XYZ CYLINDRICAL ROLLER GUIDEWAYS

LRZ·LR VERTICAL MILL

HIGH SPEED

HIGH PRODUCTIVITY

- 2-speed gearbox
- 40-taper spindle
- 10,000 rpm direct drive motor

***INA** (German) cylindrical roller guideways enable 1890 ipm rapid traverse.*

VIPER

MIGHTY VMC

ISO 9001:2008

Superb for high volume machining

LRZ·LR Series

700
900
1000
1100
1400
1600

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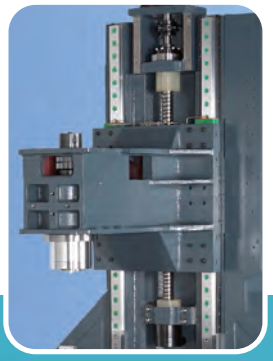
Best suited for high volume parts production.

High Speed. High Productivity.

The **LRZ / LR** series is designed to meet the industrial demand for high-efficiency components machining.



LRZ-900 model shown

LRZ

XY Cylindrical ways
Z Cylindrical ways

Cylindrical roller guideways on XYZ axes

Efficient Machine Performance

Features for reduced cycle times

- XYZ cylindrical roller guideways—fast and accurate axial movement.
- High performing next-generation direct drive spindle.
- Powerful direct drive XYZ transmission.
- Body casting provides rigid machining.
- Ideal components machining for the automotive, 3C and IT industries.

High Productivity Machining

The LRZ is designed for large volume machining—experience high speed performance with cylindrical guideways on all three axes. German made cylindrical roller guideways enable consistent feedrates. A powerful direct drive spindle provides fast speeds up to 10,000 rpm.

The LRZ utilizes a ballscrew cooling system to maintain a steady transmission system temperature. Z-axis driven without counter weight block for enhanced performance. High speed ATC uses random direction for faster tool change time.

Rigid Z-Axis Box Way

The LR vertical mill utilizes a rigid box way Z-axis travel —way travel has a wide slide surface that is treated with **Turcite-B** to reduce friction and ensure precision.

LR-1100 model shown

LR

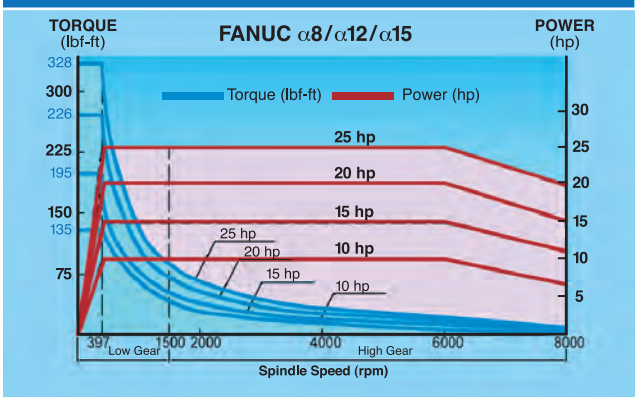
XY Cylindrical ways
Z Box ways

XY cylindrical roller guideways and Z box way

Powerful Spindle Torque

Alpha series 8,12 and 15 Fanuc motors, maximum speed 8000 rpm, 25 hp motor power, 221 N-m of torque.

Gear Spindle — **LR-900 / LR-1100**



High Torque and Low Noise Gearbox Design

Two-speed gearbox consist of DIN level 5 gears, high performing bearings and oil cooling system to minimize thermal expansion. Every gearbox set is inspected using vibration and run-in tests to ensure each gear is shifting smooth and stable, achieving a G1 vibration level.

LRZ High Rigidity Structure

The machine bed, column, spindle head, cross slides and table are all analyzed and optimized by FEM tests. The structure design assures high stability and rigid performance. A ballscrew cooling system feature minimizes thermal compensation through the ballscrews, this can extend machine service life and enhances overall machining performance.

LRZ Features

- XYZ cylindrical roller guides — low friction, superior rigidity, and heavy-loading capacity, yields excellent performance
- Y-axis has 55″ distance between guideways
- All three axes adopt 45mm wide INA (German) cylindrical guideways with rapid traverse rate of 1890 ipm
- 40 / 50-taper spindle
- 50-taper spindle available on **LRZ-1400** and **LRZ-1600** machine models

*All LRZ-LR machining centers have **Meehanite** cast iron bed-column casting.*

LRZ-1400 / LRZ-1600 casting

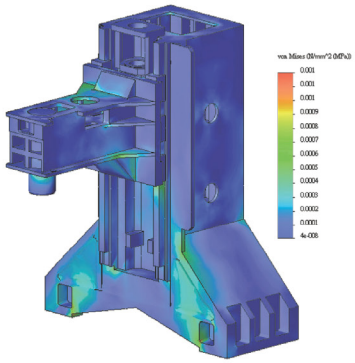
LRZ-1400 and LRZ-1600 (#50)

BALLSCREW COOLING

Reduce thermal expansion in the transmission system with cooling through the screw shaft—cooling of the ballscrew enhances overall cutting accuracy. (option)

Stress Analyzed

Machine bed, column, spindle, cross slides and table are all analyzed and optimized using **FEM** tests. The test assures high stability and rigidity of the machine, making the LRZ and LR suitable for a wide-range of heavy-duty machining applications.



