



龍門世家

ISO 9001



ISO 14001



High Speed Bridge Type Vertical Machining Center

HIGH PRECISION · HIGH SPEED · HIGH PERFORMANCE



F-16

F-7 / F-87 / F-16 / F-101

High Speed Machining Center Series



To AWEA Esteemed Customers

The brand new high speed series, with AWEA core strengths, possess superb bridge type structure. The series are equipped with advanced FANUC controller and the software of AWEA Optimal Parameter System. F-16 series are particularly suitable for high-end precision molding industry and other precision parts manufacturing in a wide range of industries.

The trustworthy series have excellent features including high speed, accuracy and durability. AWEA superb products are capable of working as pioneers to explore business for customers.



F-7

X = 700 mm
Y = 500 mm



F-87

X = 800 mm
Y = 700 mm



F-16

X = 1,000 mm
Y = 600 mm



F-101

X = 1,000 mm
Y = 1,000 mm

Industrial Applications



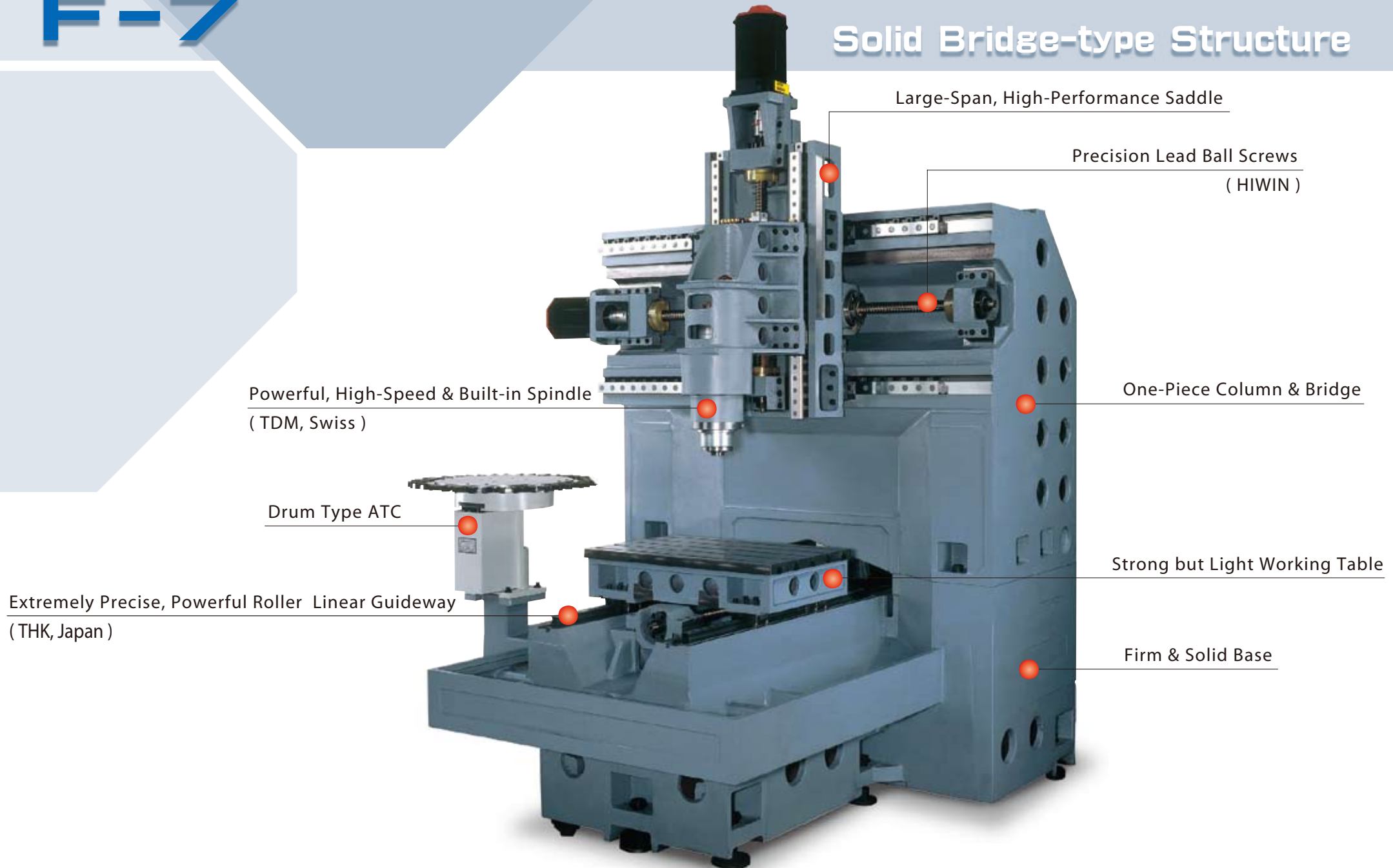
High Speed Machining Center Series

1. High-End Plastic Precision Die / Mold
2. High-End Automotive Light Mold
3. Mold Making in Telecom Industry
4. Mold Making in Electronic Industry
5. Mold Making in Computer Industry
6. Mold Making in Optical Industry
7. Precision Parts Manufacturing

G03X-.118Y19.922I-.844J1.157
G01X-21.578Y19.937
G03X-21.584Y11.937I-.003J-4.
X-21.578Y19.937I.003J4.
G01X-48.433Y19.955
G03K-48.443Y4.275I-.005J-7.84
X-32.839Y19.858I.011J15.594
X-48.422Y35.482I-15.593J.011
G01X-96.111Y35.484
G03X-98.504Y34.504I-.002J-3.38
G02X-104.16Y40.16I-2.828J2.828
X-98.504Y34.504I2.828J-2.828
G03X-99.494Y32.113I2.39J-2.39
G01Y-32.113
G03X-98.504Y-34.504I3.38J0
G02X-104.16Y-40.16I-2.828J-2.828
X-98.504Y-34.504I2.828J2.828
G03X-96.113Y-35.494I2.39J2.39
G01X-.848Y-35.493
G03X1.167Y-34.556I0J2.637
G02X7.283Y-39.713I3.058J-2.579
X1.167Y-34.556I-3.058J2.579
G03X1.725Y-32.283I-2.016J1.7
G01X-.854Y-20.698

