141** provides protection for transducer while easy mounting to the plug.

Remote Maxum Transducers
Dimentron Plug Handle
Adaptor HA-141

Extensions

Extensions for Dimentron Plugs are available for Plugs over 9.5mm/ ***.375"***. See table below:

Group 8 Plugs 9.3mm/ ***.366"*** O.D.	Group 12 Plugs Extension 16mm/ ***.63"*** O.D. Length
EX-204	EX-210 50mm/ ***1.97"***
EX-205	EX-211 100mm/ ***3.94"***
EX-206	EX-212 200mm/ ***7.87"***

Bases

Base, BA-100

Heavy cast base has tooling plate allowing plug to be mounted vertically or horizontally. Can be used with Electronic Gage Heads or Maxμm Remote Transducers or MaxμmIII Digital Transducer

Dimentron® Plug Gages

Stop Collars

Ring Style

Ring style Stop collars limit the depth a measuring head can be inserted into a bore. They are clamped onto the measuring head and are adjustable to set contact depth. Stop collars improve performance by assuring the same depth is measured consistently. Additionally, they help with alignment when plugs are used with shallow bores.

Spider Style for Large Plugs

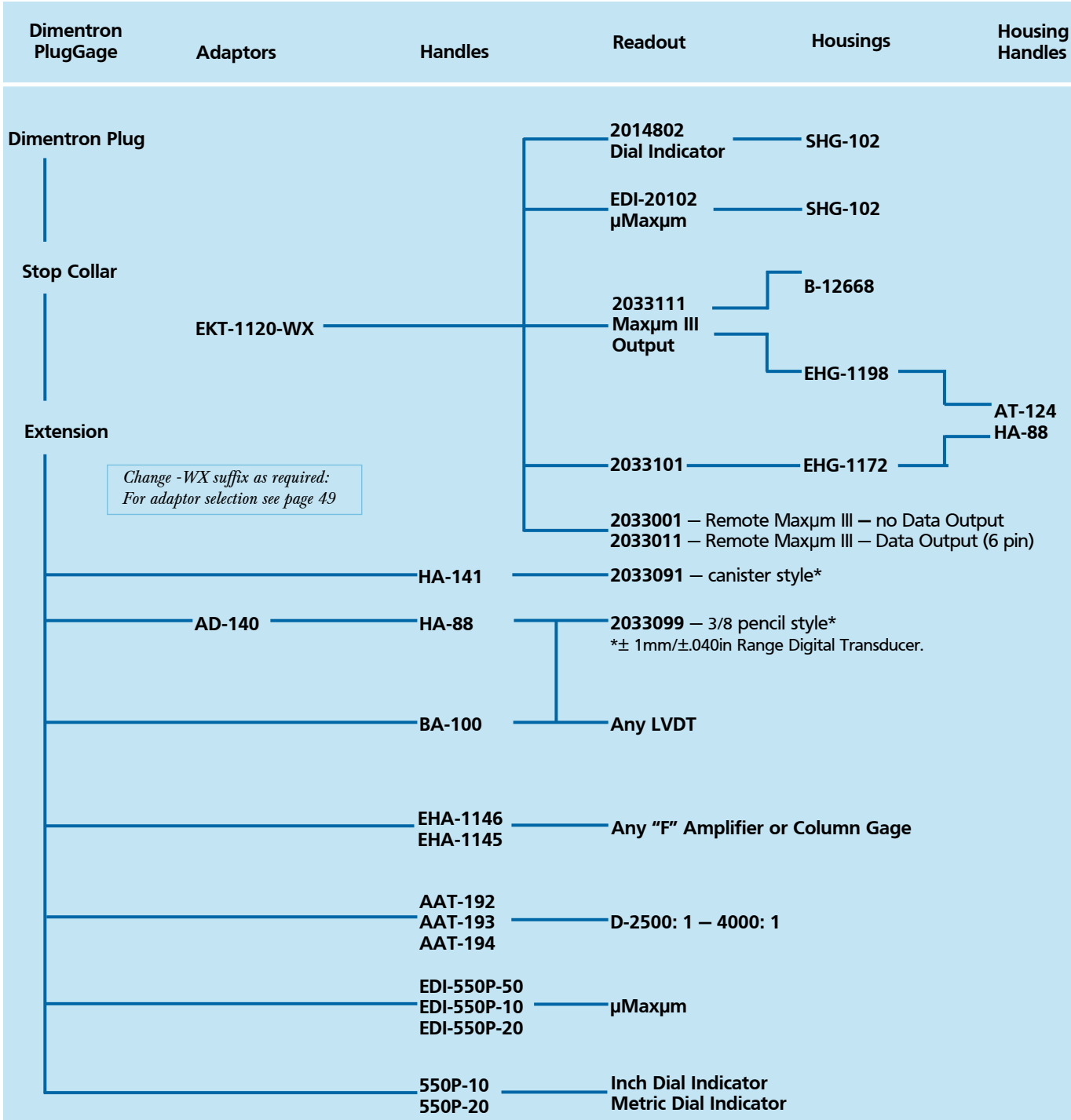
Special stop collars are available for diameters greater than 76mm/3". They provide the same function as the ring style except their design helps to reduce weight and can be used to set depth in deep holes.

Contact Mahr Federal Technical Assistance for application Information.

Order No.	Bore Size Thru & including		Outside Diameter		Width	
	mm	inch	mm	inch	mm	inch
CR-20010-W1	3.18	0.13	12.70	.500	6.35	.250
CR-20010-W2	4.76	.1875	17.48	.688	7.95	.313
CR-20010-W3	6.35	.2500	17.48	.688	7.95	.313
CR-20010-W4	7.94	.3125	17.48	.688	7.95	.313
CR-20010-W5	9.53	.3750	22.23	.875	9.53	.375
CR-20010-W6	11.11	.4375	23.83	.938	9.53	.375
CR-20010-W7	12.70	.5000	28.58	1.125	10.31	.406
CR-20010-W8	14.29	.5625	33.35	1.313	11.13	.438
CR-20010-W9	15.88	.6250	33.35	1.313	11.13	.438
CR-20010-W10	17.46	.6875	36.53	1.438	11.13	.438
CR-20010-W11	19.05	.7500	38.10	1.500	12.70	.500
CR-20010-W12	20.64	.8125	41.28	1.625	12.70	.500
CR-20010-W13	22.23	.8750	41.28	1.625	12.70	.500
CR-20010-W14	23.81	.9375	44.45	1.750	12.70	.500
CR-20010-W15	25.40	1.0000	44.45	1.750	12.70	.500
CR-20010-W16	26.99	1.0625	47.63	1.875	12.70	.500
CR-20010-W17	28.58	1.1250	47.63	1.875	12.70	.500
CR-20010-W18	30.16	1.1875	52.40	2.063	12.70	.500
CR-20010-W19	31.75	1.2500	52.40	2.063	12.70	.500
CR-20010-W20	33.34	1.3125	53.98	2.125	14.30	.563
CR-20010-W21	34.93	1.3750	57.15	2.250	14.30	.563
CR-20010-W22	36.51	1.4375	57.15	2.250	14.30	.563
CR-20010-W23	38.10	1.5000	60.33	2.375	14.30	.563
CR-20010-W24	39.69	1.5625	60.33	2.375	14.30	.563
CR-20010-W25	41.28	1.6250	66.68	2.625	17.48	.688
CR-20010-W26	42.86	1.6875	69.85	2.750	17.48	.688
CR-20010-W27	44.45	1.7500	69.85	2.750	17.48	.688
CR-20010-W28	46.04	1.8125	70.03	2.875	17.48	.688
CR-20010-W29	47.63	1.8750	70.03	2.875	17.48	.688
CR-20010-W30	49.21	1.9375	76.20	3.000	17.48	.688
CR-20010-W31	50.80	2.0000	76.20	3.000	17.48	.688
CR-20010-W32	53.98	2.1250	82.55	3.250	19.05	.750
CR-20010-W33	55.56	2.1875	82.55	3.250	19.05	.750
CR-20010-W34	57.15	2.2500	82.55	3.250	19.05	.750
CR-20010-W35	60.33	2.3750	85.73	3.375	19.05	.750
CR-20010-W36	61.91	2.4375	85.73	3.375	19.05	.750
CR-20010-W37	63.50	2.5000	95.25	3.750	22.23	.875
CR-20010-W38	68.26	2.6875	101.60	4.000	22.23	.875
CR-20010-W39	69.85	2.7500	101.60	4.000	22.23	.875
CR-20010-W40	73.03	2.8750	107.95	4.250	22.23	.875
CR-20010-W41	74.61	2.9375	107.95	4.250	22.23	.875
CR-20010-W42	76.20	3.0000	107.95	4.250	22.23	.875

** Stop Collars may require boring to measuring size. Specify measuring size of plug when ordering*

Dimentron® Plug Gages — Configurations



This table depicts available readouts for Dimentron Plug inside diameter gages. After making a plug selection, follow the chart for all the components needed to make up a gaging system suited to your application.