LR Features

- XY axes use precision INA (German) cylindrical roller guides and Z axis utilizes rigid box ways
- 40 / 50-taper spindle
- Bed and column made of Meehanite cast iron
- XYZ rapid traverse rates are 1890 / 1890 / 945 ipm

Automatic Pallet Charger (APC)

APC speeds-up large volume parts production.

LR-900APC casting

LR-900APC

INCREASE PRODUCTION

The **LR-900 APC** utilizes an automatic pallet system (APC), the system has 2 pallets, each pallet holds 660 lbs.

High accuracy, stable, unbending

Optimized Performance

BODY CASTING PROVIDES RIGID MACHINING

LRZ-LR Series has a robust machine structure made of high quality **Meehanite** casting, the wide base and body casting design provide excellent structural support for precision machining and rigid cutting performance.

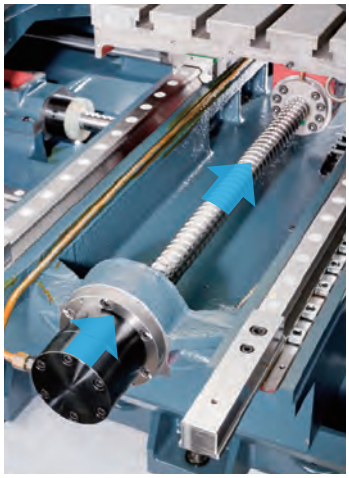
The LRZ-LR uses precision guideways that yield a high speed rapid travel rate–fast feed rate of 1890 ipm. The guideways are built using detailed manufacturing methods to ensure contact surface accuracy, and provide rigidity that imparts reliable cutting performance.

Column structure has a wide base design (55″ wide) that yields a heavier base weight, making the column more stable. Coupled with the load capacity of roller guideways a wider range of parts can be machined.

Each axes is powered by a direct drive motor, and driven by precision ballscrews. Ballscrews available with a center coolant system that prolongs machining efficiency, speed, and position accuracy.

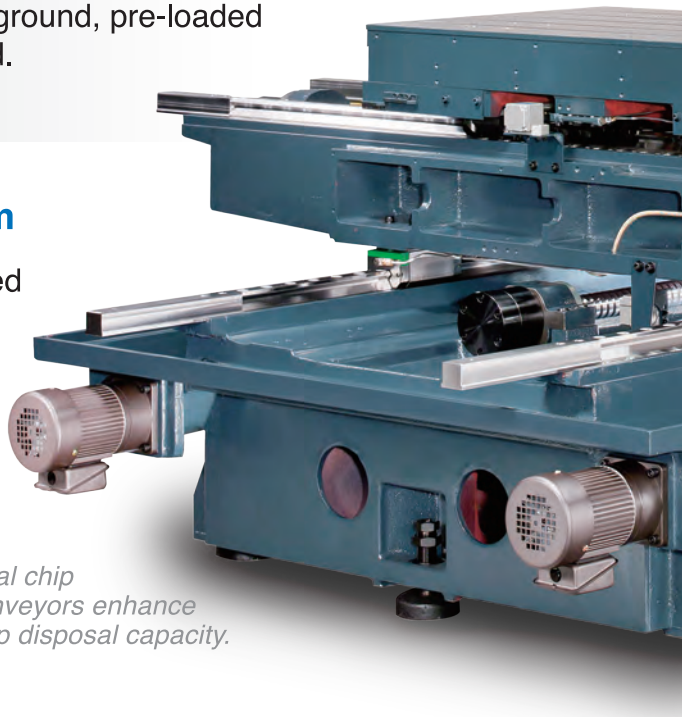
Direct Drive Axes Servo Motor

- Direct drive high-power servo motor, no backlash and no servo hysteresis or other phenomena, utilizes direct coupling to eliminate noise generated during transmission.
- XYZ axes are driven by a large diameter ballscrew–precision ground, pre-loaded and double anchored.