F-7

Solid Bridge-type Structure



F-7

High Speed Machine



High Speed Machining Center Series

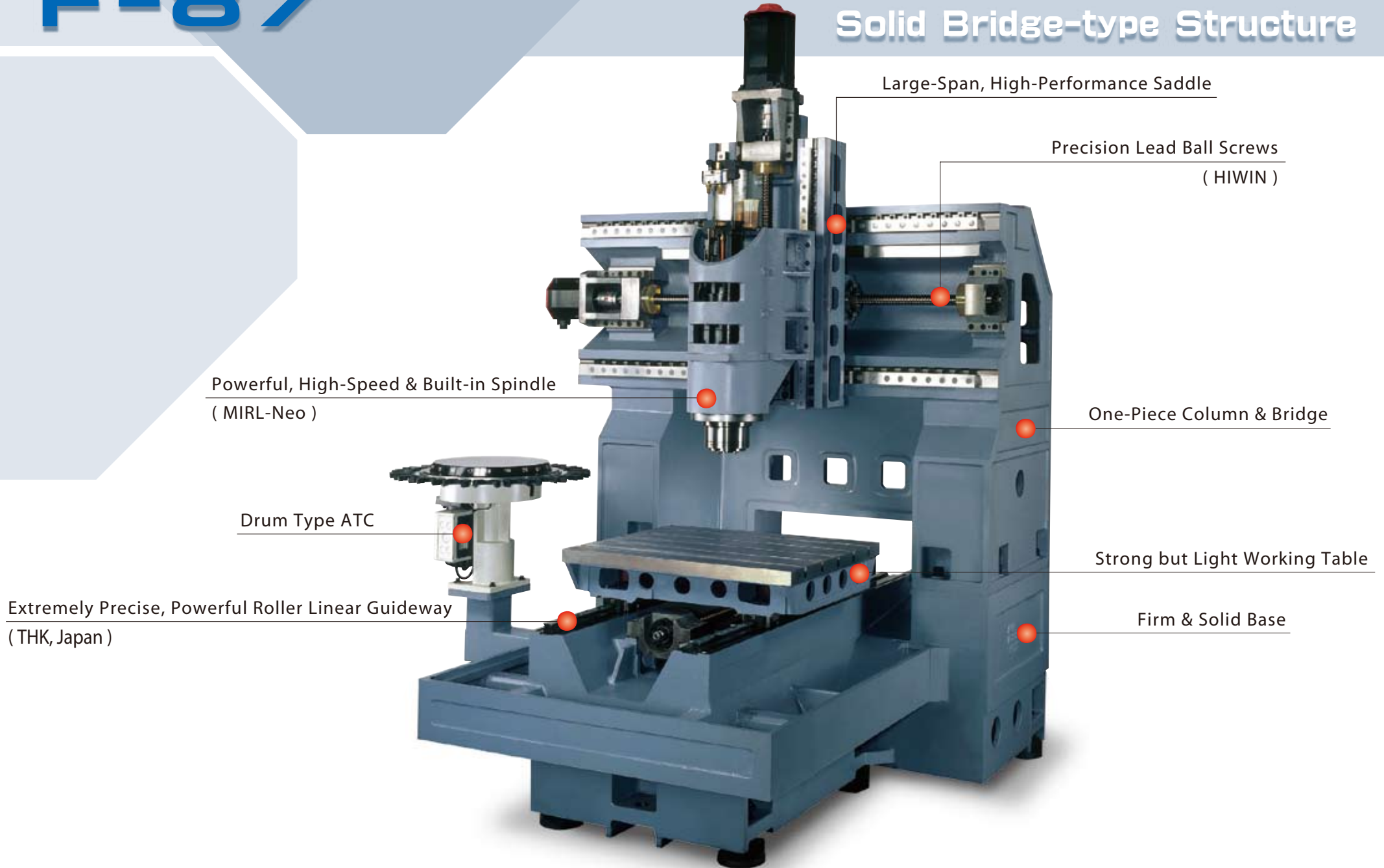
- *Advanced and Novel Design*
- *Solid Bridge Type Structure*
- *Rapid, Accurate, Durable*
- *Superior High Speed Moldmaking Machine*



- The sample machine is equipped with FANUC 18i-MB controller and built-in high speed spindle TDM (30,000 rpm) made in Switzerland. (optional)

F-87

Solid Bridge-type Structure



Large-Span, High-Performance Saddle

Precision Lead Ball Screws
(HIWIN)

Powerful, High-Speed & Built-in Spindle
(MIRL-Neo)

One-Piece Column & Bridge

Drum Type ATC

Strong but Light Working Table

Extremely Precise, Powerful Roller Linear Guideway
(THK, Japan)

