TW SERIES

NAKAMURA-TOME
PRECISION INDUSTRY CO.,LTD.

Nakamura-Tome

TW series

Multi-Tasking Turning Center for Production

From diversified small-lot production to mass production

The slides of the TW-Series adopt the technology of “KISAGE”, a long-established tradition continued since the hydraulic-turret lathe era, which requires very high skills and strict quality control. In the “KISAGE” process, the slides are coated with Turcite B ®, then hand-scraped and mated with box-type guide-ways which are flame hardened and ground to precision. Coupled with slide rigidity, the high-power motors deliver powerful machining. In addition to the low center of gravity design for more stability, the TW SERIES combine advanced capabilities and the latest technology, all packed in an ultimate turret-type multi-tasking machine.

[Reliable Covers]

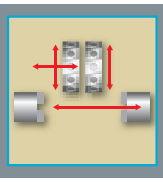
All moving units including the upper slide, lower slide and B-axis unit, are equipped with top class stainless-steel covers and protective wipers, preventing cutting chips accumulation, and providing cover against cutting chips and coolant. The whole machining area is leakage-proof thanks to fully protective covering.

[Machine Paint]

Environment-friendly non-tonic high quality powder coating

TW-Series Lineup

S² Twin-Spindle T² Double turret



TW-8

M² Milling C² C-axis

Turning Milling (op.)	L/R chuck size 6"/165mm	Distance between centers 735mm	Max. turning diameter 190mm	Max. turning length 115mm	L/R bar capacity 26mm 34mm (op.) 42mm (op.)
2-path control F-31iA 4 controlled axes	Spindle motor L:7.5kW R:7.5kW	Spindle speed 6000min^{-1}	Number of tool stations Dodecagonal 12st × 2	Driven-tool motor 2.5kW × 2 4000min^{-1}	

TW-8

■ Capacity		
Max. turning diameter / Max. turning length	190mm / 115mm	190mm / 100mm
Distance between spindles	max.735mm / min.210mm	max.743mm / min.218mm
Bar capacity	26mm op. 34mm	op. 42mm
Chuck size	6" 165mm	
■ Slide travel		
Slide travel (LX / RX)	150 / 150mm	
Slide travel (LZ / RZ)	180 / 525mm	
■ Spindle L, R		
Spindle speed	6000min^{-1}	
L-spindle motor	7.5kW	
R-spindle motor	7.5kW	
■ Turret L, R		
Number of turrets	2	
Type of turret head / Number of indexing pos.	Dodecagonal turret / 12	
■ Milling (op.)		
Driven-tool speed	4000min^{-1}	
Drive motor	2.5kW	
Drive type / Number of driven-tool stations	Simultaneous rotation / 6	
■ General		
Floor space (L × W × H)	2,300mm × 1,600mm × 1,600mm	
Machine weight (incl. Control)	4,810kg	

C- axis has only positioning function. Polar coordinate interpolation is not available.

TW-10MM

M² Milling C² C-axis Y² Y-axis

Turning Milling	L/R chuck size 6"	Distance between centers 870mm	Max. turning diameter 210mm	Max. turning length 155mm	L/R bar capacity 42mm 51mm (op.)
2-path control F-18iTB 4 controlled axes	Spindle motor 7.5/5.5kW+7.5/5.5kW 11/9kW (op. L)	Spindle speed 5500min^{-1}/42mm	Number of tool stations Dodecagonal 24st × 2	Driven-tool motor 3.7/2.2kW × 2 3600min^{-1}	Y axis (op.) ±30mm

TW-10MM

■ Capacity	
Max. turning diameter / Max. turning length	210mm / 155mm
Distance between spindles	max.870mm / min.250mm
Bar capacity	42mm (op. 51mm)
Chuck size	6" 165mm
■ Slide travel	
Slide travel (LX / RX)	180/180mm
Slide travel (LZ / RZ)	200/620mm
Slide travel (LY / RY) (op.)	±30/±30mm
■ Spindle L, R	
Spindle speed	5500min^{-1} 5000min^{-1}
L-spindle motor	7.5/5.5kW (op. 11/9kW)
R-spindle motor	7.5/5.5kW
■ Turret L, R	
Number of turrets	2
Type of turret head / Number of indexing pos.	Dodecagonal turret / 24
■ Milling	
Driven-tool speed	3600min^{-1}
Drive motor	3.7/2.2kW
Drive type / Number of driven-tool stations	Indivisual rotation / 12
■ General	
Floor space (L × W × H)	2,940mm × 2,249mm × 1,972mm
Machine weight (incl. Control)	6,150kg

TW-Series features broad machining capabilities in various fields.

Aerospace | Automotive | Construction | General | Energy | Communicaton | Transportation apparatus | Electrical Appliance | Home Appliance

TW-20

Turning Milling (op.)	L/R chuck sixze 8”	Distance between centers 1080mm	Max turning diameter 270mm	Max. turning length 192mm	L/R bar capacity 51mm 65mm (op.)
2-path control F-18iTB 4 controlled axes	Spindle motor 15/11 kW+15/11 kW 18.5/15kW (op. L)	Spindle speed 5000min^{-1}/51mm 4500min^{-1}/65mm	Number of tool stations Dodecagonal 24st x 2	Driven-tool motor 3.7/2.2kW x 2 3600min^{-1}	Y axis (op.) ±45mm

M² Milling | C² C-axis | Y² Y-axis

TW-20		
■ Capacity	**12st**	**16st**
Max turning diameter / Max turning length	270mm / 192mm	240mm / 213mm
Distance between spindles	max.1080mm / min.300mm	
Bar capacity	51mm (op. 65mm)	
Chuck size	8” 215mm	6” 165mm
■ Axis travel		
Slide travel (LX / RX)	195 / 195mm	
Slide travel (LZ / RZ)	265 / 780mm	
Slide travel (LY / RY) (op.)	±45 / ±45mm	
■ Spindle L, R		
Spindle speed	5000min^{-1} / 4500min^{-1} (op. 65mm)	
L spindle motor	15/11kW (op. 18.5/15kW)	
R spindle motor	15/11kW	
■ Turret L, R		
Number of turrets	2	
Type of turret / Number of indexing pos.	Dodecagonal / 24	16 station turret / 16
■ Driven tools (op.)		
Type of turret / Number of indexing pos.	3600min^{-1}	
Driven-tool motor	3.7/2.2kW	
Drive type / Number of driven-tool stations	Individual rotation / 12	Individual rotation / 16
■ General		
Floor space (L × W × H)	3,444mm × 2,235mm × 2,135mm	
Machine weight (incl. Control)	7,800kg	

TW-30

Turning Milling (op.)	L/R chuck sixze 10”	Distance between centers 1300mm	Max turning diameter 335mm	Max. turning length 300mm	L/R bar capacity 71mm
2-path control F-18iTB 4 controlled axes	Spindle motor 22/18.5kW+22/18.5kW 30/22kW (op. L)	Spindle speed 3500min^{-1}	Number of tool stations Dodecagonal 12st x 2	Driven-tool motor 5.5/3.7kW x 2 3600min^{-1}	Y axis (op.) ±70mm

M² Milling | C² C-axis | Y² Y-axis

TW-30	
■ Capacity	
Max turning diameter / Max turning length	335mm / 300mm
Distance between spindles	max.1300mm / min.320mm
Bar capacity	71mm
Chuck size	10” 254mm
■ Axis travel	
Slide travel (LX / RX)	265 / 265mm
Slide travel (LZ / RZ)	350 / 980mm
Slide travel (LY / RY) (op.)	±70 / ±70mm
■ Spindle L, R	
Spindle speed	3600min^{-1}
L spindle motor	22/18.5kW (op. 30/22kW)
R spindle motor	22/18.5kW
■ Turret L, R	
Number of turrets	2
Type of turret / Number of indexing pos.	Dodecagonal / 12
■ Driven tools (op.)	
Type of turret / Number of indexing pos.	3600min^{-1}
Driven-tool motor	5.5/3.7kW
Drive type / Number of driven-tool stations	Individual rotation / 12
■ General	
Floor space (L × W × H)	4,370mm × 2,125mm × 2,250mm
Machine weight (incl. Control)	10,820kg

TW-8

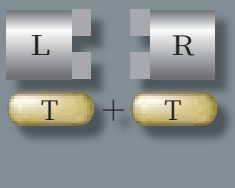
Minimum floor space, superior cost-performance, long awaited compact two-spindle machine

TW-8

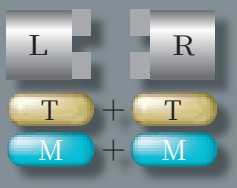
■ Spec. Line up

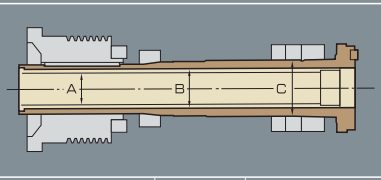
T Turning function　M Milling function
Y Y-axis function

TW-8



TW-8【MM】



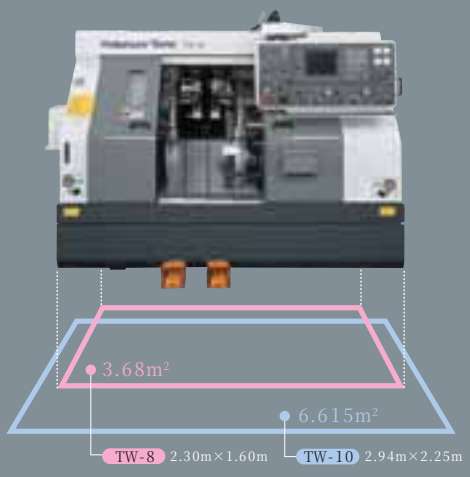


	Items	Standard	Option	
A	Draw tube I.D.	27mm	35mm	43mm
B	Spindle I.D.	47mm	47mm	52mm
C	Front bearing I.D.	75mm	75mm	80mm

C-axis function (Positioning only)

C-axis for TW-8 is positioning function only. Polar coordinate interpolation is not available.

- Rapid index feed : 600min^{-1}
- Engage time : 1.5 sec.
- Least input increment : 0.001 degree
- Least command increment : 0.001 degree



Minimun floor space
Only 2.3m machine length

TW-8 requires only 3.68m2 while its performance is almost the same as 2 CNC lathe.
Higher productivity will be achieved by combining machining process.
Floor space has been substantially reduced by 35% compared with TW-10.

TW-10MM

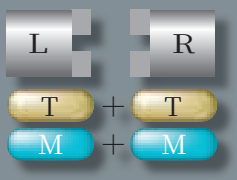
A bar machine, which improves productivity, through a high output motor, which ensures high speed machining

TW-10MM

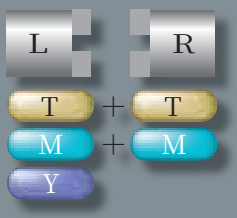
■ Spec. Line up

T Turning function M Milling function
Y Y-axis function

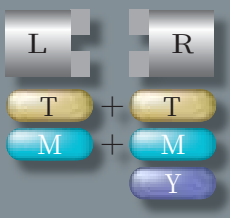
TW-10【MM】



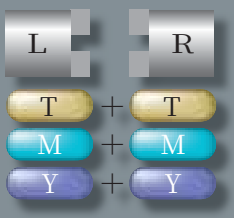
TW-10【LMY-RM】

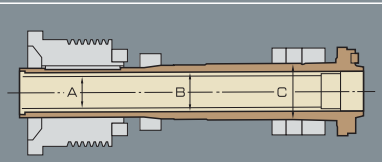


TW-10【LM-RMY】



TW-10【MMYY】



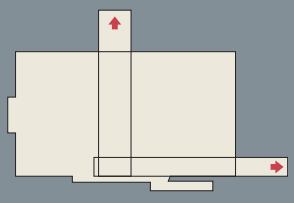


	Items	Standard
A	Draw tube I.D.	43mm
B	Spindle I.D.	52mm
C	Front bearing I.D.	80mm

■ Rapid feed

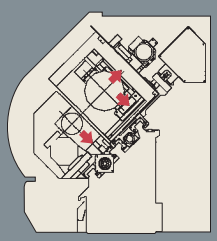
Rapid feed (LX / RX)	16m/min
Rapid feed (LZ / RZ)	40m/min
Rapid feed (LY / RY) (op.)	6m/min
Rapid index speed	600min^{-1}

TW-10MM TW-20 TW-30



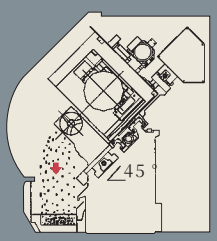
Flexible chip conveyor set-up

A chip conveyor is available with a choice of 2 discharge points enabling customised installations and overall shop floor efficiency.



Precision slideway system assures long term accuracy

All axis slideways are provided with protective guards. An automatic and monitored slideway system lubricates the maximum of the slideway contact area. This proven anti-friction system enables smooth, vibration free cutting, positioning, and rapid traverse rates up to 18m/min.



Free fall of chips & swarf

Massive, wider spaced slideways are available without compromising floor space requirements provide for uninterrupted flow of chips to the chip tank or the conveyor. A unitized chip tank can be rolled out for ease of cleaning or coolant change. Also, heat from the chips does not effect the machine structure.

TW-20

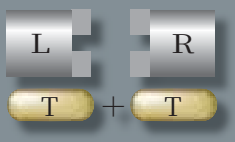
With high speed flexible machining, this, the star of the TW-series, dedicated towards factory automation

TW-20 / TW-30

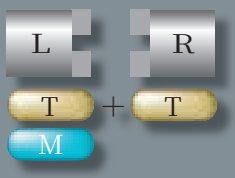
■ **Spec. Line up**

T Turning function　M Milling function
Y Y-axis function

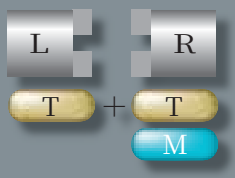
TW-20 / TW-30



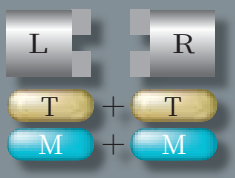
TW-20 / TW-30【LM】

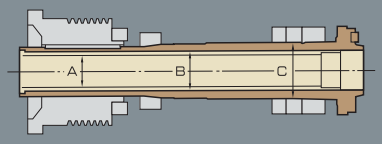


TW-20 / TW-30【RM】



TW-20 / TW-30【MM】





	Items	Standard
A	Draw tube I.D.	52mm
B	Spindle I.D.	65mm
C	Front bearing I.D.	100mm

■ **Rapid feed**

Rapid feed (LX / RX)	16m/min
Rapid feed (LZ / RZ)	27m/min
Rapid feed (LY / RY) (op.)	6m/min
Rapid index speed	600min^{-1}

TW-20
TW-30

All axes are equipped with high-rigidity and high-resistance box-type slides

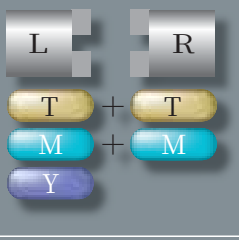
Traditionally hand-scraped and fitted slides

A tradition that has been kept since the automatic turret lathe era, “KISAGE” is a process, which prides itself for providing ultra-precision gliding qualities. Nakamura-Tome offers high-grade slide scraping for all machines.