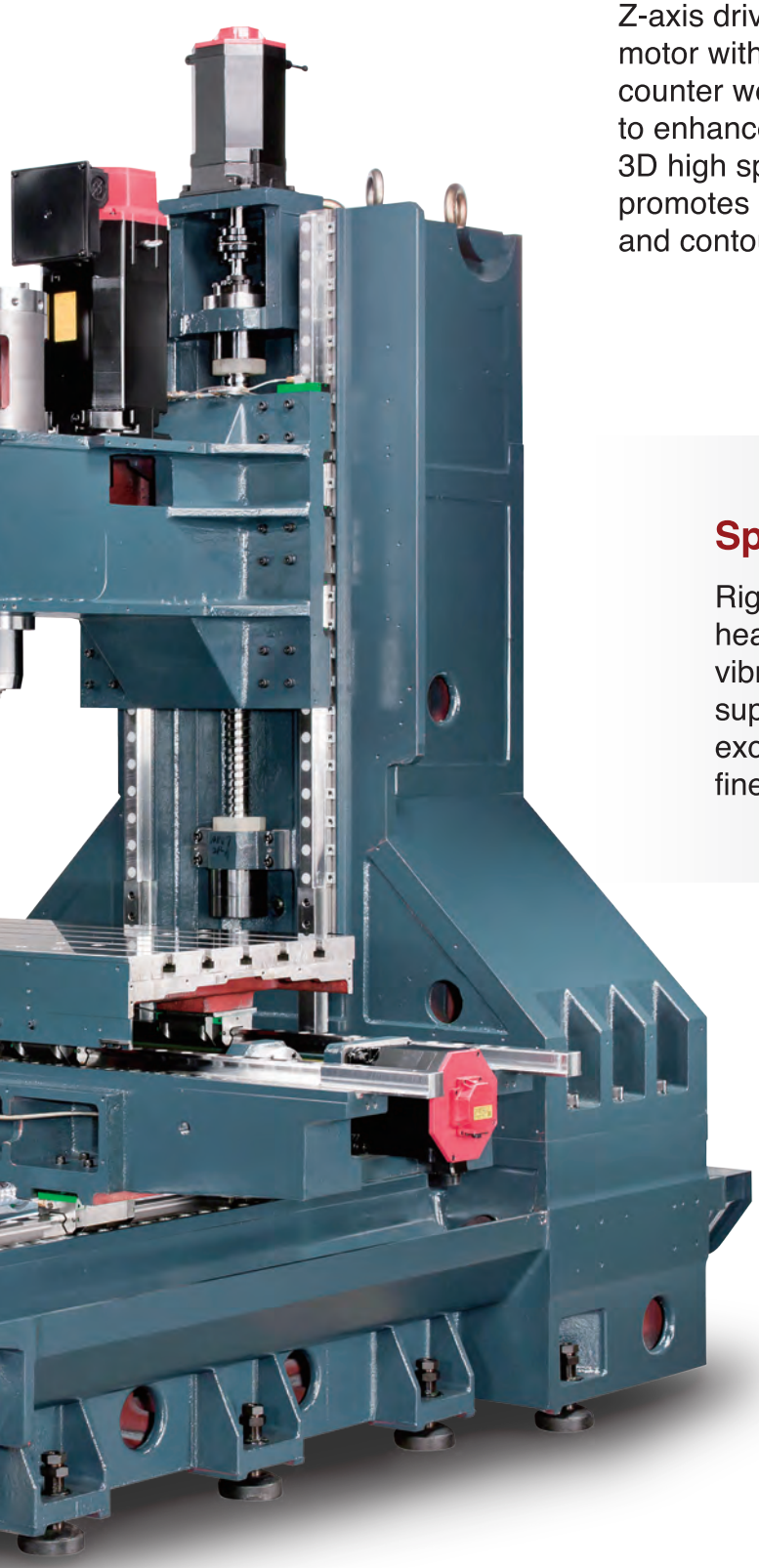


Ballscrew Coolant System

- Take away the heat generated from ballscrew movement through a center cooling system– ballscrew cooling helps maintain a fixed temperature.
- Maintains the thermal stability of the entire transmission system.



Dual chip conveyors enhance chip disposal capacity.



Z-Axis without Counter Weight Block

Z-axis driven by larger servo motor with brake—without a counter weight block—designed to enhance performance during 3D high speed machining. Setup promotes better surface finishing and contour accuracy.

Spindle Headstock

Rigid cast iron headstock dampens vibration, resulting in superb cutting capacity, excellent for machining fine surface finish.

High Efficiency ATC System

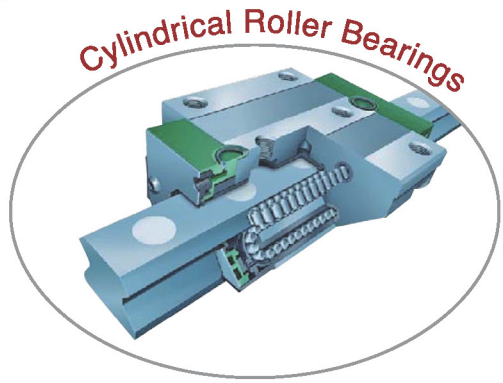
Lateral design prevents cutting fluid from flushing into tool pot.