* 3/8" body LVDT. 8mm body LVDT's require BU-197 Bushing Adaptor (flat contact point ordered separately).

Maxµm III Indicator

Inch: Specify 2033201 (2033211 if Digital Output is required) for .00005" resolution. .0001" graduation and "0" on the indicator in the 12 O'clock position. For "0" at 6 o'clock position, specify 2033101 Digital (no Output).

Metric: Specify 2033201 (2033211 if Digital Output is required) for 0.001mm resolution, 0.01mm graduation, and "0" in the 12 o"clock position. Specify 203301 for "0" at 6 o'clock position not digital with Output.

Worksheet for Ordering Dimentron® Plugs

There are four basic styles of Dimentron Plugs: Through Hole, Blind, Super Blind and Super Super Blind Style. Dimension "B" refers to the dimension of the Contact Centerline to the Nose of the Dimentron Plug. The gaging length dimension is indicated by Dimension "A". There are 4 different range codes to choose from depending on bore tolerance.

Company _____ Contact: _____ Part Number: _____

Phone: _____ Fax: _____ E-mail: _____

Required Information:

Feature Size (bore diameter): _____

Size Tolerance: _____

Plug Style:: ☐Thru ☐Blind ☐Super Blind ☐Super Super Blind

Contact Material: ☐Carbide ☐Chrome

Extra Body Length Required: ☐Yes ☐No

Extra Length:* _____

Quantity: _____

Overall Bore Length:* _____

Display to be used: _____

***Part prints for other than non-standard plugs are required.**

Options for Dimentron Plugs

Stop Collar: ☐Yes ☐No

O.D. Restrictions: _____

Special Plug Markings: _____

ISO Long Form Certification of Air Plug Required: ☐Yes ☐No

Handle Required: _____

Master Required: ☐Yes ☐No

Nominal: ☐Yes ☐No

Technical Assistance at Mahr Federal: Phone: 401-784-3100; Fax: 401-784-3246
E-mail: information@mahr.com

Indicating Plug Gages 844 D

Features

- For the rapid testing of diameter, roundness and conicity of bores
- Especially suitable for testing batches with tight tolerances
- No rocking in the bore is required to determine the reversal point
- Therefore ideal for use in conjunction with a digital indicating instrument and for subsequent processing of measured values
- Measuring head has a hardened, hard chromium-plated guide cylinder and carbide-tipped anvils
- The carbide expanding pin transfers radial movement to indicating instrument
- Constant measuring force as a result of built-in spring, thus eliminating user influence
- Measuring head, holder, depth extension, right angle attachments and depth stops are part of an extensive modular system

Technical Data of the Measuring Heads

Nominal diameter of the bore measured 844 Dk/844Dkr	Measuring range starting from the minimum bore dimension to be 844 Dks (from 4 mm)	
2,98 - 8 mm	= - 0,02+ 0,1 mm	= - 0,02 + 0,1 mm
over 8 - 16 mm	= - 0,02+ 0,15 mm	= - 0,02 + 0,15 mm
over 16 - 32 mm	= - 0,02+ 0,2 mm	= - 0,02 + 0,15 mm
over 32 - 70 mm	= - 0,03+ 0,2 mm	= - 0,03 + 0,15 mm
over 70 - 200 mm	= - 0,04+ 0,2 mm	= - 0,04 + 0,15 mm

When placing an order please quote the nominal diameter and tolerances, for example:

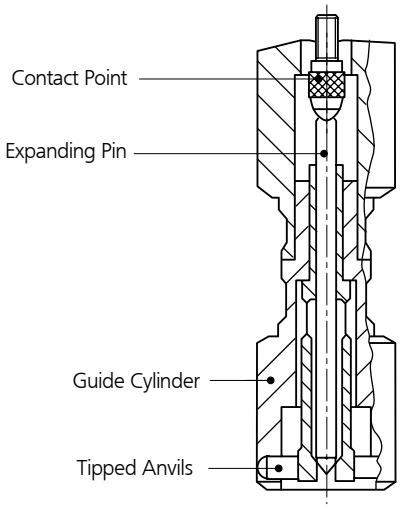
Bore diameter	Tolerance	
35 D7	+ 80	+105 µm
35 H7	+ 0	+25 µm
35 R7	- 50	-25 µm

The diameter of the guide cylinder is produced between 0.02 and 0.07 mm smaller than the minimum dimension of the bore to be checked.

Example:
Plug Gage 844 Dk for bore 35 D7
Nominal diameter: 35 mm
Minimum dimension: 35.080 mm
Maximum dimension: 35.105 mm
Meas. range: 35.050 - 35.280 mm

Accuracy

Hystersis	≤ 0.4 µm
Repeatability	≤ 1 µm
Linearity	≤ 1 %
Linearity 844 Dks >16 mm	≤ 2 %



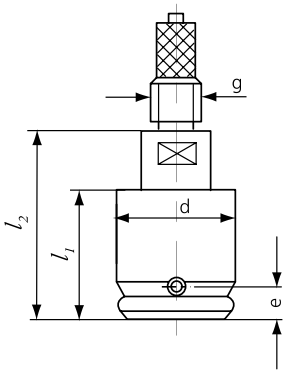
Plug Gages

Measuring Head 844 Dk

Standard version

Diameter d mm			Diameter d *inch*		l_1	Dimensions l_2 mm	e	Connection thread g
	2.98	- 8	***.12***	***.3"***	23	31	1.5	M6 x 0.75*
over	8	- 16	***.3***	***.6"***	25	33.5	3	M6 x 0.75
over	16	- 32	***.6***	***1.26"***	26	39	3.5	M10 x 1
over	32	- 44	***1.26***	***1.73"***	26	39	3.5	M10 x 1
over	44	- 70	***1.73***	***2.75"***	26	39	4	M10 x 1
over	70	- 200	***2.75***	***8"***	33	39	4	M10 x 1

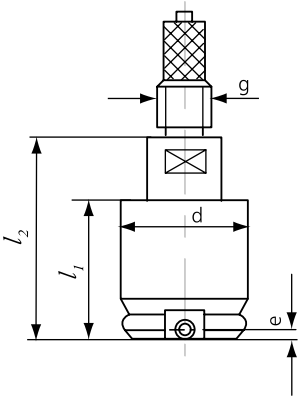
** With an Adapter for connection to the Holder*



Measuring Head 844 Dks

For the measurement of blind holes.

Diameter d mm			Diameter d *inch*		l_1	Dimensions l_2 mm	e	Connection thread g
	4	- 8	***.16***	***.3"***	23	31	0.6	M6 x 0.75*
over	8	- 16	***.3***	***.6"***	25	33.5	0.6	M6 x 0.75
over	16	- 32	***.6***	***1.26"***	26	39	1	M10 x 1
over	32	- 44	***1.26***	***1.73"***	26	39	1	M10 x 1
over	44	- 70	***1.73***	***2.75"***	26	39	1	M10 x 1
over	70	- 150	***2.75***	***6"***	33	39	1	M10 x 1

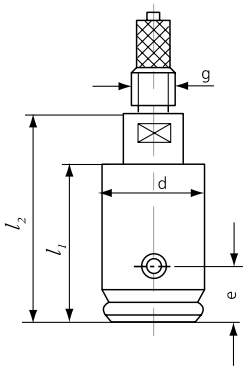


Measuring Head 844 Dkr

With an extended guide cylinder for the measurement of through holes from the edge of the bore. These are particularly suitable for narrow parts.