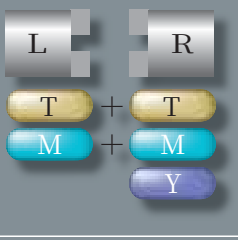
TW-30

Best suited for all sorts of Heavy Duty Machining. A super machine, which takes pride for its rigidity and bar capacity

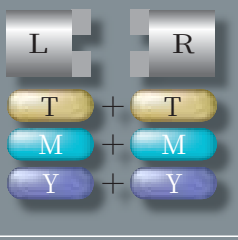
TW-20 / TW-30【LMY-RM】



TW-20 / TW-30【LM-RMY】



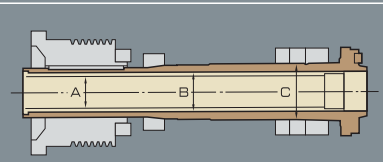
TW-20 / TW-30【MMYY】



Turcite-B ® used for coating the slide-ways, is an exceptionally low-wearing low-friction polymer, which increases slide life and rigidity, and reduces vibrations.

- By keeping a constant coefficient of friction, when the slide is static or moving, Turcite B ® prevents stick-slip motion and increases positional accuracy.
- Additionally, the low friction coefficient ensures heavy cutting even with increased loads.
- Turcite B ® has a high wear resistance, which ensures a long service life.
- Turcite B ® provides excellent vibration dampening properties. It absorbs cutting tool vibration and prevents it from migrating throughout the machine tool.
- This property is an essential factor for achieving the best surface finish, which is a prerequisite for a machine delivering the highest precision.

Spindle and slide units are mounted on the machine bed by high-qualified technicians, and each machine does not leave the production line before undergoing the most stringent quality control checks.
This machine does not only feature high capabilities, but also high performance and reliability, delivered from a machine-tool manufacturer fostering high accuracy and precision manufacturing technology over many years.



	Items	Standard
A	Draw tube I.D.	72mm
B	Spindle I.D.	120mm
C	Front bearing I.D.	85mm

■ Rapid feed

Rapid feed (LX / RX)	**12m/min**
Rapid feed (LZ / RZ)	**18m/min**
Rapid feed (LY / RY) (op.)	**6m/min**
Rapid index speed	**25min^{-1}**

A New Era of Peripheral Devices that Contribute to

Bar Feeder
Aoto Cho-bei II / Cho-bei

3m 4m **Auto Cho-bei is a bar feeder with magazine for automatic bar loading. Cho-bei is a bar feeder for manual bar loading.**

		Auto Cho-bei II NHF-CB-51(S.M.L)–(3M,4M)			Notes
Max. workpiece diameter [mm]		10 - 30	34 - 42	46 - 51	Hexagonal bar H8-H36
Max. rotation speed [min^{-1}]	Bar material	6,000	5,000	4,000	—
	Hexagonal material	3,000			—
Bar bending [mm/m]		less than 0.5			MAS level B
Bar length [mm]		3,000/4,000			Min. 1,500mm
Bar stock capacity [ϕ mm×pcs]		dia.30mm × 10pcs			Stocker length 300mm
Feeding speed [mm/sec]		Max.400mm/sec			adjustable
Feeding power [kg]		Max.40kg			adjustable
Machine dimension	Length 3M/4M [mm]	S : 3,790/4,795	M : 3,870/4,875	L : 4,165/5,170	—
	Width [mm]	733			—

This is required when bar feeder is equipped.

Parts catcher

Parts catcher A / Bucket type

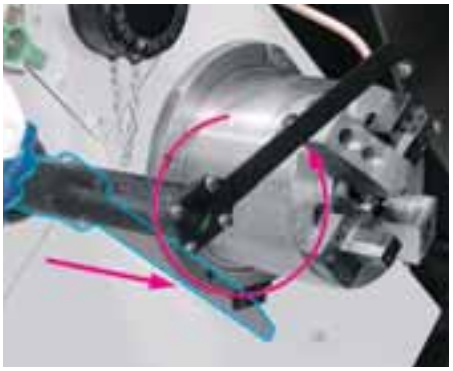
Parts catcher is a device to unload the workpiece into a bucket and bring it out of the machine.Parts catcher specifications such as Maximum part Diameter x length x weight vary from one model to another.
Besides parts catchers with standard specifications, special-made parts catchers can be offered. Please contact our local distributors for specific requirements. For high precision parts, a gripper type unloading device is recommended, such as Parts catcher G or Gantry loader. For such parts, where scratches are not allowed, part catcher A is not recommended.
Parts eject checker is necessary for Parts catcher A or B. Please discuss with your local distributor for more details.

This is required when Parts catcher A or B is equipped.

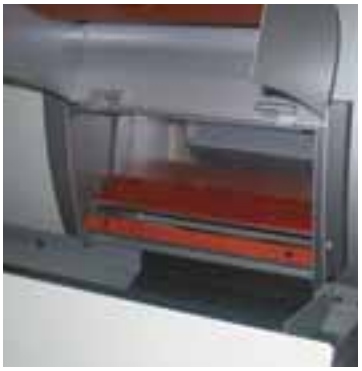
Parts eject checker

Parts eject checker (necessary)

It prevents collision by mistake during part transfer. We can offer two kinds of parts confirmation :
1. Check if there is a part in left hand side chuck.
2. Check if the part was ejected from right hand side chuck.



1. Part off detection



2. Part eject detection

Parts eject checker is necessary when parts eject conveyor is equipped.

Parts outlet Door pocket shape

Stocker type

Workpiece is stocked into a door-mounted box.

outlet chute type

Parts are unloaded through the door onto a conveyor or a bucket. To prevent scratching the parts during unloading, a conveyor is recommended. (op.) To prevent scratching the parts during unloading, additional plastic plates on the chute can be specified.

Tool setter (op.)

	Auto tool setter (slide-in type) for L	Auto tool setter (slide-in type) for R	Manual detachable tool setter
TW-8	●	●	×
TW-10MM	●	●	×
TW-20	●	●	×
TW-30	●	●	×

Note: Interference will be occurred when 24 station turret are equipped.

Cutting chips disposal system

Chip conveyor

Chip conveyor is essential for full automation. Nakamura-Tome's multi-tasking machines with their high capabilities for chip-removal ought to be taken into consideration. When using oil-through type tools, a filter shall be considered to remove fine cutting chips from coolant. When using water-soluble coolant, a coolant level float switch is necessary. When using oil-base coolant, auto extinguisher, fireproof dumper, and oil mist collector are indispensable.

■ Outlet direction

Right-side outlet

【TW-20】

Back-side outlet

* This is a custom-made chip conveyor

■ Conveyor type

Drum filter type conveyor / recommended

It prevents coolant related troubles, such as coolant overflow by clogged filters or coolant malfunction.
A large-sized drum filter in the coolant tank cleans the coolant. With a rotating drum filter, the special pump washes out coolant from inside outwards, preventing cutting chips from accumulating on the filter outer diameter.

Hinge type conveyor

Steel
Aluminum
Brass gunmetal

It is suitable for fine chips, long and curled chips, short chips and wavy chips produced during cut-off, but not for powdery chips produced from machining cast iron, ...etc

Scraper type chip conveyor

Casting
Aluminum
Brass gunmetal

Not suitable for long cutting chips, because they get caught inside the rail, causing malfunctioning. In case of machining casting iron, filtering is improved by attaching a magnet to the bottom of the conveyor.

Coolant separator

Coolant separator is necessary to keep coolant performance. By separating collected lubrication oil from coolant, this minimizes bad odors, prevents coolant from rotting, and prolongs its life.

Hinge type conveyor

Scraper type chip conveyor

In case of using tools with tiny oil-through holes, the filtering can be insufficient depending on the hole size. If the required filtering accuracy is more than 20-40 micrometers, it is recommended to use a maintenance-free type filter instead. Please contact our local distributors for details.

* In the photo is a custom-made coolant float level switch

Gantry Loader

Automation Systems for Small-Sized, Mid -Sized, and Various Kinds of Workpieces.

3kg GR-203

TW-8 + GR-203

TW-10 + GR-203 Passage type

	TW-8	TW-10	TW-20	
Workpiece weight	3kg × 2	3kg × 2	3kg × 2	5kg × 2
Workpiece diameter	ϕ80mm	ϕ20 - ϕ130mm	ϕ20 - ϕ130mm	ϕ20 - ϕ130mm
Workpiece length	20 - 75mm	20 - 85mm	20 - 85mm	20 - 85mm

10kg GR-210New

TW-20 + GR-210New

		TW-20	TW-30
Workpiece weight		10kg × 2	10kg × 2
Workpiece diameter		ϕ20 - ϕ220mm	ϕ20 - ϕ220mm
Workpiece length	LY	20 - 100mm	20 - 100mm
	RY / YY	20 - 95mm	

Multi-Layer Type Stocker

[GR-203]

WS-221	Type	Multi-layer pallet type
	Workpiece diameter	dia.15-100mm
	Number of pallets	10
	Stack height	300mm
	Max. workpiece weight	18kg / pallet

WS-231	Type	Multi-layer pallet type
	Workpiece diameter	dia.20-150mm
	Number of pallets	10
	Stack height	300mm
	Max. workpiece weight	32kg / pallet

Flat Type Stocker

[GR-203]

WS-121	Type	Flat pallet type
	Workpiece diameter	dia.20-80mm
	Number of pallets	30
	Max. workpiece weight	2kg / pallet

WS-122	Type	Flat pallet type
	Workpiece diameter	dia.20-80mm
	Number of pallets	60
	Max. workpiece weight	2kg / pallet

WS-124	Type	Flat pallet type
	Workpiece diameter	dia.20-80mm
	Number of pallets	120
	Max. workpiece weight	2kg / pallet

Multi-Layer Palletizing Stocker

- In case workpiece weight exceeds 300g (op.1000g), B2 type shall be selected. Stroke extension is necessary for B2 type.
- For B2 and C2 types, trays shall be taken out and put in from the left side of machine.
- For the D type, it is possible to specify whether the trays are be taken out and put in from either machine front, left side or back side.
- Extension for in-out conveyors is optionally available.
- Up to three extension-conveyors for tray stacks are available.

	B2 type	C2 type	D type
	For Heavy parts and large diameter parts such as aluminum die castings, the gantry picks up and returns the parts directly from and to the pallet.	Equipped with a one-Axis loader, for transferring the parts from the pallet to a work-station, where the gantry picks up and returns parts.	Equipped with a two-Axis loader, adding flexibility to the system layout. In addition to the possibility of partitioning one pallet for raw and finished parts, finished parts can be placed in a washing device.
Max. loader carriage weight	-	300g op. 1,000g	300g op. 1,000g
Loader	-	1 axis	2 axis
Shuttle (built-in) axis	Servo feed	Servo feed	Special feed control
Max. loading weight	150kg		
Max. weight for 1 tray	15kg (op.20kg)		
Tray storage space	W450 × D600 × H650		

Less Fixtures! Less Set-up! Less Skills!

Necessary functions for multi-tasking are offered as standard features.

"NT-Nurse II", "NT Work Navigator" and "Overload detection / Airbag" were developed to facilitate programming and set-up, to reduce fixture costs of complex parts, and to reduce machine-cell stops.

Nakamura-Tome safety Technology

NT Work Navigator
ACTIVE SAFETY

● Avoid a crash before it happens!

Material recognition function (G310/G312) can be used not only to avoid collisions, but also to optimize the face turning process for forgings that have different lengths. In addition, it is also useful for part-loading status confirmation, machining datum shift, and distinguishing different parts.

● Fixtures no longer necessary

Before machining a complex or irregular part, the coordinate recognition of raw part geometry is necessary. It can be provided with less cost, less labor and more ease. A round bar mounted on turret head as a measurement tool contacts with the part and then triggers the coordinate values to be recorded in the CNC control. This is versatile software developed using torque control technology of servomotor. Consequently the high complex fixtures for chucks and stocker pallets are eliminated, the cost of positioning parts can be dramatically reduced.

Overload detection*
PASSIVE SAFETY

● A security feature to rely on when the worse happens.

When unavoidable human error results in a collision, the servo drive detects overload and drastically reduces the impact on the machine by reversing the slide movement direction within less than 8 milliseconds.
In addition to minimizing damage of the first impact*, fears that the tool will move to the next program block and cause a second impact, are reduced to zero. This standard feature is available on the X, Z, Y, C and B-Axes.

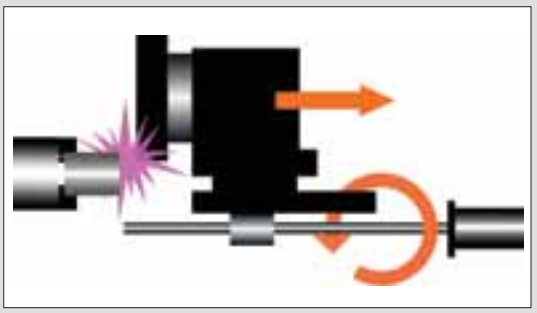

Without Overload Detection


With Overload Detection

NT Nurse

● All-in-one Software package!

NT-Nurse is software that provides the operator with user-friendly environment for operation, programming, and production on the machine. Among vital features are coordinate recognition (a must for multi-tasking), direct chucking to prevent positioning error during transfer, and perfect synchronization of the left and right hand spindles. Other features include the load monitor for detecting tool breakage and tool wear, tool life management, operation condition monitoring, in addition to many other features to simply programming, set up, operation, and production, all offered in one single package.


This feature does not mean zero impact.

Operator Full Support through Easy Operation and Reliability

FANUC 31i-A [TW-8]

Monochrome 7.2"LCD

DNC operation from memory card is available, which can be mounted internally or externally.

FANUC 18i-TB [TW-10 / TW-20 / TW-30]

Color 10.4"LCD

DNC operation from memory card is available, which can be mounted internally or externally.

TW-8

FANUC 31i-A	Display	Standard	Monochrome 7.2"LCD	Part program storage length	Standard	Total 320m		
		Luck-bei II (op.)	Color 10.4"LCD		Option	Total 640m	Total 1280m	
						Total 2560m	Total 5120m	
						Total 10240m	Total 20480m	
					Luck-bei II (op.)	Total 640m		

Number of registered programs	Standard	Total 250pcs	
	Option	Total 500pcs	Total 1000pcs
		Total 2000pcs	Total 4000pcs
Tool offset pairs	Standard	16pairs + 16pairs	
	Option	32pairs + 32pairs	99pairs + 99pairs

TW-10MM / TW-20 / TW-30

FANUC 18i-TB	Display	Standard	Color 10.4"LCD	Part program storage length	Standard	320m + 320m
					Option	640m + 640m
						1280m + 1280m

Number of registered programs	Standard	200pcs + 200pcs	
	Option	400pcs + 400pcs	1000pcs + 10000pcs
Tool offset pairs	Standard	99pairs + 99pairs	

Index Override

Turret speed can be adjusted with the feed override rotary switch from 0 to 100% during indexing in automatic or manual mode. This can be used during fully automatic operation to reduce turret speed or even bring it to a halt when necessary.