High speed **cam type** ATC System with random direction, provides faster tool changing time than an armless tool changer. Tool carriage is driven by a double roller gear cam that ensures position accuracy and extends service life. Lateral footprint prevents cutting fluid from flushing into tool pot.

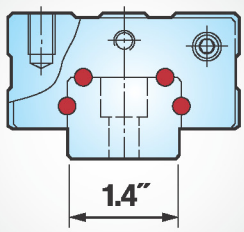
High Speed Linear Roller Guideways

Fast and accurate axis travel

- **INA** (German) cylindrical roller guideways
- Enclosed roller bearings
- Wide guideways – 1.8″ in width, enhance machining rigidity.
- Low friction and high positioning accuracy.



Competitor VMC

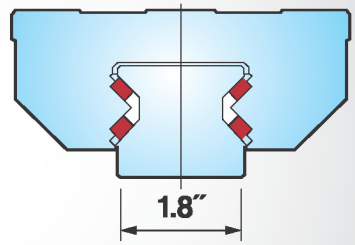


Rigidity 67.2 kN

+71%

Greater RIGIDITY

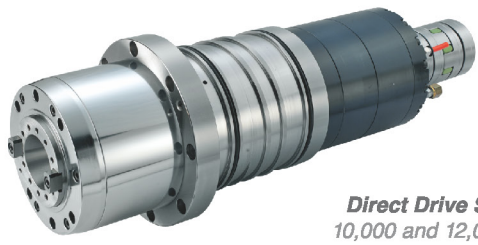
LRZ·LR Series



Rigidity 115 kN

Next Generation Spindle

High performance design



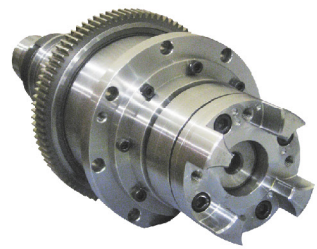
Direct Drive Spindle
10,000 and 12,000 rpm

Direct drive spindle-next generation design, provides high speed, high precision and high performance. Rigid tapping without noise, backlash or vibration problems.

Accuracy enhanced with spindle oil coolant system—system controls thermal displacement (standard).

Rigid Gear Spindle

Less heat and vibration



Gear Head Spindle

LR-900 and LR-1100 maximum spindle speed 8000 rpm

Gear head spindle (8000 rpm) yields high speed, accuracy and superior power.

Ceramic ball bearings help control vibration and thermal displacement, even after long machining periods, and provides small tolerances and prolongs high accuracy.

