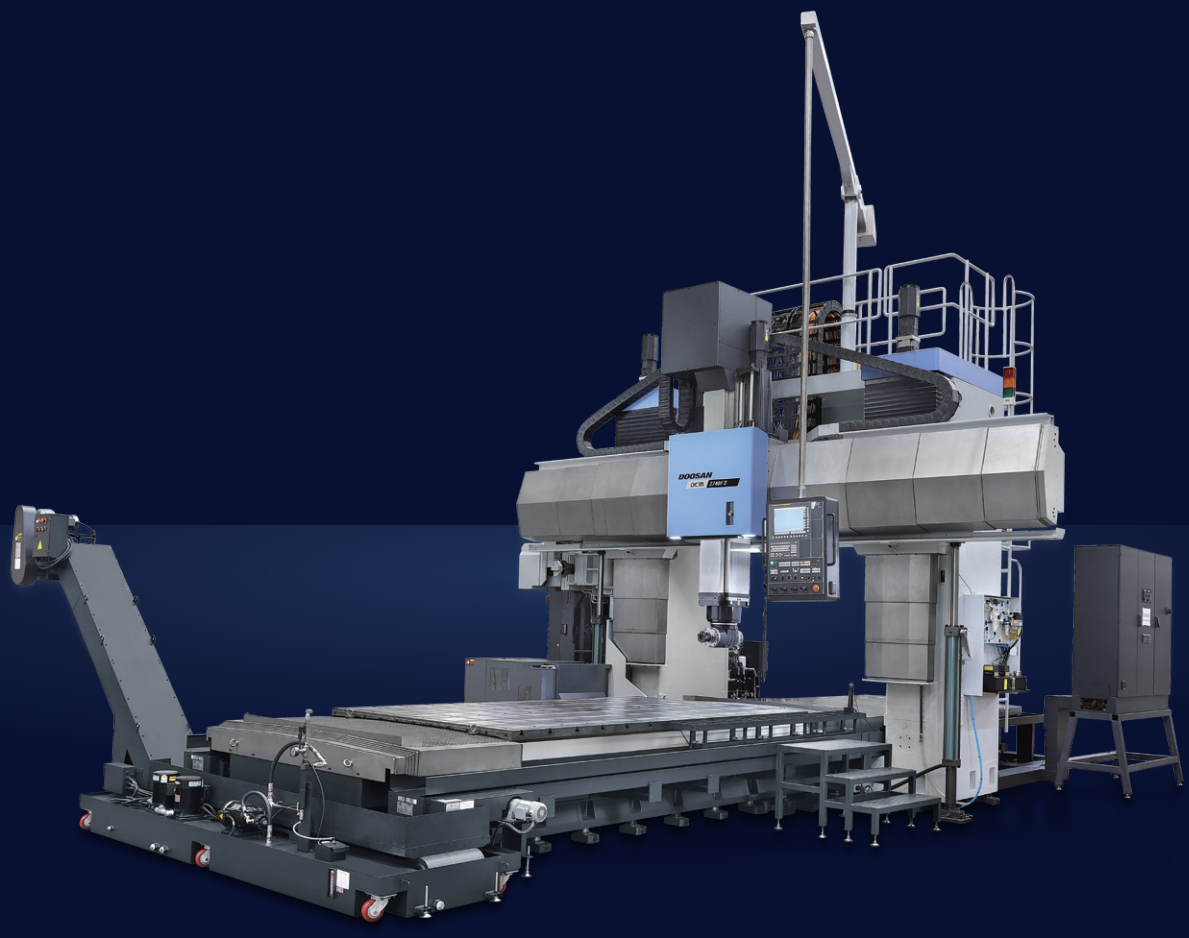
Doosan Machine Tools

MULTI-PURPOSE DOUBLE COLUMN MACHINING CENTER

DCM II

2740F II • 2750F II • 2760F II • 2780 F II • 3250F II
3260F II • 3280F II • 3780F II • 37100F II • 4280F



Basic information

Broad Range of Machining Capabilities

High-Precision, High-Speed Mold Machining Performance

Convenient Machining Functions

Machine Information

Standard/Optional Specifications

Machine Specifications

Customer Support

DCM Ⅱ series

The DCM Ⅱ series is a multi-purpose double column machining center for applications such as heavy duty machining of large parts and high precision dies and molds. Designed with the highest specifications in its class, the DCM Ⅱ series provides a broad range of machining capabilities and optional equipment, together with many convenient functions for the operator.

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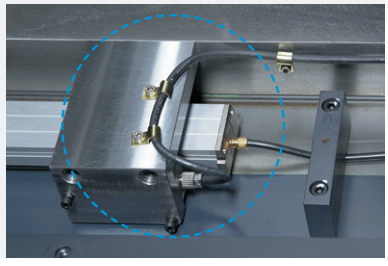
Broad Range of Machining Capabilities

- The best specifications in its class – effective width between columns has been further extended by 200 mm(7.9 inch) for increased machining capacity.
- A variety of different ram spindle specifications and a wide range of auto-change attachments support many types of machining applications, from simultaneous 5 axis processing of dies/molds to heavy duty cutting.

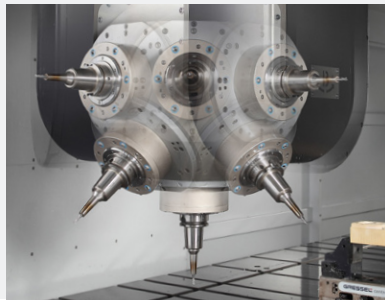
High-Precision, High-speed Mold Machining Performance

- Adoption of the DSQ Ⅰ/Ⅱ/Ⅲ functions, high-speed rapid traverse and cutting feedrate, high-load table capacity, high-precision/high-speed head attachments, X/Y/Z/W axes linear scale, or X/Y/Z axes ball screw shaft cooling as options enables the machining of high-accuracy and high-speed molds and general parts.



Convenient Machining Functions

- The DCM Ⅱ series provides a support system for 5 face machining of large and heavy workpieces, easy pattern cycles, work load counter control, automatic feed control, and process monitoring function.



Product Preview

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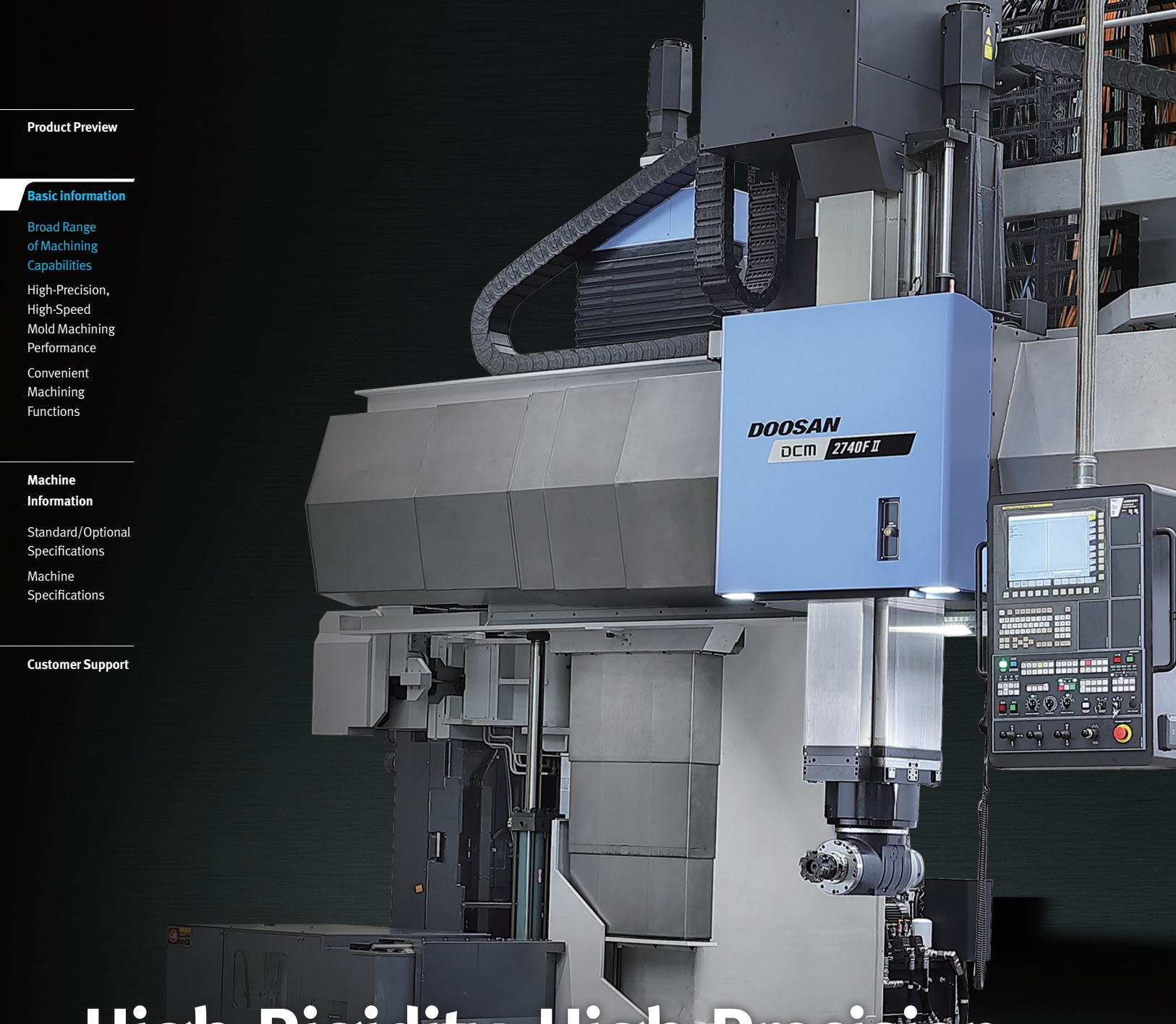


High-Rigidity, High-Precision Structure, Multi-purpose Double Column Machining Center

Optimal Solutions

Wide Machining Specifications

The best specifications in its class –effective width between column has been further extended by 200 mm(7.9 inch) for increased machining capacity.

Diverse Ram Spindles

A variety of different ram spindle specifications and a wide range of auto-change attachments support many types of machining applications, from simultaneous 5 axis processing of dies/molds to heavy duty cutting.

Various Auto-Change Head Attachments

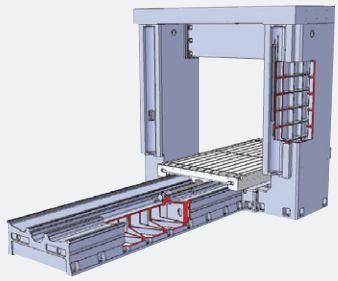
A diverse range of auto change head attachments enables a wide variety of applications to be processed, including machining of 5 faces ,angled faces using 1 degree index and simultaneous 5 axis cutting

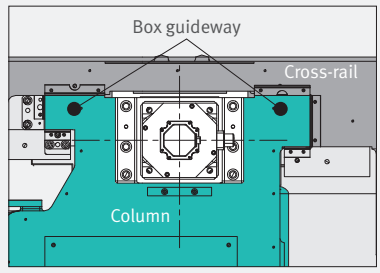
High-rigidity, High-precision Structure

Designed for large work pieces, the machine enables long-term, heavy-duty cutting with stable machining accuracy.

Bed and Column Structure

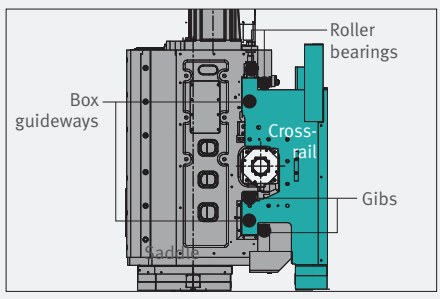
The structure of the DCM series minimizes the effects of vibration on workpieces under loads produced by both vertical and horizontal cutting during machining of 5 faces. Symmetrical structure design and the application of effective compensation reduces thermal displacement during machining.
The bed is made of an M-type cast structure excellent for vibration absorption to ensure a high level of machining accuracy.
The column provides extremely high rigidity thanks to its square-structured latticed-rib casting, which is excellent for vibration damping, and wide box guideways that are heat-treated and precision-ground.
The integrated column design provides a high degree of machining accuracy at all heights from the machine table, from heavy duty cutting to high precision finishing.

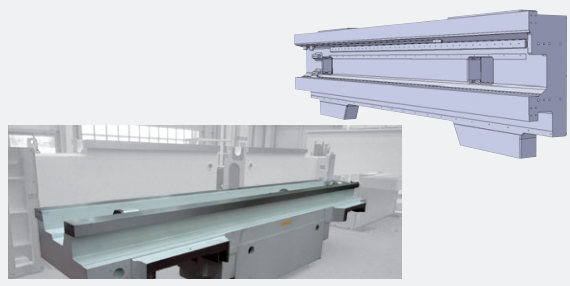




Cross-rail Structure

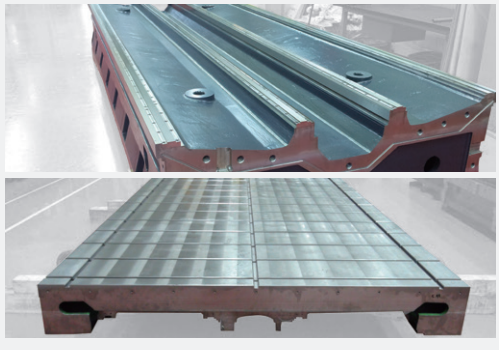
The guide-structure of the cross-rail supports the kinetic load of the saddle and ram spindle to maintain a high degree of accuracy for every type of work from heavy-duty cutting to finish cutting.
In addition, the hybrid-type structure combined with roller bearings and gibs enables smooth traveling.
The cast structure optimized for vibration damping, and the wide box guideway heat-treated and precision-ground are composed of highly rigid, square, sliding surfaces.

