DOUBLE COLUMN MACHINING CENTER

DBM

1525s

DN SOLUTIONS

DBM 1525s

The DBM Series is a double column vertical machining center capable of both hard metal cutting and high precision machining of large size molds.

The integrated column and crossrail structure provides optimum rigidity, and the box guideway Z axis ram ensures effective heavy duty and high accuracy profile milling required for mold processing.

HIGH POWER AND TORQUE BUILT IN TYPE SPINDLE AND RIGID RAM STRUCTURE

- 350mm square ram with 8 sided box guideway support provides optimal rigidity even with long ram extension.
- Built in 12000 r/min spindle with constant bearing pre-load.
- Extended spindle nose design provides good access to deep mold cavities.
- High rigidity and minimal vibration during fine cutting due to dual face-taper contact spindle design as standard.

THE DESIGN OF AXIS FEED SYSTEM AND SPINDLE ARE OPTIMIZED TO ENSURE STABILITY AND HIGH PRECISION

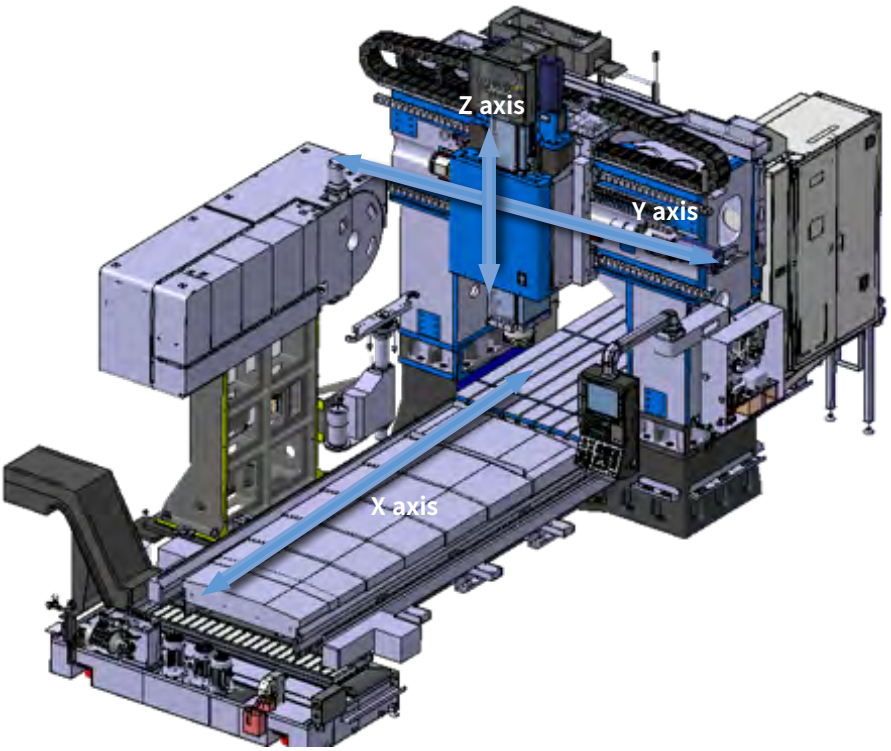
- Cooling of X and Z axis ballscrew housings and Z axis ballscrew as standard.
- Z axis ram is supported by double ballscrews
- Spindle bearings have constant pre-load for optimal stiffness across a wide range of spindle speeds.
- Linear scales on all axes as standard.

HIGH QUALITY MOLD MACHINING IS ACHIEVED BY COMBINING OPTIMISED MACHINE MECHANICAL STRUCTURE AND DN SOLUTIONS'S CONTROL TECHNOLOGY

- All structural elements are covered to minimise the effect of outside temperature.
- Thermal displacement compensation for the spindle and structure as standard.
- Large capacity 600L coolant tank stabilises coolant temperature.

BASIC STRUCTURE

The DBM1525s has a double column bridge structure with fixed crossbeam and box guideway Z axis ram for heavy duty milling.



Travel distance

X axis	**2800** mm	110.2 inch
Y axis	**1350** mm	53.1 inch
Z axis	**750** mm	29.5 inch

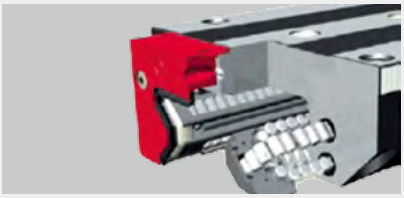
AXIS SYSTEM

To optimise the rigidity and precision of the axis system, heavy duty roller guideways, high rigidity ballscrew couplings and nut cooling are applied.

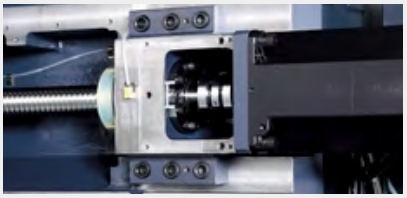
Rapid traverse rate

X axis	**16** m/min	629.9 ipm
Y axis	**16** m/min	629.9 ipm
Z axis	**16** m/min	629.9 ipm

Roller linear guideway

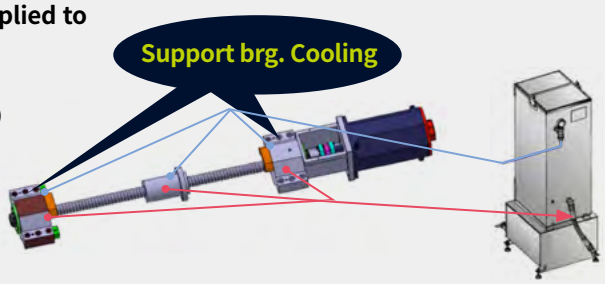


Rigid coupling



Axis cooling technology applied to optimise the precision.