Diameter d mm			Diameter d *inch*		l_1	Dimensions l_2 mm	e	Connection thread g
	2.98	- 8	***.12***	***.3"***	28	36	6	M6 x 0.75*
over	8	- 16	***.3***	***.6"***	31	40	9	M6 x 0.75
over	16	- 32	***.6***	***1.26"***	32	45	9.5	M10 x 1
over	32	- 44	***1.26***	***1.73"***	32	45	9.5	M10 x 1
over	44	- 70	***1.73***	***2.75"***	26	46.5	10.5	M10 x 1
over	70	- 200	***2.75***	***8"***	33	51	15	M10 x 1

** With an Adapter for connection to the Holder*



Measuring Heads for Special Applications

Available for example with 3 anvils for concentricity and polygon tests, with flat anvils for plane-parallel surfaces, with anvils made of plastic, ruby, ceramic or diamond for particular material characteristics.

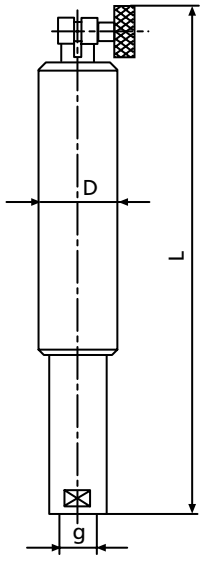
Modular Unit System 844 D

Standard Holder 844 Kg/844 Dg

With locking clamp for an indicating instrument and a connecting thread for a measuring head. Heat insulated handle. The model 844 Dg is made from **Invar steel.**

Cat. no. thread g	Connecting mm/*inch*	Length L mm/*inch*	Handle dia. D	Order no.
844 Kg	M6 x 0.75	50/ ***1.98"***	14/ ***.55"***	**4470851**
844 Dg	M10 x 1	150/ ***6"***	26/ ***1"***	**4478851**

844 Kg / 844 Dg

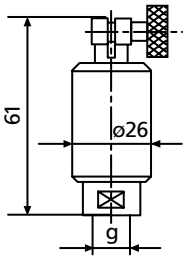


Short Holder 844 Dgk

With locking clamp for an indicating instrument and a connecting thread for a measuring head. Heat insulated handle.

Cat. no. thread g	Connecting mm/*inch*	Length L mm/*inch*	Handle dia. D	Order no.
844 Dgk	M10 x 1	61/ ***2.4"***	26/ ***1"***	**4478050**

844 Dgk

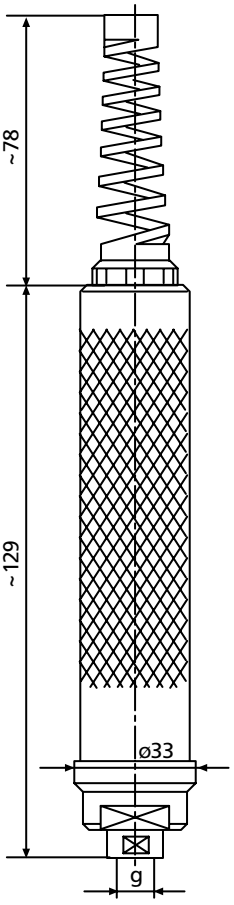


Holder 844 Dge for Inductive Measuring Probes

With long sleeve for shock and waterproof mounting of inductive measuring probes. Strain relief clamp for probe cable. Threaded connection for measuring heads. Heat insulated handle.

Cat. no. thread g	Connecting mm/*inch*	Length L mm/*inch*	Handle dia. D	Order no.
844 Dge	M6 x 0.75	195/ ***7.7"***	33/ ***1.3"***	**4478020**
M10 x 1	195/ ***7.7"***	33/ ***1.3"***	**4478021**	

844 Dge

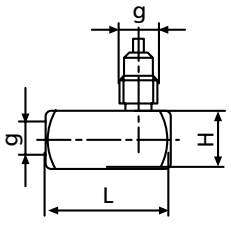


Right Angle (Elbow) Attachment

For measuring difficult to reach bores, e.g. in tight spaces, on a machine tool or when work piece bores are inconveniently located. For screwing in between holder and measuring head.

Cat. no. thread g mm	Connecting Length L mm/*inch*	Elbow Height H mm/*inch*		Order no.
844 Kw	M6 x 0.75	26.5/ ***1.04"***	22.5/ ***.89"***	**4470110**
844 Dw	M10 x 1	36.7/ ***1.44"***	17/ ***.67"***	**4478110**

844 Kw / 844 Dw



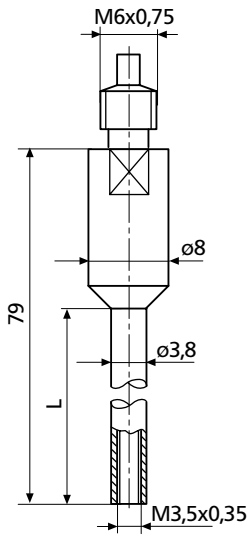
Modular System 844 D

Extensions

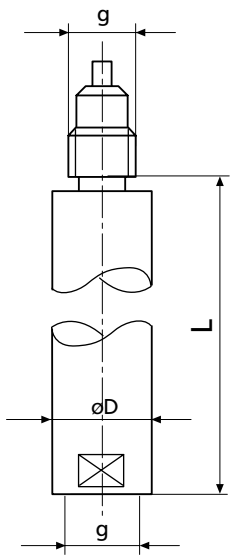
For extra-deep bores. Screws in between holder and measuring heads. Several extensions can be screwed together as of 8 mm. Models 844 Dv and 844 Dvk made of **Invar steel.**

Cat. no. thread g	Connecting mm/*inch*	Length L mm/*inch*	dia. D	Order no.
844 Dvk	M6x0.75/M3.5x0.35	64/***2.5"***	3.8/***.15"***	**4478080**
844 Kv	M6 x 0.75	64/***2.5"***	8/***.32"***	**4470070**
844 Dv	M10 x 1	64/***2.5"***	15/***.6"***	**4478070**
844 Dv	M10 x 1	80/***3"***	15/***.6"***	**4478071**
844 Dv	M10 x 1	100/***4"***	15/***.6"***	**4478072**
844 Dv	M10 x 1	125/***5"***	15/***.6"***	**4478073**
844 Dv	M10 x 1	250/***10"***	15/***.6"***	**4478074**
844 Dv	M10 x 1	500/***20"***	15/***.6"***	**4478075**
844 Dv	M10 x 1	750/***30"***	15/***.6"***	**4478076**

844 Dvk



844 Kv / 844 Dv

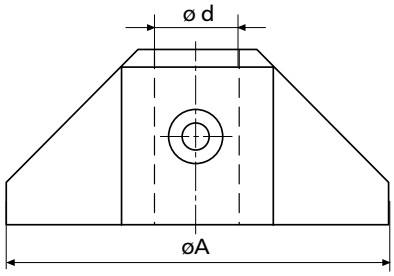


Depth Stops

For limiting depth of insertion of measuring head in bore. Can be attached to Extensions 844 Kv or 844 Dv. With clamping screw.

Cat. no. dia. d mm/*inch*	Mounting hole dia. A mm/*inch*	Stop surface	Order no.
844 Kt	8/ ***.32"***	25/ ***1"***	**4470115**
844 Dt	15/ ***.6"***	45/ ***1.8"***	**4478115**
844 Dt	15/ ***.6"***	75/ ***3"***	**4478116**
844 Dt	15/ ***.6"***	110/ ***4.3"***	**4478117**
844 Dt	15/ ***.6"***	160/ ***6.3"***	**4478118**
844 Dt	15/ ***.6"***	220/ ***8.6"***	**4478119**

844 Kt / 844 Dt

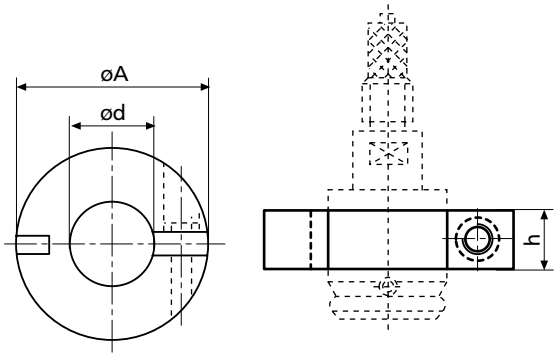


Depth Stop Rings

For limiting depth of insertion of measuring head in bore. Clamped onto the measuring head.