Firm & Solid Base

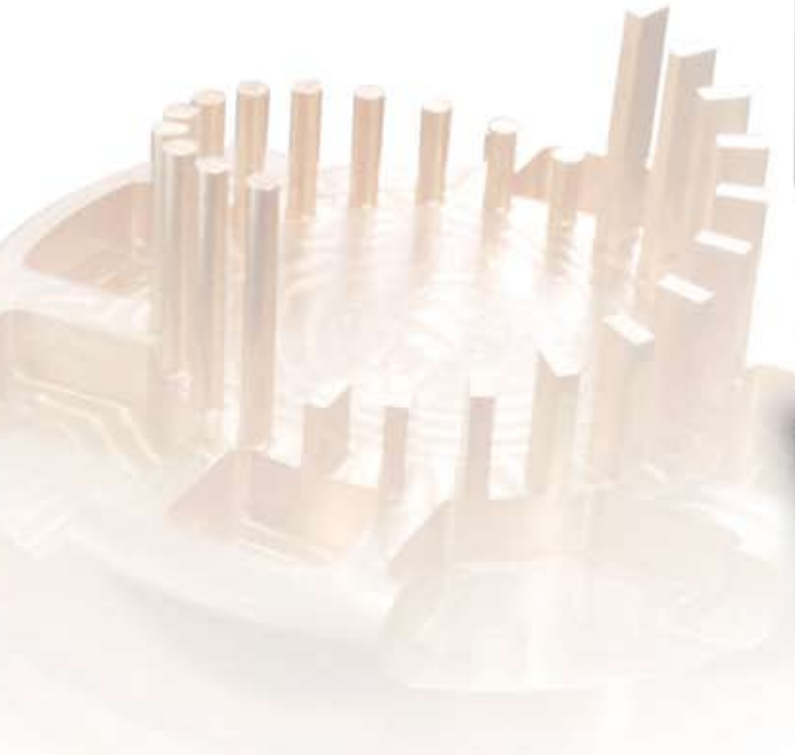
F-87

High Speed Machine



High Speed Machining Center Series

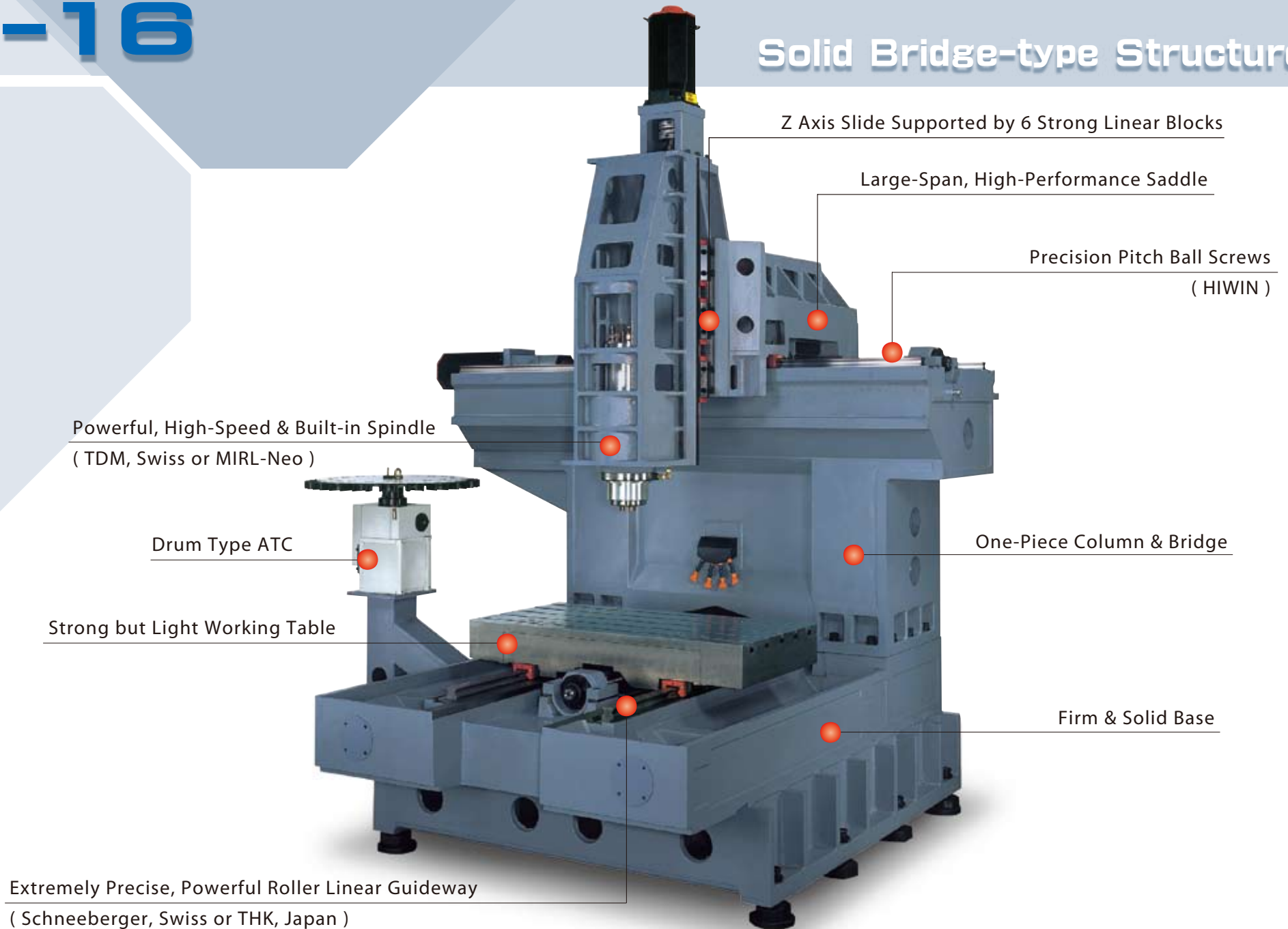
- *Advanced and Novel Design*
- *Solid Bridge Type Structure*
- *Rapid, Accurate, Durable*
- *Superior High Speed Moldmaking Machine*



- The sample machine is equipped with FANUC 18i-MB controller and built-in high speed spindle MIRL-Neo (15,000 rpm) developed by ITRI, Taiwan.

F-16

Solid Bridge-type Structure



F-16

High Speed Machine



High Speed Machining Center Series

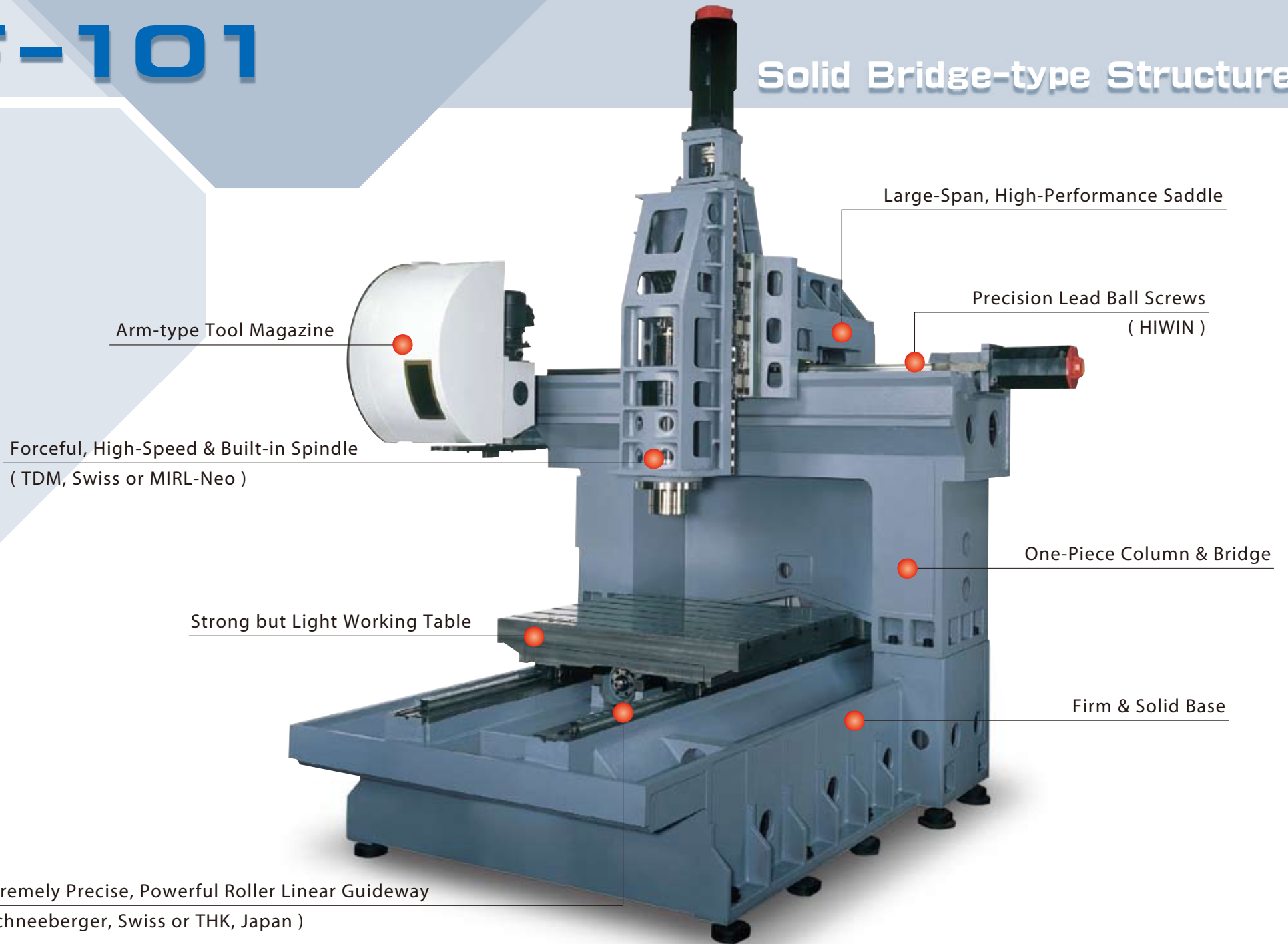
- *Advanced and Novel Design*
- *Solid Structure Shaped in Bridge Type Structure*
- *Rapid, Accurate, Durable*
- *Superior High Speed Moldmaking Machine*



- The sample machine is equipped with FANUC 18i-MB controller and built-in high speed spindle TDM (22,000 rpm) made in Switzerland.

