General Catalog

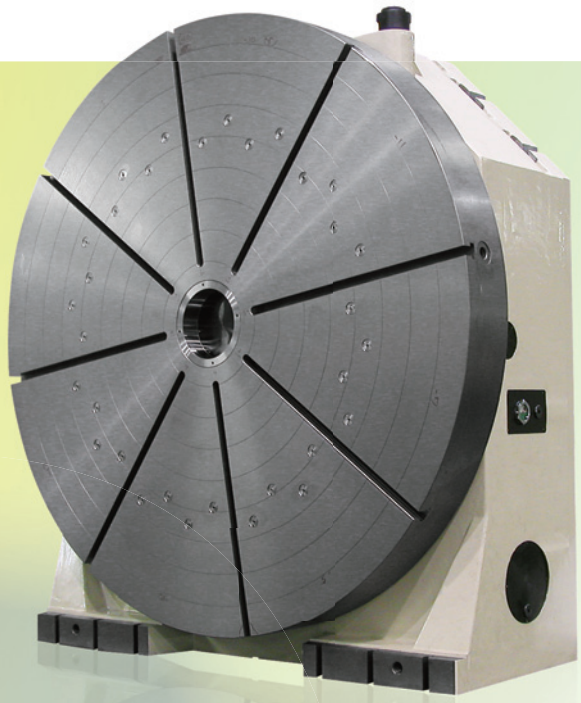
TSUDAKOMA

NC Rotary Tables

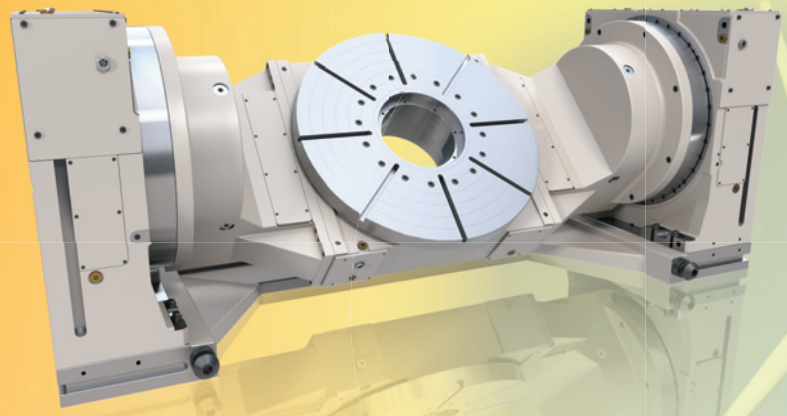
TSUDAKOMA Corp.

Productivity Innovation

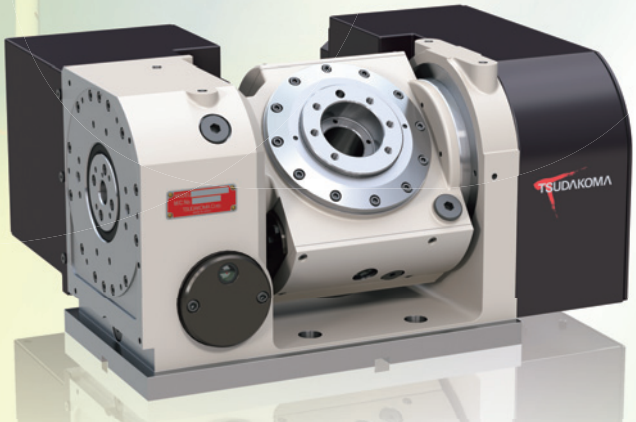
TSUDAKOMA products are being used all over the world for high-precision machining in the automobile, aerospace, electronics and medical industries.
In pursuit of the ultimate in performance, productivity, and technical advantages, TSUDAKOMA always strives to develop innovative products.
We are trying to create advantageous NC tables that best suit your needs.



Aerospace/Parts

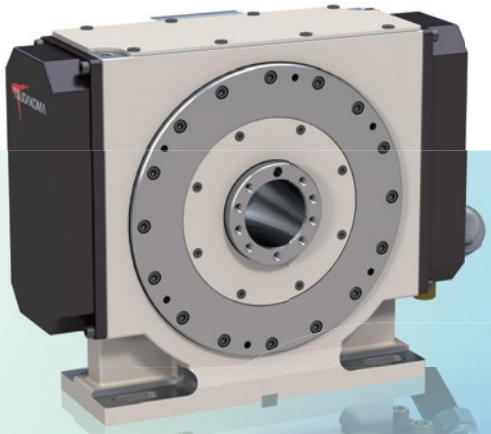


Energy



Electronics

Medical



Automotive

General Catalog

NC Rotary Tables

I N D E X

TSUDAKOMA Original Next-Generation Drive mechanism

『BallDrive®』

The perfect drive system 'BallDrive®' realizes the highest accuracy level and no-backlash.

No-clamp machining at a light load with no-backlash, high speed and high rigidity.