X / Y (Bearing Housing) ,
Z (Bearing Housing + Ballscrew Nut)



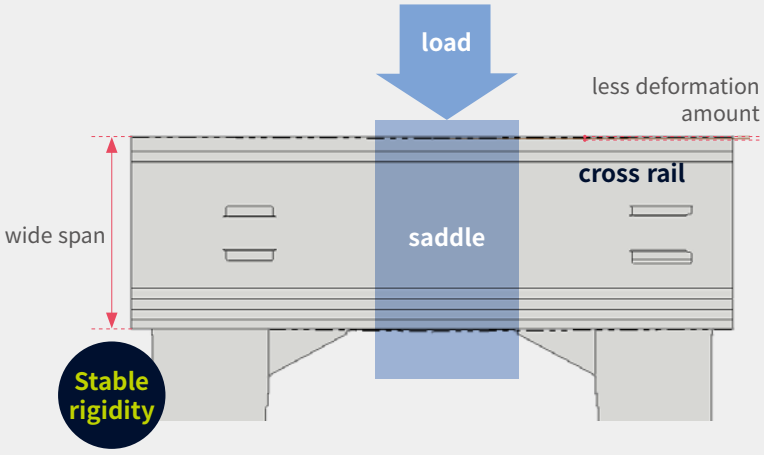
Linear scale – standard for all axes

All axes are equipped with the linear scale as a standard feature to maintain the highest degree of accuracy over many hours of operation.

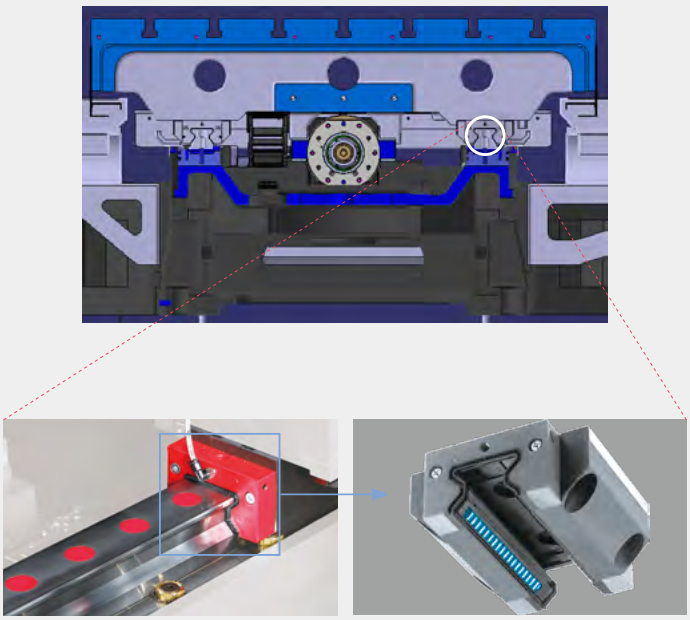
HIGH-RIGIDITY, HIGH-PRECISION STRUCTURE

The DBM1525s is designed to handle large size, heavy workpieces, and guarantee high precision and stable conditions even over long periods of machining.

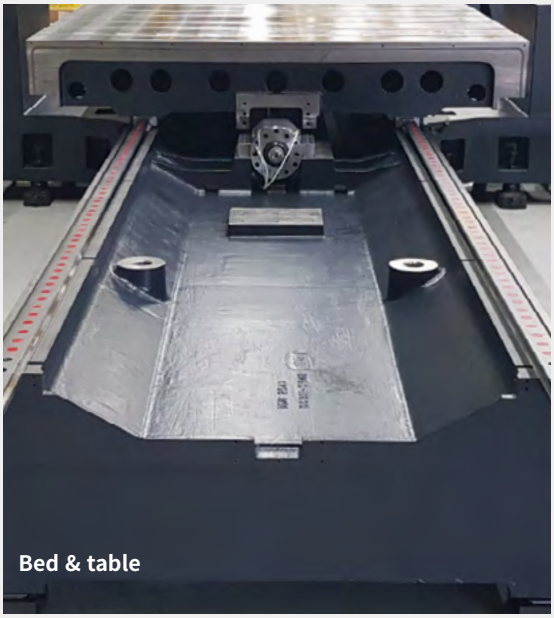
- The single piece construction of column and crossbeam provides excellent rigidity and vibration damping. It maintains optimal stability characteristics for both heavy duty milling and high precision fine cutting.



- The bed maintains machining precision by applying an M-shaped cast structure that provides excellent vibration damping characteristics
- The table is supported by two rows of high precision roller type LMG's which optimise feed conditions for high precision mold machining.

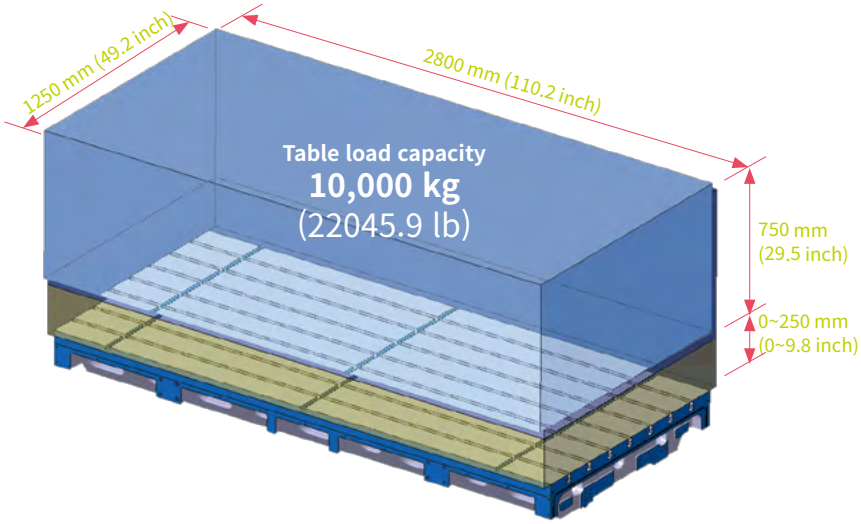


high precision roller type LMG



TABLE

The large capacity 2800mm x 1250mm table can handle workpieces up to 10000kg.