F-101

Solid Bridge-type Structure



Arm-type Tool Magazine

Forceful, High-Speed & Built-in Spindle
(TDM, Swiss or MIRL-Neo)

Strong but Light Working Table

Large-Span, High-Performance Saddle

Precision Lead Ball Screws
(HIWIN)

One-Piece Column & Bridge

Firm & Solid Base

Extremely Precise, Powerful Roller Linear Guideway
(Schneberger, Swiss or THK, Japan)

F-101 High Speed Machine



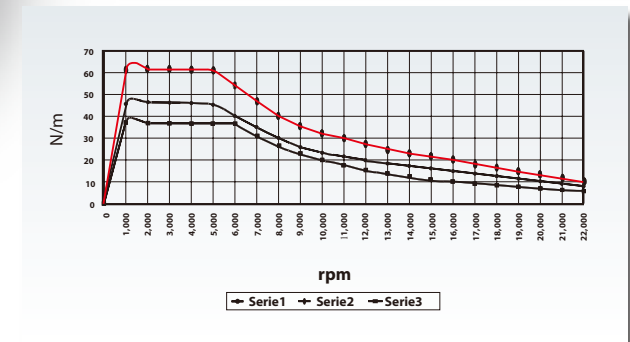
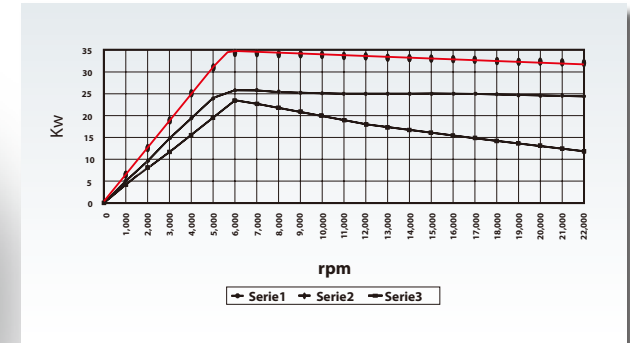
High Speed Machining Center Series

- *Advanced and Novel Design*
- *Solid Bridge Type Structure*
- *Rapid, Accurate, Durable*
- *Superior High Speed Moldmaking Machine*



- The sample machine is equipped with FANUC 18i-MB controller and built-in high speed spindle MIRL-Neo (15,000 rpm) developed by ITRI, Taiwan.

Built-in Spindle (TDM, Swiss)

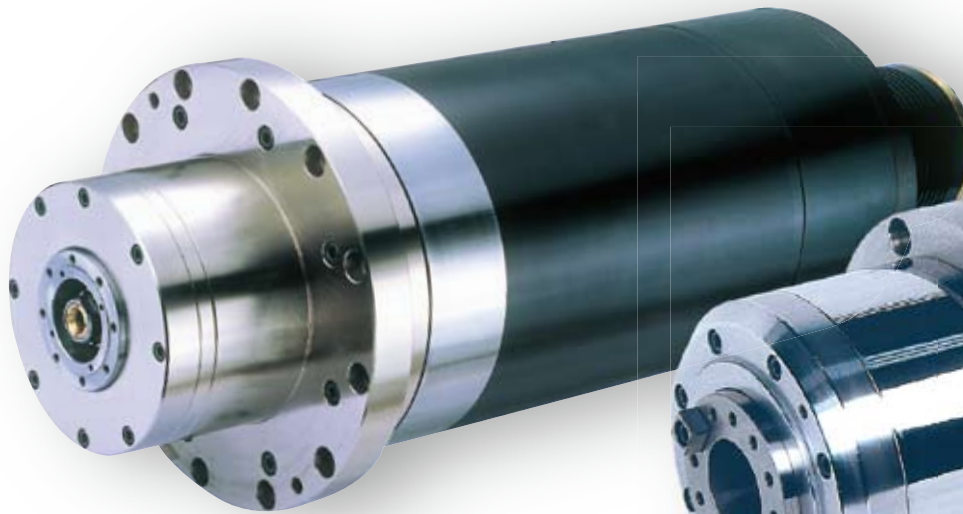


[Table] Power & Torque of A22 (22,000 rpm)

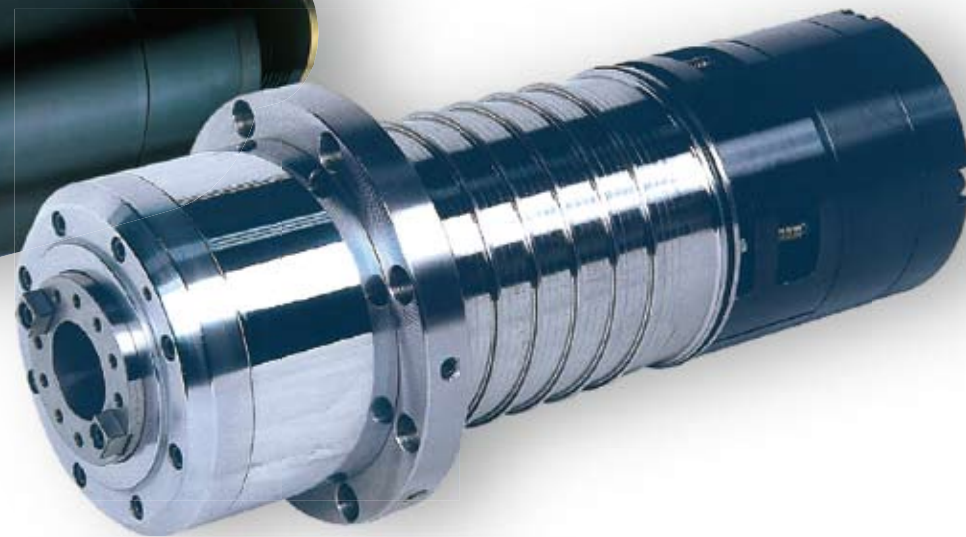
Item	Code	Spindle Speed (Max.)	Power (Max.)	Torque (Max.)	Spindle Taper	Lubrication	Motor Brand	Model
1	A22	22,000 rpm	35 Kw	60 N.m	Short Nose HSK A63	Oil-Air	TDM, Swiss	F-16 F-101
2	A21	21,000 rpm	20 Kw	20 N.m	Short Nose HSK A63	Grease	TDM, Swiss	F-7
3	A30	30,000 rpm	20 Kw	20 N.m	Short Nose HSK A63	Oil-Air	TDM, Swiss	F-7