Cat. no. dia. d mm	Mounting hole **surface** dia. A mm/*inch*	Stop h mm/*inch*	Height	Order no.
844 Dtr	3 - 5	27/ ***1.1"***	10/ ***.4"***	**4478130**
5	- 830/ ***1.2"***	10/ ***.4"***	**4478130**	
8	-1133/ ***1.3"***	10/ ***.4"***	**4478130**	
11	-1537/ ***1.5"***	10/ ***.4"***	**4478130**	
15	-2042/ ***1.7"***	10/ ***.4"***	**4478130**	
20	-2551/ ***2.0"***	12/ ***.5"***	**4478131**	
25	-3056/ ***2.2"***	12/ ***.5"***	**4478131**	
30	-3561/ ***2.4"***	12/ ***.5"***	**4478131**	
35	-4066/ ***2.6"***	12/ ***.5"***	**4478131**	
40	-4471/ ***2.8"***	12/ ***.5"***	**4478131**	
44	-5076/ ***2.9"***	12/ ***.5"***	**4478132**	
50	-6086/ ***3.4"***	12/ ***.5"***	**4478132**	
60	-7096/ ***3.8"***	12/ ***.5"***	**4478132**	
70	-80106/ ***4.1"***	12/ ***.5"***	**4478132**	
80	-90116/ ***4.6"***	12/ ***.5"***	**4478133**	
90	-100126/ ***4.9"***	12/ ***.5"***	**4478133**	

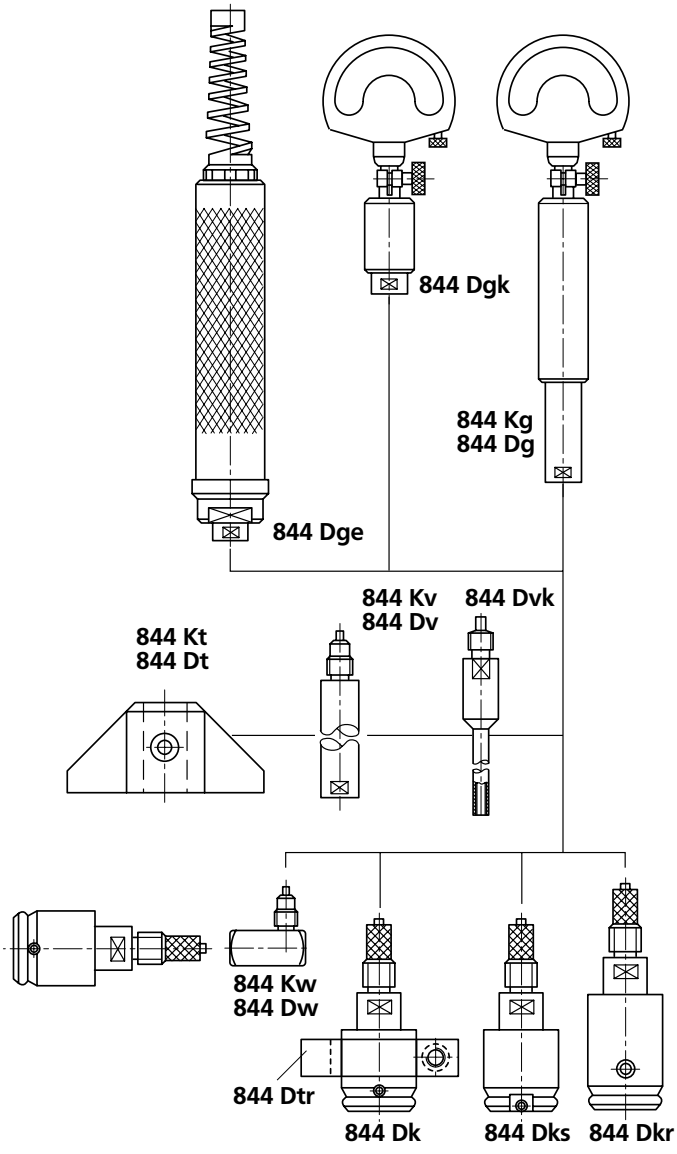
844 Dtr



Indicating Plug Gages 844 D

Modular Units	Diameter of Measuring Heads 2.98 - 8 mm *(.16 - .3")*	8 - 16 mm *(.3" - .6")*	over 16 mm *(over .6")*
844 Kg	4470851		
844 Dg			4478851
844 Dgk			4478050
844 Dge	4478020		4478021
844 Dvk 844 Kv 844 Dv	4478080	4470070	4478070 to 4478076
844 Kt 844 Dt		4470115	4478115 to 4478119
844 Kw 844 Dw	4470110		4478110
844 Dk 844 Dks 844 Dkr			

Modular Unit	Diameter of Measuring Heads 2,98 - 20 *(.16-.787")*	20 - 44 *(.787-1.72")*	44 - 80 *(1.72-3.15")*	80 - 100 *(3.15-3.94")*
844 Dtr	4478130	4478131	4478132	4478133



Indicating Instruments

All indicating instruments that have a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	mm / *inch*	Readings mm / *inch*	Order no.
Compramess	1004 / *1004 Z*	5 µm/ *.0001"*	4333000/*4333900*
Millimess	1003 / *1003 Z*	1 µm/ *.00005"*	4334000/*4334900*
Supramess	1002 / *1002 Z*	0.5 µm/ *.00002"*	4335000/*4335900*
Extramess	2000	0.2 µm/ *.00001"*	
	0.5 µm/	*.00002"*	4346000*
	1 µm/	*.00005"*	
Extramess	2001	0.2 µm/ *.00001"*	
	0.5 µm/	*.00002"*	4346100*
	1 µm/	*.00005"*	
µMaxµm		0.5 µm/ *.00002"*	EDI-20302**

Digital Indicators see Chapter 5
Electrical Indicating Instruments see Chapter 7
** 230 V, for 115 V please refer to page 6-5 ** requires contact 4360107*

Adjustment of Plug Gages 844 D

Ring Gage 355 E:
Special wear-resistant gage steel. Hardened and lapped. With actual deviation engraved.

Dimensions: DIN 2250, type C
Manufacturing tolerance: DIN 2250
Available diameters: 0.5-200 mm

Self Centering Dial Bore Gages 844 K Intramess

Features

- Measuring the diameter, roundness and conicity of bores
- Spring-loaded halves of measuring probe are split via expanding pin with precision-lapped taper. This movement is transferred to indicating instrument
- Maximum wear-resistance due to hard chrome plating. From 4 mm alternatively with carbide tipped available on request
- Constant measuring force as a result of built-in spring thus eliminating user influence
- Highly versatile, each gage covers a large range. Within the respective limits, quickly and easily adjustable to any size and any type of measuring application
- Measuring probe, holder, depth extensions, right-angle attachments and depth stops are part of an extensive modular system

Technical Data

Complete Instrument

844 K Measuring heads hard chrome plated, expanding pin made of stainless steel

844 KH Measuring heads carbide tipped on both sides, carbide expanding pin

844 KS Blind hole measuring heads hard chrome plated, expanding pin made of stainless steel

Catalog no.	Measuring range of meas. mm	*(inch)*	Number of probes	Order no.*
844 K	0.47 - 0.97	***(.018 - .038")***	6	**4470000**
0.95 - 1.55		***(.037 - .060")***	5	**4470001**
1.5 - 4.2		***(.060 - .160")***	10	**4470002**
3.7 - 7.3		***(.145 - .29")***	7	**4470003****
6.7 - 10.3		***(.26 - .40")***	7	**4470004****
9.4 - 18.6		***(.37 - .73")***	9	**4470005****
844 KH	1.5 - 4.2	***(.060 - .160")***	10	**4471002**
3.7 - 7.3		***(.145 - .29")***	7	**4471003****
6.7 - 10.3		***(.26 - .40")***	7	**4471004****
9.4 - 18.6		***(.37 - .73")***	9	**4471005****
844 KS	1.5 - 4.2	***(.060 - .160")***	10	**4482163**
3.7 - 7.3		***(.145 - .29")***	7	**4482164****
6.7 - 10.3		***(.26 - .40")***	7	**4482165****
9.4 - 18.6		***(.37 - .73")***	9	**4482166****

* *Includes holder, measuring probe, expanding pin and wooden case, but not indicating instrument*

** *Additionally includes measuring force spring 4470828 and disk 4470821*

Accuracy

Deviation of linearity
≤ 2 % measuring ranges 0.47-1.55 mm
≤ 1 % measuring ranges 1.5-18.6 mm

Repeatability
1 µmmanual measurement
≤ 0.5 µm measurement with Stand 844 Kst and Floating Holder 844 Ksts