Machine and Table Dimensions

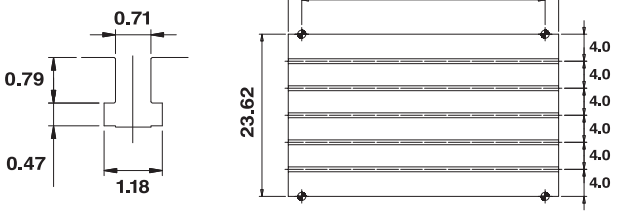
Height, width and length

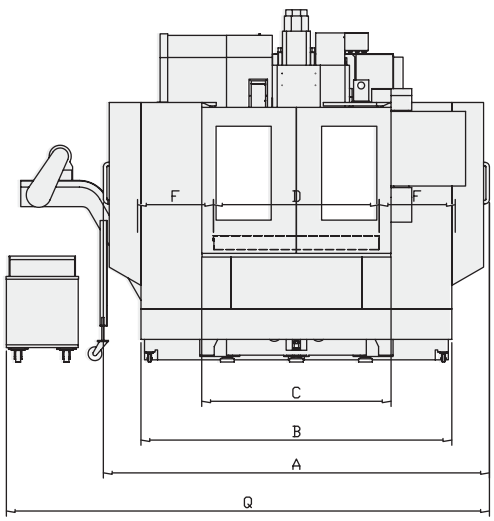
Units = inch

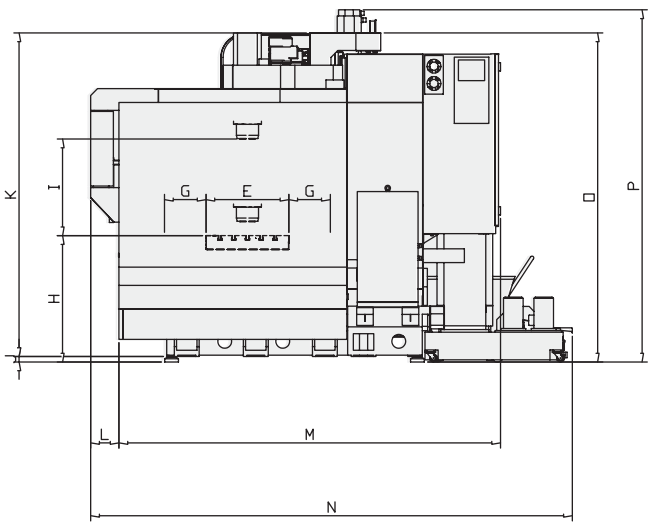
Table Dimensions

Model	A	B
LRZ/LR-900	39	35
LRZ/LR-1100	47	43

Units = inch





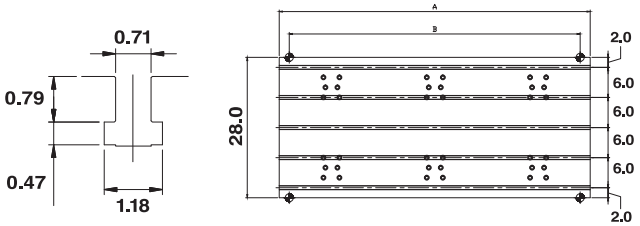


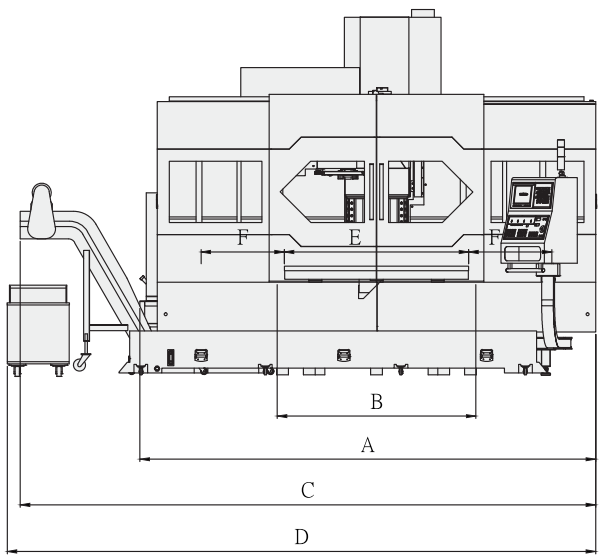
	LRZ-700	LRZ-900	LR-900	LRZ-1100	LR-1100
A	83	92		110	
B	92	89		89	
C	42	46		54	
D	34	39		47	
E	21	24		24	
F	15	18		22	
G	10	12		12	
H	37	36		36	
I	23	4~28		4~28	
J	2	2		2	
K	108	92		92	
L	8	8		8	
M	103	109		109	
N	103	138		138	
O	89~108	94~118		94~118	
P	108	101		101	
Q	131	138		138	

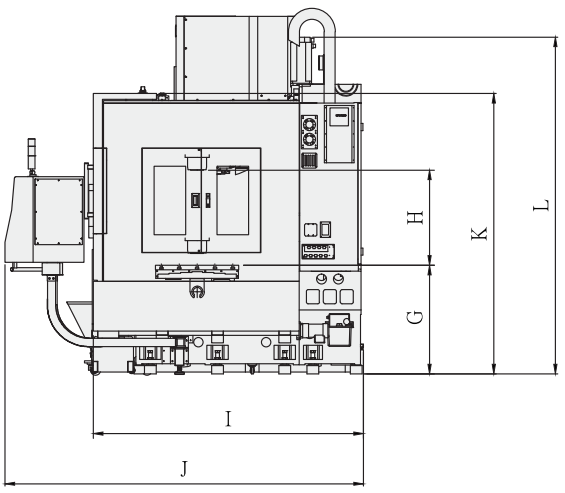
Table Dimensions

Model	A	B
LRZ-1400	61	57
LRZ-1600	69	65

Units = inch







	LRZ-1400	LRZ-1600
A	151	161
B	66	74
C	191	200
D	195	205
E	61	69
F	28	31
G	36	36
H	31	31
I	89	89
J	119	119
K	93	93
L	111	111

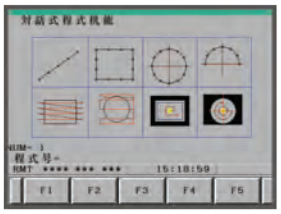
Custom Calculator Feature

FAST WORKPIECE COORDINATE CORRECTIONS CALCULATOR

Multi-Function Display

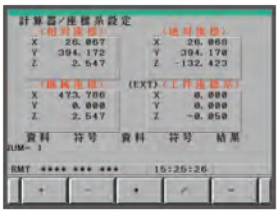
- Coordinate page
- Workpiece counter
- Date / time display
- Machining time
- Soft-key functions
- Spindle and axis loads
- Tool table display
- Timers
- Feedrates
- Spindle speeds

G-Menu Programming Assistant



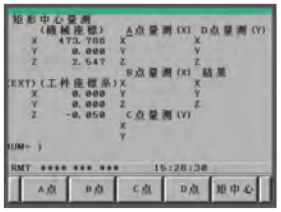
G-Menu provides simple programming functions to help operator accomplish simple machining tasks quickly and easily.