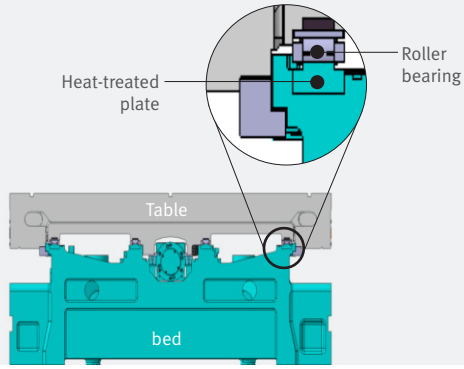




Bed and Table Structure

The bed supports traveling motion with four rows of heat-treated, precision-ground guideways.
A roller bearing pack for heavy-duty cutting and slide bearings for effective vibration damping are equipped at the bottom of the table to ensure a high level of cutting accuracy.





Wide Machining Specifications

The best specifications in its class – effective width between columns has been further extended by 200 mm(7.9 inch) for increased machining capacity.

X x Y x Z x W axes Travel

X-axis **4250 / 5250 / 6250 / 8250 / 10250 mm (167.3 / 206.7 / 246.1 / 324.8 / 403.5 inch)**

Y-axis **3200 / 3700 / 4200 / 5000 mm (126.0 / 145.7 / 165.4 / 196.9 inch)**

Z-axis **700 / 1000 mm (27.6 / 39.4 inch)**

W-axis **1100 / 1400 / 1450 mm (43.3 / 55.1 / 57.1 inch)**

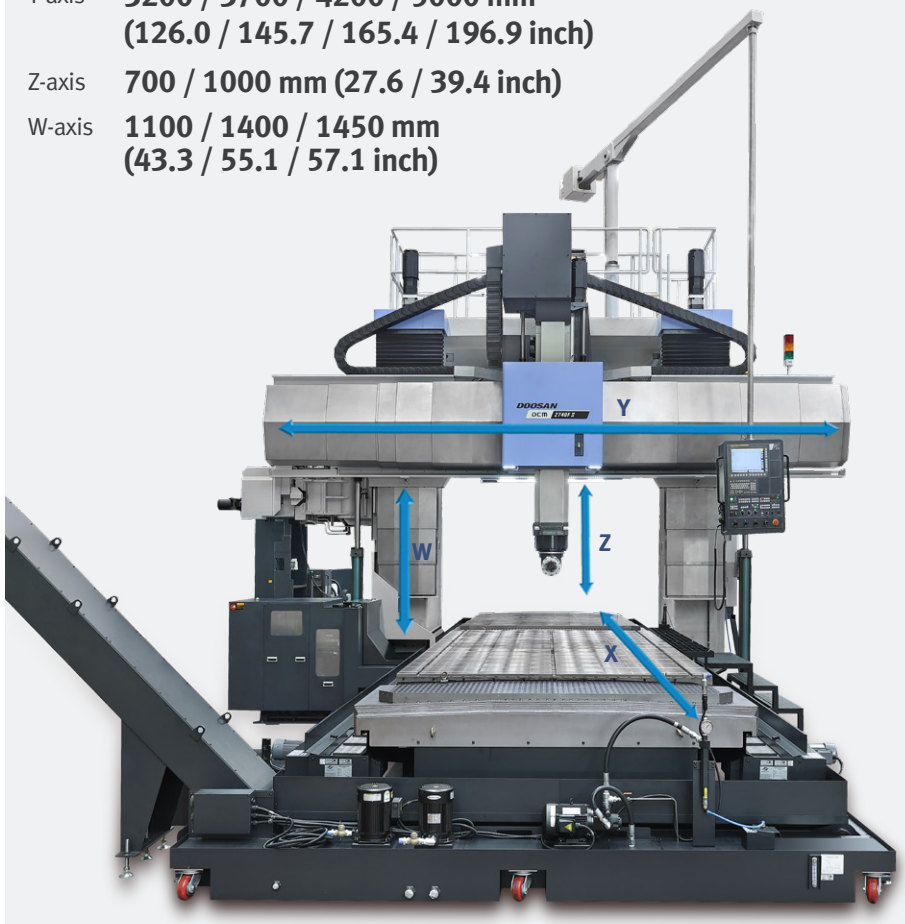


Table Load Capacity

DCM 2740 F Ⅱ	**20000 kg (44091.8 lb)**
DCM 2750F Ⅱ	**25000 kg (55114.8 lb)**
DCM 2760F Ⅱ	**30000 kg (66137.7 lb)**
DCM 2780F Ⅱ	**40000 kg (88183.6 lb)**
DCM 3250F Ⅱ	**33000 kg (72751.5 lb)**
DCM 3260F Ⅱ	**39000 kg (85979.0 lb)**
DCM 3280F Ⅱ / 3780F Ⅱ / 37100F Ⅱ DCM 4280F	**45000 kg (99206.6 lb)**

Rapid Traverse

DCM 2740F Ⅱ/2750F Ⅱ/2760F Ⅱ/2780F Ⅱ
DCM 3250F Ⅱ/3260F Ⅱ/3280F Ⅱ
DCM 3780F Ⅱ / 37100F Ⅱ

X-axis **16 m/min (629.9 ipm)** Y-axis **20* m/min (787.4 ipm)**
Z-axis **15 m/min (590.6 ipm)** W-axis **3 m/min (118.1 ipm)**

* DCM3250F Ⅱ / DCM3260F Ⅱ / DCM3280F Ⅱ / DCM3780F Ⅱ / DCM37100F Ⅱ model, the rapid traverse is reduced to 18m/min(708.7ipm) or less in range of Y axis travel tip 250 mm(9.84inch) for the stable deceleration.

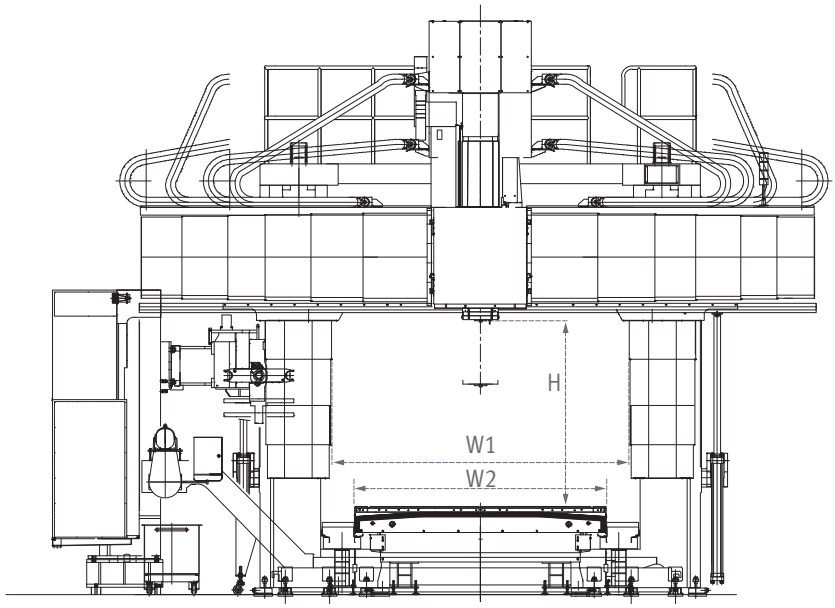
DCM 4280F

X-axis **16 m/min (629.9 ipm)** Y-axis **18 m/min (708.7 ipm)**
Z-axis **15 m/min (590.6 ipm)** W-axis **3 m/min (118.1 ipm)**

Cutting Feedrate

X/Y/Z axis **10000 mm/min (393.7 ipm)**

※ Specifications and delivery of DCM 3780F Ⅱ / 37100F Ⅱ / 4280F should be reviewed in detail before contract.



Effective width between columns W1

2700 / 3200 / 3700 / 4200 mm (106.3 / 126.0 / 145.7 / 165.4 inch)

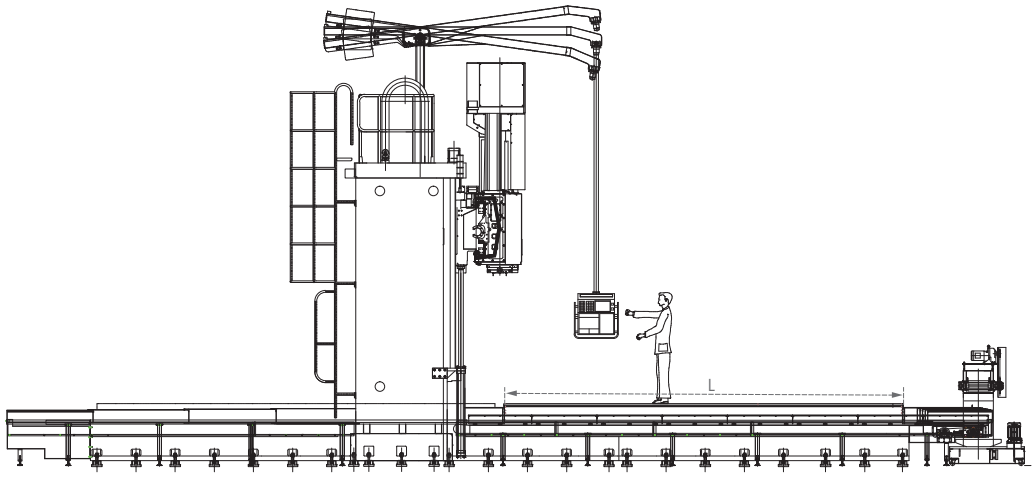
Workpiece height H

1650 / 2000 / 2350 / 2700 mm (65.0 / 78.7 / 92.5 / 106.3 inch)

Table size in Y and X axis W2 x L

W2 **2200 / 2700 / 3200 / 3500 mm (86.6 / 106.3 / 126.0 / 137.8 inch)**

L **4100 / 5100 / 6100 / 8100 / 10100 mm (161.4 / 200.8 / 240.2 / 318.9 / 397.6 inch)**

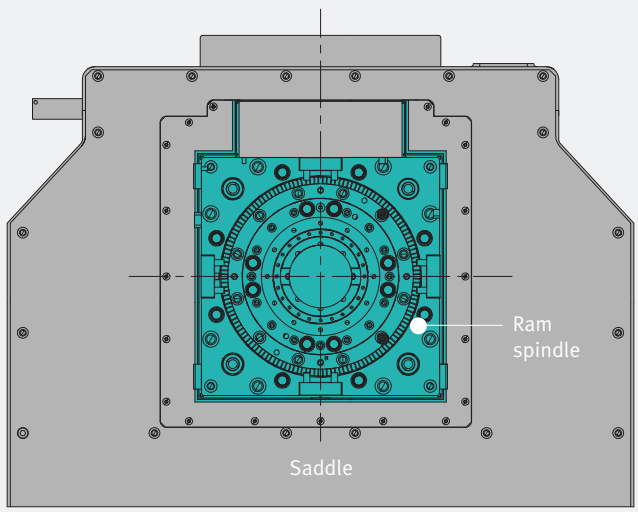


Diverse Ram Spindles

A variety of different ram spindle specifications support a wide range of applications from heavy duty cutting to high speed / high precision mood machining.

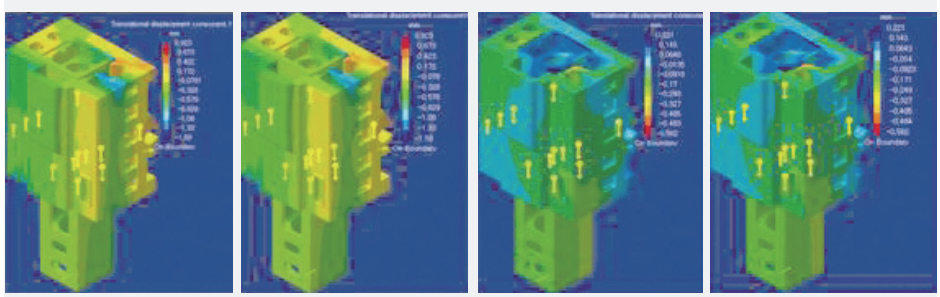
Adoption of ram spindle and saddle structure to support heavy-duty cutting

The highly rigid, square type box guideway ram has a cross section of 380 x 380mm(14.96 x 14.96 inch), which is the biggest in its class. This ensures optimum heavy duty machining capability in both vertical and horizontal applications.



Stress analysis of ram spindle unit

The ram spindle unit is designed to maintain ideal conditions under any load through stress analysis.



X + direction | X + direction | Y + direction | Y + direction

Spindle Power – Torque Diagram

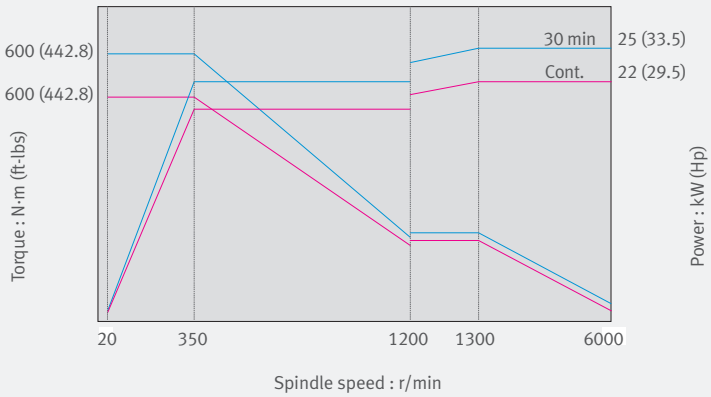
The 6000 r/min built-in driven ram spindle is equipped as a standard feature. Optionally, a 8000 r/min, built-in driven ram spindle can be selected when high-speed and high-power cutting capability are required. In addition, a ram spindle driven with a high-torque, 2-step gear shifting is also available as an optional feature for heavy-duty cutting.