Jump Programming (G411)

For machines equipped with a gantry loader or a bar feeder, restarting operation after an interruption, is significantly improved. Even if the operator has to stop and reset the machine in the middle of automatic cycle, there is no need to remove all the parts from the chucks or gantry hands to restart operation. The part status displayed on the NT Nurse screen, is used to restart the program, which depending on part machining condition (raw, half-finished or finished part), jumps to the appropriate program block and re-starts from there. Thanks to this feature, programming of machines with a gantry loader has become drastically simplified, eliminating the need to divide each machining program into several sub-programs.

Arbitrary Axis Torque Limit (G359)

During cut off and part transfer from left to right, closing the right hand side chuck may cause overload on the right hand spindle servo axis (B2-Axis), resulting in a servo alarm. By controlling the B2-Axis motor torque in a range between 20 and 100%, this feature prevents the servo motor thrust force from exceeding a certain value, by slightly moving the B2-axis when it is subjected to a certain load, thus preventing cut-off tool insert breakage and overload servo alarms.

Deep Hole Rigid Tapping Cycle

Step feed rigid tapping cycle is useful for difficult-to-machine materials and deep holes. Regarding the tapping tool retract amount, it is possible to choose between two patterns.

	NT Nurse	NT Work Navigator	Overload Detection	Rigid tapping		Manual handle retrace	Luck-bei II
				Spindle	Milling		
TW-8	●	●	●	●	● Standard when milling function is equipped	● (op.)	Option
TW-10	●	●	●	●	● Standard when milling function is equipped	● (op.)	Standard
TW-20							
TW-30							

● These items are only part of 24 features. ● These screens are of FANUC 18i-TB for TW10,20,30.

NT Nurse with its user-friendly features. A machine management feature that contributes to drastic reduction of set-up time !!

NT-Nurse provides a user-friendly environment to achieve the best production results. Among NT Nurse features are the Load monitor for monitoring tool breakage and tool wear, the Soft Work Pusher for accurate parts transfer, as well as several other features to prevent errors and facilitate production.

Menu Display

Operation Condition Display

Tool Life (spare tool call-up)

Tool Counter

Offset History

Load Monitor

Power-Saving Setting

Quick Offset Input

General Pata Input / Output Function

NT Manual Guide i

NT Manual guide i is optionally available for TW-8.

A programming system with the ability of generating NC programs (ISO/EIA G-code programs) easily. Among its features are: Machining cycle creation (conversational function) for easy programming, NC Programming Support, which enables once-programmed machining processes to be cut, copied, pasted and moved, as well as NC program simulation using tool path or solid models.

Simulation

Turning/milling operation can be simulated using 3D solid model.

Fixed Form Function

Abundant fixed forms with over 300 patterns are standard. Fixed forms can be easily selected from a menu.

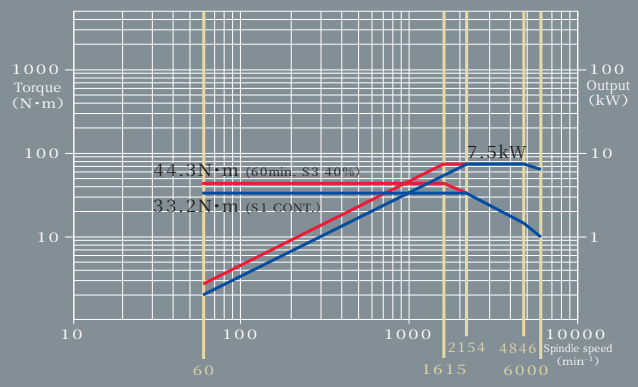
Process Editing

A function that automatically recognizes and extracts the name and order of all machining processes, then display them in table layout. Machining processes can be moved, copied or swapped easily.

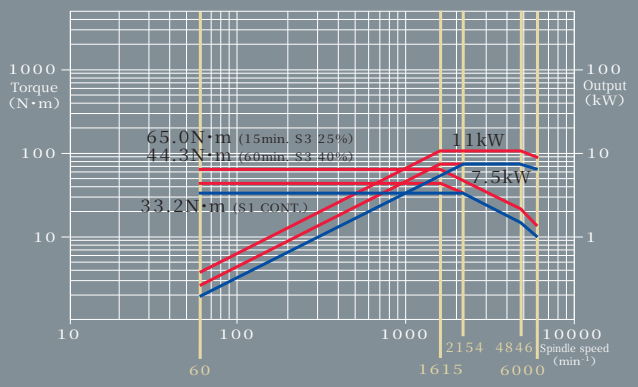
TW-8

S² Twin-Spindle [7.5kw + 7.5kw] M² Double Milling Motor [2.5kw + 2.5kw]

■ L, R Spindle motor [7.5kW]



■ L, R Spindle motor [11/7.5kW] (op.)

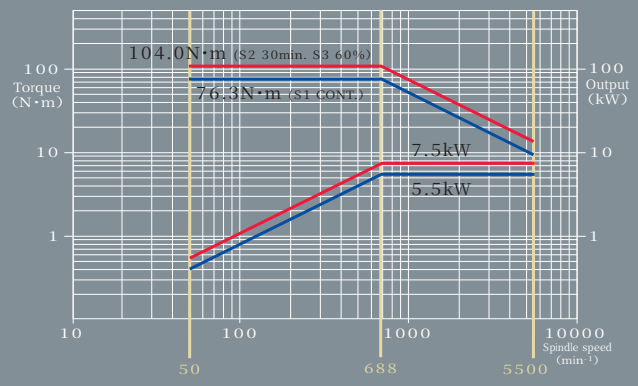


TW-10MM

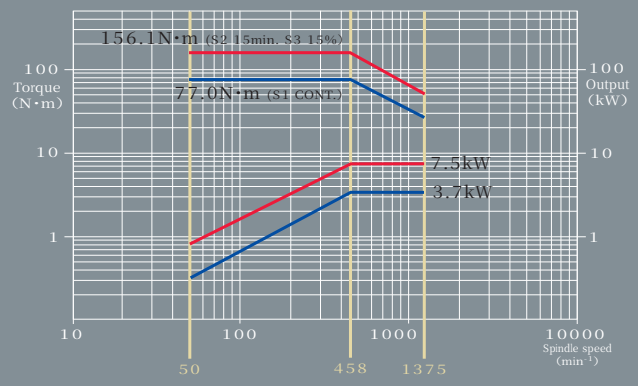
S² Twin-Spindle [11 / 7.5kw x 2] M² Double Milling Motor [3.7 / 2.2kw x 2]

Φ42 L, R Spindle motor [7.5/5.5kW]

●Higher speed



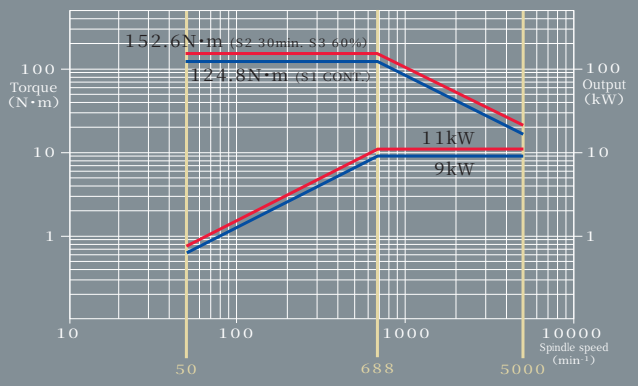
●Lower speed



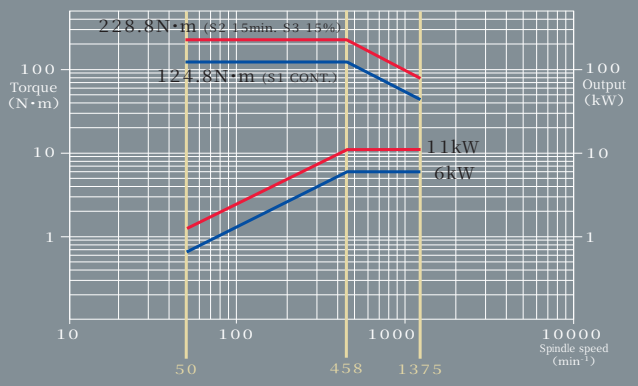
Φ42 L Spindle motor [11/9kW] (op.)

Available only for left spindle

●Higher speed

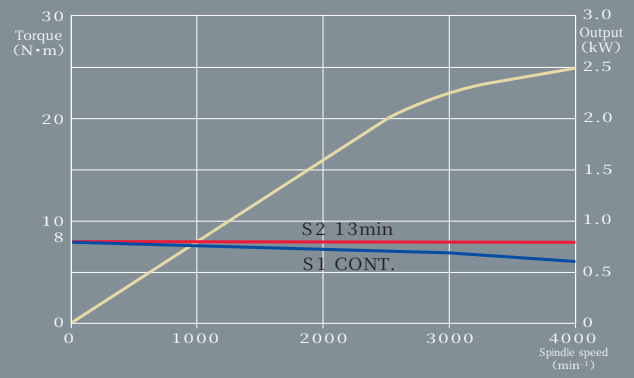


●Lower speed



Combining Turning and Milling Capabilities.

■ Milling motor [2.5kW]

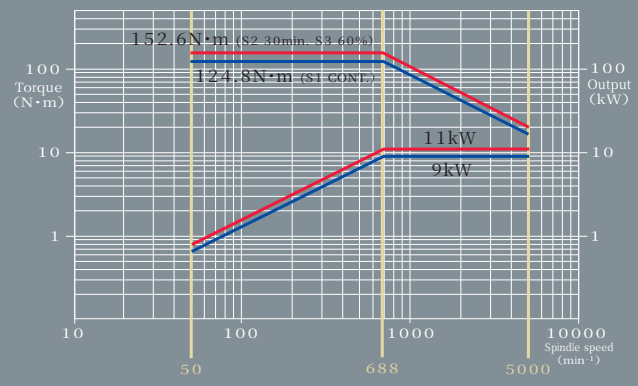


Combining Turning and Milling Capabilities.

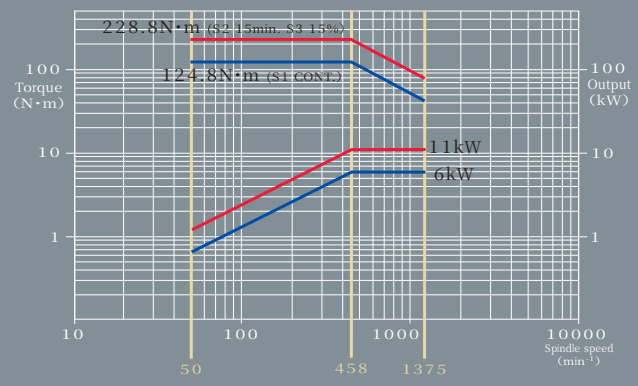
Φ51 L Spindle motor [11/9kW] (op.)

Available only for left spindle

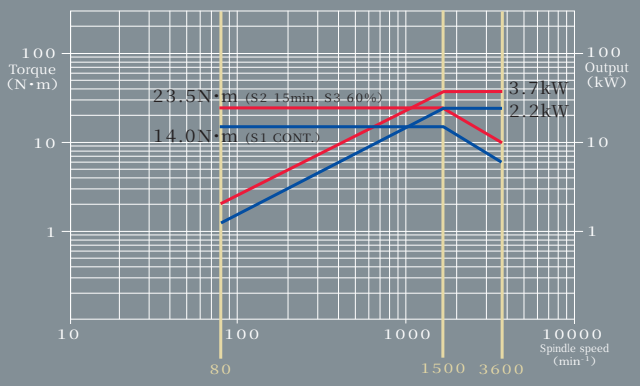
●Higher speed



●Lower speed



■ Milling motor [3.7/2.2kW]

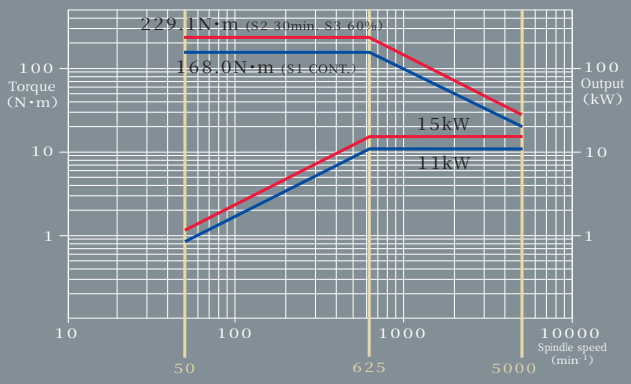


TW-20

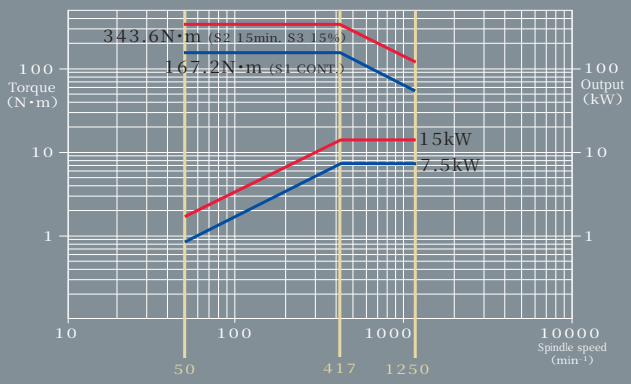
S² Twin-Spindle [15 / 11kw x 2] M² Double Milling Motor [3.7 / 2.2kw x 2]

Φ51 L, R Spindle motor [15/11kW]

●Higher speed

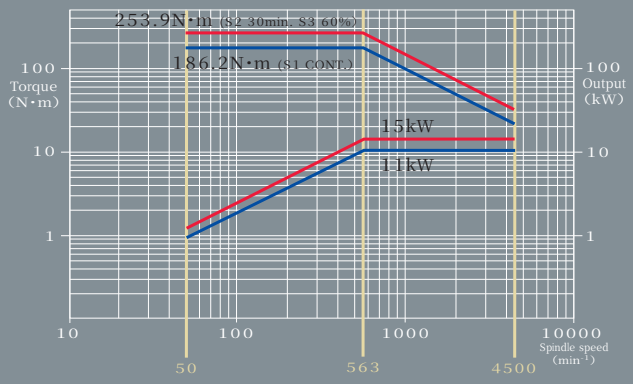


●Lower speed

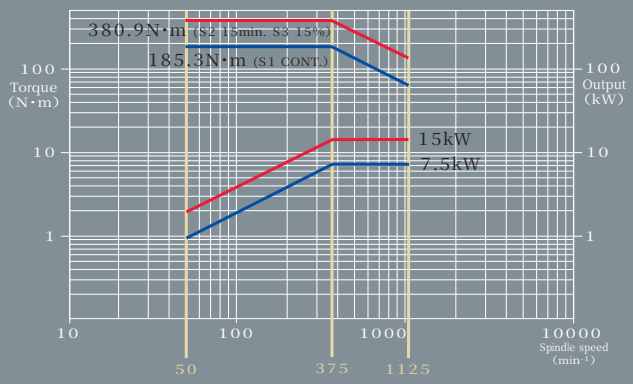


Φ65 L Spindle motor [15/11kW]

●Higher speed



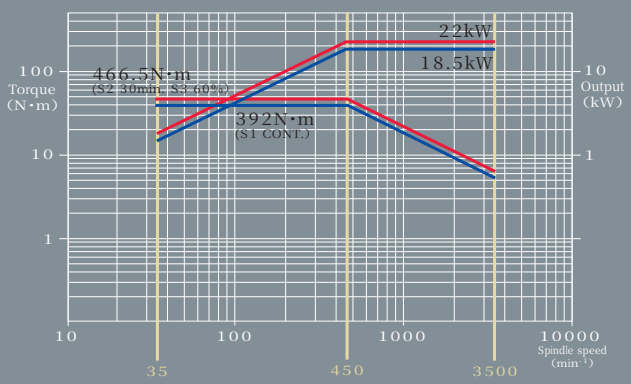
●Lower speed



TW-30

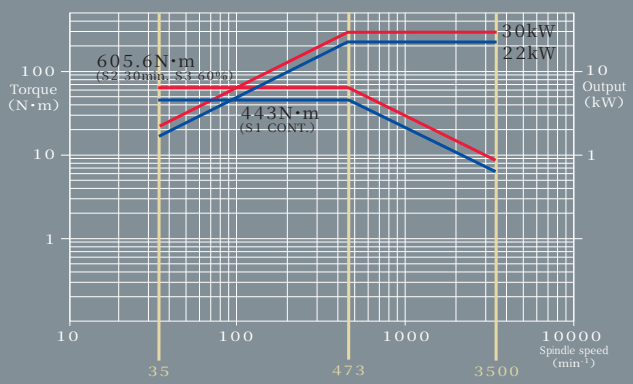
S² Twin-Spindle [11 / 7.5kw x 2] M² Double Milling Motor [3.7 / 2.2kw x 2]

Φ71 L, R Spindle motor [22/18.5kW]



Φ71 L Spindle motor [30/22kW] (op.)