Calculator Function



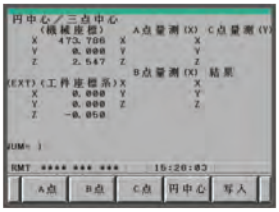
Calculator function provides fast calculation and entry of the workpiece coordinate setting and corrections.

Center of Rectangle Function



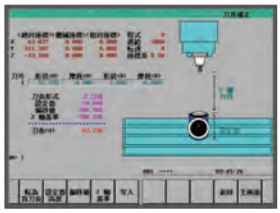
By measuring four points of a rectangular workpiece, it calculates the center of the workpiece and the tilt angle.

Center of Circle Function



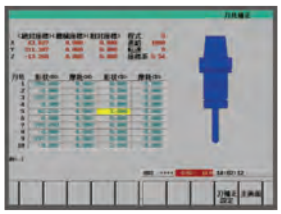
Provides the coordinates for the center of a circle, using three points on the workpiece.

Tool Length Measurement and Setting



Manual setting of compensation and tool length values.

Tool Length Corrections

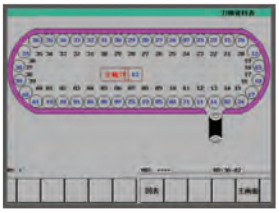


Easy and fast entryof wear values on length and diameter.

Intelligent ATC System Management

User-friendly tool storage check-and-set, and display of program number, spindle speed and feedrates. Allows the operator to view cutting conditions.

Intelligent ATC System Management

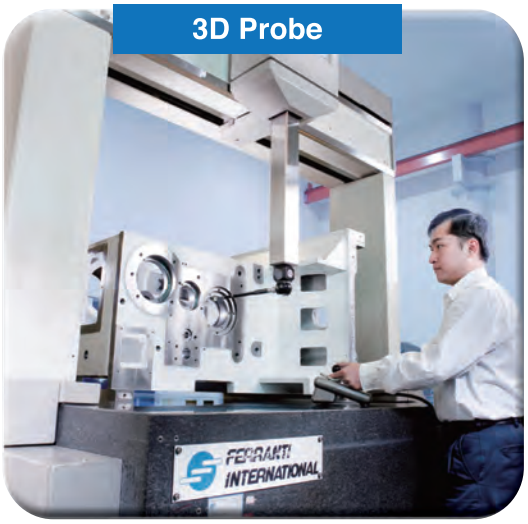


It displays the pot numbers and the corresponding tool numbers. Also displays and modifies the standby tool number.

Quality Assurance

Rigorous tests and inspection–Extra level of quality control performed on key components.

3D Probe



3D probe system quality assurance (CMM)

Dynamic Balance

Inspection on spindle motor and gear unit

Laser

Laser inspection

Ball Milling

3D circular ball milling

Cutting Test

Light cutting test - 45° parallel
and 2D circular milling

Ball Bar

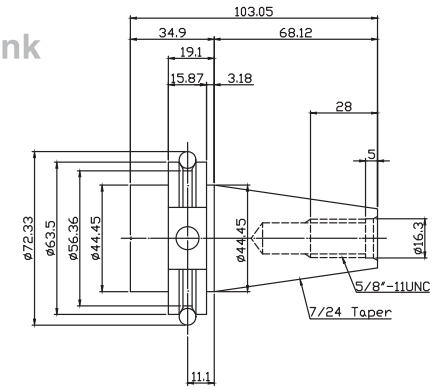
Ball bar inspection

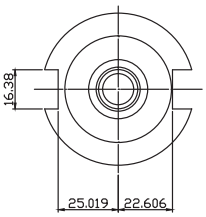
Tool holder dimensions

Tool Shank and Pull Stud

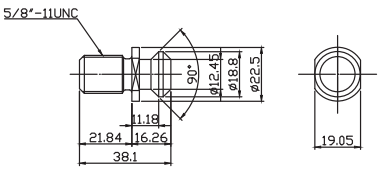
And tool cooling options.