Standard speed (built-in driven)

Spindle speed **6000** r/min

Spindle power **25** kW **(33.5** Hp**)**

Spindle torque **600** N·m **(442.8** ft-lbs**)**

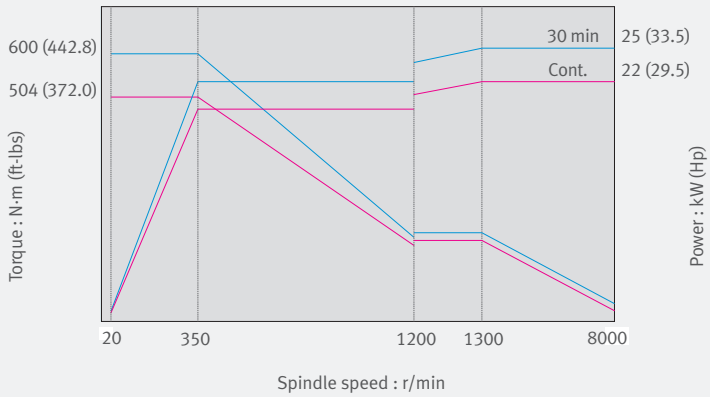


High speed option (built-in driven)

Spindle speed **8000** r/min

Spindle power **25** kW **(33.5** Hp**)**

Spindle torque **600** N·m **(442.8** ft-lbs**)**

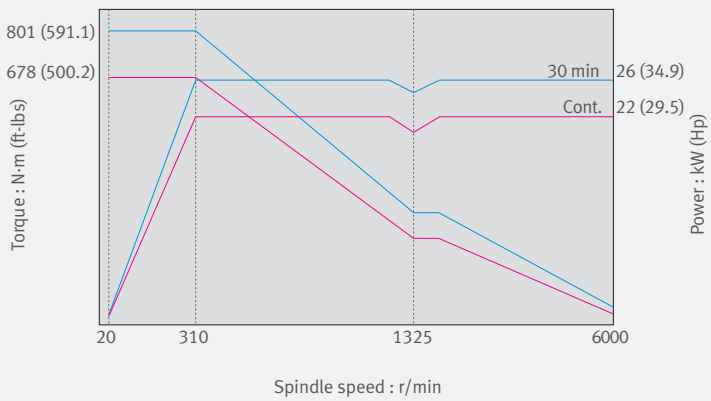


Heavy-duty cutting I option (gear driven)

Spindle speed **6000** r/min

Spindle power **26** kW **(34.9 Hp)**

Spindle torque **801** N·m **(591.1 ft-lbs)**

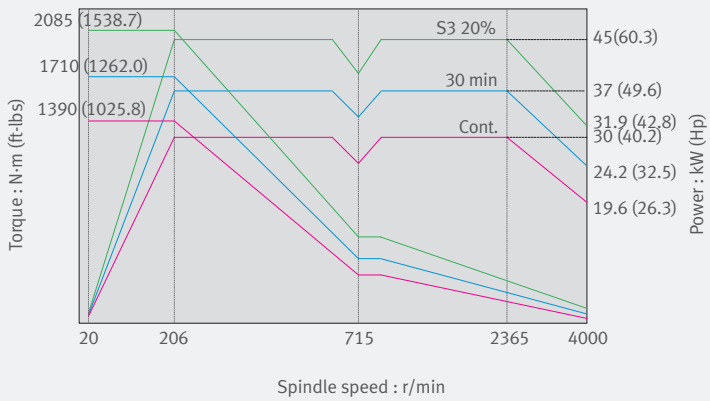


Heavy-duty cutting II option (gear driven)

Spindle speed **4000** r/min

Spindle power **45** kW **(60.3 Hp)**

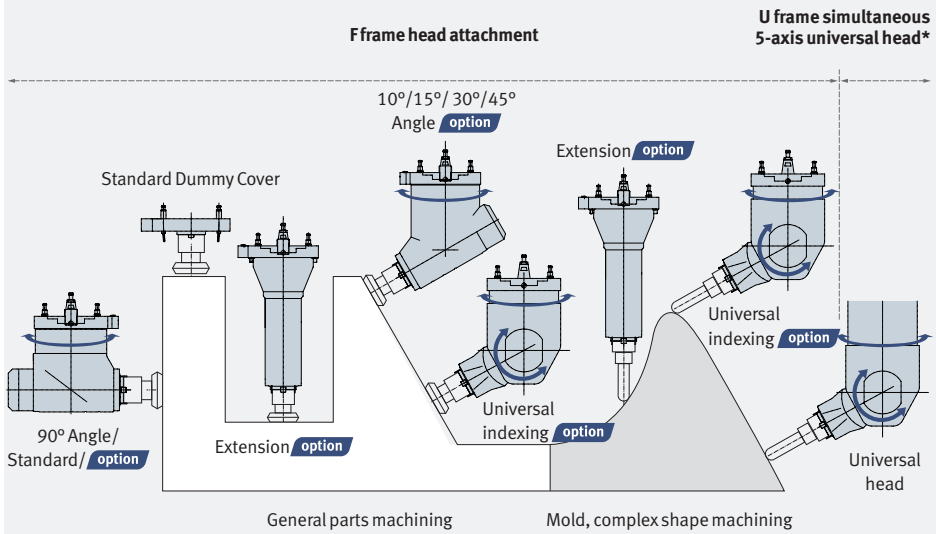
Spindle torque **2085** N·m **(1538.7 ft-lbs)**



Various Auto-Change Head Attachments

Diverse head attachments for a wider range of machining applications

A diverse range of auto-change head attachments enables the machining of a variety of complex shapes, from 5 axis simultaneous processing of Molds to angled faces using 1 degree indexing, as well as 5 face machining. Head indexing is achieved by C axis control through the ram



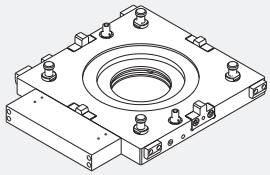
Various utilities are available to keep the same level of performance even when the head attachment is changed.
Provides numerous utilities to ensure the same performance provided by the original ram spindle even after changing a Head Attachment

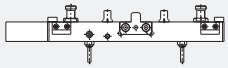
Features	Standard Dummy Cover	Extension option	90° Angle (Standard/ option)
Spindle Air Curtain	Standard	Standard	–
Flood Coolant / Air Blow	Standard	Standard	Standard
Head Attachment Tool Unclamp	Standard	Standard	Standard
Head Attachment Spindle Air Purge	Standard	Standard	Standard
TSC (Through Spindle Coolant)	option	option	option
TSA (Through Spindle Air)	option	option	option

※ The provided utility line could be different as choosing the head attachment.
※ When a universal head attachment, 10/15/30/45 degree angle attachment, or U-frame universal head is considered for purchase, please contact Doosan for detailed specifications.

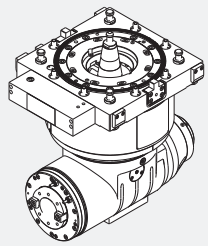
F Frame Head Attachment

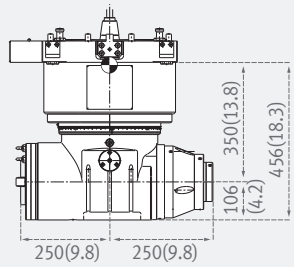
Unit: mm (inch)





Standard Dummy Cover

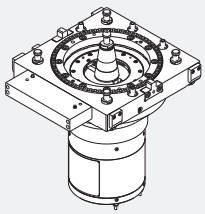


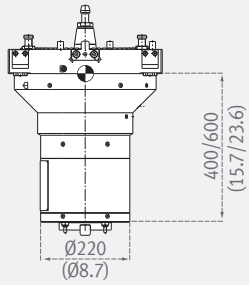


Standard 90° angle : 4000 r/min, 22 kW (29.5 Hp), min. 5/2.5/1° indexing

Angle Head option **:** 3000 r/min, 30 kw (40.2Hp), 1000 N·m (738.0 ft-lbs)

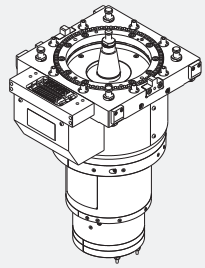
High speed 90° angle option **:** 6000 r/min, 15 kW (20.1 Hp), min. 5/2.5/1° indexing

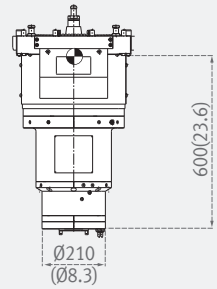




Extension option

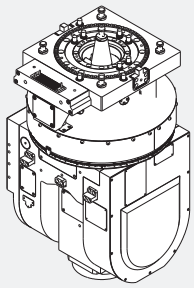
- 4000 r/min, 22 kW (29.5 Hp)
- 6000 r/min, 22 kW (29.5 Hp)

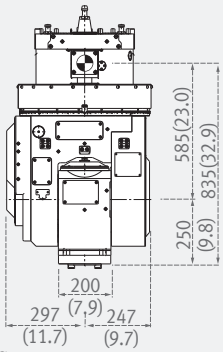




High-speed extension option

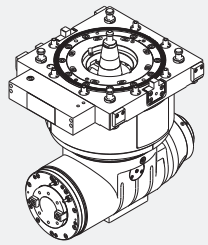
- 6000~12000 r/min, 15/11 kW (20.1/14.8 Hp)

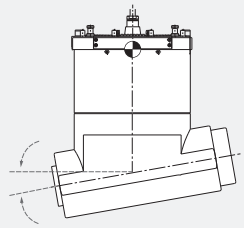




Universal indexing option

- 4000 r/min, 11 kW (14.8 Hp), B/C axes min. 1° indexing





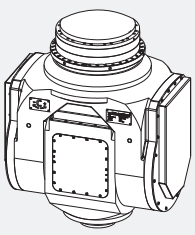
10°/15°/ 30°/45° angles option

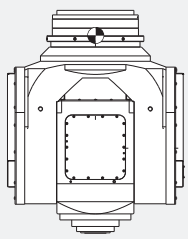
U Frame Simultaneous 5-Axis Universal Head

Unit: mm (inch)

High-speed, high-precision built-in driven universal head 15000 r/min

- B axis 0.001° indexing
- C axis 0.001° indexing

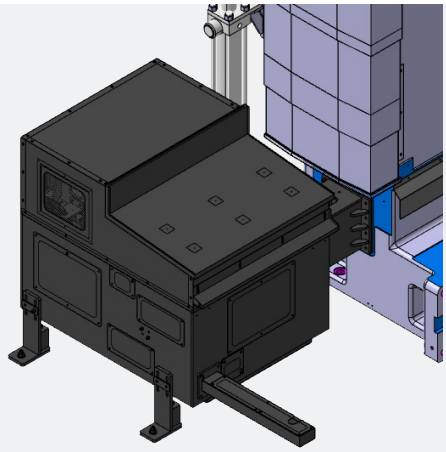




Automatic Head Attachment Changer (AAC)

Standard AAC – 2 Stations (NOMAL COLUMN, W/O AAC CHIP COVER)

Two types of head attachment including dummy cover and 90° angle are equipped as a standard feature to minimize the time required to change a head attachment. (NORMAL COLUM)

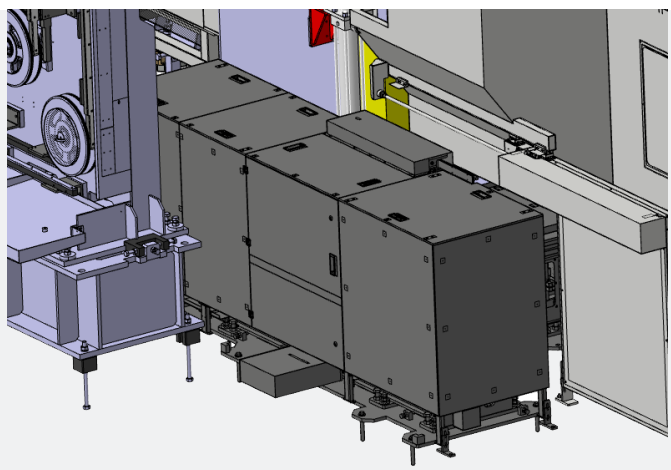


Standard AAC – 2 Stations (HITHG COLUMN, WITH AAC CHIP COVER) option

Two types of head attachment including dummy cover and 90° angle are equipped as a standard feature to minimize the time required to change a head attachment. (HIGH COLUM)

Linear Shuttle type AAC - 3/4/5/7 Stations (WITH AAC CHIP COVER) option

Optionally 3, 4, 5, or 7 head attachment can be equipped.