Available only for right spindle

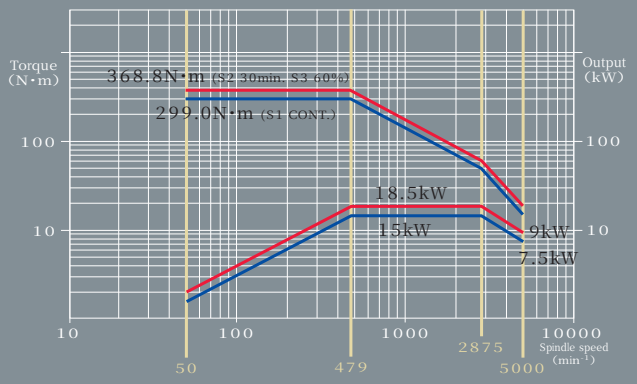


Combining Turning and Milling Capabilities.

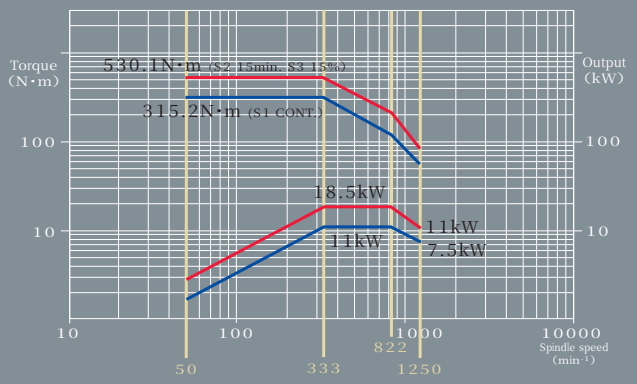
Φ51 L Spindle motor [18.5/15kW] (op.)

Available only for left spindle

●Higher speed



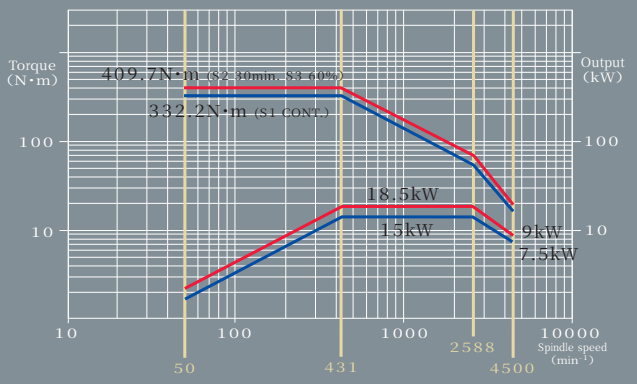
●Lower speed



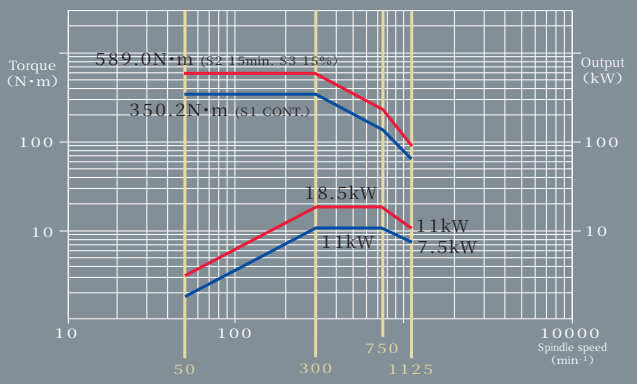
Φ65 L Spindle motor [18.5/15kW] (op.)

Available only for left spindle

●Higher speed

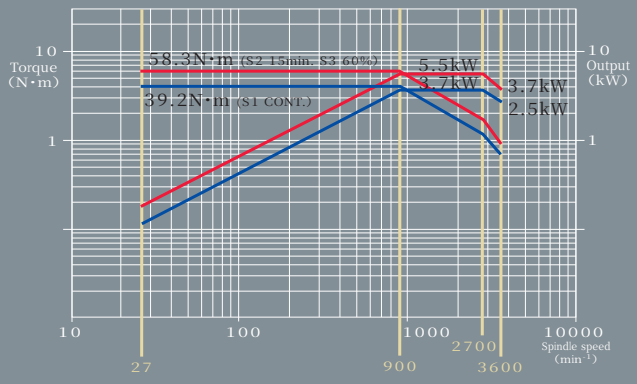


●Lower speed

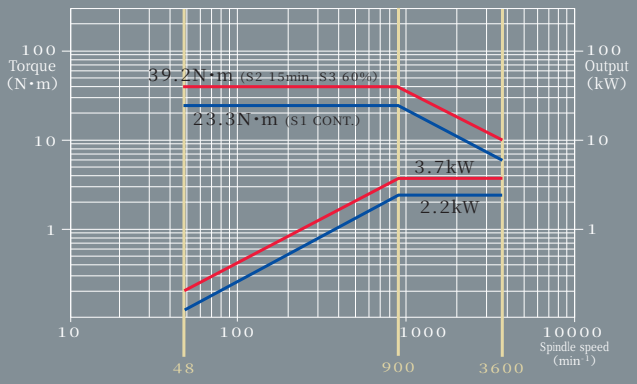


Combining Turning and Milling Capabilities.

■ Milling motor [3.7/2.2kW]



■ Milling motor [3.7/2.2kW]

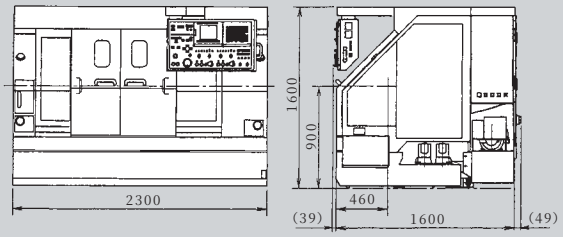


Machine Dimensions

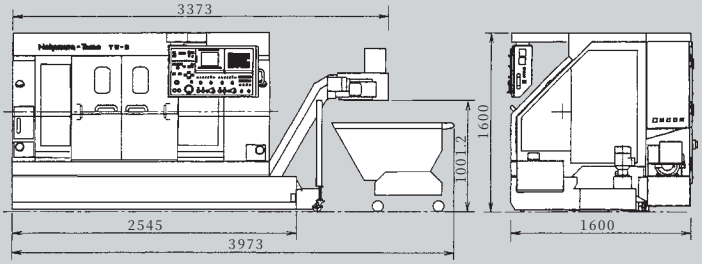
TW-8

unit : mm

■ **Standard**



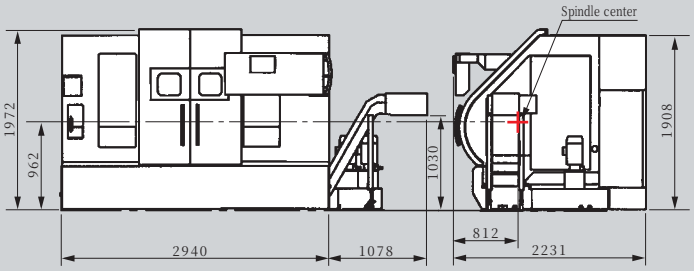
■ **Chip conveyor right side outlet type**



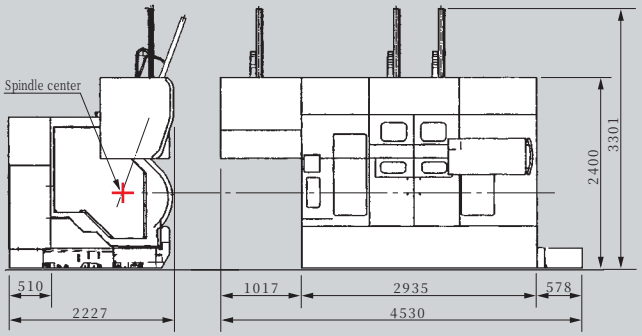
TW-10MM

unit : mm

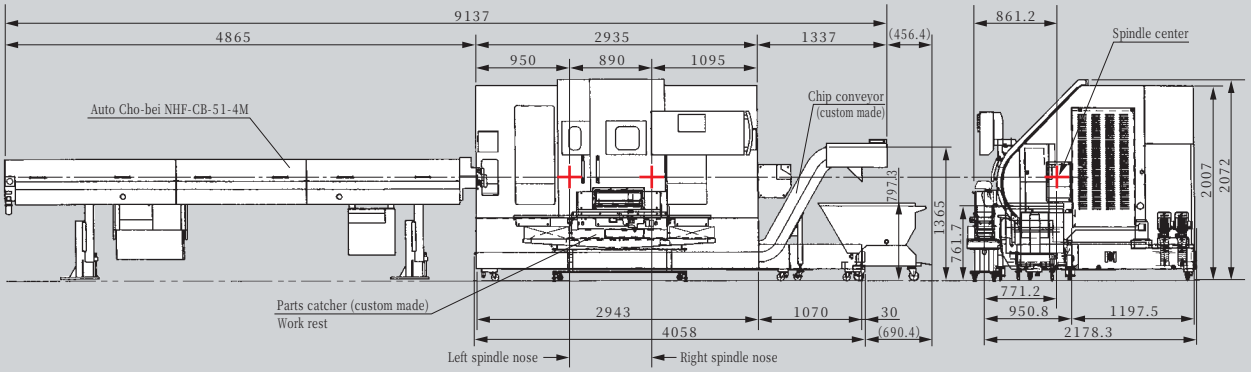
■ **Standard**



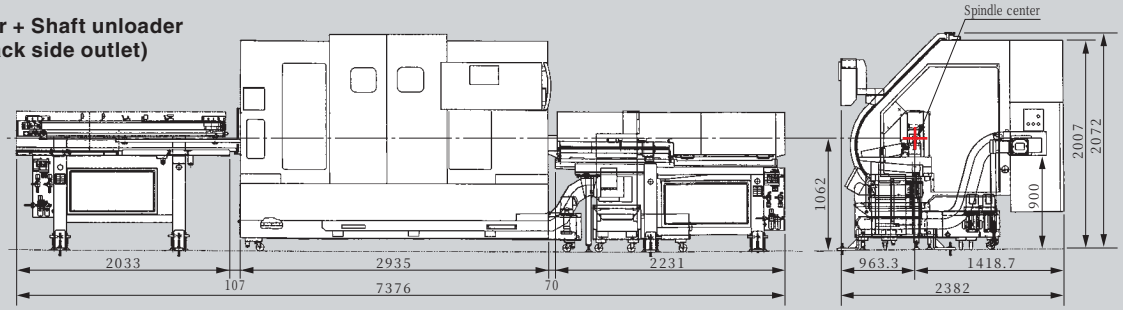
■ **TW-10MM + GR-203**



■ **TW-10MM + Bar feeder [Auto Cho-bei]**



■ **TW-10MM + Shaft loader + Shaft unloader (Chip conveyor right-back side outlet)**



The dimension is subject to change depending on the specifications.