Indicating Instruments

All indicating instruments that has a 8 mm mounting shank may be used. Recommended are:

Dial Comparator	mm / *inch*	Readings mm / *inch*		Order no.
Comprames	**1004 / *1004 Z***	5 µm/	***.0001"***	**4333000/*4333900***
Millimess	**1003 / *1003 Z***	1 µm/	***.00005"***	**4334000/*4334900***
Millimess	**1003 XL**	2 µm		**4334001**
Supramess	**1002 / *1002 Z***	0.5 µm/	***.00002"***	**4335000/*4335900***
Extramess	**2000**	0.2 µm/	***.00001"***	
		0.5 µm/	***.00002"***	**4346000***
		1 µm/	***.00005"***	
Extramess	**2001**	0.2 µm/	***.00001"***	
		0.5 µm/	***.00002"***	**4346100***
		1 µm/	***.00005"***	
µMaxµm		0.5 µm/	***.00002"***	**EDI-20302****

Digital Indicators see Chapter 5 in Mahr Dimensional Metrology Catalog
Electrical Indicating Instruments see Chapter 7 Mahr Dimensional Metrology Catalog

* *230 V, for 115 V please refer to page 6-5*

** *Requires contact 4360107*

Modular System Unit For 844 K Standard Measuring Probes

In addition to complete Dial Bore Gages 844 K, modular units can also be compiled as required to suit a individual measuring task and or application.

Measuring Probe 844 Kk, Expander Pin, individual Ring Gage for 844 Ke

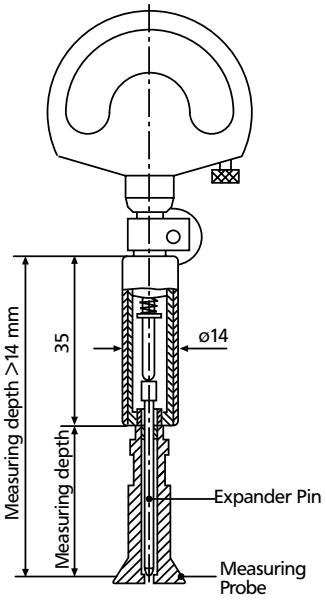
Nominal dimension mm	Measuring range mm	Measuring depth mm	Measuring probe hard chrome plated	Expanding pin steel	Measuring probe carbide tipped	Expander pin carbide	Ring gage
0.50	0.47 - 0.53	1.25	4470586	4470801			4482300
0.55	0.52 - 0.58	1.5	4470587				4482301
0.60	0.57 - 0.67	1.7	4470588				4482302
0.70	0.65 - 0.77	2.2	4470589	4470802			4482303
0.80	0.75 - 0.87	2.55	4470590				4482304
0.90	0.85 - 0.97	2.65	4470591				4482305
1.00	0.95 - 1.15	10.5	4470592				4482306
1.10	1.07 - 1.25	10.5	4470593				4482307
1.20	1.17 - 1.35	10.5	4470594	4470803			4482308
1.30	1.27 - 1.45	10.5	4470595				4482309
1.40	1.37 - 1.55	10.5	4470596				4482310
1.75	1.50 - 1.90	16	4470597		4471234		4482311
2.00	1.80 - 2.20	16	4470598	4470804	4471206	4471207	4482312
2.25	2.05 - 2.45	16	4470599		4471812		4482313
2.50	2.30 - 2.70	21	4470600		4471813		4482314
2.75	2.55 - 2.95	21	4470601		4471814		4482315
3.00	2.80 - 3.20	21	4470602		4471208		4482316
3.25	3.05 - 3.45	21	4470603	4470805	4471815	4471819	4482317
3.50	3.30 - 3.70	21	4470604		4471816		4482318
3.75	3.55 - 3.95	21	4470605		4471817		4482319
4.00	3.80 - 4.20	21	4470606		4471204		4482320
4.00	3.70 - 4.30	38	4470607		4471607		4482320
4.50	4.20 - 4.80	38	4470608		4471608		4482321
5.00	4.70 - 5.30	38	4470609		4471609		4482322
5.50	5.20 - 5.80	38	4470610		4471610		4482323
6.00	5.70 - 6.30	38	4470611		4471611		4482324
6.50	6.20 - 6.80	38	4470612		4471612		4482325
7.00	6.70 - 7.30	38	4470613	4470806	4471613	4471200	4482326
7.50	7.20 - 7.80	38	4470615		4471615		4482327
8.00	7.70 - 8.30	38	4470616		4471616		4482328
8.50	8.20 - 8.80	45	4470617		4471617		4482329
9.00	8.70 - 9.30	45	4470618		4471618		4482330
9.50	9.20 - 9.80	45	4470619		4471619		4482331
10.00	9.70 - 10.30	45	4470620		4471620		4482332
10.00	9.40 - 10.60	45	4470621		4471621		4482332
11.00	10.40 - 11.60	45	4470622		4471622		4482333
12.00	11.40 - 12.60	45	4470623		4471623		4482334
13.00	12.40 - 13.60	45	4470624		4471624		4482335
14.00	13.40 - 14.60	45	4470625	4470808	4471625	4471202	4482336
15.00	14.40 - 15.60	45	4470626		4471626		4482337
16.00	15.40 - 16.60	80	4470627		4471627		4482338
17.00	16.40 - 17.60	80	4470628		4471628		4482339
18.00	17.40 - 18.60	80	4470629		4471629		4482340

Modular System Unit For 844 K Blind Hole Measuring Probes

In addition to complete Dial Bore Gages 844 KS, modular units are available for assembly as required to suit an individual measuring task and or application.

Blind Hole Measuring Probe 844 Kk, Blind Hole Expander Pin

Nominal dimension mm	Measuring range mm	Measuring depth mm	Blind hole measuring probe hard chrome plated	Blind hole expander pin steel
1.751.50	- 1.90	16 **4482228**		
2.001.80	- 2.20	16 **4482229**	**4482176**	
2.252.05	- 2.45	16 **4482230**		
2.502.30	- 2.70	21 **4482301**		
2.752.55	- 2.95	21 **4482227**		
3.002.80	- 3.20	21 **4482178**		
3.253.05	- 3.45	21 **4482179**	**4482177**	
3.503.30	- 3.70	21 **4470300**		
3.753.55	- 3.95	21 **4482188**		
4.003.80	- 4.20	21 **4482180**		
4.003.70	- 4.30	38 **4482057**		
4.504.20	- 4.80	38 **4482162**		
5.004.70	- 5.30	38 **4482056**		
5.505.20	- 5.80	38 **4470953**		
6.005.70	- 6.30	38 **4482140**		
6.506.20	- 6.80	38 **4482055**		
7.006.70	- 7.30	38 **4482108**	**4482028**	
7.507.20	- 7.80	38 **4482204**		
8.007.70	- 8.30	38 **4482054**		
8.508.20	- 8.80	45 **4482206**		
9.008.70	- 9.30	45 **4482170**		
9.509.20	- 9.80	45 **4482182**		
10.009.70	- 10.30	45 **4470375**		
10.009.40	- 10.60	45 **4482205**		
11.0010.40	- 11.60	45 **4482042**		
12.0011.40	- 12.60	45 **4482112**		
13.0012.40	- 13.60	45 **4482102**		
14.0013.40	- 14.60	45 **4482181**	**4482192**	
15.0014.40	- 15.60	45 **4482202**		
16.0015.40	- 16.60	80 **4482021**		
17.0016.40	- 17.60	80 **4482203**		
18.0017.40	- 18.60	80 **4482113**		



844 Kk

Ring Gage Sets 844 Ke

For setting Dial Bore Gages 844 K, 844 KH and 844 KS. Supplied in sets to match the measuring ranges of these instruments. Can be stored in wooden case of bore gages.

Diameter tolerance ± 1 µm

Ring Gages 844 Ke are only available with the diameters given in the table on the right.
For all other dimensions use must be made of Ring Gages 355 E with dimensions as per DIN 2250 and with actual deviation engraved.