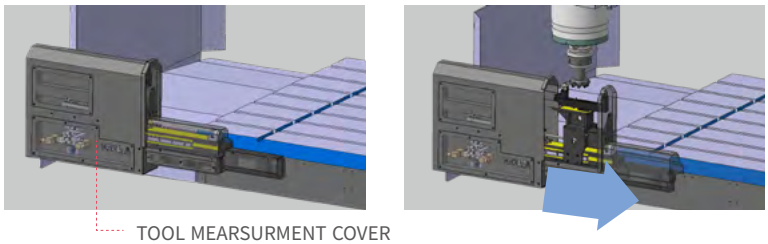


Table size

2800 x 1250 mm
110.2 x 49.2 inch

Table load capacity

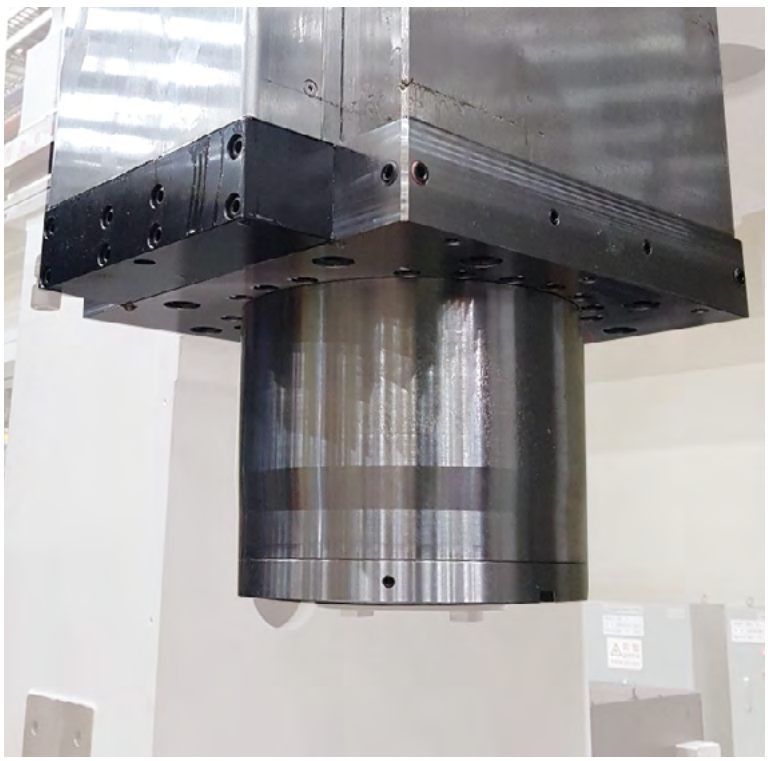
10000 kg 22045.9 lb

Tool measuring device

A travelling type tool measuring device is applied to minimize interference with the machine working area, and a cover is provided to avoid contamination by chips.

SPINDLE INFORMATION

Ram type built in spindle is standard, suitable for heavy duty cutting and fine milling of high quality molds.



Max. spindle speed

12000 r/min
8000 r/min option

Max. spindle motor power

30 kW 40.2 Hp

Max. spindle motor torque

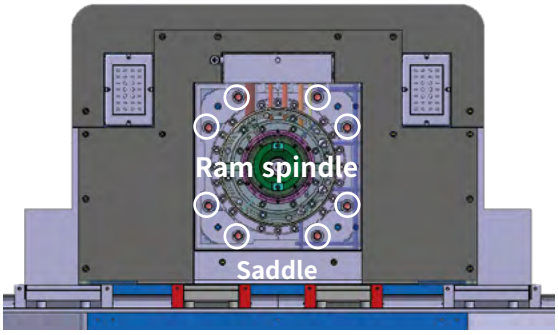
420 N·m 310 ft-lbs

Tool taper

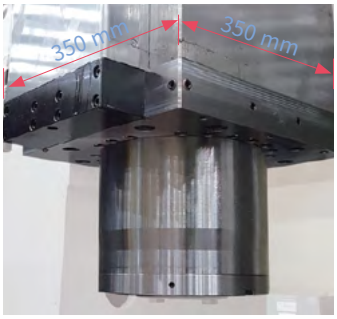
ISO #50

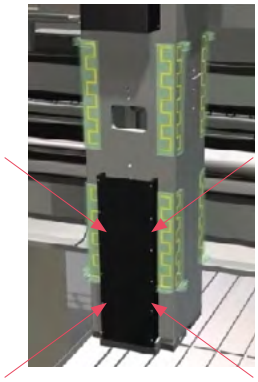
RAM/SADDLE STRUCTURE

Powerful and high precision machining is possible by applying a 350mm square ram spindle.



- The high rigidity box guideway ram spindle with quadrangular structure optimizes thermal stability.
- 8 sided restraint of the ram guideways provides vibration-free heavy duty cutting.





load direction during cutting

RAM size

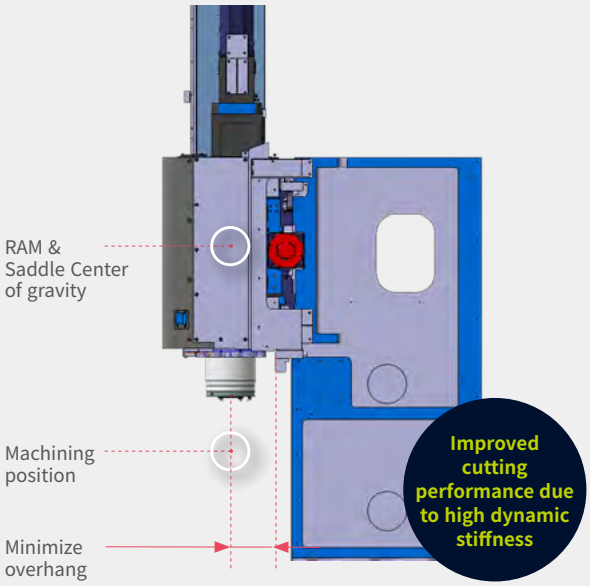
350 x 350 mm

13.8 x 13.8 inch

8 sided restraint of the ram guideway

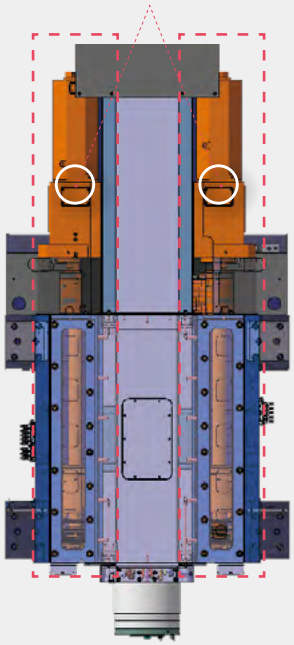
STABLE SADDLE STRUCTURE

- The distance between the spindle centerline and the Y axis guide surface is minimized to reduce overhang of the saddle assembly and optimise dynamic stiffness. This creates the optimal conditions for heavy duty cutting and also high performance finish machining of mold surfaces.



- The Z axis double ballscrew arrangement is applied to maintain the best possible stability and precision.

Z axis double ballscrew



TOOL CHANGE SYSTEM

Tool storage capacity

40 ea

8/60 ea option

Higher productivity can be achieved with the CAM-type tool changer that supports faster tool changing.