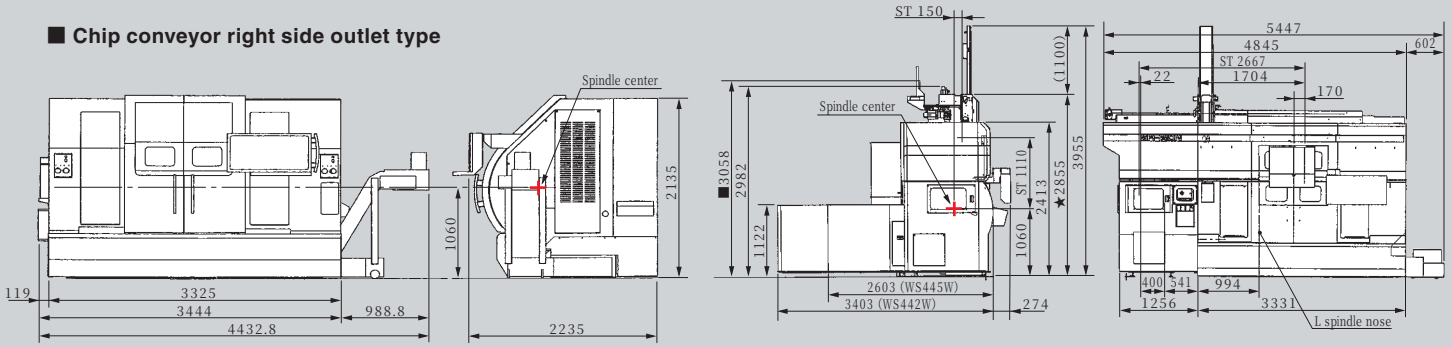
TW-20

unit : mm

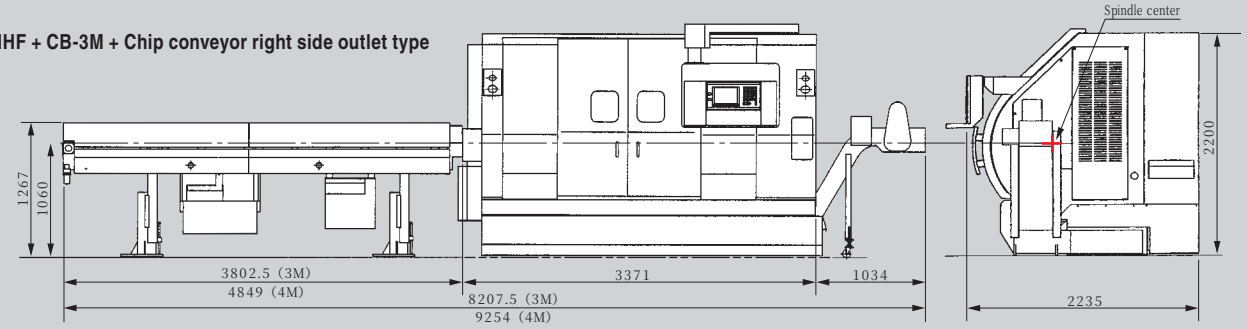
■ TW-20 + GR210N + WS442W/445W (CE)

★ 2855 is the hight when the gantry arm is descended to spindle center. The highest point is ■ 3058 (stroke joint box)

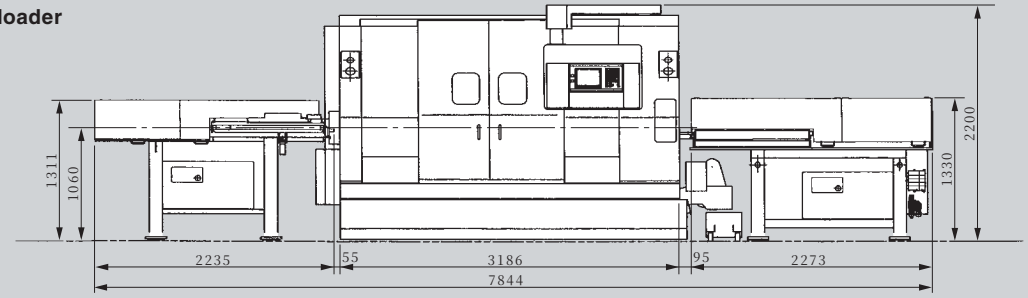
■ Chip conveyor right side outlet type



■ TW-20MMYY + NHF + CB-3M + Chip conveyor right side outlet type



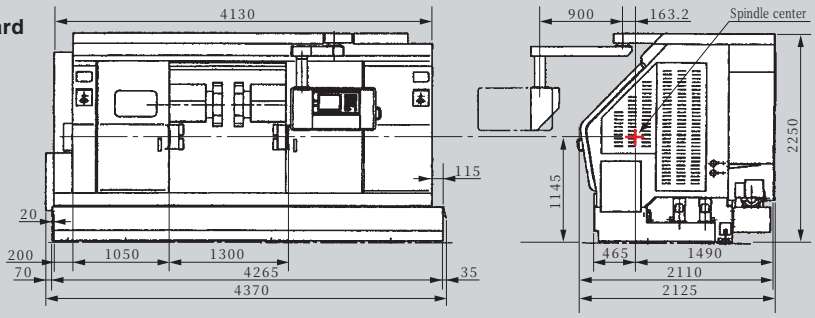
■ TW-10MM + Shaft loader + Shaft unloader



TW-30

unit : mm

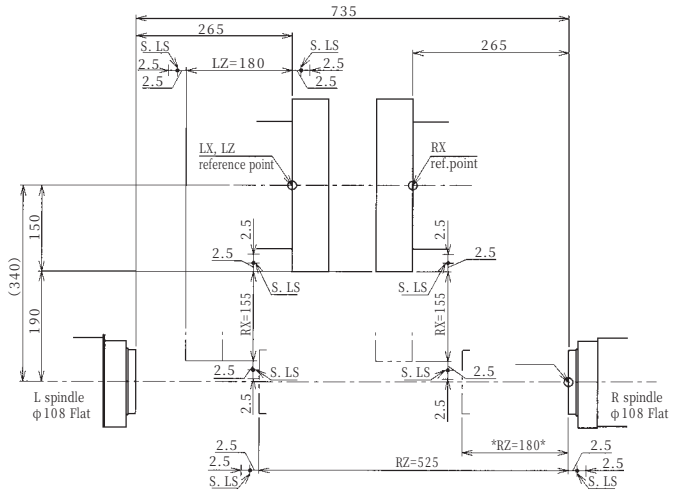
■ Standard



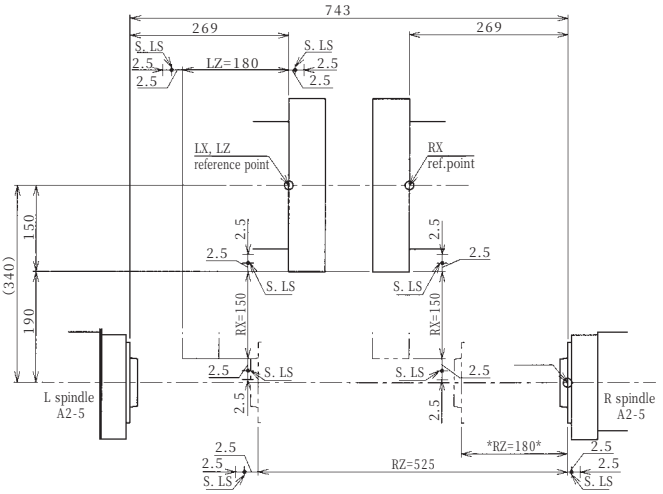
The dimension is subject to change depending on the specifications.

TW-8

■ **Bar capacity 34mm / dia.108mm flat**

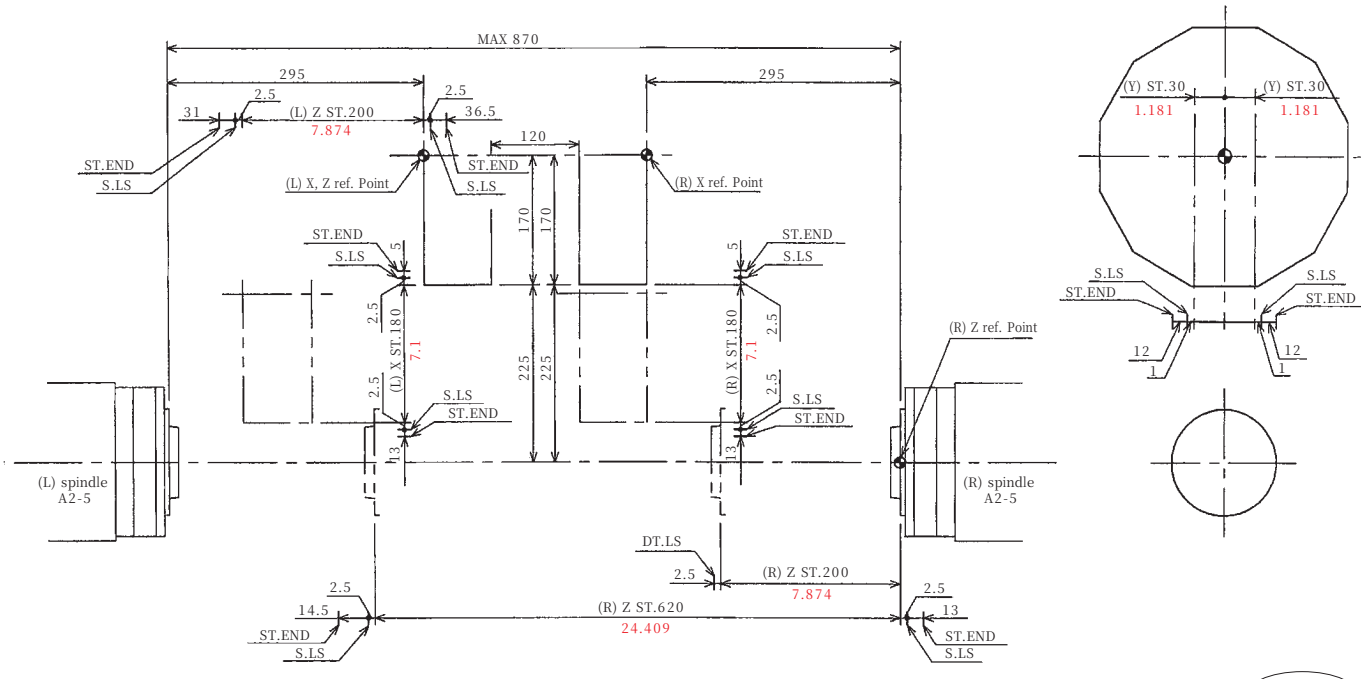


■ **Bar capacity dia.42mm / A2-5 (Option)**



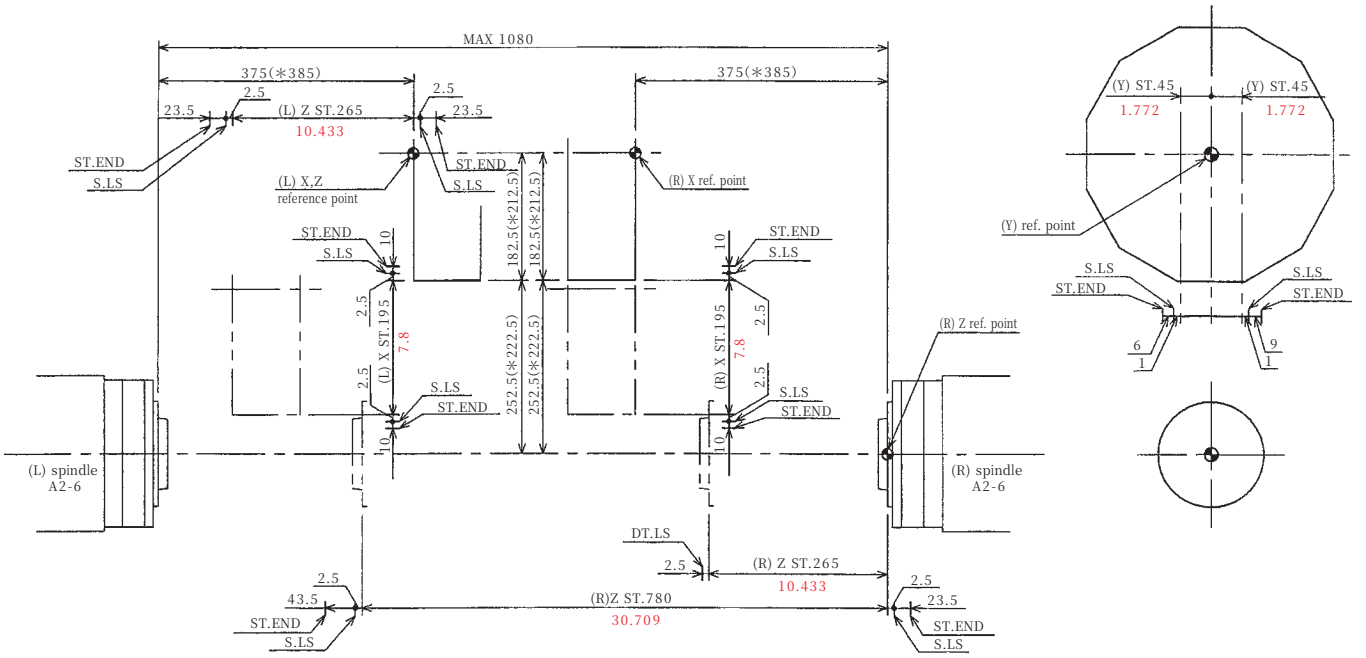
unit : mm

TW-10MM



unit mm / inch

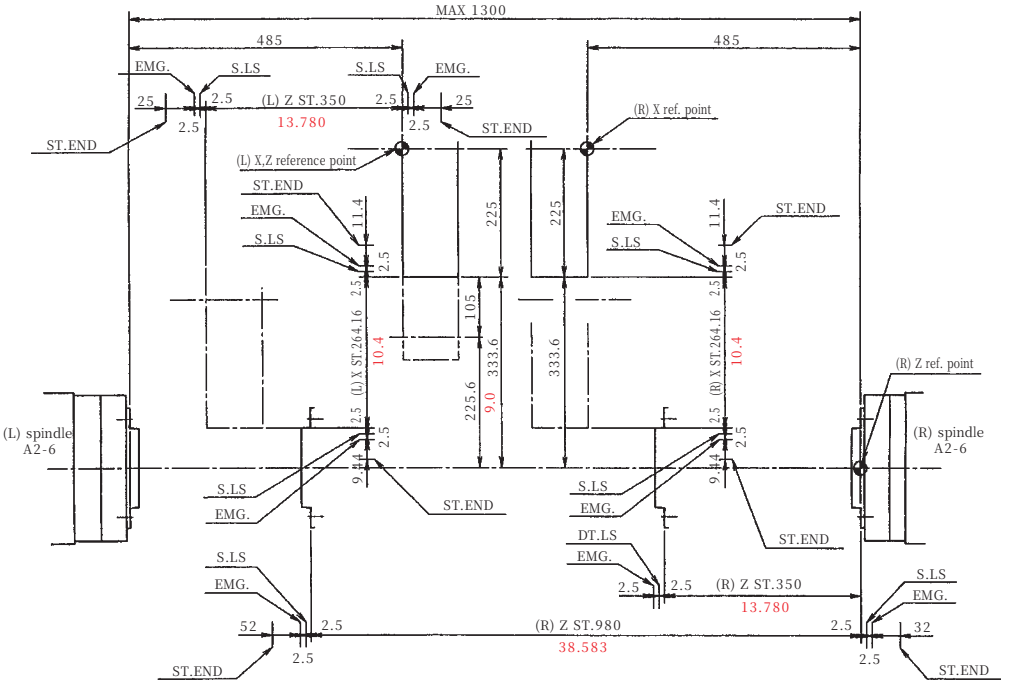
TW-20



∗ when 16st turrets are equipped.