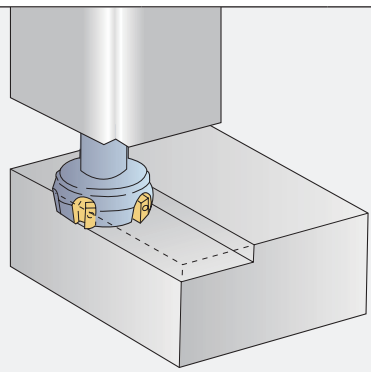


High-precision Mold Machining

Automotive Side Outer(Press mold)		4-Door Sedan Door Trim (press mold)	
Model	DCM 3250F Ⅱ	**Model**	DCM 3250F Ⅱ
Material	Cast steel & Cast iron	**Material**	Mold steel
Workpiece size	4500 mm x 2500 mm x 900 mm (177.2 inch x 98.4 inch x 35.4 inch)	**Workpiece size**	1500 mm x 1000 mm x 500 mm (59.06 inch x 39.37 inch x 19.69 inch)
Machining time	35H (Roughing/Finishing)	**Machining time**	80H (finishing)

Heavy-duty Cutting Capacity

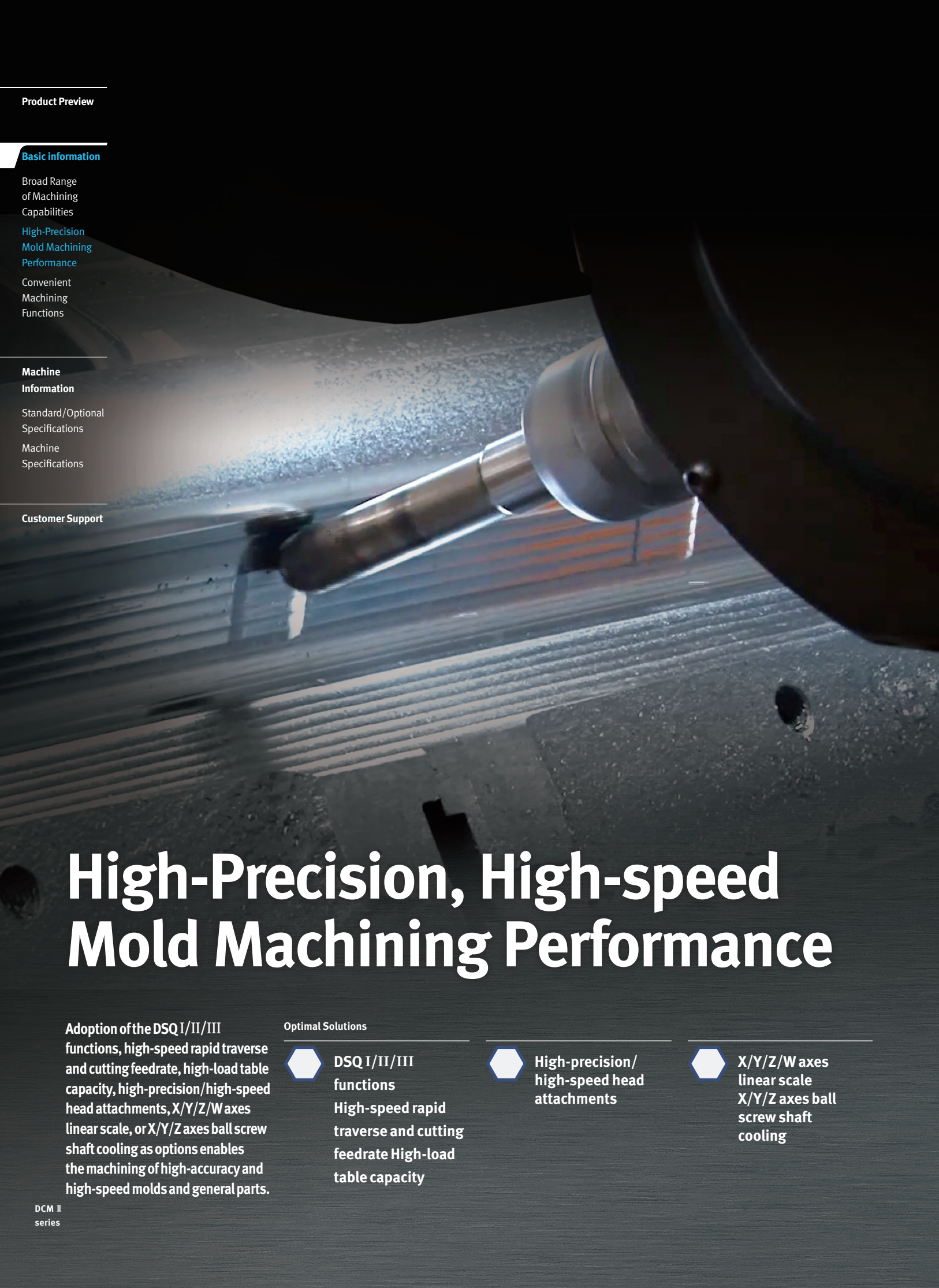
Face mill



Material : SM45C (Carbon steel)

Max. Cutting Capacity (Heavy-Duty Cutting I)	FACE CUTTER				
	Cutter Dia.	Spindle Speed	Feedrate	Chip removal rate	Cutting Depth
	125 mm (4.9 inch)	310 r/min	1300 mm/min (51.2 ipm)	780 cm^3/min (47.6 $inch^3$/min)	6 mm (0.2 inch)
	125 mm (4.9 inch)	310 r/min	740 mm/min (29.1 ipm)	666 cm^3/min (40.6 $inch^3$/min)	9 mm (0.4 inch)
	U-DRILL				
	Drill Dia.	Spindle Speed	Feedrate	Chip removal rate	
	70 mm (2.8 inch)	310 r/min	124 mm/min (4.9 ipm)	477 cm^3/min (29.1 $inch^3$/min)	
	MAX. TAPPING				
	Thread	Spindle Speed	Feedrate	Reamark	
	M42xP4.5	190 r/min	855 mm/min (33.7 ipm)	Fine.	

* The results, indicated in this catalogue are provides as example. They may not be obtained due to differences in cutting conditions and environmental conditions during measurement.



High-Precision, High-speed Mold Machining Performance

Adoption of the DSQ I/II/III functions, high-speed rapid traverse and cutting feedrate, high-load table capacity, high-precision/high-speed head attachments, X/Y/Z/W axes linear scale, or X/Y/Z axes ball screw shaft cooling as options enables the machining of high-accuracy and high-speed molds and general parts.

Optimal Solutions

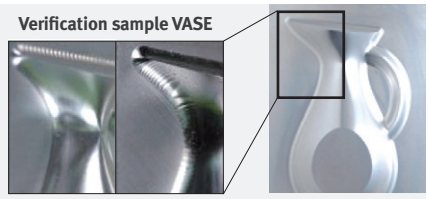
- **DSQ I/II/III functions**
  High-speed rapid traverse and cutting feedrate High-load table capacity
- **High-precision/ high-speed head attachments**
- **X/Y/Z/W axes linear scale**
  X/Y/Z axes ball screw shaft cooling

High-Precision Mold Machining

High-speed, High-precision Contouring Control

- DSQⅠ(AICCⅡ _ 200 Block + Machining condition selection function)
- DSQⅡ(DSQⅠ + Data server [1GB]) option
- DSQⅢ(DSQⅡ + High speed processing _ 600 Block) option

* DSQ : Doosan Super Quality



Cutting condition selection function

Cutting condition	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
Quality	Normal									Excellent
Tool life	Long									Normal
Application	High-speed roughing									High-precision finishing

- Use the R code in the program to change the cutting condition by up to 10 steps.
  - Improved productivity (high-speed roughing, high-precision finishing)
- Various servo-related NC parameters such as acceleration and deceleration time constants and maximum cutting feed can be set automatically.

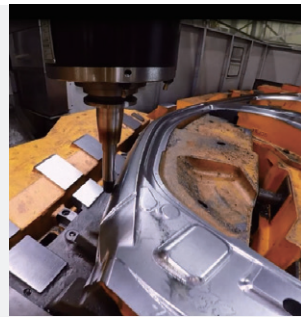
High-speed Rapid Traverse and Cutting Feedrate, High-load Table Capacity

For high-speed mold machining, the rapid traverse of DCM Ⅱ is increased by 25% on Y-axis, 50% on Z-axis, and 10m/min(393.7ipm) on X/Y/Z-axis cutting feedrate compared to the previous model. For high-load mold machining, the table load capacity of DCM Ⅱ is increased by 30% compared to the previous model.

DCM 2740F Ⅱ / 2750F Ⅱ / 2760F Ⅱ /
DCM 2780F Ⅱ / 3250F Ⅱ / 3260F Ⅱ /
DCM 3280F Ⅱ / 3780F Ⅱ / 37100F Ⅱ

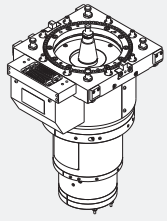
X-axis **16 m/min (629.9 ipm)** Y-axis **20* m/min (787.4 ipm)**
Z-axis **15 m/min (590.6 ipm)** W-axis **3 m/min (118.1 ipm)**

* DCM 3250FⅡ/3260FⅡ/3280FⅡ/3780FⅡ/37100FⅡ model, the rapid traverse is reduced to 18m/min(708.7ipm) or less in range of Y-axis travel tip 250 mm(9.84inch) for the stable deceleration.

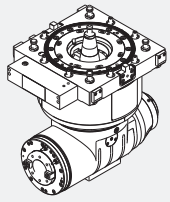


High-precision, High-speed Head Attachments and Universal Head Specialized for Mold Machining

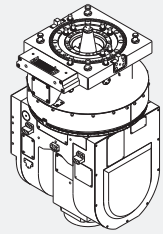
Optimized mold machining can be achieved by selecting various head attachments and ram spindles specialized for diverse mold shapes and high-speed mold machining.



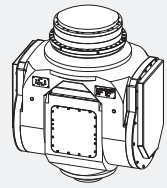
High-speed extension option
6000~12000 r/min,
15/11 kW (20.1/14.8 Hp)



High-speed 90° angle option
6000 r/min, 15 kW (20.1Hp),
min 5/2.5/1° indexing



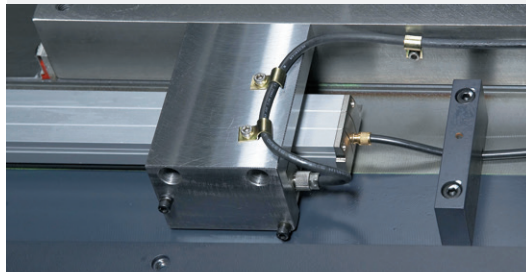
Universal indexing option
4000 r/min, 11 kW (14.8 Hp),
B/C axes min. 1° indexing



High-speed, high-precision built-in driven 5-axis simultaneous universal head 15000r/min
B axis 0.001° indexing
C axis 0.001° indexing

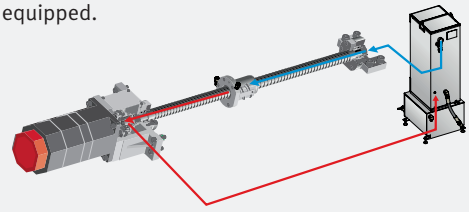
X/Y/Z/W-axis Linear Scale Feedback System option

The linear scale feedback system provides high positioning accuracy in the X, Y, Z, and W axes.



X/Y/Z-axis Ball Screw Shaft Cooling option

The heat generated in the ball screw is removed by a high-efficiency cooler to minimize thermal deformation of the ball screw.
For faster removal of frictional heat, a hollow ball screw shaft through which the coolant oil flows is equipped.



Convenient Machining Functions

The DCM Ⅱ series provides a support system for 5 face machining of large and heavy workpieces, easy pattern cycles, work load counter control, automatic feed control, and process monitoring function.

Optimal Solutions

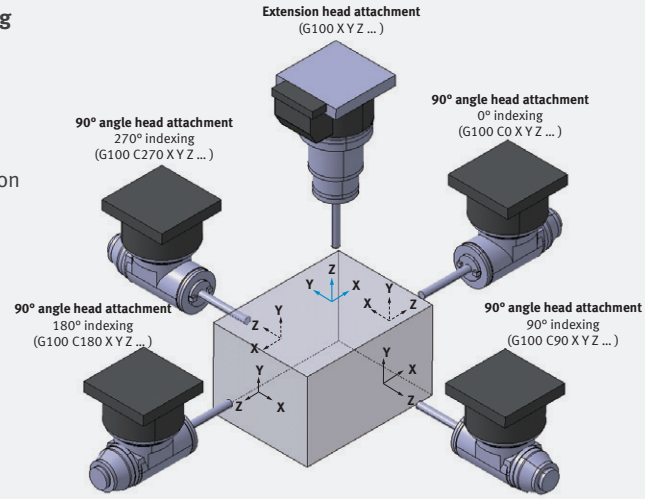
- 5-face machining support system
- Easy pattern cycle
- Work load counter control
- Automatic Feed Control
- Process monitoring function
- Enhanced operator's convenience

5-face machining support system

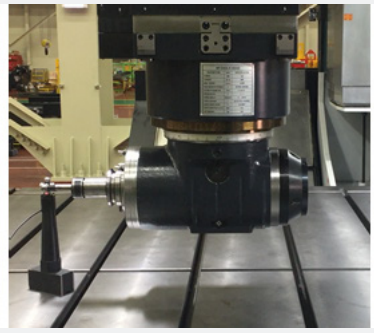
Supporting functions for 5-face machining

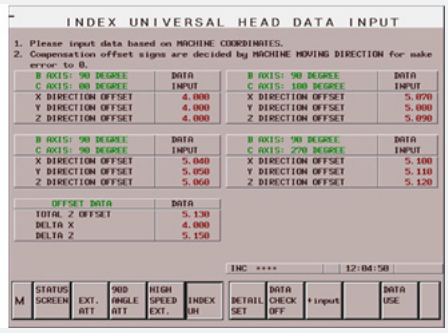
- 3-dimentional-work coordinates conversion system
- Tool end point shift within work coordinate system
- AAC control and head attachment position control by M-Code
- ATC is applicable for various head attachments.

※ These functions are provided as a standard package when the 5 face machining head attachment is supplied.

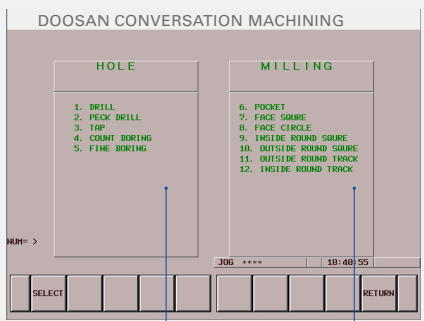


- Automatic head attachment offset measurement(G120)



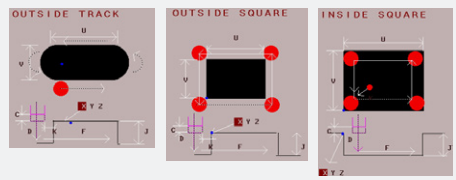


Easy Pattern Cycle

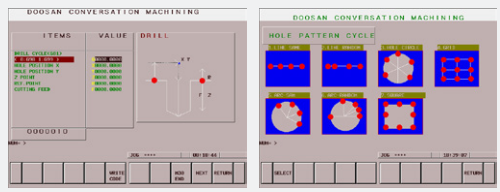


Programming time can be dramatically reduced by creating cutting programs and inputting the major parameters of the cutting pattern cycle required for parts cutting. The function is embedded in the CNC for convenient use in the field. Up to 22 complex pattern cycles including basic 5 patterns are available.