High-Speed Spindle

Built-in Type



Direct Drive Type



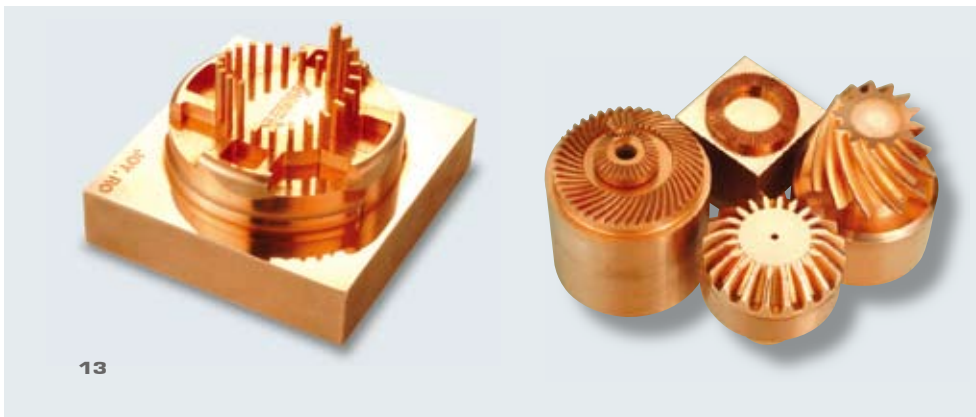
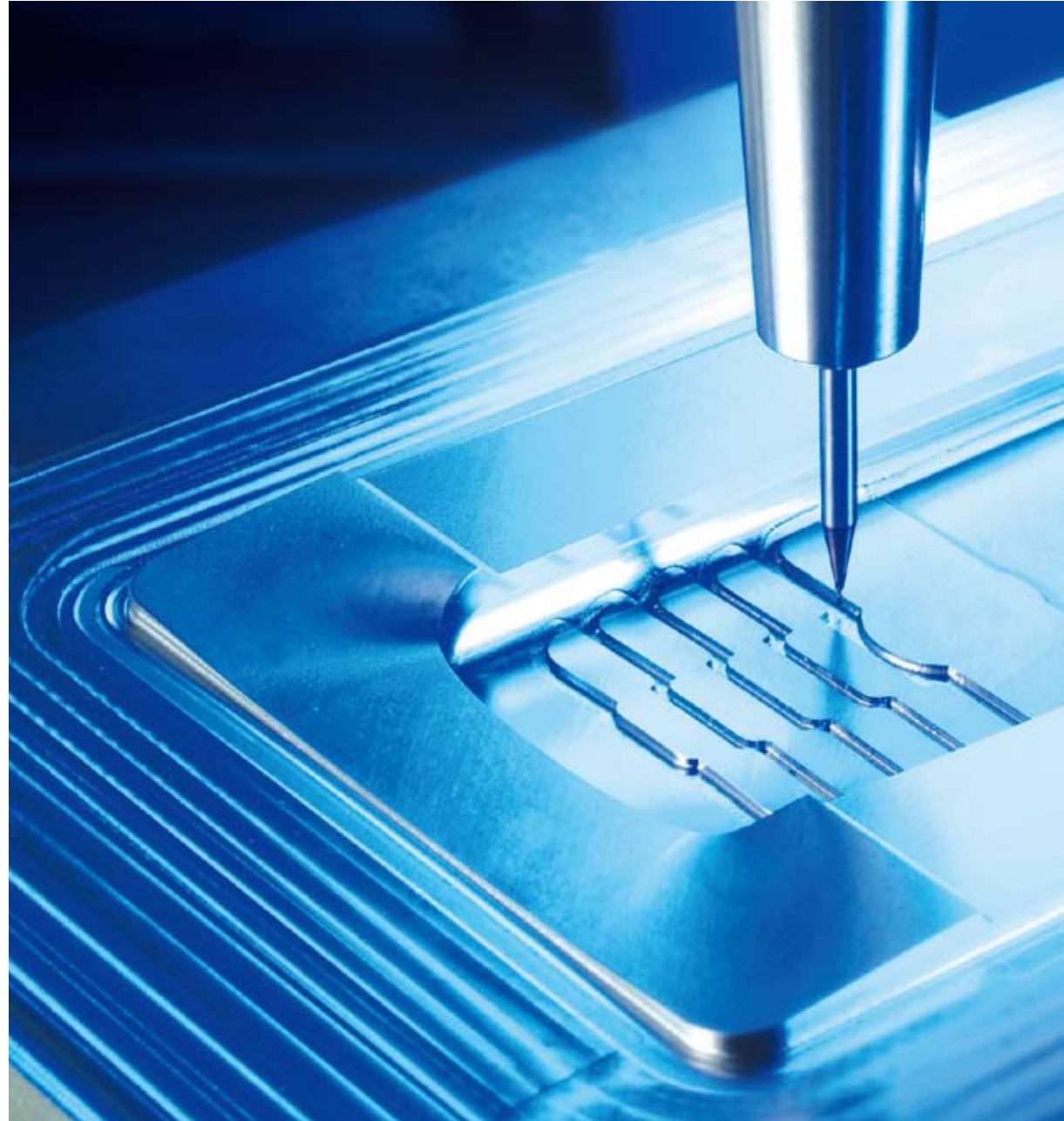
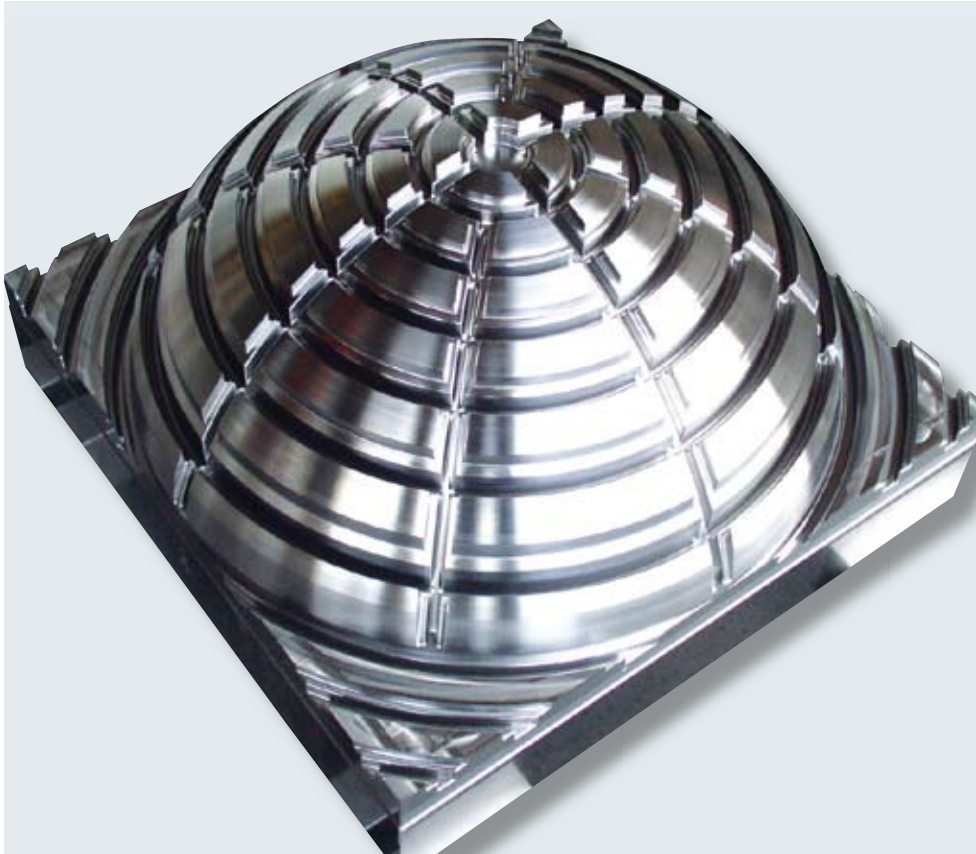
Built-in Spindle