CUTTING PERFORMANCE

High cutting performance with high speed built-in spindle.

Cutting Process	Tool mm (inch)	Spindle speed r/min	Feedrate (mm/min (ipm))	Machining rate cm^3/min ($inch^3$/min)
FACEMILL (SM45C)	D125 (D4.9)	500	2600 (102.4)	780 (47.6)
		500	1200 (47.2)	720 (43.9)

Cutting Process	Tool mm (inch)	Spindle speed r/min	Cutting Depth mm (inch)	Machining rate cm^3/min ($inch^3$/min)
U-DRILL	D80 (D3.1)	500	140 (5.5)	703 (42.9)
TAP	M42 x 4.5	190	508 (20.0)	50 (3.1)

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

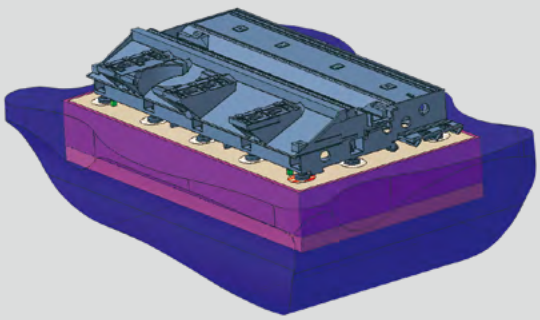
Foundation

Anchoring is recommended to ensure machining accuracy over a long time.

Machine foundation *

Since machining accuracy is highly dependent on the machine's foundation, anchoring is recommended to maintain accuracy over a long period of time. The anchor bolts and other related parts for foundation work are supplied as standard items.

* *Please consult with DN Solutions sales technicians regarding ground and operating conditions.*



OPTIMIZED TOOL PROCESSING SOLUTION

Superior surface finishes and superior machining precision are achieved by using standard DN Solutions processing solutions, such as high speed / high precision contour control and thermal displacement compensation functions.

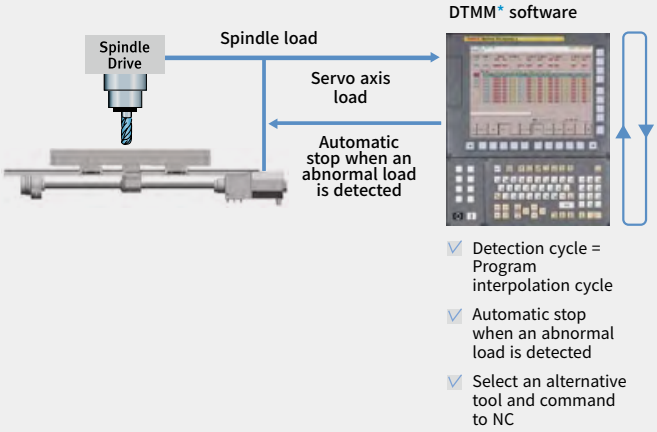
High Speed / High Precision Contour Control

AICC 200 Block + Machining condition selection function

*DSQ : DN Solutions Super Quality

Tool Load Monitoring System (DTMM*)

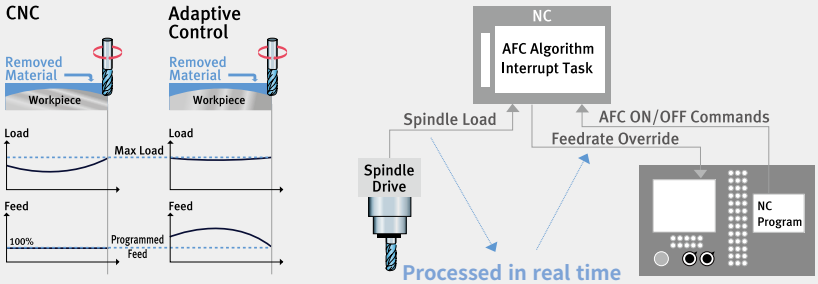
The technology that protects the tool and machine when machining abnormal loads.



*DTMM : DN Solutions Tool load Monitoring for Machining Centers

The Optimal Feed Control (DAFC*)

Optimal feed control is ensured by spindle load detection that occurs in real time.



*DAFC : DN Solutions Adaptive Feedrate Control

Smart, multi-compensation thermal displacement technology (DSTC*)

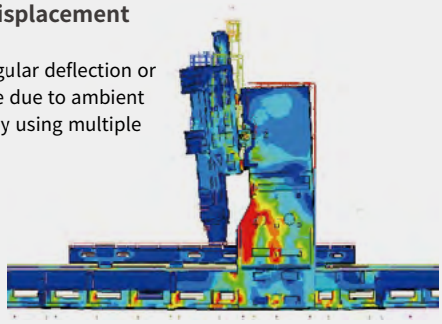
Realization of high-quality, high-precision machining achieved by thermal compensation of the spindle and machine structure.

Compensation of static spindle displacement

Compensates for changes in tool position caused by expansion of the spindle shaft during high speed operations.

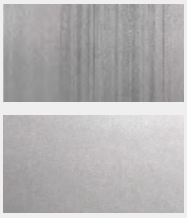
Structural thermal displacement compensation

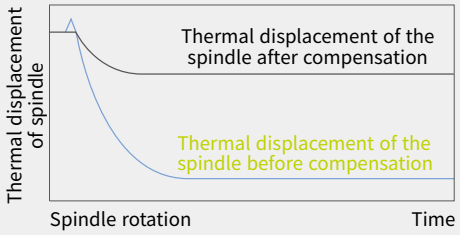
Compensates for any irregular deflection or expansion of the structure due to ambient temperature fluctuation by using multiple temperature sensors.



Thermal displacement compensation structure

Thermal displacement of the spindle, caused by heat accumulation, is compensated for using 5 algorithms including a smoothing function.





*DSTC : DN Solutions Smart Thermal Control

STANDARD | OPTIONAL SPECIFICATIONS

A range of options is available to suit individual requirements.