Example) Milling pattern

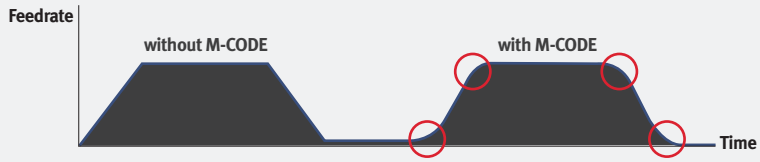


Example) Hole pattern



Work load counter control

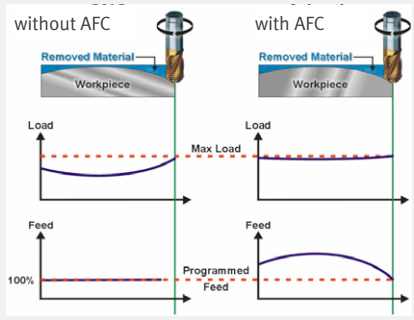
If customer selects proper M-Code according to weight of the work piece, the machine can decide itself the best moving pattern of the table. And machining can progress by this decision.

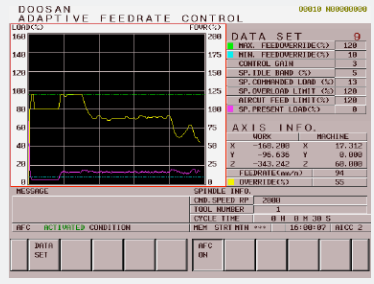


M-Code	Weight of work piece	DCM 2740F Ⅱ	DCM2750F Ⅱ	DCM 2760F Ⅱ	DCM 3250F Ⅱ	DCM 3260F Ⅱ
M380 A1	5 tons(11023.0 lb) or less	•	•	•	•	•
M380 A2	10 tons(22045.9 lb) or less	•	•	•	•	•
M380 A3	15 tons(33068.9 lb) or less	•	•	•	•	•
M380 A4	20 tons(44091.8 lb) or less	•	•	•	•	•

Adaptive Feedrate Control(AFC)

If tool overload is detected during operation, the feed rate is controlled to prevent the tool from being damaged.



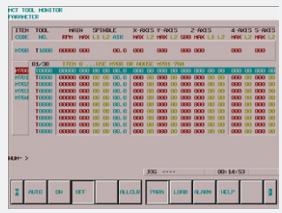


Process monitoring function and manual operation screen

In-process monitoring minimizes the risk of damage to the workpiece during cutting

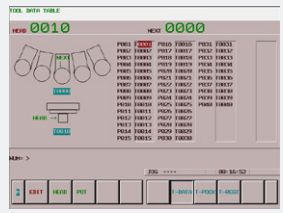
Tool load monitoring

During cutting operation, abnormal load caused by wear and tear of the tool is detected and an alarm is triggered to prevent further damage.

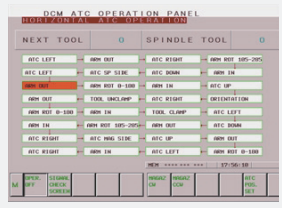


Tool management option

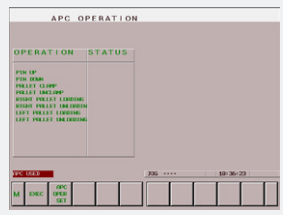
This function controls information on the tools in the tool magazine pots.



ATC manual operation screen

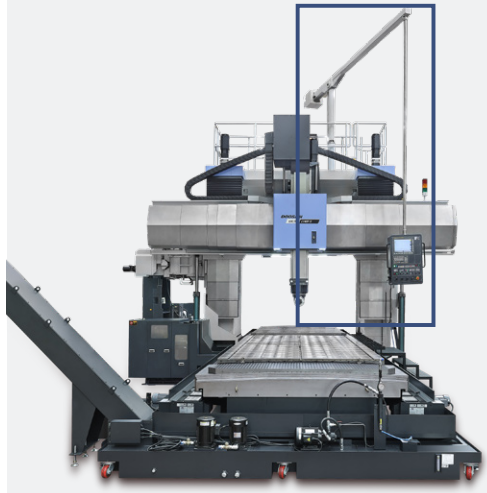


APC manual operation screen



Enhanced operator's convenience

A pendent-arm type operation panel, movable from top beam to the operator, ensures easier operation.



Stand-type pendent arm operation panel installed on the floor option

Gantry type pendent arm option is available

- Various switches are available as standard or option at the bottom of the main operation panel for easier long-axis feeding of large machine tools.

Mono lever type switch

Button type switch 1 option

Button type switch 2 option

※The name of each axis can be different for each option.

- The pulse handle, manual handle (portable MPG) or others enabling easy setup of work pieces for the operator's convenience are provided as a standard feature or option.

Manual handle
Portable MPG

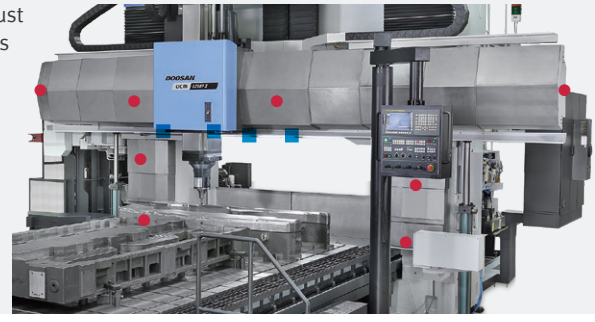
Manual handle option
Portable 3 MPG

Manual handle option
MPG with LCD display

Manual operation panel option
HMOP(Handy Machine Operator's Panel)

- In order to increase the brightness around the ram spindle to improve the workability, 2 to 3 work lights at the bottom of the cross rail and 2 work lights at the bottom of the ram saddle are provided as standard according to the model. (■mark)

- Stainless steel materials are used to prevent rust on the end of covers and the first sliding covers on the left and right sides of the Y and W axes. (● mark)



Various Optional Equipment

Various options to satisfy the customers' requirements can be selected and applied.

NO	Division	Description		DCM Ⅱ series
1	Electric cabinet light			○
2	Electric cabinet air conditioner			○
3	High-quality machining (DOOSAN SUPER QUALITY)	DSQ I : AICCII+MACHINING CONDITION SELECTION		●
4		DSQ II : DSQ I+DATA SERVER (1GB)		○
5		DSQ III : DSQ II+HIGH SPEED PROCESSING_600 Block)		○
6	Tool management			○
7	Tool shank	BT50		●
8		CAT50		○
9		DIN50		○
10		HSK 63A		○
11	Tool magazine	40 tools		●
12		60 tools		○
13		90 tools		○
14		120 tools		○
15	Work load counter control			●
16	Electric leakage breaker			○
17	Electric line filter			○
18	Ram spindle	6000 r/min (Built-in)	25/22 kW (33.5 / 29.5 Hp) (FANUC)	●
19		8000 r/min (Built-in)	25/22 kW (33.5 / 29.5 Hp) (FANUC)	○
20		6000 r/min (Gear box)	22/18.5 kW(29.5 / 24.8 Hp) (FANUC)	○
21		4000 r/min (Gear box W/ HIGH TORQUE)	45/37/30KW(60.3/49.6 / 40.2 Hp) (FANUC)	○
22		Spindle lubrication device		●
23		Step Cooling System		●
24	Linear scale feedback system	X-axis		○
25		Y-axis		○
26		Z-axis		○
27		W-axis		○
28	Lift-up chip conveyor	HINGED PLATE		○
29		MAGNETIC SCRAPER		○
30	Components for installation	Leveling blocks and anchoring bolts		●
31	Safety ladder and top beam fence			●
32	Hydraulic power unit			●
33	Bellows cover for axis	W-axis		●
34	Sliding covers for axes	X/Y/Z axes		●
35	Easy pattern cycle			●
36	Automatic tool length measurement	TS27R_RENISHAW		○
37		NC4_RENISHAW		○
38	Automatic workpiece measurement	RMP60,STYLUS LENTH50(100)_RENISHAW		○
39		RMP600,STYLUS LENTH50(100)_RENISHAW		○
40	Master tool for automatic tool length measurement	CALIBRATION BLOCK		○
41	Automatic attachment changer (AAC)	LINEAR TYPE 2-ST (W/O AAC COVER, NORMAL COLUMN)		●
42		LINEAR TYPE 2-ST (HIGH COLUMN)		○
43		LINEAR SHUTTLE 3-ST (NONE U-INDEX HEAD)		○
44		LINEAR SHUTTLE 3-ST		○
45		LINEAR SHUTTLE 4-ST		○
46		LINEAR SHUTTLE 5-ST		○
47		LINEAR SHUTTLE 7-ST		○

● Standard ○ Optional X Not applicable

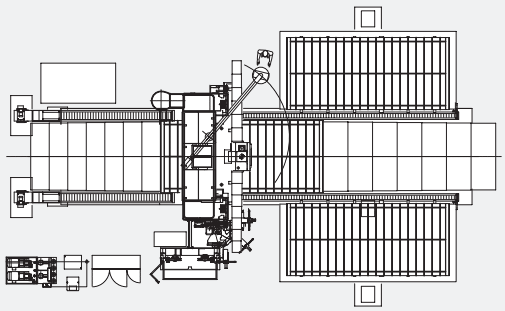
NO	Division	Description	DCM Ⅱ series
48	Auto power on		○
49	Auto power off		●
50	Automatic Pallet Changer (APC)	SIDE SHUTTLE (2-PALLET)	○
51	Work light	LED lamps: 2EA (DCM 27 Series Ⅱ)LED lamps: 3EA (DCM 32/37/42 Series Ⅱ)	●
52	Operator call lamp (Red/Yellow/Green)		●
53	Tool load monitoring		●
54	Coolant tank	500L(132.1 galon)	●
55		1000L(264.2 galon)	○
56	Periodical checking function		●
57	Main operation panel (pendent type)	POLE TYPE	●
58		STAND TYPE	○
59		GANTRY TYPE	○
60	Max. tool weight	30KG(66.1 lb)	●
61	Max. tool length	400mm(15.7 inch)	●
62	Chip & coolant protective cover	CHIP COVER	○
63		SEMI GUARD	○
64	Coolant	FLOOD 2.2 kW (2.95 Hp)	●
65		FLUSHING	○
66		Coolant gun	○
67		Coolant level switch : Sensing level - Low / High**	○
68	Test bar	BT50	○
69	Table T-slot Table CROSS SLOT	24H_8 (0.94H_8)	●
70		28H_8 (1.10H_8)	○
71	Chip bucket	Rotary type (380L) (100.4 galon)	○
72		Lift type (380L) (100.4 galon)	○
73	High column	+350mm (13.8 inch)	○
74		+700mm (27.6 inch)	○
75		+1050mm (41.3 inch)	○
76	W-axis balancing system		●
77	Air	AIR BLOWER	●
78		AIR PURGE	●
79		AIR CURTAIN	●
80		AIR GUN	○
81		AIR DRYER	○
82	CS control BZ sensor		●
84	Display unit	15" COLOR LCD	●

NO	Division	Description		DCM Ⅱ series
85	F frame head attachment	DUMMY HEAD		●
86		EXTENSION HEAD (L400/4K R/MIN)		○
87		EXTENSION HEAD (L400/6K R/MIN)		○
88		EXTENSION HEAD (L600/4K R/MIN)		○
89		EXTENSION HEAD (L600/6K R/MIN)		○
90		EXTENSION HEAD (L600/12K R/MIN)		○
91		90D ANGLE HEAD (L350/4K R/MIN)		●
92		90D ANGLE HEAD (L350/4K R/MIN W/TSC)		○
93		90D ANGLE HEAD (L350/6K R/MIN)		○
94		90D ANGLE HEAD (L350/6K R/MIN W/TSC)		○
95		UNIVERSAL INDEXING HEAD (L835/4K R/MIN)		○
96	F frame 90° head attachment indexing angle	5°		●
98		1°		○
99	MPG	PORTABLE TYPE 1-MPG		●
100		MPG WITH LCD DISPLAY		○
101		PORTABLE TYPE 3-MPG		○
102		HMOP(Handy Machine Operator's Panel)		○
103	NC Controller	FANUC 31i		●
104		HEIDENHAIN TNC640		○
105		SIEMENS 840D		○
106	Oil skimmer	BELT TYPE		○
107	Pull stud	MAS 403 P50T-I (45°)		●
108		MAS 403 P50T-II (60°)		○
109	Spot light on ram spindle			●
110	TSC	NONE		●
111		1.5 kW(2.0 Hp)_2.0 MPa(290.0 psi)		○
112	TSA	NONE		●
113		0.5 MPa		○
114	U frame universal head	UNIVERSAL CONTOURING HEAD (3K R/MIN)		○
115		UNIVERSAL CONTOURING HEAD (15K R/MIN)		○
116		UNIVERSAL CONTOURING HEAD SPINDLE MONITORING SYSTEM(15K R/MIN)	PACKAGE I	○
117			PACKAGE II	○
118	Thermal error compensation sensor (X-axis)			○
119	2-side chip conveyor (in machine to tank)	HINGED PLATE		○
120		MAGNETIC SCRAPER		○
121	5-face machining support system			●
122	Additional 5th axis	PACKAGE #1 : ONLY WIRING		○
123		PACKAGE #2 : HYD. & CONTROL READY		○
124		PACKAGE #3 : FULL OPT.		○

* Please contact DOOSAN to select detail specifications. ** Special Quotation.