Item	Code	Spindle Speed (Max.)	Power (Max.)	Torque (Max.)	Spindle Taper	Lubrication	Motor Brand	Model
1	M15	15,000 rpm	22 Kw	118 N.m	BT40	Grease	FANUC, Japan	F-87 F-16 F-101
2	M20	20,000 rpm	18.5 Kw	95 N.m	Short Nose HSK A63	Oil-Air	FANUC, Japan	F-87 F-16 F-101

Direct Drive Spindle

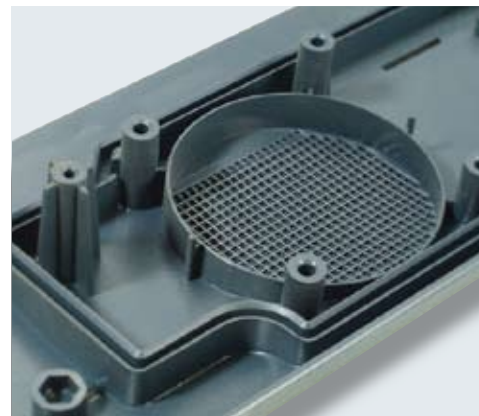
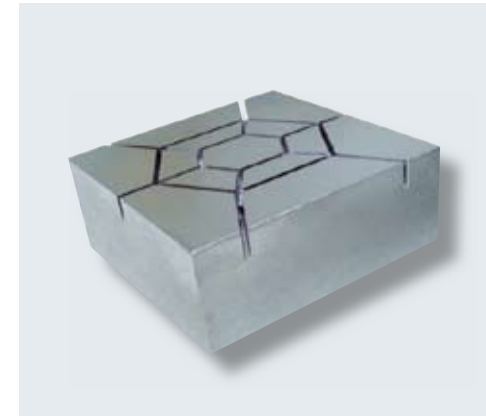
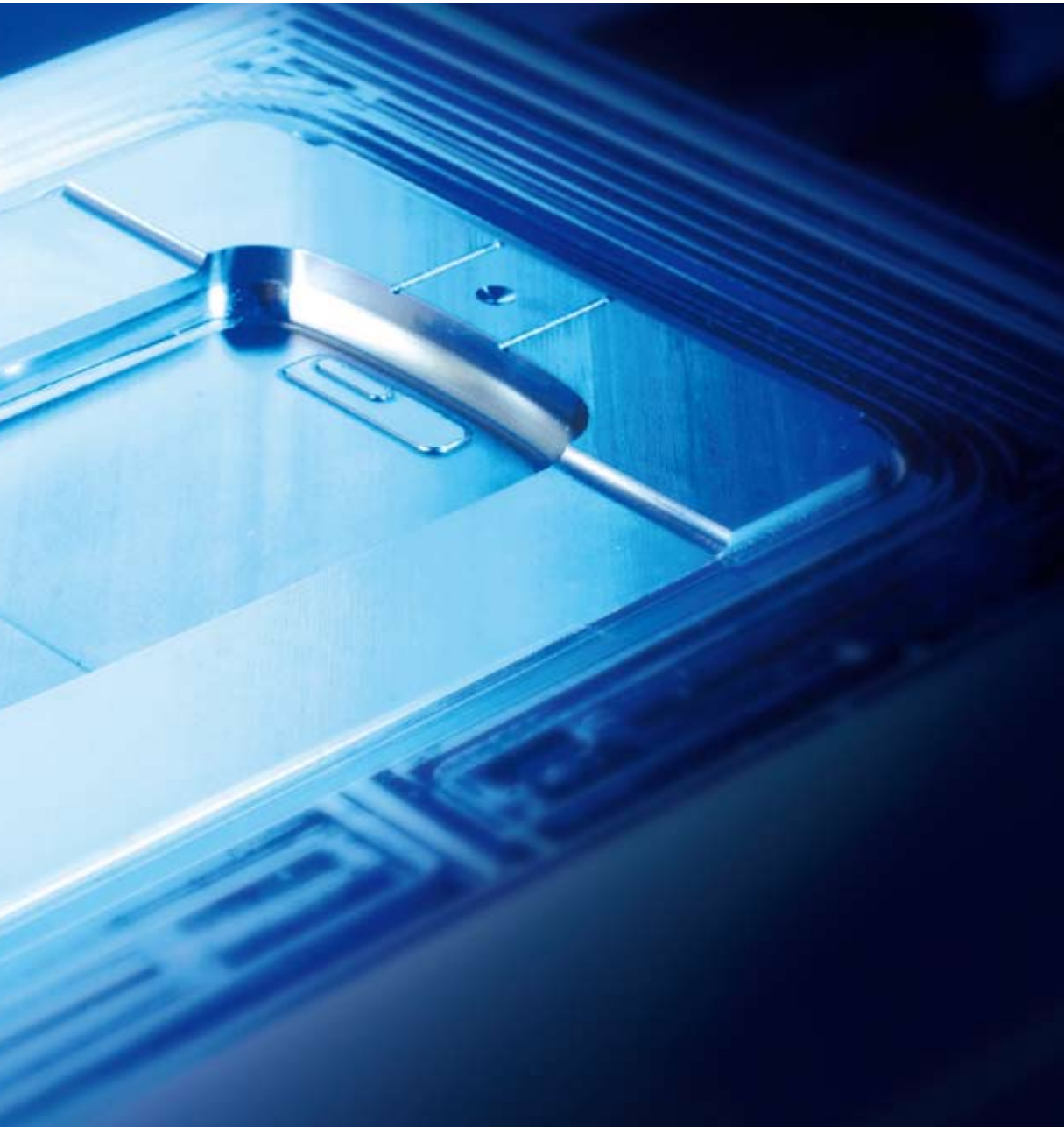
Item	Code	Spindle Speed (Max.)	Power (Max.)	Torque (Max.)	Spindle Taper	Lubrication	Motor Brand	Model
1	B12	12,000 rpm	18.5 Kw	118 N.m	BT40	Grease	FANUC, Japan	F-16 F-101
2	B15	15,000 rpm	15 Kw	95 N.m	BT40	Grease	FANUC, Japan	F-16 F-101