Description	Features		DBM 1525s
Spindle	12000 r/min	30/25 KW	●
Tool Shank type	BIG PLUS BT50		●
Magazine	Tool strage capacity	40 EA	●
		8 EA	○
		60 EA	○
Coolant	COOLANT TANK DIRECTION	LEFT SIDE	●
	FLOOD COOLANT PUMP	1.5 KW_0.69 MPA_200_CIRCULAR	●
	THROUGH SPINDLE COOLANT	1.5 KW_2.0 MPA	○
	COOLANT GUN		●
	OIL SKIMMER	BELT TYPE	○
	Water soluble Coolant Chiller**		○
Chip disposal	CHIP CONVEYOR TYPE	HINGED BELT_FRONT SIDE	○
		CHIP CONVEYOR TYPE	○
	CHIP BUCKET TYPE	FORKLIFT_380L	○
		CHIP BUCKET TYPE	○
		CHIP BUCKET TYPE	○
	AIR GUN		○
Precision enhance	LINEAR SCALE	X/Y/Z AXIS	●
	AICC 200 block		●
	AICC 1000 block		○
	SPINDLE THERMAL COMPENSATION		●
Measurement & Automation	AUTOMATIC TOOL MEASUREMENT	TS27R_RENISHAW	○
		NC4_RENISHAW	○
Extra option	SPINDLE 8000 r/min	55/45/37 KW	○
	RAISED COLUMN	300 MM	○
	MACHINE COVER TYPE	SPLASH GUARD_W/O TOP	●
		SPLASH GUARD_REAR TOP	○
		SPLASH GUARD_WITH TOP	○
	TEST BAR	TEST BAR GAUGE	○
	Portable handle MPG	MPG 1	●
		MPG 3	○
	STEP FOOT STOOL	STEP FOOT STOOL	○
	MAINTENANCE TOOL KIT	L-WRENCH AND SPANNER SET	○
NC	Fanuc 31i-B Plus		●

※ Please contact DN Solutions for detailed specification information.

** When using a semi-synthetic type or synthetic type, contact our sales representative or service center in advance.*

*** Technical consultation is mandatory for the chilling of non-water soluble coolant*

● *Standard* ○ *Optional* X *N/A*

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

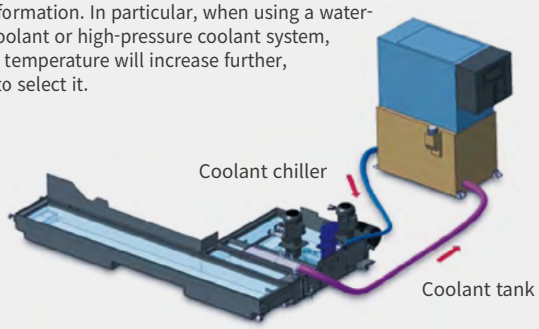
PERIPHERAL EQUIPMENT

Coolant tank

Large capacity up to 650L is applied for customer convenience

Coolant chiller option

The heat generation of cutting oil circulates through the machine and transfers the temperature to the machine body and workpiece/jig, causing thermal deformation, which adversely aects the precision. We recommend a coolant chiller that can prevent such temperature rise and minimize thermal deformation. In particular, when using a water-insoluble coolant or high-pressure coolant system, the coolant temperature will increase further, so be sure to select it.



Chip disposal

Side Hidge type conveyor is applied to disposal large-capacity chips and operator's safety.

• HINGED TYPE CONVEYOR
⇨ 476cc/hr x 2
⇨ Better durability

Chip conveyor option

	 Long x 50mm	 Short 5~50mm	 Needle	 Fine 1~5mm	 Sludge, Swarp
Material	Steel, AL	Steel AL, Cast iron	Steel AL, Cast iron	Steel AL, Cast iron	AL, Cast iron
Hinged belt	○	△	△ (Steel, AL)	X	X
Scraper	X	○	△ (Cast iron)	△	X
Magnetic scraper	X	○ (Cast iron)	X	△ (Steel, Cast iron)	X
Hinged belt + Drum filter	-	○	○	X	X
Scraper + Drum filter	-	○	○	○	○

** If smaller and thinner chips than short chips occur, it is recommended to use a chip conveyor equipped with a drum filter. When applying the drum type conveyor, some changes may apply, so it is recommended to contact sales.*

○ : Suitable, △ : Possible, X : Not suitable

HYD' UNIT

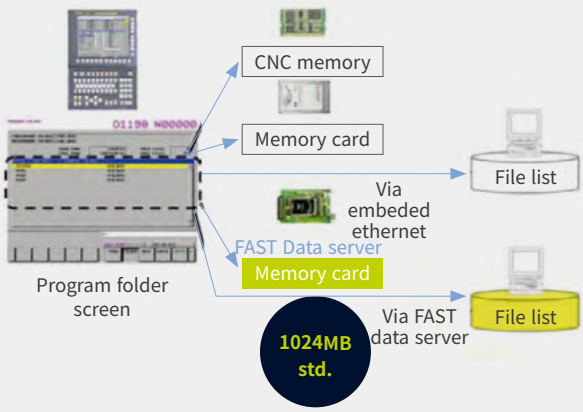
- Minimize noise and power consumption from hydraulic unit by applying power pack
- Minimized use of hydraulic oil compared to previous (up to 3.9L)

Linear scale

Linear scale standard for all axes to maintain precision during machining

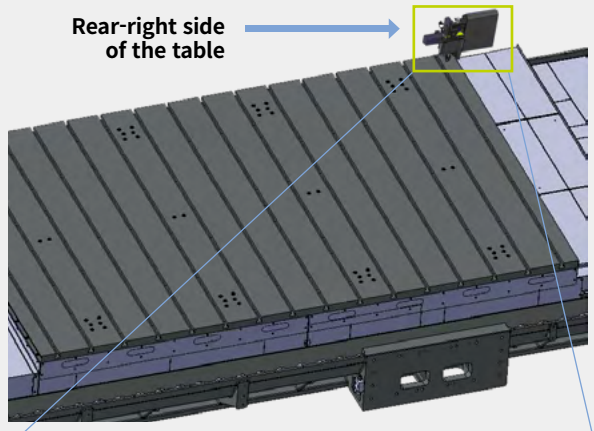
Data server

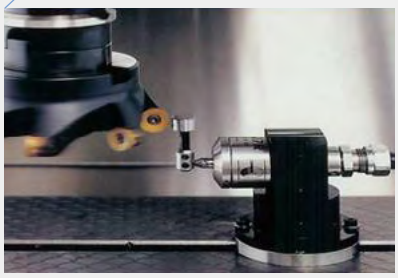
Data server 1024MB standard applied to further improve data storage capacity.