Tool Shank

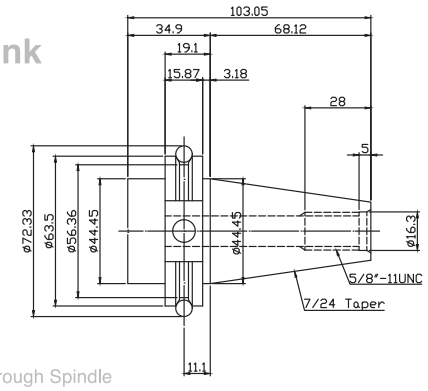


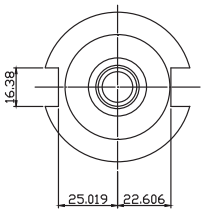


Pull Stud

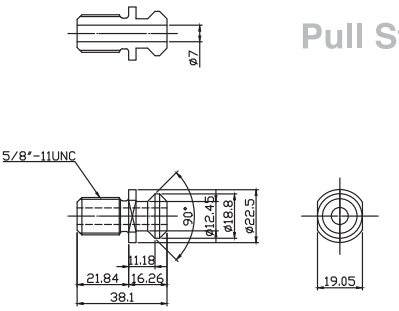


Tool Shank (CTS)





Pull Stud

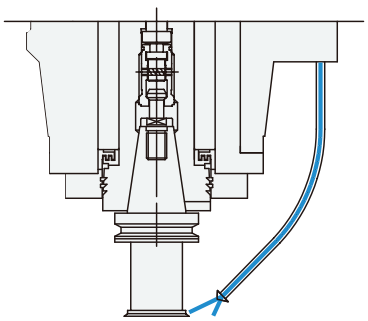


CTS = Coolant Through Spindle

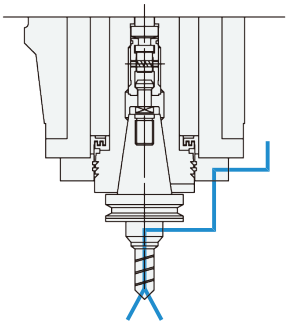
Spindle Tool Cooling

Options for cooling spindle tool temperature.

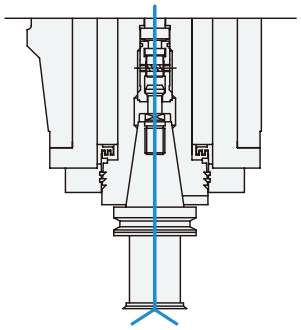
Standard – Coolant Nuzzle



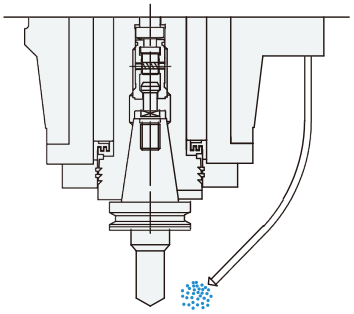
Optional – Coolant Through Tool and Tool Holder



Optional – Coolant Through Spindle



Optional – Oil-Mist Coolant System



Machine Specifications

Subject to change without prior notice.

ITEM	UNIT	LRZ-700	LRZ-900	LRZ-1100	LRZ-1400	LRZ-1600
Travel						
X-axis	inch	30	35	43	55	63
Y-axis	inch	20	24	24	28	28
Z-axis	inch	19	24	24	28	28
Distance spindle nose-to-table surface	inch	4~23	4~28	4~28	4~32	4~32
Table						
Table Size (X x Y)	inch	20x34	39 x 23	47 x 23	61 x 27	69 x 27
Max. Loading Capacity	lbs	662	1433	1762	2205	2205
T-Slots (numbers x width x pitch)	inch	3 x 0.6 x 5	5 x 0.7 x 4	5 x 0.7 x 4	5 x 0.7 x 6	5 x 0.7 x 6
Spindle						
Spindle Speed - Direct-Drive (Std.)	rpm	12,000	10,000 / 12,000* / 15,000*		10,000	
Spindle Taper	type	#40			#40 / #50*	
Feed						
Rapid Travel Rate (X/Y/Z)	ipm	1889 / 1889 / 1889			1574 / 1574 / 1417	
Cutting Rate	ipm	393				
ATC						
Tool Shank type	type	CAT-40 / BT-40*			CAT-40 / BT-40* (CAT-50* / BT-50*)	
Magazine Capacity	tools	24 / 32* / 40*			30 / 40*	
Max Tool Diameter (with adjecent tools)	inch	Ø3				
Max Tool Diameter (without adjecent tools)	inch	Ø6				
Max Tool Length	inch	12				
Max Tool Weight	lbs	15				
Tool Change Time (Tool-to-Tool)	sec	1.2 (2)	2	2	1.32 (ATC 24) / 1.94 (ATC 32, 40)	
Tool Change Time (Chip to Chip)	sec	2.7 (5.8)	3.8	3.8	3.8	3.8
Motor						
Spindle Motor (30 min.)	hp	10 / 15*	15 / 20* / 25*	15 / 20* / 25*	15 / 20* / 25*	15 / 20* / 25*
Feed Motor X / Y / Z	hp	4 / 4 / 5	4 / 5 / 9	4 / 5 / 9	5 / 5 / 9	5 / 5 / 9
Power Supply						
Power Supply	kVA	15	20	20	35	35
Compressed Air Supply	psi	90	90	90	90	90
Coolant Tank Capacity	gal	65	110	110	130	130
External Dimension						
Width	inch	83	92	110	94	94
Length	inch	105	138	138	151	159
Height	inch	104	118	118	118	118
Weight	lbs	8400	14900	15300	21000	24300
Accuracy		(following values were tested in the temperature-controlled room)				
Positioning Accuracy - JIS 6338 (within 12″)	inch	±0.00015				
Repeatability Accuracy - JIS 6338 (within 12″)	inch	±0.00008				

● *Specification measurements are rounded to the nearest whole unit.*

Machine Specifications

Subject to change without prior notice.