Fine Surface Finishness





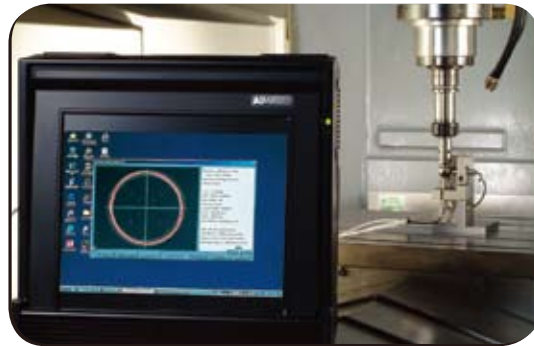
High Speed Machining Center Series



Quality Test & Performance Probe

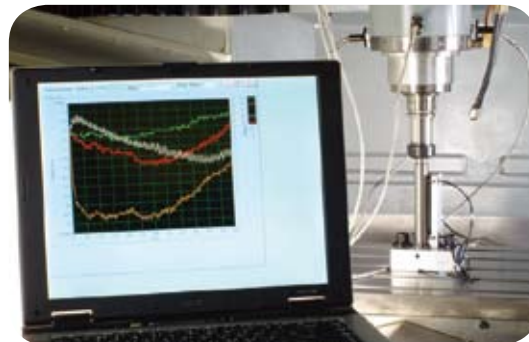
Inspection on Dynamic Characteristics of the High Speed Spindle

The test and probe are undertaken under different rotational conditions of the high speed spindle. The scope of inspection includes dynamic balance, vibration, noise, temperature rising, thermal variation and run-out precision and so on. It aims to ensure the high speed spindle at optimal status with excellent functioning.



Spindle Thermal Variation Probe & Compensation Function (Opt.)

Machining centers during operation are affected by internal thermal source, such as power and spindle rotation as well as external thermal source, such as environment temperature. It will generate 'expansion/contraction effect' upon the metal and further induce thermal variation as a result. The compensation function AWEA developed can dramatically improve the side effect of spindle thermal variation.



3D Precision Measurement

- All of precision parts pass 3 D precision measuring test in order to ensure dimension tolerance and geometric precision.



Ball Bar Inspection

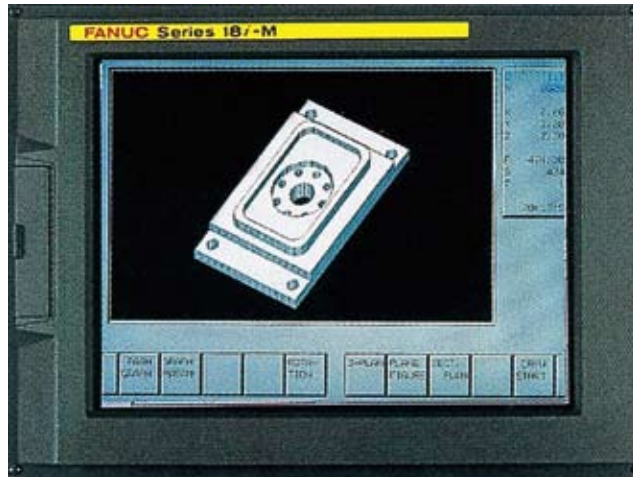
- 3 D ball bar inspection aims to make optimal adjustment .
- Strict German VDI 3441 standard.



Laser Inspection

- Positioning accuracy, repeatability, backlash test and offset.
- Strict German VDI 3441 standard. (5 times of back and forth running to get the statistics)

Controller & AWEA Optimal Parameter System



Japanese-made FANUC 18iMB Controller

- Advanced Control Functions with High Speed, High Precision & High Efficiency
- Built-in Network Function & PCMCIA Interface; ATA Flash Memory Card as DNC Function
- Equipped with AI Nano HPCC and High-Efficiency FSSB DATA BUS to upgrade speed and accuracy

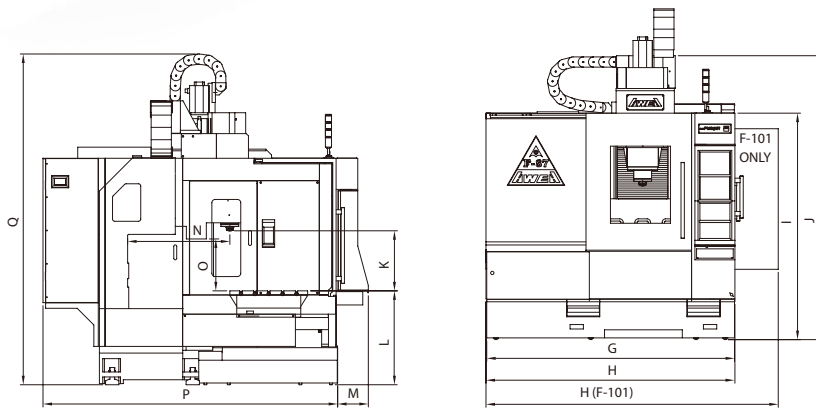
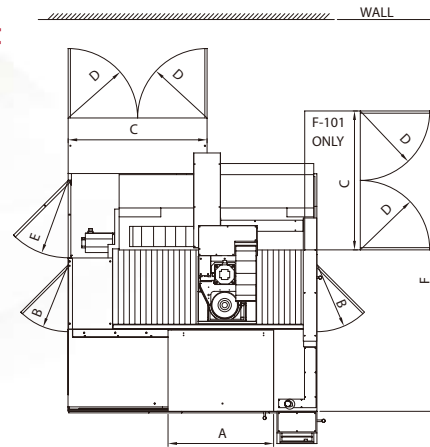


AWEA Elaborate Optimal Parameter System

To meet the rigid standard raised by the molding industry, AWEA continuously develops and tests product characteristics both in static and dynamic states. The machining parameters are optimized to set up various modules. Those modules comprise the information of work pieces in exact size, high precision, fine surface and fast feed rate. AWEA Optimal Parameter System meets a variety of quality requirements made by customers from different industrial sectors.