PERIPHERAL EQUIPMENT

Tool measuring device option





TS27R

NC4

MPG suitable for large works

Manual handle Portable MPG

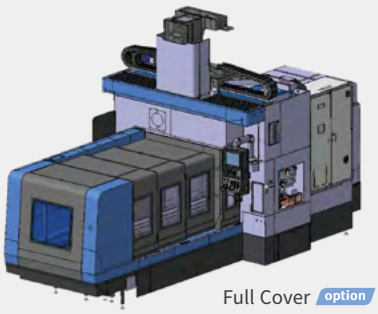
Manual handle Portable 3 MPG option

Manual handle MPG with LCD option

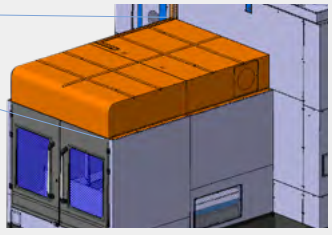
Manual operation panel option
HMOP (Handy Machine Operator's Panel)

Prevent chip scattering

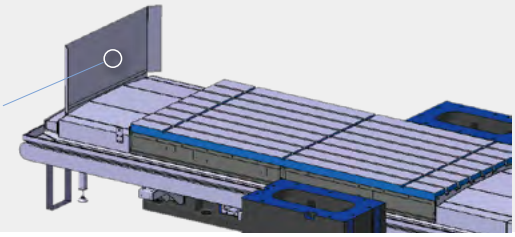
- Semi-splash guard applied as standard, Rear-top cover option
- Additional cover to prevent scattering chip to the rear side
- Full cover option



Full Cover option



Rear Top Cover option



Additional chip cover
to prevent scatter chip
on rear side

**Add Splash Guard option to provide protection and to prevent the scattering of coolant oil. If Splash Guard option is not selected, then it is highly advised for customers to prepare separate protective measures*

FANUC 31iB PLUS

Fanuc 31i Plus maximizes customer productivity and convenience.

15" Touch screen + New OP

DN Solutions Fanuc 31iB/B5 Plus' operation panel enhances operating convenience by incorporating common-design buttons and layout. It features a Qwerty keyboard for fast and easy data input and operation.

FANUC 31iB PLUS

- 15-inch color display
- Intuitive and user-friendly design

USB and PCMCIA card QWERTY keyboard

- EZ-Guide i standard
- Ergonimic operator panel
- 4MB Memory
- Hot keys
- Enhance AICC BLOCK
- Touch pen provided as standard

iHMI touchscreen

iHMI provides an intuitive interface that uses a touchscreen for quick and easy operation.

Range of applications

Providing various applications related to planning, machining, improvement and utility, for customer convenience.

NUMERIC CONTROL SPECIFICATIONS

FANUC

Division	Item	Specifications	F31iB PLUS
			DBM 1525s
Controlled axis	Controlled axes		3 (X,Y,Z)
	Simultaneously controlled axes		3 axes
	Additional controlled Axis	Add 1 Axis (4th Axis)	●
Data input/output	Fast data server		○
	Memory card input/output		●
	USB memory input/output		●
	Large capacity memory(2GB)*2	Available Option only with 15" Touch LCD (iHMI Only) *2)	○
Interface function	Embedded Ethernet		●
	Fast Ethernet		○
	Enhanced Embedded Ethernet function		●
Operation	DNC operation	Included in RS232C interface.	●
	DNC operation with memory card		●
Program input	Workpiece coordinate system	G52 - G59	●
	Addition of workpiece coordinate system	G54.1 P1 X 48 (48 pairs)	●
	Tool number command		T4 digits
Feed function	AI contour control II	G5.1 Q_, 1000 Blocks *1)	●
Operation Guidance Function	EZ Guidei (Conversational Programming Solution)		●
	iHMI with Machining Cycle	Only with 15" Touch LCD standard *2)	●
	EZ Operation package		●
Setting and display	CNC screen dual display function		●
Network	FANUC MT Connect		✪
	FANUC OPC UA		✪
Others	Display unit	15" color LCD with Touch Panel	●
	Part program storage size & Number of registerable programs	10240M(4MB)_1000 programs	●
		20480M(8MB)_1000 programs	○
		2560M(1MB)_2000 programs	○
		5120M(2MB)_4000 programs	○
		10240M(4MB)_4000 programs	○
		20480M(8MB)_4000 programs	○

*1) The number of look-ahead blocks may be changed or limited depending on the peripheral device or the configuration of the internal NC system.
*2) Available Option only with Fanuc i plus iHMI

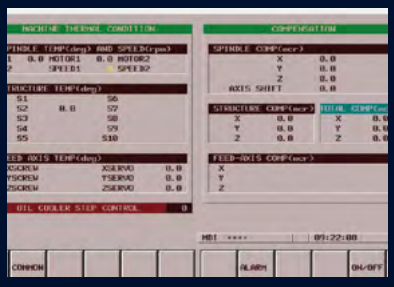
● Standard ○ Optional X N/A ✪ Available
Network: FANUC MT Connect and FANUC OPC UA available.

EZ WORK

The software developed by DN Solutions features numerous functions designed for convenience and ease of operation.

EZ work

The EZ work delivers speed and efficiency. This menu-driven innovation not only helps customers reduce setup times, but also simplifies common tasks and procedures, reducing the potential for errors. EZ work reduces operating time, protects machinery, enhances quality and speeds up maintenance interventions.

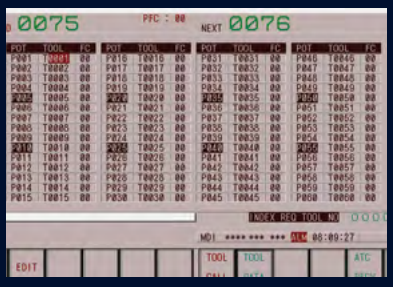


Thermal Compensation

A function to maintain high-precision machining quality by analyzing and correcting the amount of thermal displacement of a structure through a temperature sensor

M/G-Code List

Functional description of M code and G code

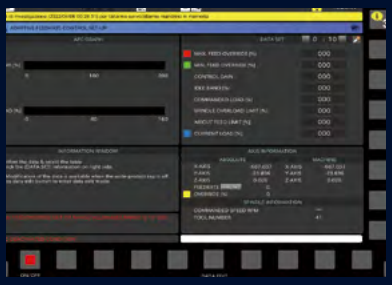


Tool Management

Function to manage tool information [Tool information / Tool No. / Tool condition (normal, large diameter, worn / damaged, used for the rst time, manual) / Tool name]