For Meas. range mm	Diameter mm	Order no.
0.47 - 0.97	0.5/0.55/0.6/0.7/0.8/0.9	**4470160**
0.95 - 1.55	1/1.1/1.2/1.3/1.4	**4470161**
1.5 - 4.2	1.75/2/2.25/2.5/2.75/ 3/3.25/3.5/3.75/4	**4470162**
3.7 - 7.3	4/4.5/5/5.5/6/6.5/7	**4470163**
6.7 - 10.3	7/7.5/8/8.5/9/9.5/10	**4470164**
9.4 - 18.6	10/11/12/13/14/15/ 16/17/18	**4470165**

Modular Unit System for 844 K

Holder 844 Kg
With locking clamp for an indicating instrument and a connecting thread for a **measuring head 844 Kk.** Heat insulated handle

Order no. 4470851

Extensions 844 Kv
For extra-deep bores. Screws in between Holder 844 Kg and Measuring head 844 Kk for measuring range 10-18 mm. Length 64 mm, ø 8 mm,

Order no. 4470070

Right Angle Attachment 844 Kw
For measuring bores which are difficult to reach, e.g. in tight spaces, on machine tools or when work piece bores are inconveniently located. For screwing in between Holder 844 Kg and Measuring Head 844 Kk

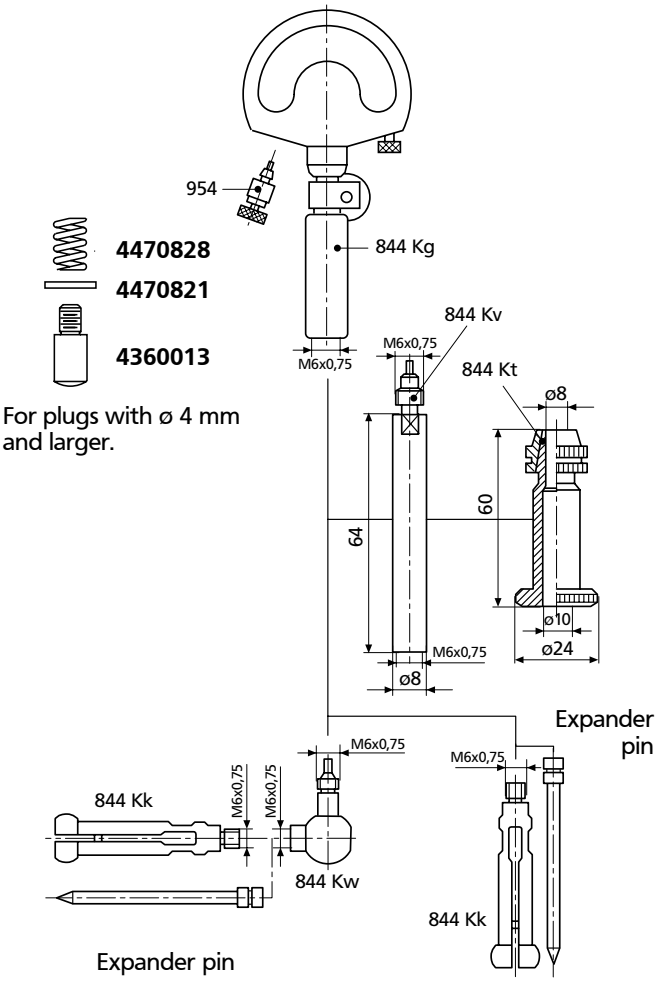
Order no. 4470110

Lifter 954
Facilitates insertion of measuring probe in bore by lifting measuring spindle of dial comparator.

Order no. 4372030

Depth Stop 844 Kt
For checking diameter of bores at prescribed depth. Only to be used with Extension 844 Kv.

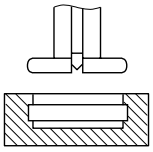
Order no. 4470115



Measuring Probes for Special Applications

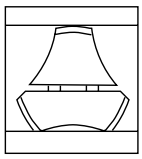
For measurement of blind holes, diameters of recesses, distances between plane-parallel surfaces, etc. special models of measuring probes are available on request.

1. Measurement of the diameter of recesses*

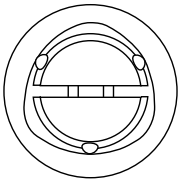


* *Requires holder 4471196*

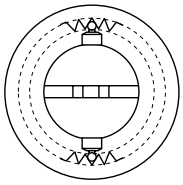
2. Measurement of plane-parallel surfaces



3. Measurement of polygon bores



4. Measurement of inside serrations, see 844 Z Page 9-60



Accessories

Stand 844 Kst

Features

For quick checks of bores in small work pieces. Hardened table plate can be raised with lever, thus moving test piece into position. Plate can be clamped at any height for checking eccentricity. Particularly suited to use with digital indicators, where appropriate in conjunction with data printers or computer equipment, in cases where determination of reversal point is inappropriate.

Table dia.	58 mm /***2.28"***
Throat depth of arm	45 mm / ***1.77"***
Table stroke	30 mm / ***1.18"***
Max. work piece height	approx. 100 mm / ***4"***

Order no. **4470100**

Angle Stop 844 Ka

Facilitates positioning of cylindrical work pieces under measuring instrument. For clamping to Stand 844 Kst.

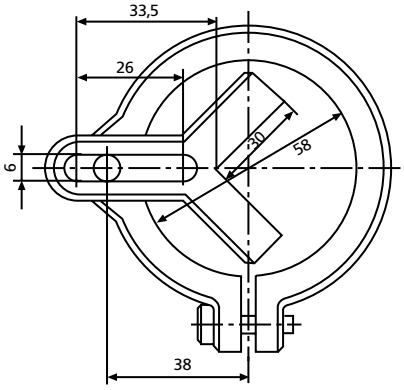
Order no. **4470120**

Floating Holder 844 Ksts

Features

For use in conjunction with Stand 844 Kst. Enables measuring probe to find common axis of bore and measuring instrument quickly and easily on insertion into hole, thus providing optimum measuring speed and high accuracy. Particularly suitable for small diameters, as measuring confidence is considerably enhanced.

Order no. **4470105**



Dimentron® Plug Gages

AGD Master Setting Rings, Discs, and Plugs

Master Rings

- Traceable certification and calibration available on request.
- Lapped to size and polished.
- Non-gaging areas black oxidized – ring faces ground.
- Meet all requirements of ANSI Specification B47.1-1988.
- Manufactured in accordance with ANSI Specification B89.1.6-1984.

Master Plugs

- Traceable certification and calibration available on request.
- Stabilized and hardened.
- 100% usable grinding surface.
- Ends ground square.
- Lapped finish.

Master Discs AGD Style 3

- Traceable certification and calibration available on request.
- Lapped to size and polished.
- Non-gaging areas black oxidized – ring faces ground.
- Meet all requirements of ANSI Specification B47.1-1988.
- Manufactured in accordance with ANSI Specification B89.1.5.
- Furnished with clear insulators.
- All dimensions are AGD style 3.

Classes and Tolerances

Size Range of Work (mm/inch)		Tolerance of Master		
To and Above	Including	Class XXX	Class XX	Class X
2.67/ ***.105"***	20.96/ ***.825"***	.00025/ ***.00001"***	.00051/ ***.00002"***	.00102/ ***.00004"***
20.96/ ***.825"***	38.35/ ***1.510"***	.00038/ ***.000015"***	.00076/ ***.00003"***	.00152/ ***.00006"***
38.45/ ***1.510"***	63.75/ ***2.510"***		.00102/ ***.00004"***	.00203/ ***.00008"***
63.75/ ***2.510"***	114.55/ ***4.510"***		.00127/ ***.00005"***	.00254/ ***.00010"***
114.55/ ***4.510"***	165.35/ ***6.510"***		.00165/ ***.000065"***	.00330/ ***.00013"***
165.35/ ***6.510"***	216.15/ ***8.510"***		.00203/ ***.00008"***	.00406/ ***.00016"***

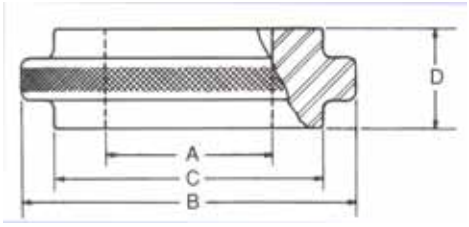
Master plugs and discs are furnished in hardened steel, either plain or chrome plated. They are made in Class XX and X for Air Gage applications. Discs are also available in Class Y.

Tolerances are divoded equaly plus and minus from the required size unless otherwise specified. Plug and disc certification supplied on request.

If Air Rings 1.5" and smaller are equipped with guide chutes, A.G.D. style 3 Discs are required.