Dimension & Tool Size

Machine Space Requirement

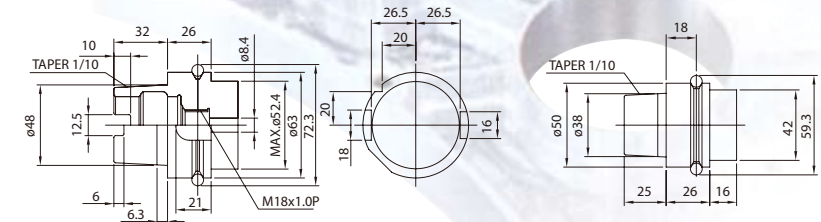


Unit : mm

	A	B	C	D	E	F	G	H	I
F-7	810	700	1200	600	550	3700	2050	2240	2145
F-87	880	600	1250	625	700	3475	2230	2240	2030
F-16	1140	615	2850	1000	545	3970	2850	2850	2360
F-101	1035	845	1250	625	700	3425	2750	3255	2435

	J	K	L	M	N	O	P	Q
F-7	2655	150-500	915	290	605	460	2800	2950
F-87	2640	150-570	845	290	920	400	2550	2970
F-16	3050	125-625	820	225	655	725	2820	3200
F-101	2880	175-683	850	290	1135	560	3125	3270

Tool Shank & Pull Stud

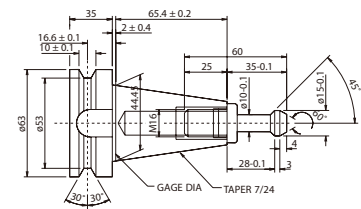
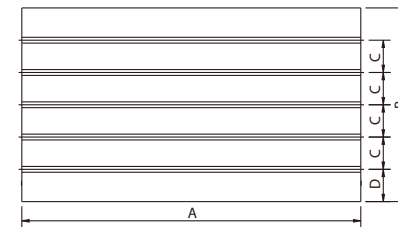


HSK A63

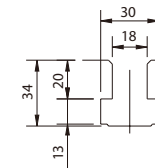
HSK E50

- Tool dynamic balance should be within G1.2 level.

Table Dimension



BT 40



	A	B	C	D
F-7	770	500	100	50
F-87	850	700	125	100
F-16	1160	600	115	70
F-101	1100	1000	140	80

Machine Specifications



High Speed Machining Center Series

Item		F-7	F-87	F-16	F-101
Working Range	X travel (left & right)	mm (in)	700 (27.6)	800 (31.5)	1,000 (39.4)
	Y travel (in & out)	mm (in)	500 (19.7)	700 (27.6)	600 (23.6) 1,000 (39.4)
	Z travel (up & down)	mm (in)	350 (13.8)	420 (16.5)	500 (19.7)
	Distance from spindle nose to table top	mm (in)	150 ~ 500 (5.9 ~ 19.7)	150 ~ 570 (5.9 ~ 22.4)	125 ~ 625 (4.9 ~ 24.6) 175 ~ 683 (6.9 ~ 26.9)
Table	Table size (L × W)	mm (in)	770 × 500 (30.3 × 19.7)	850 × 700 (33.5 × 27.6)	1,160 × 600 (45.7 × 23.6) 1,100 × 1,000 (43.3 × 39.4)
	T slot (width × No. × pitch)	mm (in)	18 × 5 × 100 (0.7 × 0.2 × 3.9)	18 × 5 × 125 (0.7 × 0.2 × 4.9)	18 × 5 × 115 (0.7 × 0.2 × 4.5) 18 × 7 × 140 (0.7 × 0.3 × 5.5)
	Table load	kg (lb)	600 (1,320)	800 (1,760)	1,000 (2,200) 2,000 (4,400)
Spindle (Standard)	Spindle speed	rpm	21,000	15,000	12,000
	Spindle brand		TDM (Built-In)	MIRL-Neo (Built-In)	FANUC (Direct Driven)
	Spindle motor (cont./30 min.)	kw (HP)	24 (32)	22 (29.5)	18.5 (24.8)
	Max. torque	N.m	20	118	118
	Spindle taper		HSK-E50	BT40	BT40
	Bearing lubrication		Grease		Grease
	Spindle bearing diameter	mm (in)	ø 60 (2.4)	ø 70 (2.8)	ø 70 (2.8)
	Spindle cooling system		The same temperature as indoor ± 1°C		The same temperature as indoor ± 1°C
Controller	FANUC	18i-MB		18i-MB	
Feed rate	Cutting feed rate	M(in)/min	24 (944.9)		20 (787.4)
	Rapid feed rate	M(in)/min	30 (1181.1)		30 (1181.1)
Tool magazine	Max. tool diameter	mm (in)	ø 20 (0.8)	ø 35 (1.4)	ø 80 (3.1) ø 76 (3.0)
	Max. tool length	mm (in)	200 (7.9)	220 (8.7)	300 (11.8)
	Max. tool weight	kg (lb)	3 (6.6)	7 (15.4)	7 (15.4)
	Number of tools	pcs	20		20 30
	Mode		Umbrella Type		Umbrella Type Arm type
Pneumatic requirement	Air resource	kg/cm ² (lb/cm ²)	6 (13.2)		7 (15.4)
Power equipment	Total capacity	KVA	40		55
	Pump	kw	0.7 + 1.17 = (1.87)		0.7 + 1.17 = (1.87)
Cooling liquid	Volume of tank	L	250		360 450
	Machine size (length×width×height)	mm (in)	2,650 × 2,400 × 2,850 (104.3 × 94.5 × 112.2)	2,930 × 2,240 × 3,000 (115.4 × 88.2 × 118.1)	3,050 × 2,850 × 3,200 (120.1 × 112.2 × 126.0) 3,260 × 3,120 × 3,200 (128.3 × 122.8 × 126.0)
Dimensions	Machine weight	kg (lb)	6,800 (14,960)	7,000 (15,400)	11,000 (24,200) 12,500 (27,500)
Positioning accuracy (P)	VDI 3441 total range	mm	0.008		0.010
Repeatability (Ps mean)	VDI 3441 total range	mm	0.004		0.005

• Product specifications and accessories are subject to change without notice.

Standard Accessories

- Spindle temperature control system
- Three axes auto lubrication system
- Machining air blast system
- Full enclosure splash guard
- Three Axes ball screw pretension
- Automatic power off system
- Automatic spindle air blast system
- RS-232 interface
- Tool box & foundation kit
- Electronic cabinet & heat exchanger
- Water proof work light
- Operation cycle finish & alarm light
- Bed flushing
- Water gun
- Air gun
- Screw type chip auger (F-16, F-101)
- Chips collector (F-7, F-87)
- Program Manual
- Operation & maintenance manual

Optional Accessories

- Built-in high speed spindle (15,000 ~ 30,000 rpm available)
- Scraper type chip conveyor (F-16, F-101)
- Caterpillar chip conveyor (F-16, F-101, F-87)
- The 4th axis interface
- Auto tool length measurement
- Dust collecting system
- Air-conditioned electronic cabinet
- Oil / Coolant separator
- Spindle thermal compensation
- X, Y, Z axes linear scales
- Servo tool magazine
- Transformer
- Ethernet card



AWEA Premium Brand

AWEA provides a full range of superior products marketed worldwide

Choice Products, One Stop Shop

We offer full product line from 510 to 20,000 mm on X-axis travel. The production lines include :

- Bridge Type Machining Center
- Bridge Type 5-Face Machining Center
- 5-Axis Machining Center
- Horizontal Boring Mills
- Vertical Machining Center
- Bridge Type High Speed Machining Center

Welcome to AWEA, one stop shop for all you need.

We offer superb products & excellent service!

AWEA MECHANTRONIC CO., LTD.

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