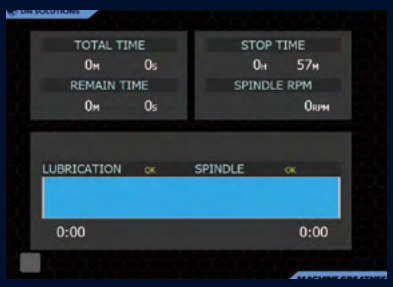
Operation Rate

Machine operation history management function by date based on load



Adaptive Feed Control

Function to control feedrate so that the cutting can be carried out at a constant load



Spindle Warm Up

A function that assists spindle warm-up for spindle life when the spindle has not been used for a certain period of time

ATC Recovery

Function to view detailed info with recommended actions and to perform step-by-step operation manually (when an alarm is triggered during an ATC operation)

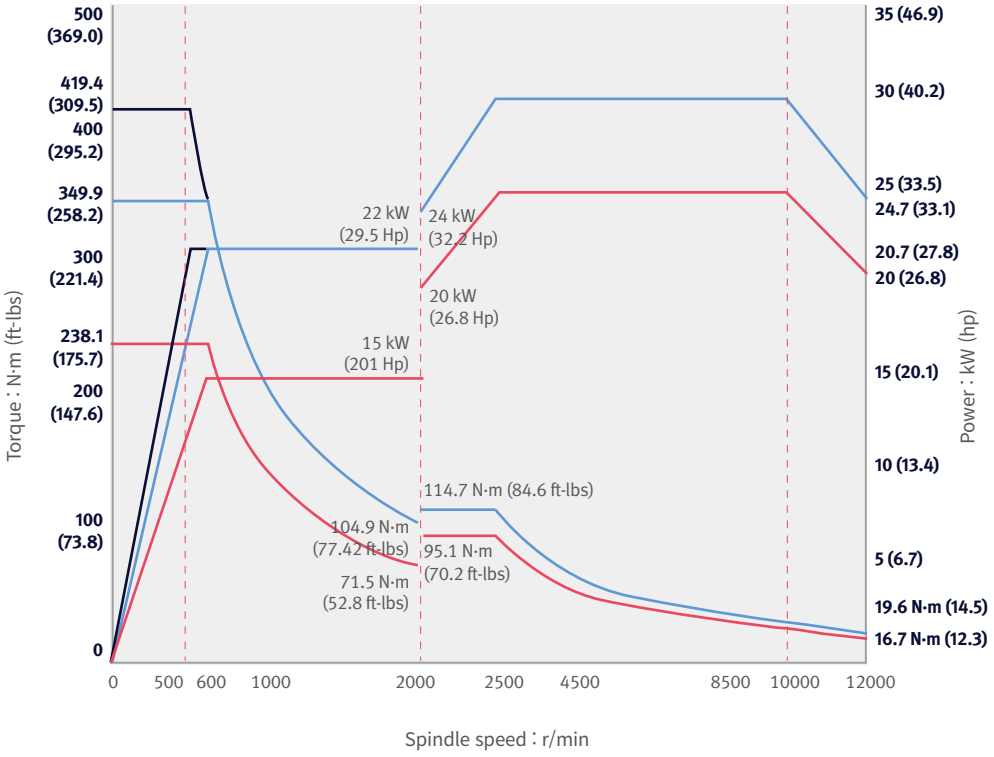
POWER | TORQUE

12000 r/min

SPEED: **12000** r/min

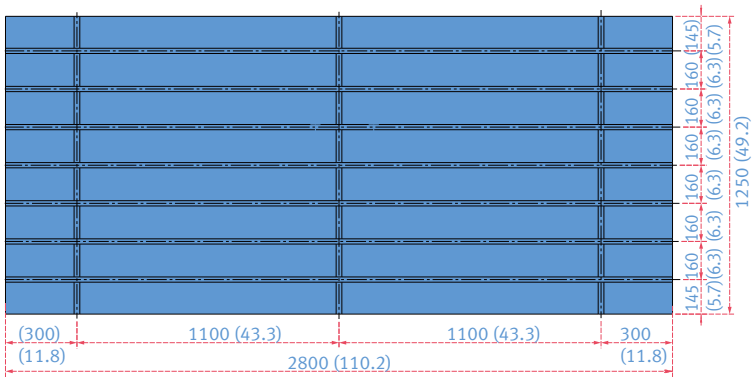
POWER: **30** kw 40.2 Hp

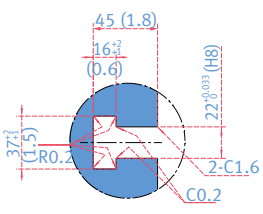
TORQUE: **420** N·m 310 ft-lbs

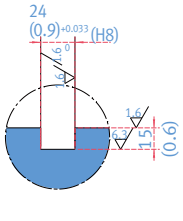


TABLE

Units : mm (inch)