unit mm / inch

TW-30

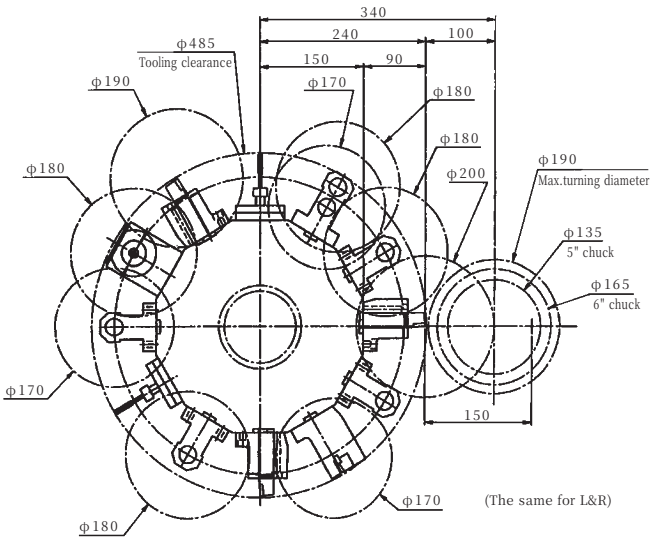


unit mm / inch

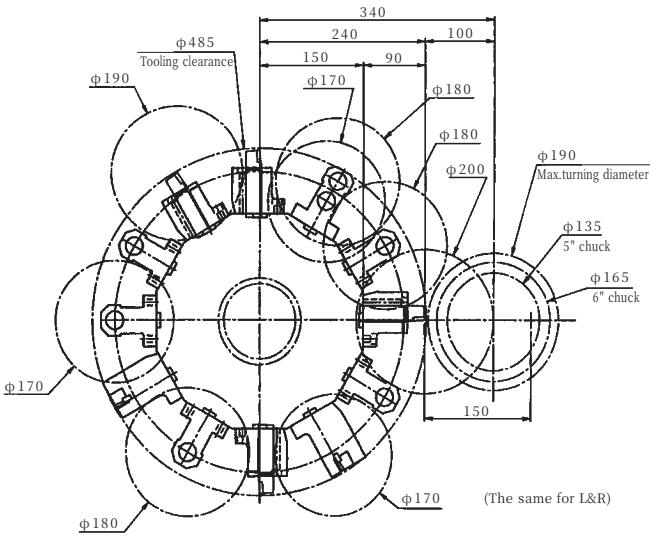
Tool Interference

TW-8

■ Milling



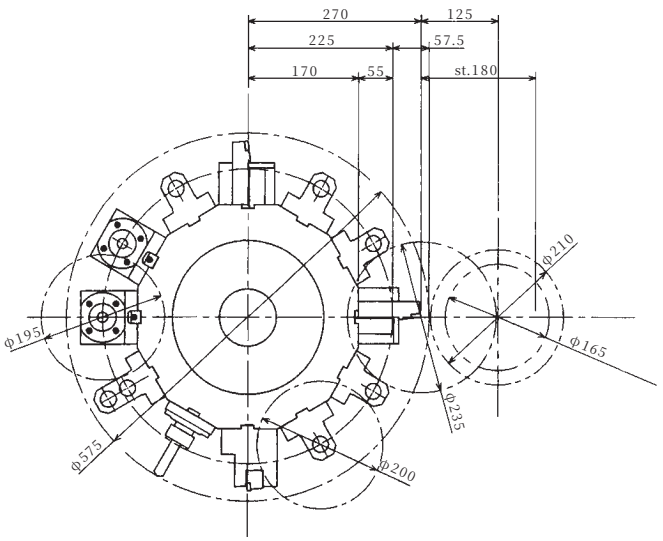
■ Turning



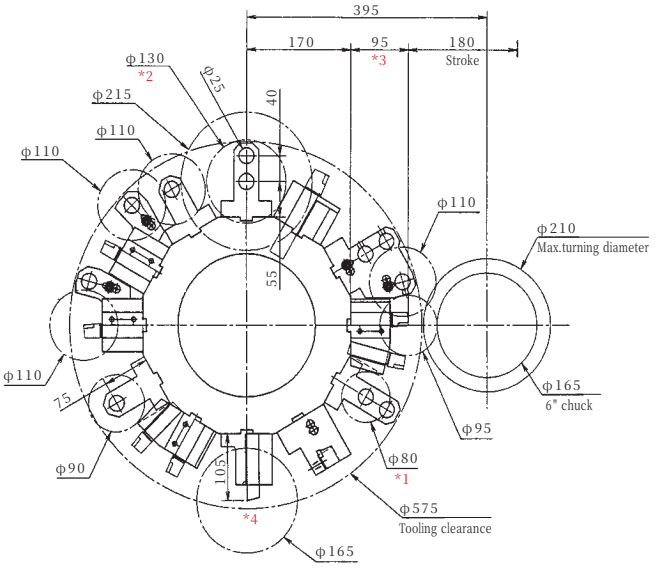
unit : mm

TW-10MM

■ Milling



■ 24 st. turret



*1) Max. turning diameter will be 80mm within 33mm from the turret face due to interference between double boring holder and double turning holder.

*2) Max. turning diameter will be 130mm within 20mm from the turret face due to interference between double boring holder and turning holder. (A)

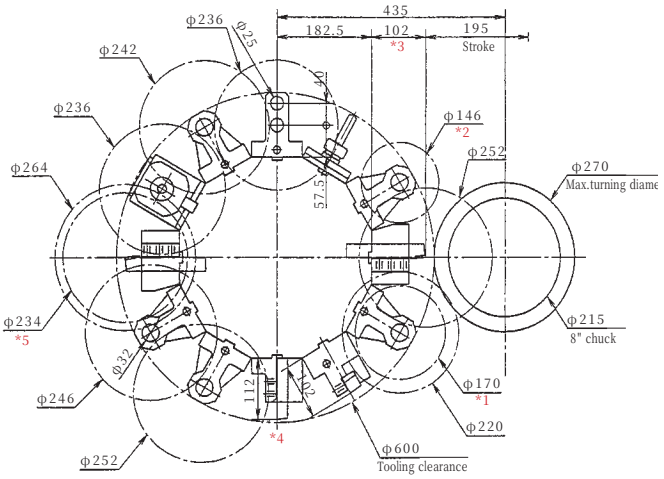
*3) OD turning tool length shall be less than 95mm.

*4) Cut-off tool length shall be less than 105mm.

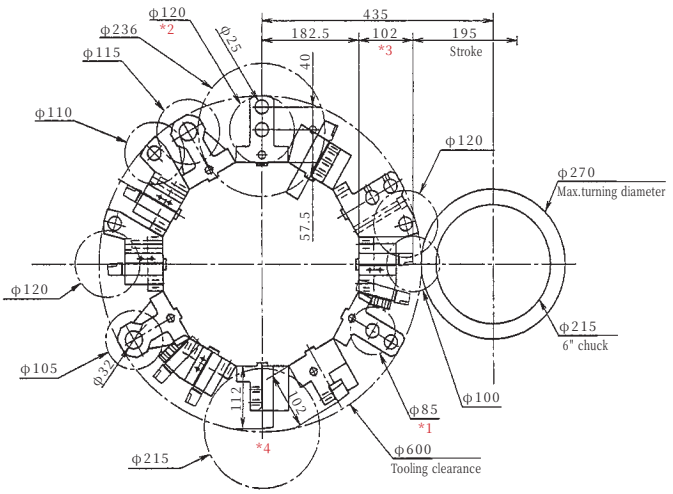
unit : mm

TW-20

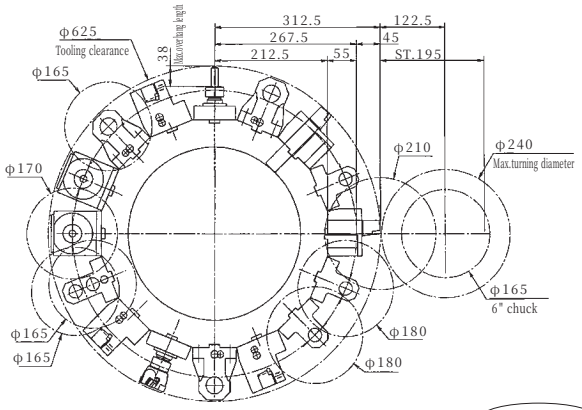
■ Milling



■ 24 st. turret



■ 16 st. turret



unit : mm

[Milling]

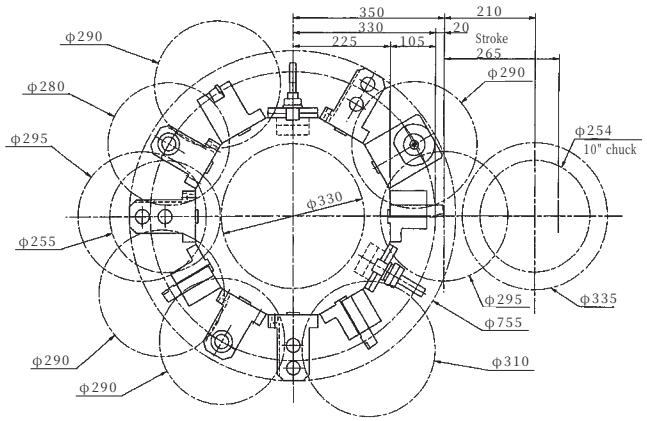
*1) Max. turning diameter will be 170mm within 26mm from the turret face due to interference between double boring holder and turning holder. (A)
Max. turning diameter will be 170mm within 15mm from the turret face due to interference between double boring holder and turning holder. (B)
*2) Max. turning diameter will be 146mm within 26mm from the turret face due to interference between double boring holder and turning holder.(A)
*3) OD turning tool length shall be less than 102mm.
*4) Cut-off tool length shall be less than 105mm.
*5) Max. turning diameter will be 234mm within 70mm from the turret face due to interference between double boring holder and Straight holder.

[24 st. turret]

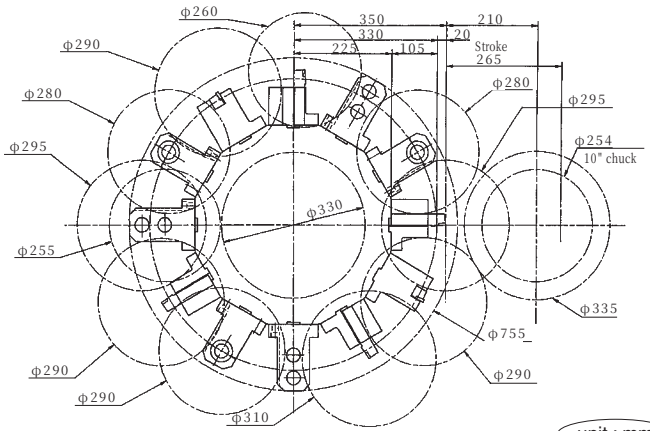
*1) Max. turning diameter will be 85mm within 33mm from the turret face due to interference between double boring holder and double turning holder.
*2) Max. turning diameter will be 120mm within 26mm from the turret face due to interference between double boring holder and turning holder.(A)
*3) OD turning tool length shall be less than 102mm.
*4) Cut-off tool length shall be less than 112mm.