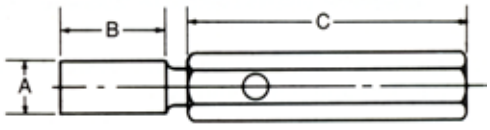
Dimentron® Plug Gages

Master Setting Rings



(mm/inch)			
"A"	**"B"**	**"C"**	**"D"**
1.52 - 3.8/ *.060 - .150"*	23.83/ *.938"*		6.35/ *.250"*
3.8 - 5.84/ *.150 - .230"*	23.83/ *.938"*		9.53/ *.375"*
5.84 - 9.27/ *.230 - .365"*	31.75/ *1.25"*		14.3/ *.563"*
9.27 - 12.95/ *.365 - .510"*	34.93/ *1.375"*		19.05/ *.750"*
12.95 - 20.95/ *.510 - .825"*	44.45/ *1.750"*		23.83/ *.938"*
20/95 - 28.83/ *.825 - 1.135"*	53.98/ *2.125"*		28.58/ *1.125"*
28.83 - 38.35/ *1.135 - 1.510"*	63.5/ *2.500"*		33.35/ *1.313"*
38.35 - 51.05/ *1.510 - 2.010"*	102/ *4"*	73.0/ *2.875"*	38.1/ *1.5"*
51.05 - 63.75/ *2.010 - 2.510"*	114.3/ *4.500"*	85.7/ *3.375"*	38.1/ *1.5"*
63.75 - 76.45/ *2.510 - 3.010"*	127/ *5"*	101.6/ *4.000"*	38.1/ *1.5"*
76.45 - 89.15/ *3.010 - 3.510"*	139.7/ *5.500"*	114.3/ *4.500"*	38.1/ *1.5"*
89.15 - 101.85/ *3.510 - 4.010"*	161.93/ *6.375"*	130.2/ *5.125"*	38.1/ *1.5"*
101.85 - 120.9/ *4.010 - 4.760"*	181.15/ *7.250"*	149.2/ *5.875"*	38.1/ *1.5"*
120.9 - 139.95/ *4.760 - 5.510"*	209.5/ *8.250"*	168.3/ *6.625"*	38.1/ *1.5"*
139.95 - 159/ *5.510 - 6.260"*	234/ *9.250"*	187.3/ *7.375"*	38.1/ *1.5"*
159 - 178.05/ *6.260 - 7.010"*	260.35/ *10.250"*	206.4/ *8.125"*	38.1/ *1.5"*
178.05 - 197.1/ *7.010 - 7.760"*	285.75/ *11.250"*	225.4/ *8.875"*	38.1/ *1.5"*
197.1 - 216.15/ *7.760 - 8.510"*	311.15/ *12.250"*	244.5/ *9.625"*	38.1/ *1.5"*

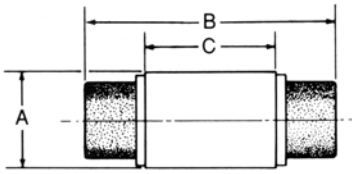
Master Setting Plugs



"A"	**"B"**	**"C"**
6.3 - 9.3/ *.248 - .365"*	19.05/ *.750"*	69.85/ *2.750"*
9.3 - 13.0/ *.365 - .510"*	25.4/ *1.0"*	76.2/ *3.0"*
13.0 - 21.0/ *510 - .825"*	31.75/ *1.25"*	82.55/ *3.25"*
21.0 - 28.8/ *.825 - 1.135"*	34.93/ *1.375"*	92.08/ *3.625"*
28.8 - 38.4/ *1.135 - 1.510"*	38.1/ *1.500"*	102/ *4"*
38.4 - 51.1/ *1.510 - 2.010"*	47.63/ *1.875"*	127/ *5"*
51.1 - 63.8/ *2.010 - 2.510"*	50.8/ *2.0"*	127/ *5"*
63.8 - 76.5/ *2.510 - 3.010"*	53.98/ *2.125"*	152.4/ *6"*

Indicating Plug Gages 844 D

Master Setting Discs



(mm/inch)		
"A"	**"B"**	**"C"**
3.8 - 6.1/ ***.150 - .240"***	41.28/ ***1.625"***	11.25/ ***.438"***
6.1 - 9.3/ ***.240 - .365"***	42.88/ ***1.688"***	12.70/ ***.500"***
9.3 - 13.0/ ***.365 - .510"***	47.63/ ***1.875"***	14.30/ ***.563"***
13.0 - 21.0/ ***.510 - .825"***	49.23/ ***1.938"***	15.88/ ***.625"***
21.0 - 28.8/ ***.825 - 1.135"***	57.15/ ***2.250"***	17.48/ ***.688"***
28.8 - 38.4/ ***1.135 - 1.510"***	60.33/ ***2.375"***	22.17/ ***.813"***
38.4 - 51.1/ ***1.150 - 2.010"***	60.33/ ***2.375"***	22.23/ ***.875"***
51.1 - 63.8/ ***2.010 - 2.510"***	60.33/ ***2.375"***	22.23/ ***.875"***
63.8 - 76.5/ ***2.510 - 3.010"***	85.73/ ***3.375"***	25.40/ ***1"***
76.5 - 89.2/ ***3.010 - 3.510"***	85.73/ ***3.375"***	25.40/ ***1"***
89.2 - 101.9/ ***3.510 - 4.010"***	85.73/ ***3.375"***	25.40/ ***1"***
101.9 - 114.3/ ***4.010 - 4.510"***	85.73/ ***3.375"***	25.40/ ***1"***
114.3 - 120.9/ ***4.510 - 4.760"***	85.73/ ***3.375"***	25.40/ ***1"***
120.9 - 127.3/ ***4.760 - 5.510"***	85.73/ ***3.375"***	25.40/ ***1"***
127.3 - 133.6/ ***5.510 - 5.260"***	85.73/ ***3.375"***	25.40/ ***1"***
133.6 - 140.0/ ***5.260 - 5.510"***	85.73/ ***3.375"***	25.40/ ***1"***
140.0 - 146.3/ ***5.510 - 5.760"***	85.73/ ***3.375"***	25.40/ ***1"***
146.3 - 152.7/ ***5.760 -6.010"***	85.73/ ***3.375"***	25.40/ ***1"***
152.7 - 159.0/ ***6.010 - 6.260"***	85.73/ ***3.375"***	25.40/ ***1"***
159.0 - 165.4/ ***6.260 - 6.510"***	85.73/ ***3.375"***	25.40/ ***1"***
165.4 - 171.7/ ***6.510 - 6.760"***	85.73/ ***3.375"***	25.40/ ***1"***
171.7 - 178.1/ ***6.760 - 7.010"***	85.73/ ***3.375"***	25.40/ ***1"***
178.1 - 184.4/ ***7.010 - 7.260"***	85.73/ ***3.375"***	25.40/ ***1"***
184.4 - 190.8/ ***7.260 - 7.510"***	85.73/ ***3.375"***	25.40/ ***1"***
190.8 - 197.1/ ***7.510 - 7.760"***	85.73/ ***3.375"***	25.40/ ***1"***
197.1 - 203.5/ ***7.760 - 8.010"***	85.73/ ***3.375"***	25.40/ ***1"***

Custom Part Masters

Custom Part Masters are used as a standard for many Engineered Gage Solutions. Almost every dedicated variable gage in use has at least one custom master associated with it. Typically these masters are used on shop floor inspection equipment as artifacts that reference the equipment. Some common examples include rotors, connecting rods, pistons, special tapers, cylinder liners, hydraulic and pump housings.

All masters are made of tool steel, hardened and double stabilized. Chrome plate is also available. In cases where the gage might be used in a corrosive environment, 440-C Stainless Steel may be used. Certain tight manufacturing tolerance applications may need min., mean and max. condition masters for greater accuracy when setting the gage fixture.

Our technical services department will be pleased to review your custom master needs.