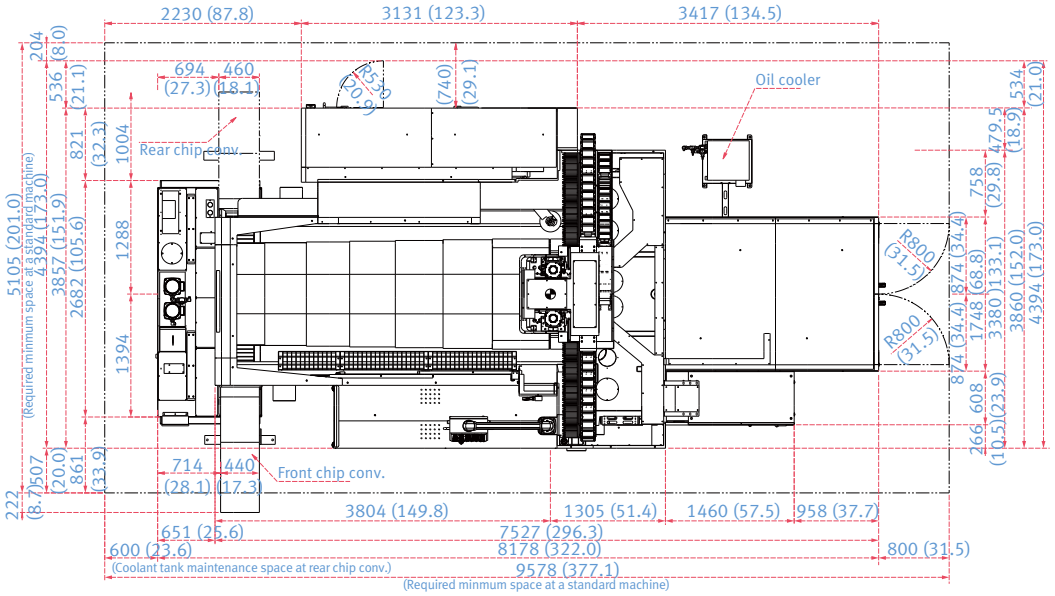




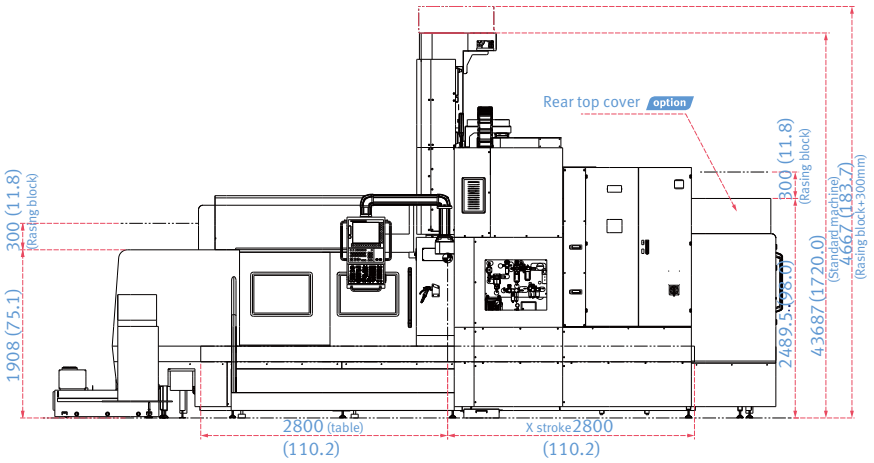
DIMENSIONS

Units : mm (inch)

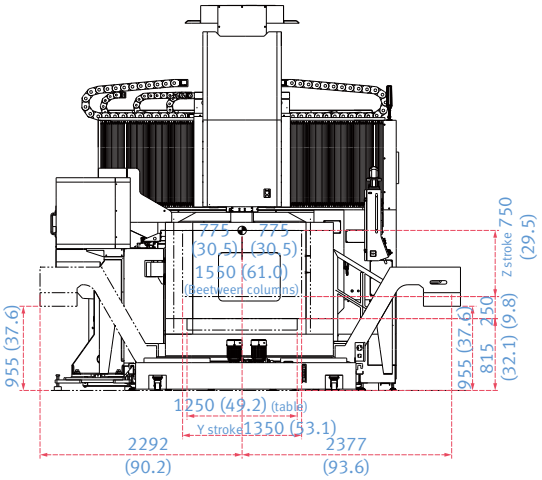
TOP



SIDE



FRONT



** Some peripheral equipment can be placed in other areas.*

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

MACHINE SPECIFICATIONS

Description		Unit	DBM 1525s
Travel	X-axis	mm (inch)	2800 (110.2)
	Y-axis	mm (inch)	1350 (53.1)
	Z-axis	mm (inch)	750 (29.5)
Table	Spindle to table surface	mm (inch)	250~1000 (9.8~39.4)
	Distance between columns	mm (inch)	1550 (61.0)
	Table size	mm (inch)	2800 x 1250 (110.2 x 49.2)
	Loading capacity	kg (lb)	10000 (22045.9)
	Table Surface	-	T-SLOT (7-160 x 22H8)
Spindle	Speed	r/min	12000 {8000}
	Taper	-	ISO #50, 7/24
	Max. torque	N·m (ft-lb)	420 (310.0)
	Spindle power	kW (Hp)	30 / 25 (40.2 / 33.5) (30min/continuous)
Feed rate	Rapid feedrate (X / Y / Z)	m/min (ipm)	16 / 16 / 16 (629.9 / 629.9 / 629.9)
	Cutting feedrate	mm/min (ipm)	8000 (315.0)
ATC	Tool shank type	-	BT / CAT / DIN 50
	Tool storage capacity	ea	40 {8, 60}
	Max. tool diameter [w/o adjacent tool]	mm (inch)	125 (200) (4.9 (7.9))
	Max. tool length	mm (inch)	500 (19.7)
	Max. tool weight	kg (lb)	20 (44.1)
	Max. tool moment	N·m (ft-lb)	21.17 (15.62)
	Tool selection type	-	MEMORY RANDOM
	Tool change time (T-T-T)	s	3.4
Machine Size	Height	mm (inch)	4360 (171.7)
	Dimension (L x W)	mm (inch)	8220 x 4395 (323.6 x 173.0)
	Weight	kg (lb)	28000 (61728.5)

{ } : Option

WHY DN SOLUTIONS

The DN Solutions promise, MACHINE GREATNESS, has two important meanings. The first is simple: DN Solutions makes great machines. The second is a challenge to our end-users. With a product line that is this comprehensive, accurate and reliable, we equip our customers to machine greatness. The big question: **Why should you choose DN Solutions over other options?**

Here's why…

WHAT YOU MAKE AND HOW YOU MAKE IT MATTERS—SO MAKE IT GREAT WITH DN SOLUTIONS.

UNBEATABLE MACHINES

You won't find a more comprehensive range or a better combination of value, performance and reliability anywhere else.

READILY AVAILABLE - ANYWHERE IN THE WORLD

Machining centres (including 5-axis machines), lathes, multi-tasking turning centres and mill-turn machines, and horizontal borers with best-in-class specifications are all available…ready to install.

ROBUST PRODUCT LINE

We offer an impressive range of machine models and hundreds of configurations. Whatever your machining needs and requirements, there's a DN Solutions for you.

EXPERT SERVICE

Our dedicated, experienced and knowledgeable team is totally committed to improving your productivity, growth and success.

RESPONDING TO CUSTOMERS
ANYTIME, ANYWHERE

DN Solutions Global Network

66 Countries | **140** + Sales networks | **3** Factories | **6** Regional HQs

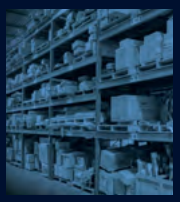
CUSTOMER SUPPORT AND SERVICES

We're there for you whenever you need us.

We help our customers operate at maximum efficiency by providing them with a range of tried, tested and trusted services - from pre-sales consultancy to post-sales support.

Field services

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



Parts supply

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

Training

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

Technical support

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

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