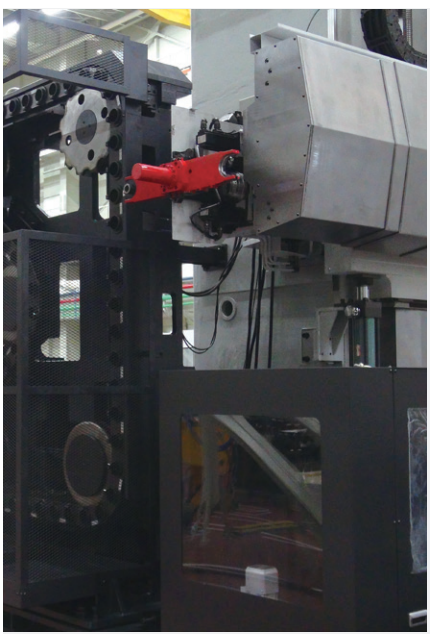
Automatic Pallet Changer (APC, option)

Faster shipment thanks to standardized modular design

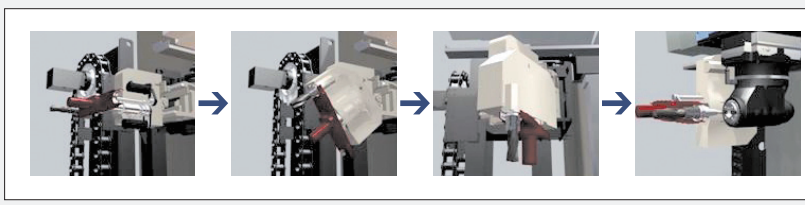


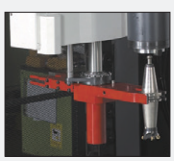
Automatic Tool Changer (ATC)

Equipped with one tool change arm, ATC can change tools regardless of the head attachment. Hydraulic-driven ATC and servo motor-driven magazine provide high reliability and minimize machine downtime.



Horizontal ATC operation with a 90° head attach mounted.



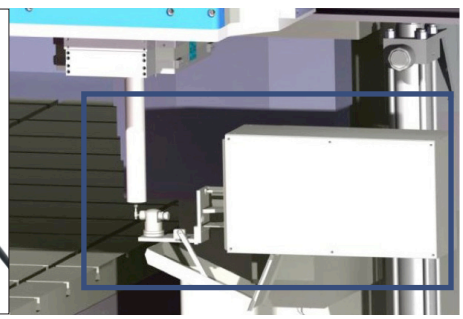


※ Picture-Vertical ATC in operation

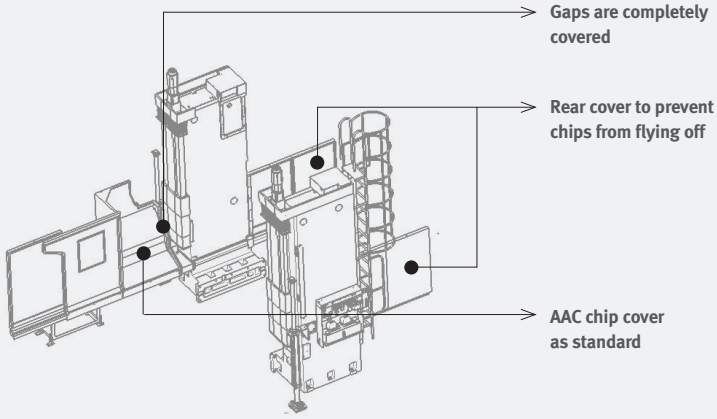
Max. No. of tools	40 [option 60, 90, 120] EA
Max. tool diameter	130 [near pot empty: 250] mm (5.1 [near pot empty: 9.8] inch)
Max. tool length	400mm (15.7 inch)
Max. tool weight	30 kg (66.1 lb)
Tool selection type	Fixed address
Tool changing time (T-T)	5.5 s

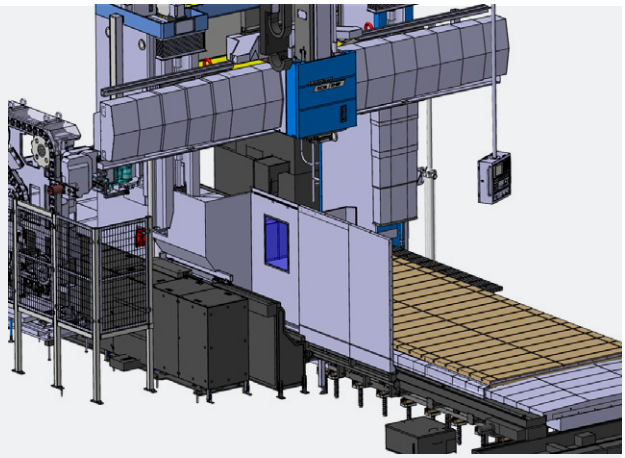
Automatic Tool Length Measurement option

Tool length can be measured in the vertical and horizontal directions. The length of tool set up on the spindle is measured automatically, and the tool offset data of the tool number are entered automatically.



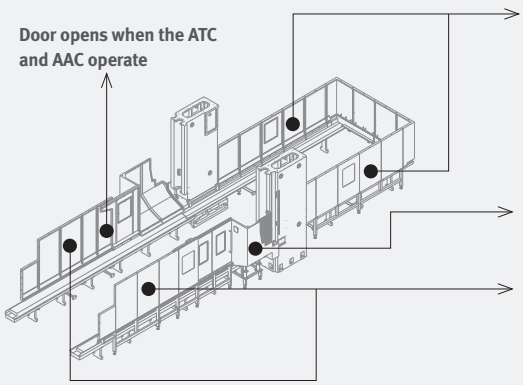
Chip Cover option

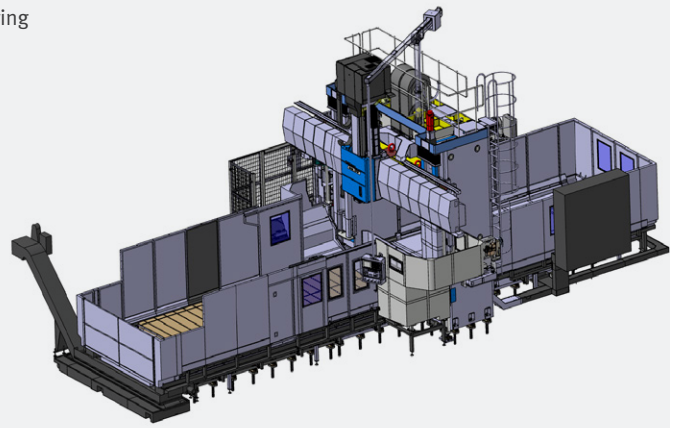




Semi-guard option

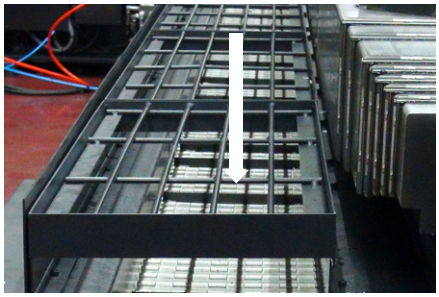
The semi-guard covers the entire cutting area to prevent chips and coolant from flying off during cutting operation.



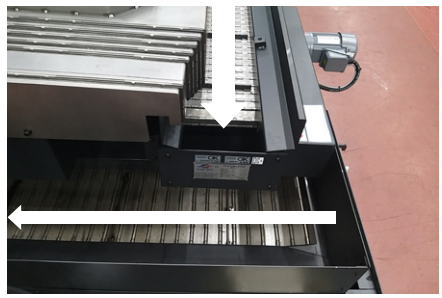


Chip Conveyor

Optional chip conveyors are available to discharge chips and improved to prevent chips and coolant from falling on the floor.



Both sides of the table - chip conveyors option



Lift-up chip conveyor option

※ The hinged-plate chip conveyor and the magnetic scraper chip conveyor are optional features.

Chip Bucket option

Forklift type

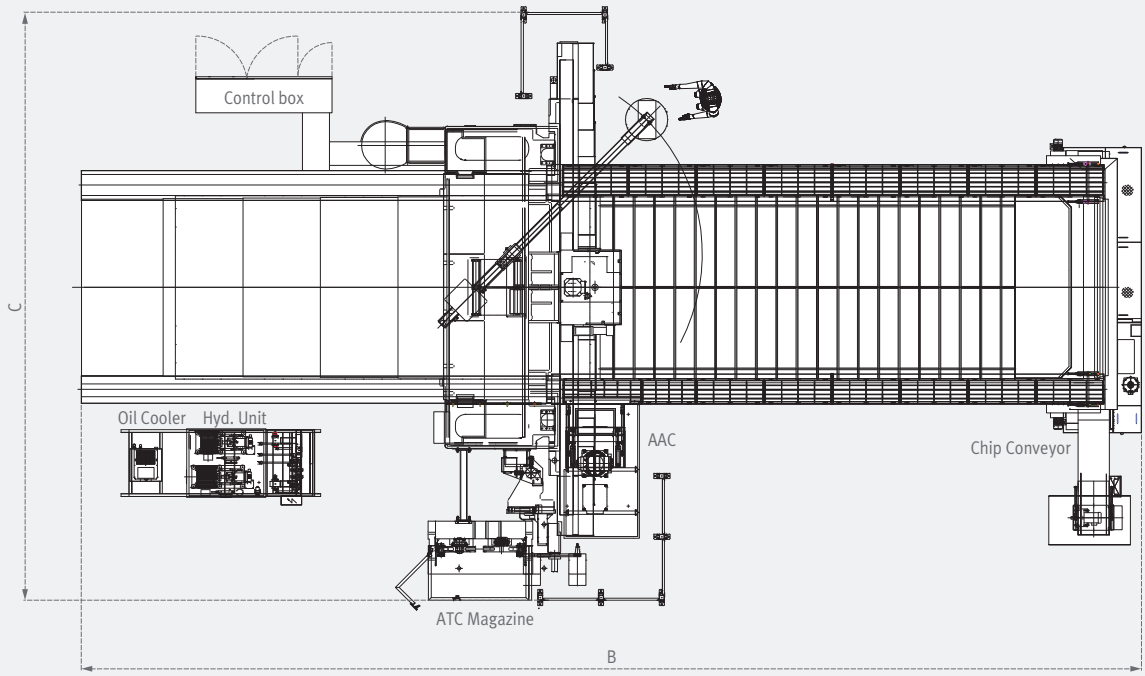
The bottom of the chip bucket has a space into which forks can be inserted to allow transportation by a forklift .

Rotation type

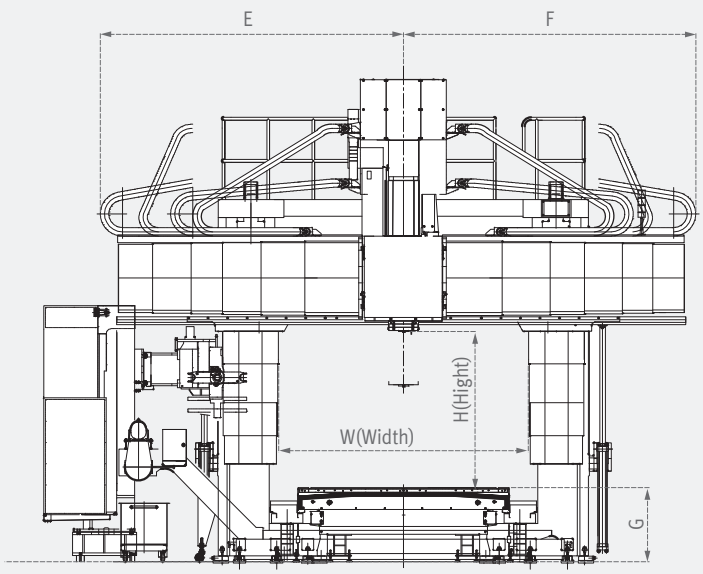
The chip bucket is fitted with a rotating joint for tilting and emptying the bucket.