Indicating Plug Gages 844 D

Master Rings for Calibration of Air and Dimentron Plugs

Requirement: (1) Nominal sized master or,
(optionally) (1) Minimum and (1) Maximum Deviation Master

Single (zeroing) Master Information:

Measurement Units: ☐Inch ☐metric Quantity required: 1 / 2 / 3 / _____
Nominal Master Size: _____ Class: ☐Y ☐X ☐XX ☐ XXX
Material: ☐Steel ☐Chrome ☐ Carbide Special Marking: _____
Certification to Class: ☐ Yes ☐ No Certification to Size: (extra cost) ☐ Yes ☐ No
Tolerance Applied: Bi-Lateral (Per rules for nominal masters) Uni-Lateral (Per rules for Go / NoGo masters)

Deviation Master Information:

Measurement Units: ☐Inch ☐metric Quantity required: 1 / 2 / 3 / _____
Minimum Master Size: _____
Maximum Master Size: _____ Class: ☐ Y ☐X ☐XX ☐ XXX
Material: ☐Steel ☐Chrome ☐ Carbide Special Marking: _____
Certification to Class: ☐ Yes ☐ No Certification to Size: (extra cost) ☐ Yes ☐ No
Tolerance Applied: Bi-Lateral (Per rules for nominal masters) Uni-Lateral (Per rules for Go / NoGo masters)

Master Plugs for Calibration of Air Rings

Requirement: (1) Nominal sized master or,
(optionally) (1) Minimum and (1) Maximum Deviation Master

Single (zeroing) Master Information:

Measurement Units: ☐Inch ☐metric Style: ☐Disc ☐Plug
Quantity required: 1 / 2 / 3 / _____
Nominal Master Size: _____ Class: ☐Y ☐X ☐XX
Material: ☐Steel ☐Chrome ☐ Carbide Special Marking: _____
Certification to Class: ☐ Yes ☐ No Certification to Size: (extra cost) ☐ Yes ☐ No
Tolerance Applied: Bi-Lateral (Per rules for nominal masters) Uni-Lateral (Per rules for Go / NoGo masters)

Deviation Master Information:

Measurement Units: ☐Inch ☐metric Style: ☐Disc ☐Plug
Quantity required: 1 / 2 / 3 / _____
Minimum Master Size: _____ Class: ☐Y ☐X ☐XX
Maximum Master Size: _____ Class: ☐Y ☐X ☐XX
Material: ☐Steel ☐Chrome ☐ Carbide Special Marking: _____
Certification to Class: ☐ Yes ☐ No Certification to Size: (extra cost) ☐ Yes ☐ No
Tolerance Applied: Bi-Lateral (Per rules for nominal masters) Uni-Lateral (Per rules for Go / NoGo masters)

Note: Mahr Federal recommends XX masters certified to size instead of XXX certified to class.

Calibration Services

International Standards require complete documentation and calibration of all gaging instruments. Mahr Federal Inc., as well as being a manufacturer of quality dimensional measuring instruments, is an established primary source for high accuracy dimensional measurement services.

Mahr Federal offers an inspection and recalibration program for dimensional standards including:

- gage blocks • master rings • master discs and plugs • master balls (roundness)
- cylindrical form and precision reference specimens surface roughness standards.

For these services, we have created an ideal environment - a metrology laboratory in Providence, Rhode Island that is ranked as one of the world's finest.:

- High quality measurements - 0.06 micron/2.3 micro inch uncertainty of measurement on gage blocks (up to 50 mm/2 in long).
- All measurements traceable to the Standards of the United States.
- Grand Masters/Primary standards used in our Measurement Center have been certified by NIST.
- Calibration system is certified to ISO-9001:2000 by NQA, USA and accredited to ISO 17025 NVLAP Lab Code 200605-0.
- We offer Fast turnaround and competitive prices.

Mahr Federal also specializes in the calibration and certification of the following gages including:

Dial, Digital & Test Indicators • Mikrokators® • Micrometers • Dial & Vernier Calipers • Pin & Radius Gages • Snaps, I.D. / O.D. & Bore Gages • Dimentron® Plugs • Plug & Ring Gages • Groove, Caliper, Thickness, Thread, Height & Depth Gages • Air Gages & Magnification Kits • Electronic Amplifiers & Gage Heads • Surface Finish Gages • Level Systems

Certificate of Registration

nqa usa

This is to certify that the Quality Management System of:

Mahr Federal Inc.
1144 Eddy Street
Providence, RI 02905

Includes facilities at:
11435 Williamson Road, Cincinnati, Ohio 45241
11155 Knott Avenue, Suite 1, Cypress, CA 90630
Col. Chepevera, C.P. 64030 Monterrey, Nuevo Leon, Mexico

applicable to:

Design, manufacture and servicing of dimensional gages and gaging systems and dimensional calibration services including field service for masters, standards and gages

has been assessed and approved by
National Quality Assurance, U.S.A., against the provisions of:

ISO 9001:2000

For and on behalf
of NQA, USA, Acton, MA 01720

Certificate Number: 10057
EAC Code: 19, 35
First Issued: October 6, 1995
Valid Until: September 1, 2010
Reissued: September 2, 2007

ANAB

This approval is subject to the company maintaining its system to the required standard, which will be monitored by NQA, USA, an accredited organization under the ANSI-ASQ National Accreditation Board.

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200605-0

Mahr Federal Inc.
Providence, RI

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

CALIBRATION LABORATORIES

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).

2008-04-01 through 2009-03-31
Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2008-09-13)

Precision Measurement Center

Precision Measurement Center – Mahr Federal's Metrology Laboratory in Providence, RI.

The environment, by far, is the biggest contributor to measurement errors.

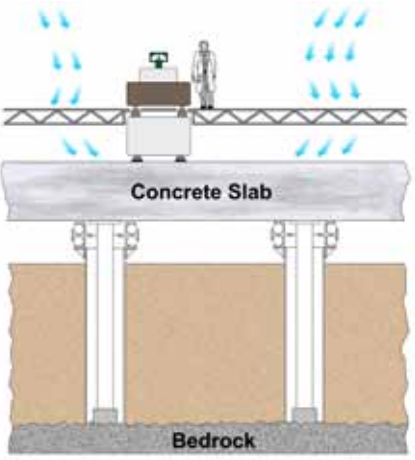
Mahr Federal's Precision Measurement Center in Providence was built to minimize environment related errors.

Structurally, the Center is different. All measurement equipment rests on a five-foot thick concrete slab located just below the floor. Weighing nearly 375 tons, the slab is independent of the surrounding building and is supported by three 30-foot tubular steel columns which rest on a vibrationally stable layer of rock.

This elaborate construction eliminates the influence of external vibrations which could cause measurement inaccuracies ... even eliminating the influence of laboratory personnel moving about the room. Because the slab is so well isolated from its local environment, other disturbances such as highway traffic and heavy equipment in the adjoining factory do not adversely affect the high accuracy gaging equipment.

Air and Atmosphere ... tightly controlled

A complex air conditioning, circulation and filtration system controls our Measurement Center's temperature and atmospheric conditions. Air cascades through the room from ceiling to floor, changing itself every half-minute. This important vertical down flow eliminates air stratification, helps control dust and provides a barrier of clean air between the gages and technicians. Since air temperature and humidity can adversely affect measurements, air temperature is maintained at 68°F/20°C, within 2/10 of 1°C and relative humidity is a constant 40%, ±10%.



Model 130B Gage Block Comparator

High Accuracy Measurements

High accuracy is realized with uncertainty measurements of 0.06 micron/2.3 microinch on gage blocks (up to 50 mm/2.3 inch long).

The Mahr 828 CiM in the Precision Measurement Center has a gaging uncertainty of as little as .000004". Its measuring precision, high measuring speed, innovative measuring processes, and ease of operation all combine to ensure fast, reliable measurements.

Additionally, the Mahr Federal Model 130B-24 and Model 130B-16 Gage Block Comparators, widely used and recognized as the finest of their kind, are employed in the Precision Measurement Center together with the Model 136B-3 Master Ring and Disc Comparators.

NIST Traceability Grand Master Sets

Working masters are remeasured annually against the Grand Master sets, which are calibrated at NIST on a regular schedule. This procedure provides Mahr Federal and its customers with a link directly traceable to NIST, assuring not only that our standards are accurate, but the lab itself, the equipment and measuring techniques used are rigidly maintained. Thereby, our commitment to a constant quest for the highest reliability in industrial metrology is also constantly maintained. Mahr Federal's Calibration system is certified to ISO-9001:2000 by NQA, USA and accredited to ISO 17025 NVLAP Lab Code 200605-0.


Mahr FEDERAL

REPORT OF MEASUREMENT

MASTER RING - CERTIFICATION OF SIZE

NVLAP

- 0 +

Mahr FEDERAL

EXACTLY

Mahr Federal Inc. • 1144 Eddy Street • Providence, RI 02905 • Phone: 1-800-486-8858 • Fax: 1-401-784-3246 • Internet: www.mahr.com

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