ITEM	UNIT	LR-900	LR-900 APC	LR-1100
Travel				
X-axis	inch	35	35	43
Y-axis	inch	24	24	24
Z-axis	inch	24	22	24
Distance spindle nose-to-table surface	inch	4 ~ 28	6 ~ 28	4 ~ 28
Table				
Table Size	inch	39 x 23	33 x 20 (2-pallets)	47 x 24
Max. Loading Capacity	lbs	1433	661 x 2	1763
T-Slots (numbers x width x pitch)	no x inch	5 x 0.7 x 4	5 x 0.7 x 4	5 x 0.7 x 4
Spindle				
Spindle Speed - Direct Drive	rpm	10,000 / 12,000* / 15,000*		
Spindle Speed - Gear	rpm	8000	8000	8000
Spindle Taper	type	#40		#50
Feed				
Rapid Travel Rate (X/Y/Z)	ipm	1890 / 1890 / 945	1890 / 1890 / 945	1890 / 1890 / 945
Cutting Rate	ipm	395		
ATC				
Tool Shank type	type	CAT-40 / BT-40*		CAT-50 / BT-50*
Magazine Capacity	tools	24 / 32* / 40*		
Max Tool Diameter (with adjecent tools)	inch	3		
Max Tool Diameter (without adjecent tools)	inch	Ø6		
Max Tool Length	inch	12		
Max Tool Weight	lbs	15		
Tool Change Time (Tool to Tool)	sec	2	2	2
Tool Change Time (Chip to Chip)	sec	3.8	3.8	3.8
Motor				
Spindle Motor (30 min.)	hp	10 / 15*	15 / 20* / 25*	15 / 20* / 25*
Feed Motor X / Y / Z	hp	4 / 4 / 5	4 / 5 / 9	4 / 5 / 9
Power Supply				
Power Supply	kVA	15	20	20
Compressed Air Supply	psi	90	90	90
Coolant Tank Capacity	gal	66	110	110
External Dimension				
Width	inch	92	90	110
Length	inch	138	143	138
Height	inch	118	123	118
Weight	lbs	17,086	18,740	17,530
Accuracy		(following values were tested in the temperature-controlled room)		
Positioning Accuracy - JIS 6338 (within 12″)	inch	±0.00008		
Repeatability Accuracy - JIS 6338 (within 12″)	inch	±0.0002		

● *Specification measurements are rounded to the nearest whole unit.*

Machine Accessories

Subject to change without prior notice.

Standard Features

- Air blast through spindle
- ATC 24-tool
- Automatic lubrication equipment
- Coolant system
- Direct drive 10,000 rpm
- Fanuc control
- Full splash guard
- Leveling bolts and blocks
- Lift-up chip conveyor
- Operating instructions
- Programming manual
- Spindle chiller
- Tool box
- Work light

Increase **machining capacity** with performance enhancing accessories. Extend spindle efficiency with coolant through spindle, coolant through tool and tool holder, and spindle air blast.

Boost chip removal with a chip flush coolant system, air blast function for workpiece or coolant gun.

Combine optonal accessories for greater machine performance.

Optional Accessories

- Adjusting tools and box
- Air blast function for workpiece (M07)
- ATC 32/40-tool
- Automatic door
- Auto lubrication system
- Auto power off (M30)
- Chip flush coolant system
- Coolant gun
- Coolant system
- Coolant through spindle
- Coolant through tool and tool holder
- Heat exchanger on electric cabinet
- Liner scales (Axes X/Y/Z)
- Oil skimmer
- Oil-mist collection system
- Rigid tapping function
- Screw type chip conveyor
- Spindle air blast
- Spindle oil cooler (Refrigerant R407C)
- Tool length measurement
- Work light and tri-status light
- Workpiece length measurement

MIGHTY VIPER

Over 45 years, **Mighty Viper** has sold more than 25,000 machines nationwide, resulting in a world of satisfied customers and a wealth of feedback that has added to our arsenal of experience and fine craftsmanship. In keeping with our commitment to provide only the highest quality machining centers, every available resource is utilized to maintain a state-of-the art manufacturing process and to continue the delivery of cutting edge technologies.

Your local Mighty Viper dealer:

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