External Dimensions

Top View



Front View

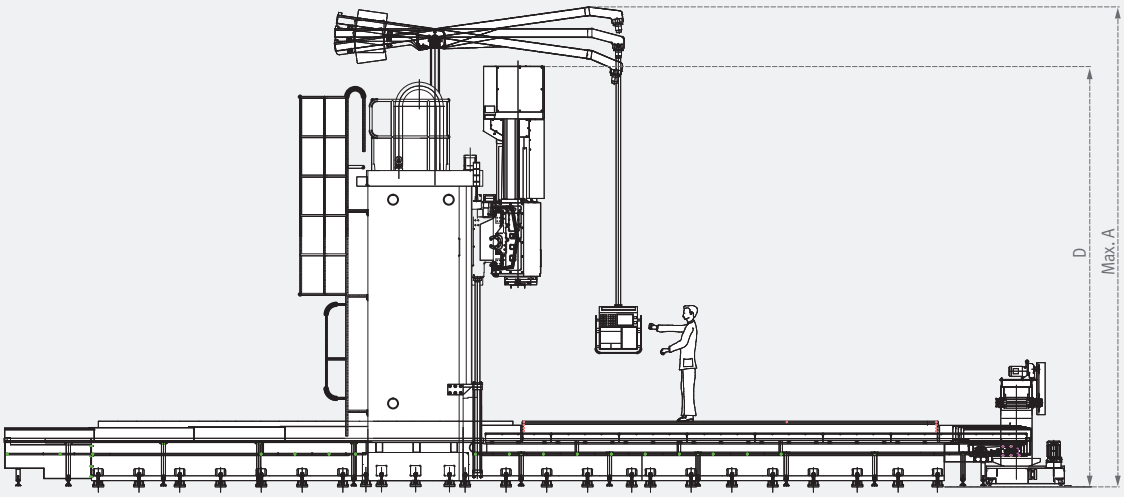


* Some peripheral equipment can be placed in other places

** Providing anchoring bolts. Foundation work must be done.

Unit: mm (inch)

Side View



Model	A	B	C	D	E	F	G	H	W
DCM 2740F Ⅱ	6700 (263.8)	11200 (440.9)	8150 (320.9)	5830 (229.5)	3710 (146.1)	3610 (142.1)	950 (37.4)	1650 (65.0)	2700 (106.3)
DCM 2750F Ⅱ	6700 (263.8)	13375(526.6)	8150 (320.9)	5830 (229.5)	3710 (146.1)	3610 (142.1)	950 (37.4)	1650 (65.0)	2700 (106.3)
DCM 2760F Ⅱ	6700 (263.8)	15790 (621.7)	8150 (320.9)	5830 (229.5)	3710 (146.1)	3610 (142.1)	950 (37.4)	1650 (65.0)	2700 (106.3)
DCM 2780F Ⅱ	6700 (263.8)	19710 (776.0)	8150 (320.9)	5830 (229.5)	3710 (146.1)	3610 (142.1)	950 (37.4)	1650 (65.0)	2700 (106.3)
DCM 3250F Ⅱ	6700 (263.8)	13600 (535.4)	8650 (340.6)	5830 (229.5)	3960 (155.9)	3860 (152.0)	950 (37.4)	1650 (65.0)	3200 (126.0)
DCM 3260F Ⅱ	6700 (263.8)	15750 (620.1)	8650 (340.6)	5830 (229.5)	3960 (155.9)	3860 (152.0)	950 (37.4)	1650 (65.0)	3200 (126.0)
DCM 3280F Ⅱ	6700 (263.8)	19710 (776.0)	8650 (340.6)	5830 (229.5)	3960 (155.9)	3860 (152.0)	950 (37.4)	1650 (65.0)	3200 (126.0)
DCM 3780F Ⅱ	8000 (315.0)	20215 (795.9)	9220 (363.0)	7105 (279.7)	4210 (165.7)	4160 (163.8)	950 (37.4)	2350 (92.5)	3700 (145.7)
DCM 37100F Ⅱ	8000 (315.0)	24235 (954.1)	9220 (363.0)	7105 (279.7)	4210 (165.7)	4160 (163.8)	950 (37.4)	2350 (92.5)	3700 (145.7)
DCM 4280F	8000 (315.0)	20405 (803.3)	10100 (397.6)	7105 (279.7)	4800 (189.0)	4800 (189.0)	950 (37.4)	2350 (92.5)	4200 (165.4)

※ The dimensions above are the standard type for each model.

Installation precautions

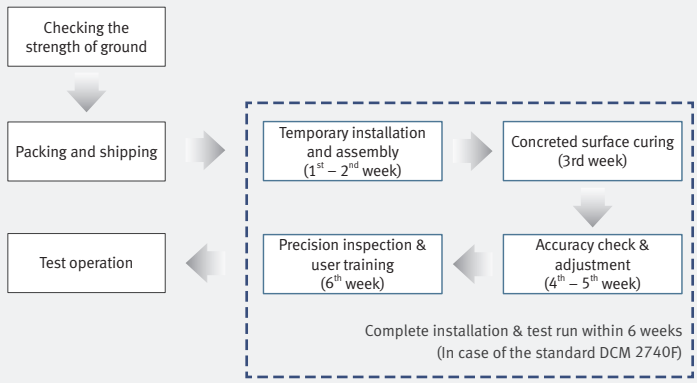
1. Test for bearing capacity of soil should be taken more than four areas.(In particular, places for bed and column where the loads are concentrated must be tested.)
2. Basically, the bearing capacity of soil should exceed the values determined by Doosan. (Test for bearing capacity of soil should follow Doosan's standards.)
3. Our engineering team may be available even during the foundation work at customer's request.

* Please comply with our company's installation guideline, such as ground condition and anchoring, in order to achieve the maximum precision and performance of the machine.

Installation & test run

On-site installation and commissioning will be conducted according to a '5-week' schedule. [Excluding the concreted surface curing period (3rd week)]

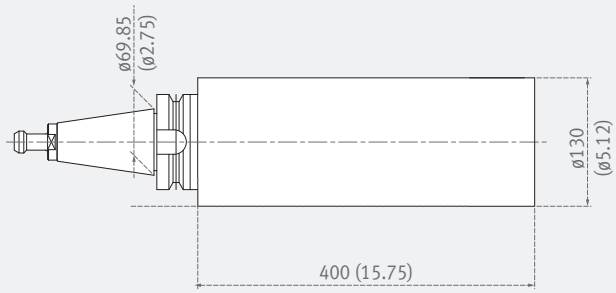
※ The installation plan may vary according to the size of the machine, optional devices, and the conditions and environment of the site.



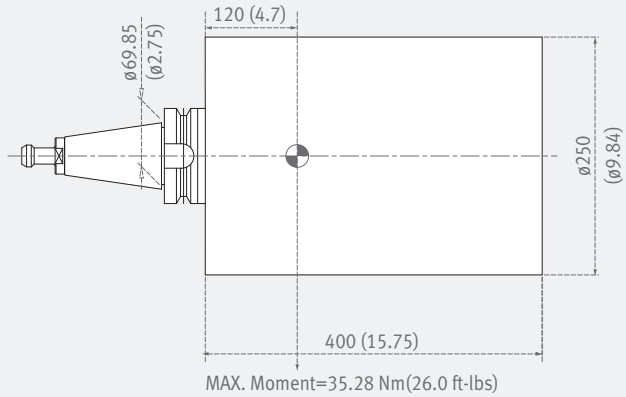
Tool Dimensions

Unit: mm (inch)

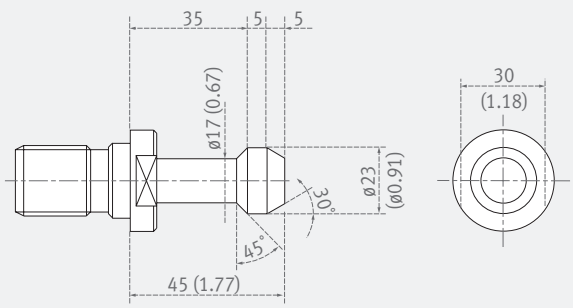
With an adjacent tool



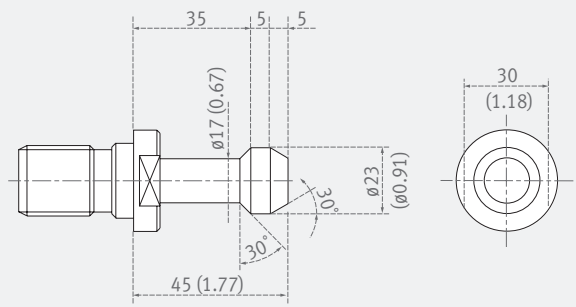
Without adjacent tools



Pull Stud : MAS 403 P50T-I (45°)



Pull Stud : MAS403 P50T-II (60°) option



Maximum tool weight

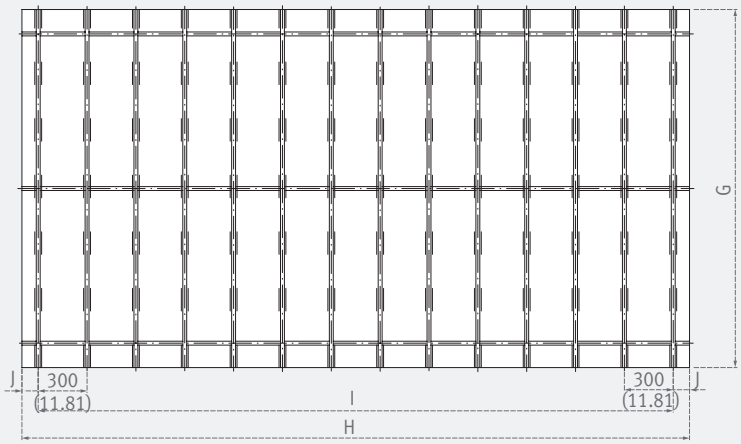
- Standard: 30 kg × 120 mm
- The center of gravity must be within 120 mm from the gauge line.

Various tooling applications

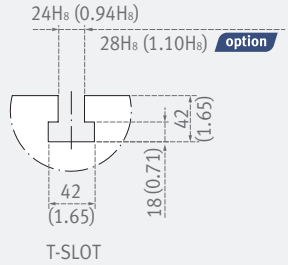
- Any type of tooling is applicable.
- Please contact our engineering team if necessary

Work Area and Table Dimensions

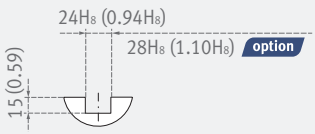
Unit: mm (inch)



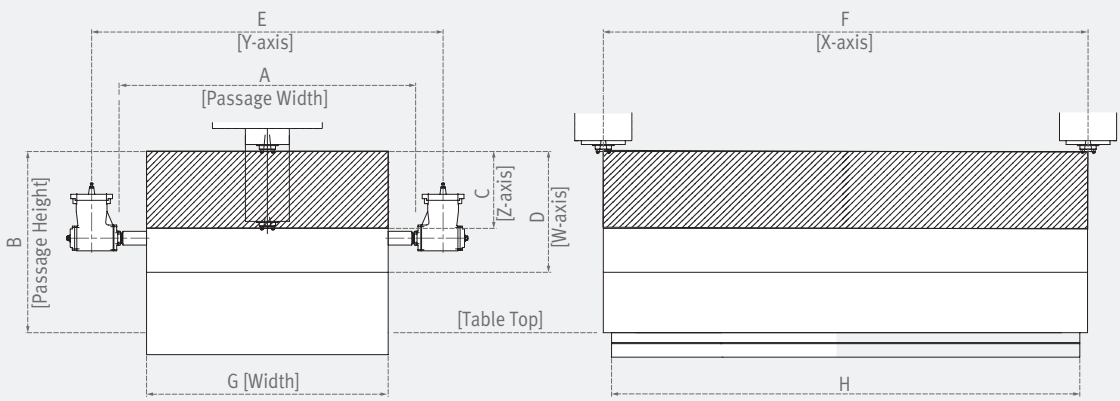
OPERATOR SIDE



T-SLOT



CROSS SLOT



Model	Table type	A	B	C	D	E	F	G	H	I	J
DCM 2740F Ⅱ	22 x 41	2700 (106.3)	1650 (65.0)	700 (27.6)	1100 (43.3)	3200 (126.0)	4250 (167.3)	2200 (86.6)	4100 (161.4)	3900 (153.5)	100 (3.9)
DCM 2750F Ⅱ	22 x 51	2700 (106.3)	1650 (65.0)	700 (27.6)	1100 (43.3)	3200 (126.0)	5250 (206.7)	2200 (86.6)	5100 (200.8)	4800 (189.0)	150 (5.9)
DCM 2760F Ⅱ	22 x 61	2700 (106.3)	1650 (65.0)	700 (27.6)	1100 (43.3)	3200 (126.0)	6250 (246.1)	2200 (86.6)	6100 (240.2)	5700 (224.4)	200 (7.9)
DCM 2780F Ⅱ	22 x 81	2700 (106.3)	1650 (65.0)	700 (27.6)	1100 (43.3)	3200 (126.0)	8250 (324.8)	2200 (86.6)	8100 (318.9)	7800 (307.1)	150 (5.9)
DCM 3250F Ⅱ	27 x 51	3200 (126.0)	1650 (65.0)	700 (27.6)	1100 (43.3)	3700 (145.7)	5250 (206.7)	2700 (106.3)	5100 (200.8)	4800 (189.0)	150(5.9)
DCM 3260F Ⅱ	27 x 61	3200 (126.0)	1650 (65.0)	700 (27.6)	1100 (43.3)	3700 (145.7)	6250 (246.1)	2700 (106.3)	6100 (240.2)	5700 (224.4)	200 (7.9)
DCM 3280F Ⅱ	27 x 81	3200 (126.0)	1650 (65.0)	700 (27.6)	1100 (43.3)	3700 (145.7)	8250 (324.8)	2700 (106.3)	8100 (318.9)	7800 (307.1)	150 (5.9)
DCM 3780F Ⅱ	32 x 81	3700 (145.7)	2350 (92.5)	1000 (39.4)	1400 (55.1)	4200 (165.4)	8250 (324.8)	3200 (126.0)	8100 (318.9)	7800 (307.1)	150 (5.9)
DCM 37100F Ⅱ	32 x 101	3700 (145.7)	2350 (92.5)	1000 (39.4)	1400 (55.1)	4200 (165.4)	10250 (403.5)	3200 (126.0)	10100 (397.6)	9900 (389.8)	100 (3.9)
DCM 4280F	35 x 81	4500 (177.2)	2350 (92.5)	1000 (39.4)	1400 (55.1)	5000 (196.9)	8250 (324.8)	3500 (137.8)	8100 (318.9)	7800 (307.1)	150 (5.9)