TW-30

■ Milling



■ Turning

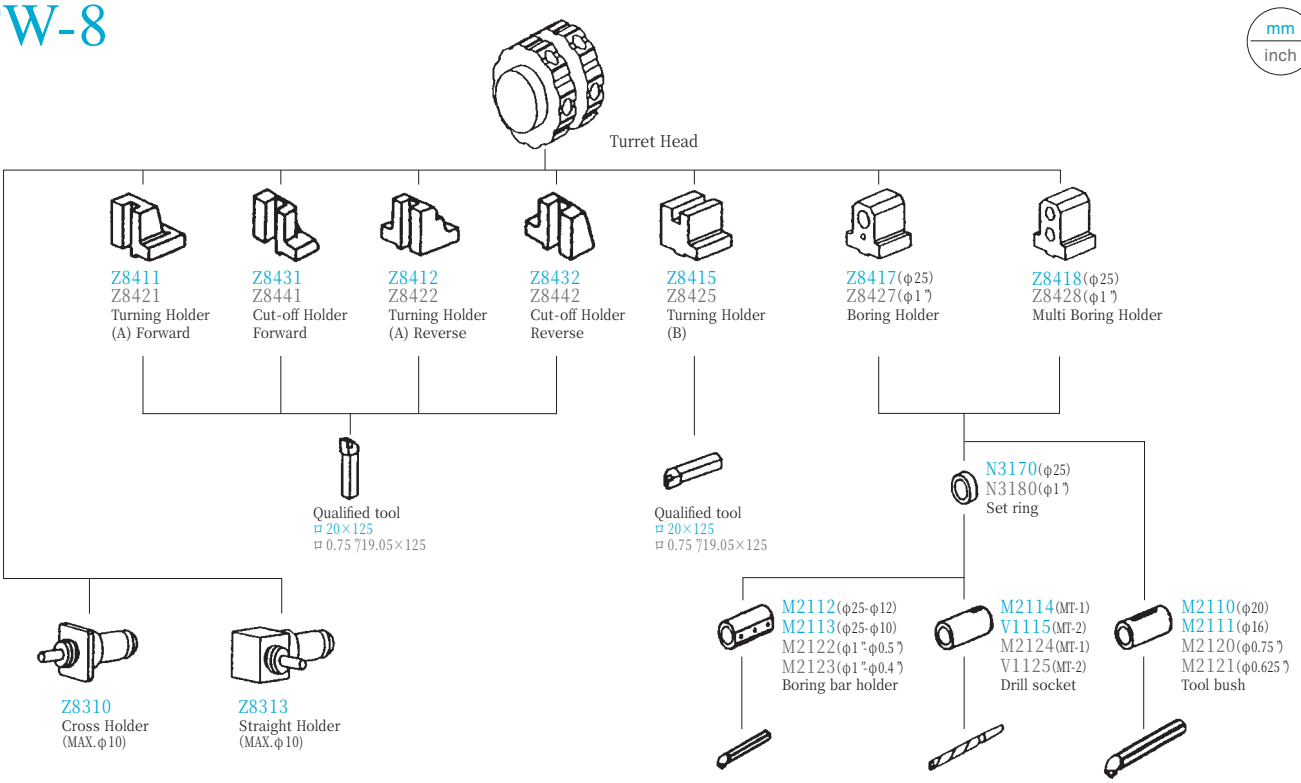


unit : mm

Tooling System Diagram

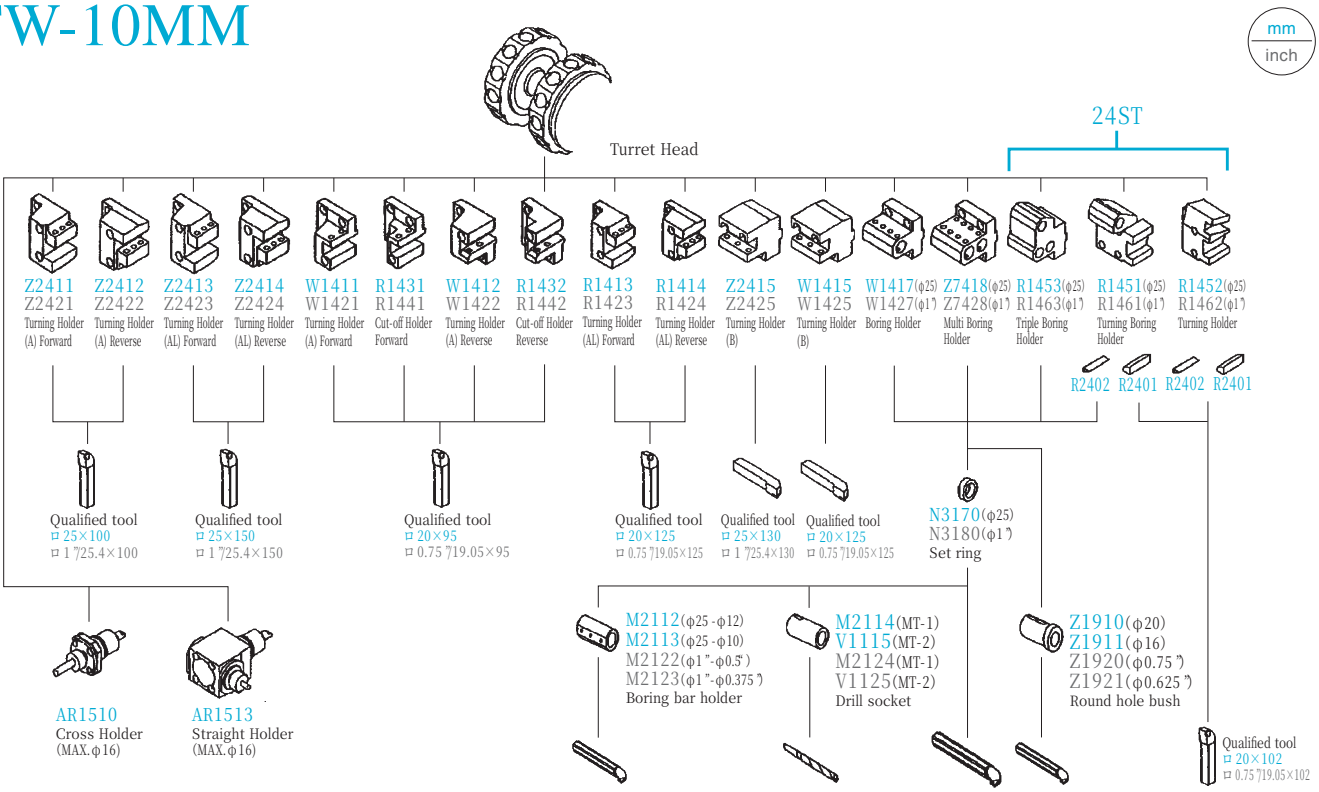
TW-8

mm / inch



TW-10MM

mm / inch

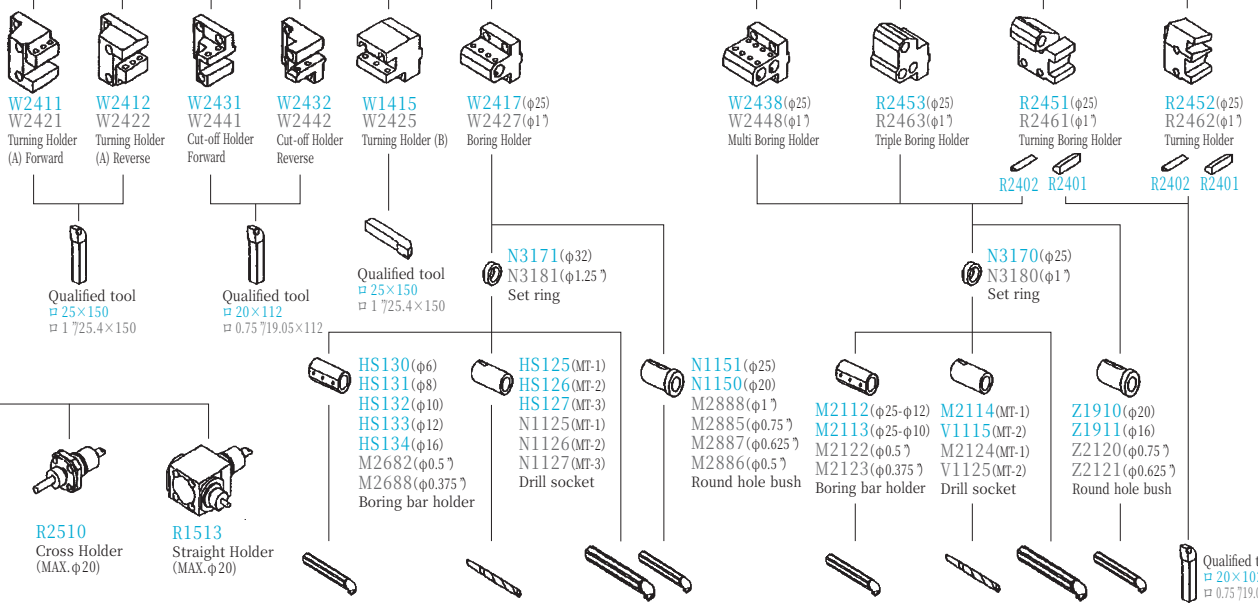


TW-20

mm / inch

Turret Head

24ST

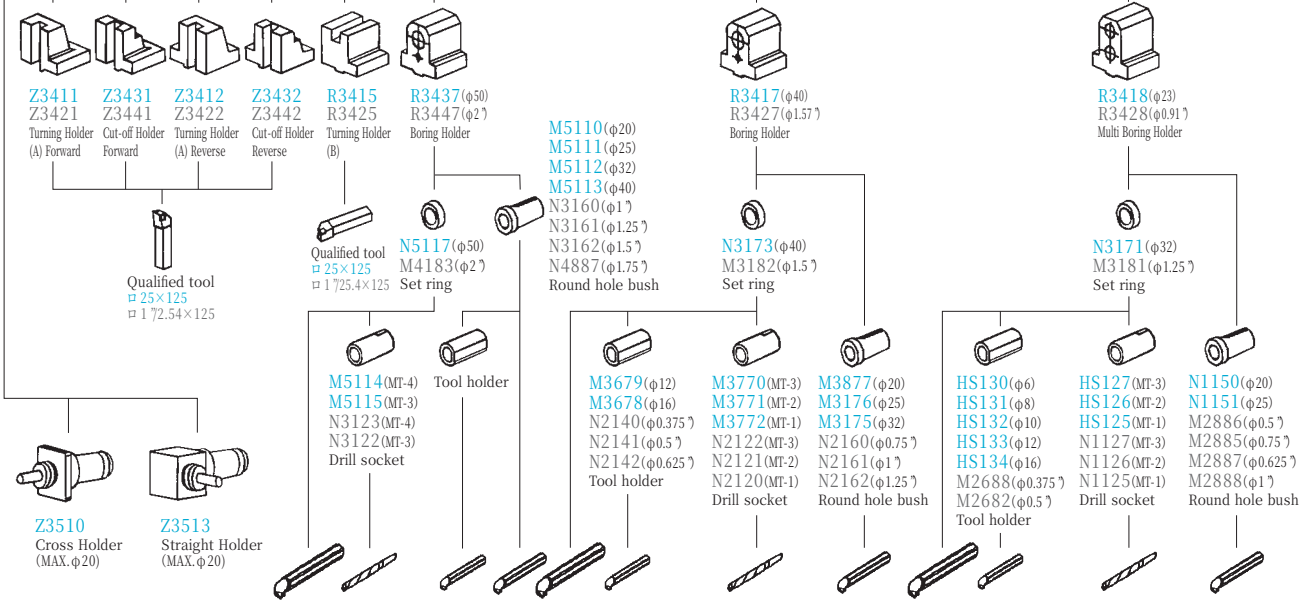


For TW-20 equipped with 16-stations turret, toolings of TW-10 shall be used, except that of 24 station tools.

TW-30

mm / inch

Turret Head



TW-8 Machine Specification / Control Specification

Machine Specification

■ Capacity

Max. turning diameter	φ190mm
Std. turning diameter	φ170mm
Max. turning length	115mm 100mm (op.)
Distance between spindles	max.735mm / min.210mm max.743mm / min.218mm (op.)
Bar capacity	26mm 34mm (op.) 42mm (op.)
Chuck size	165mm (6 ")

■ Axis travel

Slide travel (LX / RX)	150mm
Slide travel (LZ / RZ)	180mm / 525mm
Slide travel (LY / RY) (op.)	not available
Rapid feed (LX / RX)	12m/min
Rapid feed (LZ / RZ)	36m/min

■ Left and Right spindles

Spindle speed	6000min^{-1}
Spindle speed range	Stepless
Spindle nose	φ108FLAT A2-5 (op.)
Hole through spindle	47mm 52mm (op.)
I.D. of front bearing	70mm 80mm (op.)
Hole through draw tube	27mm 35mm 43mm (op.)

■ C-axis

Least input increment	0.001 °
Least command increment	0.001 °
Rapid index speed	600min^{-1}
Cutting feed rate	1- 4800 °/min
C-axis clamp	knock clamp
C-axis engage time	1.5 sec.

■ Left and Right turret

Type of turret head	Dodecagonal drum turret ×2
Number of tool stations	12 × 2
Number of indexing positions	12 × 2
Tool size (square shank)	□20mm
Tool size (round shank)	φ25mm
Max. tool swing	485mm

■ Driven tools

Rotary system	Simultaneous rotation
Spindle speed	4000min^{-1}
Spindle speed range	Stepless
Number of driven-tool stations	6 × 2
Tool shank	Straight holder φ2mm - 10mm Cross holder φ2mm - 10mm

■ Drive motor and torque

Left spindle	7.5kW 44.3/33.2N・m
Right spindle	7.5kW 44.3/33.2N・m
Driven tool spindle	2.5kW

■ General

Machine height	1600mm
Floor space	2300mm ×1600mm
Machine weight	4810kg

■ Power source

Power supply	54kVA
Air supply	150 - 200NL/min, 0.5 - 0.7MPa

- Safety devices such as various interlock, fences for robotics, auto loading device, work stocker, automatic fire extinguisher etc. are available as options which can be included in your purchase package. Please contact our local distributor and dealer for your specific requirements.

- **Precautions about the use of cutting coolant**
  Synthetic Coolants are Damaging to Machine Components
  Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used.
  Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper.
  To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided.
  Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.

Control Specification

■ Items

Control Type	FANUC 31i-A 2-PATH

■ Controlled axes

Controlled axes	4axes
Simultaneously controlled axes	2axes + 2axse

■ Input command

Lease input increment	0.001mm / 0.0001inch (diameter for X-axis), 0.001degree
Lease command increment	X : 0.0005mm, Z : 0.001mm, C : 0.001degree
Max. programable dimension	±999999.999mm / ±39370.0787inch, ±999999.999 °
Absolute / Incremental programming	X, Z, C, / U, W, H
Decimal input	Standard
Program code	EIA / ISO automatic recognition
Inch / Metric conversion	G20 / G21
Programable data input	G10

■ Feed function

Cutting feed	feed/min. X : 1 - 4800mm/min, 0.01 - 188inch/min Z : 1 - 4800mm/min, 0.01 - 188inch/min C : 1 - 4800degree/min (with C-axis) feed/rev. 0.0001 - 4800.0000mm/rev 0.000001 - 50.000000in/rev
Dwel	G04
Feed per minute / Feed per revolution	G98 / G99
Thread cutting	G32 + F
Thread cutting retract	Standard
Continuous thread cutting	Standard
Variable lead threading	G34
Handle feed	Manual pulse generator 0.001/0.01/0.1mm (per pulse)
Automatic acceleration/decelaration	Standard
Linear accel. / decel. After cutting feed interpolation	op.
Rapid override	F0 / 25 / 100% (changeable to every 10% by switch)
Cutting feed override	0 - 150% (each 10%)

■ Tool offset

Tool offset	T code (Last 2 digits : Tool geometly and wear offset)
Tool nose R compensation	G41, G42 / G40
Tool offset pairs	16 + 16

■ Program memory

Part program storage langth	320m
Part program editing	delete, incert, change
Program number search	Standard
Sequence number search	Standard
Address search	Standard
number of registerable programs	250 programs
Program storage memory	Back up by battery
Multiple program simultaneous editing	Standard (Multiple program simultaneous editing is not available during Gantry loader auto operation)
DNC operation through memory card	Standard (not including memory card)
Extended part program editing	Standard

■ Operation and display

Operation panel : Display	7.2" monochrome LCD (10.4" color LCD for Luck-bei II op.)
Operation panel : Keyboard	Separate type MDI unit

■ Program support

Circular interpolation R programming	Standard
Direct drawing dimension programming or Chamfering and Corner R	Standard (Direct drawing dimension programming is standard)
Cannd cycle	G90, G92, G94
Multiple repeatitive canned cycle	G70 - G76
Multiple repeatitive canned cycle II	Standard
Cannd cycle for drilling	G80 - G89
Sub program	Standard
Custom macro	Standard
Work cordinate system	G52 - G59
Luck-Bei II (NT Manual Guide i)	op.
Over load detection	Standard
NT work navigator (torque type)	Standard (not including contact bar)
NT NURSE	Standard
Help function	Standard

■ Machining support

Rigid tapping	Standard
Spindle synchronization	Standard

TW-10 Machine Specification / Control Specification

Machine Specification

■ Capacity

Max. turning diameter	210mm
Std. turning diameter	205mm
Max. turning length	155mm
Distance between spindles	max.870mm / min.250mm
Bar capacity	42mm (op.L / 51mm)
Chuck size	165mm (6 ")

■ Axis travel

Slide travel (LX / RX)	180mm / 180mm
Slide travel (LZ / RZ)	200mm / 620mm
Slide travel (LY / RY) (op.)	±30mm
Rapid feed (LX / RX)	16m/min
Rapid feed (LZ / RZ)	40m/min
Rapid feed (LY / RY) (op.)	6m/min

■ Left and Right spindles

Spindle speed	5500min^{-1}
Spindle speed range	Stepless
Spindle nose	A2-5
Hole through spindle	52mm
I.D. of front bearing	80mm
Hole through draw tube	φ43mm

■ C-axis

Least input increment	0.001 °
Least command increment	0.001 °
Rapid index speed	600min^{-1}
Cutting feed rate	1 - 4800 °/min
C-axis clamp	Disk clamp
C-axis engage time	1.5sec.

■ Left and Right turret

Type of turret head	Dodecagonal drum turret × 2
Number of tool stations	24 × 2
Number of indexing positions	24 × 2
Tool size (square shank)	□25mm
Tool size (round shank)	φ32mm
Max. tool swing	575mm

■ Driven tools

Rotary system	Indivisual rotation
Spindle speed	3600min^{-1}
Spindle speed range	Stepless
Number of driven-tool stations	12 × 2
Tool shank	Straight holder φ1mm - φ16mm Cross holder φ1mm - φ16mm

■ Drive motor and torque

Left spindle	7.5/5.5kW 156.1/76.3N·m
Right spindle	7.5/5.5kW 156.1/76.3N·m
Driven tool spindle	3.7/2.2kW 23.5/14N·m

■ General

Machine height	1972mm
Floor space	2940mm × 2249mm
Machine weight	6150kg

■ Power source

Power supply	65.0kVA
Air supply	300 - 400NL/min, 0.5 - 0.7MPa

● Safety devices such as various interlock, fences for robotics, auto loading device, work stocker, automatic fire extinguisher etc. are available as options which can be included in your purchase package. Please contact our local distributor and dealer for your specific requirements.

● **Precautions about the use of cutting coolant**

Synthetic Coolants are Damaging to Machine Components
Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used.
Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper.
To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided.
Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.

Control Specification

■ Items

Control Type	FANUC 18i-TB 2-PATH		
■ Controlled axes	TW-10MM	TW-10ML, MR	TW-10
Controlled axes	6axes	5axes	4axes
Simultaneously controlled axes	3axes + 3axse	ML : 3axes + 2axse, MR : 2axes + 3axse	2axes + 2axse

■ Input command

Lease input increment	0.001mm / 0.0001inch (diameter for X-axis), 0.001degree
Lease command increment	X : 0.0005mm, Z : 0.001mm, Y : 0.001mm, C : 0.001degree
Max. programable dimension	±99999.999mm / ±9999.9999inch
Absolute / Incremental programming	X, Z / U, W,
Decimal input	Standard
Program code	EIA / ISO automatic recognition
Inch / Metric conversion	G20 / G21
Programable data input	G10

■ Feed function

Cutting feed	feed/min. 1 - 4800mm/min,0.01 - 188inch/min feed/rev. 0.0001- 500.0000mm/rev 0.000001 - 9.999999inch/rev
Dwel	G04
Feed per minute / Feed per revolution	G98 / G99
Thread cutting	G32 + F
Thread cutting retract	Standard
Continuous thread cutting	Standard
Variable lead threading	G34
Handle feed	Manual pulse generator 0.001/0.01/0.1mm (per pulse)
Automatic acceleration/decelaration	Standard
Linear accel. / decel. After cutting feed interpolation	Standard
Rapid override	F0 / 25 / 100%
Cutting feed override	0 - 150%

■ Tool offset

Tool offset	T code (Last 2 digits : Tool geometly and wear offset)
Tool nose R compensation	G41, G42 / G40
Tool offset pairs	99 + 99

■ Program memory

Part program storage langth	320m + 320m
Part program editing	delete, incert, change
Program number search	Standard
Sequence number search	Standard
Address search	Standard
number of registerable programs	200 + 200
Program storage memory	Back up by battery
Multiple program simultaneous editing	Standard (Multiple program simultaneous editing is not available during Gantry loader auto operation)
DNC operation through memory card	Standard (not including memory card)
Extended part program editing	Standard

■ Operation and display

Operation panel : Display	10.4" color LCD
Operation panel : Keyboard	Separate type MDI unit

■ Program support

Circular interpolation R programming	Standard
Direct drawing dimension programming or Chamfering and Corner R	Standard (Direct drawing dimension programming is standard)
Cannd cycle	G90, G92, G94
Multiple repeatitive canned cycle	G70 - G76
Multiple repeatitive canned cycle II	Standard
Cannd cycle for drilling	G80 - G89
Sub program	Standard
Custom macro B	Standard
Background editing	Standard (This function is not available during Gantry loader auto operation)
Work cordinate system	G52, G53, G54 - G59
Extended part program editing	Standard
Program copy	Standard
Luck-Bei II (NT Manual Guide i)	Standard
Over load detection	Standard (Z axis)
NT work navigator (torque type)	Standard (not including contact bar)
NT NURSE	Standard
Help function	Standard

■ Machining support

Rigid tapping	Standard
Spindle synchronization	Standard
Spindle orientation	Standard (360 °unit : 0.088 °)

TW-20 Machine Specification / Control Specification

Machine Specification

■ Capacity	Dodecagonal drum turret	16-stations turret (op.)
Max. turning diameter	270mm	240mm
Std. turning diameter	215mm	165mm
Max. turning length	192mm	213mm
Distance between spindles	max.1080mm / min.300mm	
Bar capacity	51mm (op. 65mm)	
Chuck size	195mm (8 ")	165mm (6 ")
■ Axis travel		
Slide travel (LX / RX)	195mm / 195mm	
Slide travel (LZ / RZ)	265mm / 780mm	
Slide travel (LY / RY) (op.)	± 45mm	
Rapid feed (LX / RX)	16m/min	
Rapid feed (LZ / RZ)	27m/min	
Rapid feed (LY / RY) (op.)	6m/min	
■ Left and Right spindles		
Spindle speed	5000min^{-1} / 4500min^{-1} (op. 65mm)	
Spindle speed range	Stepless	
Spindle nose	A2-6	
Hole through spindle	65mm	
I.D. of front bearing	100mm	
Hole through draw tube	52mm	
■ C-axis		
Least input increment	0.001 °	
Least command increment	0.001 °	
Rapid index speed	600min^{-1}	
Cutting feed rate	1 - 4800 °/min	
C-axis clamp	Disk clamp	
C-axis engage time	1.5sec.	
■ Left and Right turret		
Type of turret head	Dodecagonal drum turret X 2	16-stations turret
Number of tool stations	24 × 2	16
Number of indexing positions	24 × 2	16
Tool size (square shank)	□ 25mm, □ 20mm	
Tool size (round shank)	φ 32mm	
Max. tool swing	600mm	625mm
■ Driven tools		
Rotary system	Indivisual rotation	
Spindle speed	3600min^{-1}	
Spindle speed range	Stepless	
Number of driven-tool stations	12 × 2	16 × 2
Tool shank		
Straight holder	φ 2mm - φ 20mm	φ 1mm - φ 16mm
Cross holder	φ 2mm - φ 20mm	φ 1mm - φ 16mm
■ Drive motor and torque		
Left spindle	15/11kW 380.9/185.3N·m	
Right spindle	15/11kW 380.9/185.3N·m	
Driven tool spindle	3.7/2.2kW 39.2/23.3N·m	
■ General		
Machine height	2135mm	
Floor space	3444mm × 2235mm	
Machine weight	7800kg	
■ Power source		
Power supply	77kVA (92kVA : when L spindle motor 18.5/15kW is equipped)	
Air supply	150 - 200NL/min, 0.5 - 0.7MPa	

● Safety devices such as various interlock, fences for robotics, auto loading device, work stocker, automatic fire extinguisher etc. are available as options which can be included in your purchase package. Please contact our local distributor and dealer for your specific requirements.

● **Precautions about the use of cutting coolant**

Synthetic Coolants are Damaging to Machine Components
Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used.
Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper.
To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided.
Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.

Control Specification

■ Items			
Control Type	FANUC 18i-TB 2-PATH		
■ Controlled axes	TW-20MM	TW-20ML, MR	TW-20
Controlled axes	6axes	5axes	4axes
Simultaneously controlled axes	3axes + 3axse	ML : 3axes + 2axse, MR : 2axes + 3axse	2axes + 2axse
■ Input command			
Lease input increment	0.001mm/0.0001inch (diameter for X-axis), 0.001degree		
Lease command increment	X : 0.0005mm, Z : 0.001mm, Y : 0.001mm, C : 0.001degree		
Max. programable dimension	± 99999.999mm / ± 9999.9999inch		
Absolute / Incremental programming	X, Z / U, W,		
Decimal input	Standard		
Program code	EIA / ISO automatic recognition		
Inch / Metric conversion	G20 / G21		
Programable data input	G10		
■ Feed function			
Cutting feed	feed/min. 1 - 4800mm/min, 0.01 - 188inch/min feed/rev. 0.0001 - 500.0000mm/rev 0.000001 - 9.999999inch/rev		
Dwel	G04		
Feed per minute / Feed per revolution	G98 / G99		
Thread cutting	G32 + F		
Thread cutting retract	Standard		
Continuous thread cutting	Standard		
Variable lead threading	G34		
Handle feed	Manual pulse generator 0.001/0.01/0.1mm (per pulse)		
Automatic acceleration/decelaration	Standard		
Linear accel. / decel. After cutting feed interpolation	Standard		
Rapid override	F0 / 25 / 100%		
Cutting feed override	0 - 150%		
■ Tool offset			
Tool offset	T code (Last 2 digits : Tool geometly and wear offset)		
Tool nose R compensation	G41, G42 / G40		
Tool offset pairs	99 + 99		
■ Program memory			
Part program storage langth	320m + 320m		
Part program editing	delete, incert, change		
Program number search	Standard		
Sequence number search	Standard		
Address search	Standard		
number of registerable programs	200 + 200		
Program storage memory	Back up by battery		
Multiple program simultaneous editing	Standard (Multiple program simultaneous editing is not available during Gantry loader auto operation)		
DNC operation through memory card	Standard (not including memory card)		
Extended part program editing	Standard		
■ Operation and display			
Operation panel : Display	10.4" color LCD		
Operation panel : Keyboard	Separate type MDI unit		
■ Program support			
Circular interpolation R programming	Standard		
Direct drawing dimension programming or Chamfering and Corner R	Standard (Direct drawing dimension programming is standard)		
Cannd cycle	G90, G92, G94		
Multiple repeatitive canned cycle	G70 - G76		
Multiple repeatitive canned cycle II	Standard		
Cannd cycle for drilling	G80 - G89		
Sub program	Standard		
Custom macro B	Standard		
Background editing	Standard (This function is not available during Gantry loader auto operation)		
Work cordinate system	G52, G53, G54 - G59		
Extended part program editing	Standard		
Program copy	Standard		
Luck-Bei II (NT Manual Guide i)	Standard		
Over load detection	Standard (Z axis)		
NT work navigator (torque type)	Standard (not including contact bar)		
NT NURSE	Standard		
Help function	Standard		
■ Machining support			
Rigid tapping	Standard		
Spindle synchronization	Standard		
Spindle orientation	Standard (360 °unit : 0.088 °)		

TW-30 Machine Specification / Control Specification

Machine Specification

■ Capacity

Max. turning diameter	335mm
Std. turning diameter	255mm
Max. turning length	300mm
Distance between spindles	max.1300mm / min.320mm
Bar capacity	71mm
Chuck size	254mm (10 ")

■ Axis travel

Slide travel (LX / RX)	265mm / 265mm
Slide travel (LZ / RZ)	350mm / 980mm
Slide travel (LY / RY) (op.)	± 70mm
Rapid feed (LX / RX)	12m/min
Rapid feed (LZ / RZ)	18m/min
Rapid feed (LY / RY) (op.)	6m/min

■ Left and Right spindles

Spindle speed	3500min^{-1}
Spindle speed range	Stepless
Spindle nose	A1-8
Hole through spindle	85mm
I.D. of front bearing	120mm
Hole through draw tube	72mm

■ C-axis

Least input increment	0.001 °
Least command increment	0.001 °
Rapid index speed	25min^{-1}
C-axis clamp	Disk clamp

■ Left and Right turret

Type of turret head	Dodecagonal drum turret × 2
Number of tool stations	12 × 2
Number of indexing positions	12 × 2
Tool size (square shank)	□ 25mm
Tool size (round shank)	φ 32mm, φ 40mm, φ 50mm
Max. tool swing	755mm

■ Driven tools

Rotary system	Indivisual rotation
Spindle speed	3600min^{-1}
Spindle speed range	Stepless
Number of driven-tool stations	12 × 2
Tool shank	Straight holder φ 2mm - φ 20mm Cross holder φ 2mm - φ 20mm

■ Drive motor and torque

Left spindle	22/18.5kW 466.8/392N·m
Right spindle	22/18.5kW 466.8/392N·m
Driven tool spindle	5.5/3.7kW 58.3/39.2N·m

■ General

Machine height	2250mm
Floor space	4370mm × 2125mm
Machine weight	10820kg

■ Power source

Power supply	99kVA
Air supply	150 - 200NL/min, 0.5 - 0.7MPa

● Safety devices such as various interlock, fences for robotics, auto loading device, work stocker, automatic fire extinguisher etc. are available as options which can be included in your purchase package. Please contact our local distributor and dealer for your specific requirements.

● **Precautions about the use of cutting coolant**

Synthetic Coolants are Damaging to Machine Components
Concerning the use of cutting fluids, cautions have to be taken on the type of coolant being used.
Among coolants available in the market, some types are damaging to machine components and should be avoided. Typical damages are turcite wear, peeling of paint, cracking and damage to plastics and polymers, expansion of rubber parts, corrosion and rust build up on aluminum and copper.
To prevent such damages, coolants that are synthetic, or containing chlorine have to be avoided.
Machine warranty terms do not apply to any claims or damage arising from the use of improper coolant.

Control Specification

■ Items

Control Type	FANUC 18i-TB 2-PATH

■ Controlled axes

Controlled axes	4axes
Simultaneously controlled axes	2axes + 2axse

■ Input command

Lease input increment	0.001mm/0.0001inch (diameter for X-axis), 0.001degree
Lease command increment	X : 0.0005mm, Z : 0.001mm
Max. programable dimension	± 99999.999mm / ± 9999.9999inch
Absolute / Incremental programming	X, Z / U, W,
Decimal input	Standard
Program code	EIA / ISO automatic recognition
Inch / Metric conversion	G20 / G21
Programable data input	G10

■ Feed function

Cutting feed	feed/min. 1 - 4800mm/min, 0.01 - 188inch/min feed/rev. 0.0001 - 500.0000mm/rev 0.000001 - 9.999999inch/rev
Dwel	G04
Feed per minute / Feed per revolution	G98 / G99
Thread cutting	G32 + F
Thread cutting retract	Standard
Continuous thread cutting	Standard
Variable lead threading	G34
Handle feed	Manual pulse generator 0.001/0.01/0.1mm (per pulse)
Automatic acceleration / decelaration	Standard
Linear accel. / decel. After cutting feed interpolation	Standard
Rapid override	F0 / 25 / 100%
Cutting feed override	0 - 150%

■ Tool offset

Tool offset	T code (Last 2 digits : Tool geometly and wear offset)
Tool nose R compensation	G41, G42 / G40
Tool offset pairs	99 + 99

■ Program memory

Part program storage langth	320m + 320m
Part program editing	delete, incert, change
Program number search	Standard
Sequence number search	Standard
Address search	Standard
number of registerable programs	200 + 200
Program storage memory	Back up by battery
Multiple program simultaneous editing	Standard (Multiple program simultaneous editing is not available during Gantry loader auto operation)
DNC operation through memory card	Standard (not including memory card)
Extended part program editing	Standard

■ Operation and display

Operation panel : Display	10.4" color LCD
Operation panel : Keyboard	Separate type MDI unit

■ Program support

Circular interpolation R programming	Standard
Direct drawing dimension programming or Chamfering and Corner R	Standard (Direct drawing dimension programming is standard)
Cannd cycle	G90, G92, G94
Multiple repeatitive canned cycle	G70 - G76
Multiple repeatitive canned cycle II	Standard
Cannd cycle for drilling	G80 - G89
Sub program	Standard
Custom macro B	Standard
Background editing	Standard (This function is not available during Gantry loader auto operation)
Work cordinate system	G52, G53, G54 - G59
Extended part program editing	Standard
Program copy	Standard
Luck-Bei II (NT Manual Guide i)	Standard
Over load detection	Standard (Z axis)
NT work navigator (torque type)	Standard (not including contact bar)
NT NURSE	Standard
Help function	Standard

■ Machining support

Rigid tapping	Standard
Spindle synchronization	Standard
Spindle orientation	Standard (360 °unit : 0.088 °)

NAKAMURA-TOME PRECISION INDUSTRY CO., LTD.

http://www.nakamura-tome.co.jp

Netsuno 15, Hakusan city, Ishikawa, 920-2195 Japan
Phone : +81 76 273 8100 Fax : +81 76 273 4312
E-mail : nt-jpn@nakamura-tome.co.jp

Cat.No.0092E01010807N