Machine Specifications

Item		Unit	DCM 2740F Ⅱ	DCM 2750F Ⅱ	DCM 2760F Ⅱ	DCM 2780F Ⅱ	DCM 3250F Ⅱ	DCM 3260F Ⅱ	DCM 3280F Ⅱ	DCM 3780F Ⅱ	DCM 37100F Ⅱ	DCM 4280F
Travel	X-axis Travel (Table Longitudinal)	mm (inch)	4250 (167.3)	5250 (206.7)	6250 (246.1)	8250 (324.8)	5250 (206.7)	6250 (246.1)	8250 (324.8)	8250 (324.8)	10250 (403.5)	8250 (324.8)
	Y-axis Travel (Spindle Head Cross)	mm (inch)	3200 (126.0)				3700 (145.7)			4200 (165.4)		5000 (196.9)
	Z-axis Travel (Ram Vertical)	mm (inch)	700 {1000}* (27.6{39.4})							1000 (39.4)		
	W-axis Travel (Vertical Movement of Crossrail)	mm (inch)	1100 (43.3) {1450 (57.1): applicable to height of table to spindle nose 2350mm and over}*							1400 (55.1)		
	Effective width between columns	mm (inch)	2700 (106.3)				3200 (126.0)			3700 (145.7)		4200 (165.4)
	Table to Spindle Nose	mm (inch)	1650 {2000, 2350, 2700}* (65.0 {78.7, 92.5, 106.3)							2350 {2700 }		
Feedrate	Rapid Traverse X, Y, Z, W	m/min (ipm)	16, 20*, 15, 3 (629.9, 787.4*, 590.6, 118.1)							1650 {2000, 2350, 2700}* (65.0 {78.7, 92.5, 106.3)		16, 18, 15, 3 (629.9, 708.7, 590.6, 118.1)
	Max. Cutting Feedrate X, Y, Z	mm/min (ipm)	10000, 10000, 10000 (393.7, 393.7, 10000)									
Table	Table Size (Width x Length)	mm (inch)	2200 x 4100 (86.6 x 161.4)	2200 x 5100 (86.6 x 200.8)	2200 x 6100 (86.6 x 240.2)	2200 x 8100 (86.6 x 318.9)	2700 x 5100 (106.3 x200.8)	2700 x 6100 (106.3 x 240.2)	2700 x 8100 (106.3 x 318.9)	3200 x 8100 (126.0 x 318.9)	3200 x10100 (126.0 x 397.6)	3500 x 8100 (137.8 x 318.9)
	Load Capacity	kg (lb)	20000 (44091.8)	25000 (55114.8)	30000 (66137.7)	40000 (88183.6)	33000 (72751.5)	39000 (85979.0)	45000 (99206.6)			
	T-Slot	mm (inch)	24H8 {28H8, 32H8}* (0.94H8 {1.10H8, 1.26H8})									
Spindle Head	Tool Shank	-	BT 50 {CAT 50, DIN 50, HSK 63A}									
	Ram Size	mm (inch)	380 x 380 (15.0 x 15.0)									
	Max. Spindle Speed	r/min	Built-in 6000, {Built-in 8000 , Gear box 6000 ,4000}									
	Spindle Drive Motor (30min. / cont.)	kW (Hp)	25 {Built-in 25, Gear box 26, 45} (33.5 {Built-in 25, Gear box 34.9, 60.3})									
ATC	Tool Storage Capacity	ea	40 {60, 90, 120}									
	Max. Tool Diameter	mm (inch)	130 [adjacent pot empty: 250](5.1[adjacent pot empty: 9.8])									
	Max. Tool Length	mm (inch)	400 (15.7)									
	Max. Tool Weight	kg (lb)	30 (66.1)									
	Max. Tool Moment	N-m (ft-lbs)	29.4 (21.7)									
	Tool Selection Type		Fixed address									
AAC	Type		Linear type 2-station {Linear shuttle type 3/4/5/7 stations}									
Machine Size	Machine Height	mm (inch)	6700 (263.8)									7870 (309.8)
	Floor Space (Machine only)	mm (inch)	7730 x 11200 (304.3 x 440.9)	7730 x 13375 (304.3 x 526.6)	7730 x 15710 (304.3 x 618.5)	7730 x 19710 (304.3 x 776.0)	8230 x 13375 (324.0 x 526.6)	8230 x 15710 (324.0 x 618.5)	8230 x 19710 (324.0 x 776.0)	8730 x 19710 (343.7 x 776.0)	8730 x 959.8 (343.7 x 776.0)	9970 x20920 (392.5 x 823.6)
	Machine Weight	kg (lb)	65000 (143298.4)	68000 (149912.1)	71000 (156525.9)	77000 (169753.4)	82000 (180776.4)	86000 (189594.7)	94000 (207231.5)	112000 (246914.1)	120000 (264550.8)	130000 (286596.7)

* { } : optional

* DCM 3250F Ⅱ / 3260F Ⅱ / 3280F Ⅱ model, the rapid traverse is reduced to 18m/min(708.7 ipm) or less in range of Y axis travel tip 250 mm(9.84 inch) for the stable deceleration.

※ Specifications and delivery of DCM 3780F Ⅱ / 37100F Ⅱ / 4280F should be reviewed in detail before contract.

※ Specifications of DCM U-frame with simultaneous 5-axis universal head should be reviewed in detail before contract.

NC Unit Specifications

FANUC 31i

- Axes control
- Interpolation & feed function
- Spindle & M-code function
- Tool function
- Programming and editing function
- Others (operation, setting & display, etc)
- Frame reference function

● Standard ○ Optional X N/A

Classification	Item	Spec.	FANUC 31i
Axes control	Controlled axes	4 (X,Y,Z,W)	●
	Additional controlled axes	6 axes in total	○
	Simultaneously controlled axes	Positioning(G00)/Linear interpolation(G01) : 3 axes Circular interpolation(G02, G03) : 2 axes	●
	Backlash compensation		●
	Emergency stop / overtravel		●
	HRV control		●
	Least command increment	0.001 mm / 0.0001"	●
	Least input increment	0.001 mm / 0.0001"	●
	Machine lock	all axes / Z-W axis	●
	Mirror image	Reverse axis movement (setting screen and M - function)	●
	Stored pitch error compensation	Pitch error offset compensation for each axis	●
	Interpolation type pitch error compensation		○
	Stored stroke check1	Overtraval controlled by software	●
	Absolute pulse coder		●
	Position switch		●
Interpolation & feed function	2nd reference point return	G30	●
	3rd/4th reference return	G30P3/P4	●
	Circular interpolation	G02, G03	●
	Cylinderical interpolation	G07.1	○
	Linear interpolation	G01	●
	Helical interpolation		●
	Bell-type acceleration/deceleration before look ahead interpolation		○
	Polar coordinate interpolation	G12.1 / G13.1	○
	Exponential interpolation		○
	Involute interpolation		○

● Standard ○ Optional X N/A

Classification	Item	Spec.	FANUC 31i
Interpolation & feed function	Smooth backlash compensation		●
	Dwell	G04	●
	Exact stop check	G09, G61 (mode)	●
	Feed per minute	mm / min	●
	Feedrate override	0 - 200 % (10% unit)	●
	Jog override	0 - 5000mm/min	●
	Automatic corner override	G62	○
	Automatic corner deceleration		●
	Cutting feedrate clamp		●
	Rapid traverse bell-shaped acceleration/ deceleration		●
	3-dimensional manual feed		●
	Manual handle feed	1 unit	●
	Manual handle feed 2/3 unit	Max. 3unit	○
	Manual handle feed rate	x1, x10, x100 (per pulse)	●
	Manual handle interruption		○
	Manual handle retrace		○
	Override cancel	M48 / M49	●
	Positioning	G00	●
	Rapid traverse override	F0 (fine feed), 25 / 50 / 100 %	●
	Reference point return	G27, G28, G29	●
	Skip function	G31	●
	AICC II	200 BLOCK	●
	High-speed processing	600 BLOCK	○
	Look-ahead blocks expansion	1000 BLOCK	○
	DSQ I	AICC II (200block) + Machining condition selection function	●
	DSQ II	AICC II (200block) + Machining condition selection function + Data server(1GB)	○
	DSQ III	AICC II with high speed processing (600block) + Machining condition selection function + Data server(1GB)	○
Spindle & M-code function	M- code function		●
	Spindle orientation	M 3 digits	●
	Spindle speed command	S5 digits	●
	Spindle speed override	10 - 150 (10% increments)	●
	Retraction for rigid tapping		●
	Rigid tapping	G84, G74	●
Tool function	Tool nose radius compensation (Cutter compensation C)	G40, G41, G42	●
	Number of tool offsets	200 ea	●
	Number of tool offsets	400 ea	○
	Number of tool offsets	499 / 999 / 2000 ea	○
	Tool length compensation	G43, G44, G49	●
	Tool life management		●
	Addition of tool pairs for tool life management		○
	Tool number command	T3 digits	●
	Tool offset memory C	Geometry / Wear and Length / Radius offset memory	●
	Tool offset	G45 - G48	○
Programming and editing function	Absolute / Incremental programming	G90 / G91	●
	Automatic Coordinate system setting		●
	Background editing		●
	Canned cycle	G73, G74, G76, G80 - G89, G99	●
	Circular interpolation by radius programming		●
	Custom macro		●
	Addition of custom macro common variables	#100 - #199, #500 - #999	●
	Macro executor		●
	Decimal point input		●
	Extended part program editing		●
	Part program storage	1MB(2,560m)	●
	Part program storage	2MB(5,120m)	○
	Part program storage	4MB(1,0240m)	○
	Part program storage	8MB(2,0480m)	○
	Inch/metric conversion	G20 / G21	●
	Label skip		●
	Maximum commandable value	±99999.999mm (±9999.9999 inch)	●
	No. of Registered programs	1000 ea	●
	No. of Registered programs	4000 ea	○
	Optional block skip	9 BLOCK	○
	Optional stop	M01	●
	Program file name	32 characters	●

Classification	Item	Spec.	FANUC 31i
Programming and editing function	Program number	O4-digits	●
	Sequence number	N 8-digit	●
	Playback function		○
	Program protect		●
	Program stop / end	M00 / M02, M30	●
	Programmable data input	Tool offset and work offset are entered by G10, G11	●
	Sub program	Up to 10 nesting	●
	Tape code	ISO / EIA Automatic discrimination	●
	Thread cutting		●
	Program restart		●
	Workpiece coordinate system	G52 - G59	●
	Addition of workpiece coordinate system	G54.1 P1 - 48 (48 pairs)	●
	Addition of workpiece coordinate system	G54.1 P1 - 300 (300 pairs)	○
	Coordinate system rotation G68, G69		●
	Extended part program editing		●
	Optional angle chamfering . Corner R		●
Others (Operation, setting & Display, etc)	Alarm display		●
	Alarm history display		●
	Actual cutting speed display		●
	Clock function		●
	Coordinate system rotation	G68,G69	●
	Cycle start / Feed hold		●
	Display of PMC alarm message	Message display when PMC alarm occurred	●
	Dry run		●
	Embeded Ethernet		●
	Graphic display	Tool path drawing	●
	Help function		●
	Loadmeter display		●
	MDI / DISPLAY unit	15" Color LCD, Keyboard for data input, soft-keys	●
	Memory card interface		●
	I/O interface	RS - 232C	●
	USB memory interface	Only Data Read & Write	●
	Operation functions	Tape / Memory / MDI / Manual	●
	Operation history display		●
	DNC operation with memory card		●
	Optional angle chamfering / corner R		●
	Run hour and part number display		●
	Search function	Sequence NO. / Program NO.	●
	Self - diagnostic function		●
	Servo setting screen		●
	Single block		●
	External data input		●
	Stored stroke check 2, 3		○
	Multi language display		●
	Cs contouring control		●
	CNC screen display		●
	CNC screen dual display function		●
	Reader/Puncher interface (for 2ch)	Note1)	○
	Multi spindle control	Note2)	○
	Extended Spindle orientation	Note2)	○
	Extended spindle output switching function	Note2)	○
	Chopping function	G81.1	○
	High speed skip function		○
	Polar coordinate command	G15 / G16	○
	Programmable mirror image	G50.1 / G51.1	○
	Scaling	G50, G51	○
	Single direction positioning	G60	○
	Fast Data server with1GB PCMCIA card		○
	Fast Ethernet		○
	3-dimensional tool compensation		○
	Tape format for FS15		○
	Figure copying	G72.1, G72.2	○
	Machining time stamp function		○
	EZ Guide I with 15" Color TFT	- Doosan machine tools Conversational Programming Solution - When the EZ Guide i is used, the Dynamic graphic display cannot application	○
	Dynamic graphic display (with 15" Color TFT LCD)	- Machining profile drawing. - When the EZ Guide i is used, the Dynamic graphic display cannot application	○
	Nano smoothing		○
	3D Manual handle interruption		○

Responding to Customers Anytime, Anywhere

Doosan Machine Tools' Global Network, Responding to Customer's Needs nearby, Anytime, Anywhere

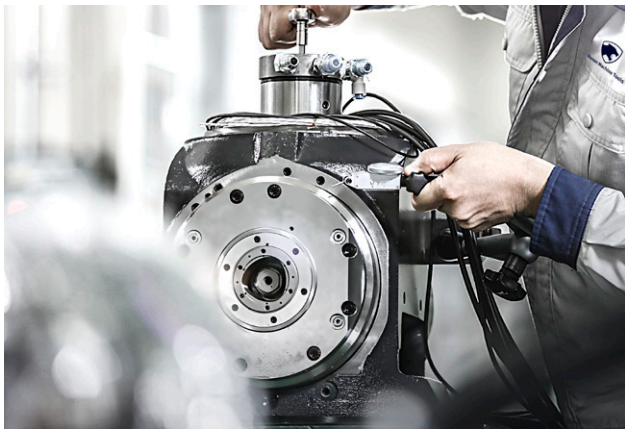
Doosan machine tools provides a system-based professional support service before and after the machine tool sale by responding quickly and efficiently to customers' demands. By supplying spare parts, product training, field service and technical support, we can provide top class support to our customers around the world.

Global Sales and Service Support Network

Corporations	Dealer Networks	Technical Centers	Service Post	Factories
		Technical Center: Sales Support, Service Support, Parts Support		
4	167	51	200	3

Doosan Machine Tools Customer Support Service

We help customers to achieve success by providing a variety of professional services from pre-sales consultancy to post-sales support.



Supplying Parts

- Supplying a wide range of original Doosan spare parts
- Parts repair service

Field Services

- On site service
- Machine installation and testing
- Scheduled preventive maintenance
- Machine repair

Technical Support

- Supports machining methods and technology
- Responds to technical queries
- Provides technical consultancy

Training

- Programming / machine setup and operation
- Electrical and mechanical maintenance
- Applications engineering

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*The specifications and information above-mentioned may be changed without prior notice.

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Fire Safety Precautions | There is a high risk or fire when using non-water-soluble cutting fluids, processing flammable materials, neglecting use coolants and modifying the machine without the consent of the manufacturer. Please check the SAFETY GUIDANCE carefully before using the machine.

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