Shorten cycle time to improve your productivity by zeroizing of clamp/unclamp time and more than double indexing speed ※

No backlash

High accuracy machining without backlash

High rigidity

Stable positioning using a powerful clamp

Maintenance free

Extremely small aged deterioration
Original precision is maintained

Cycle time reduction

Twice as fast as the current model
Clampless machining

Power saving

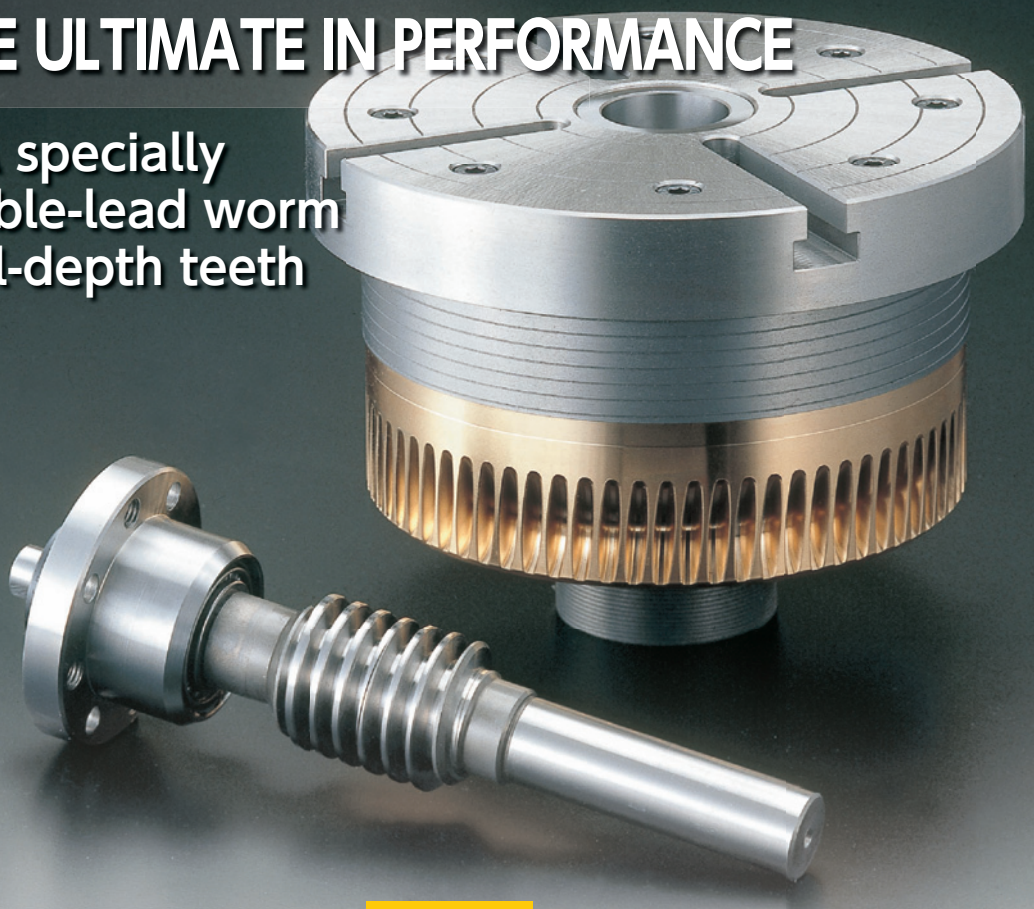
High transfer efficiency with a ball rolling system

※In-house comparison

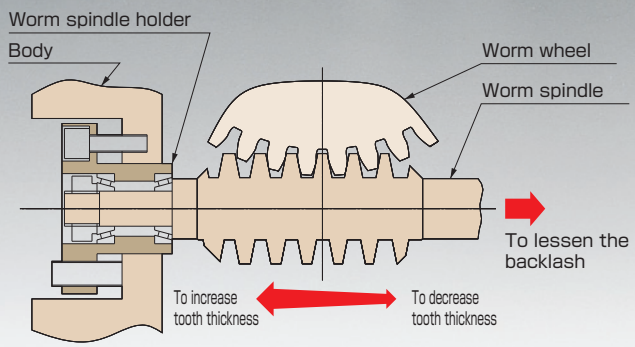
EXCELLENT BALANCE OF SMOOTHNESS, POWER AND DURABILITY BY SPECIAL GEAR SYSTEM ASSURES THE ULTIMATE IN PERFORMANCE

TSUDAKOMA specially designed double-lead worm gears with full-depth teeth

The setting of the lead amount on this gear system is different depending on the rotating direction of the worm wheel and the worm spindle. By moving the worm spindle axially, the tooth engagement can be changed successively. As the backlash between the worm wheel and the worm spindle can be adjusted while keeping them in their proper positions, the ideal tooth engagement is maintained.



Gear system



Materials

Worm spindle: Case-hardened alloy steel
Worm wheel: Special high-tensile brass equal in strength to a steel alloy

Torque transfer efficiency

The combination of iron and brass produces less friction. A more effective transfer of the motor torque is achieved compared with other combinations of materials.

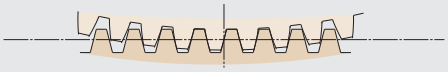
Larger worm wheel

The worm wheel with a large pitch diameter creates a large engagement area and less pressure on the contact surface, resulting in high durability against wear compared with conventional gear system.

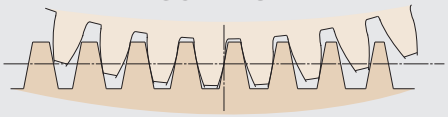
Tooth profile

The adoption of full-depth gear teeth, instead of standard teeth, results in higher strength equal to that of a gear of a size larger in module.

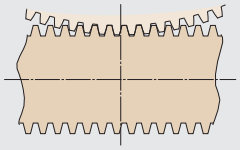
Conventional type



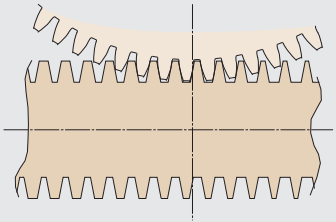
TSUDAKOMA

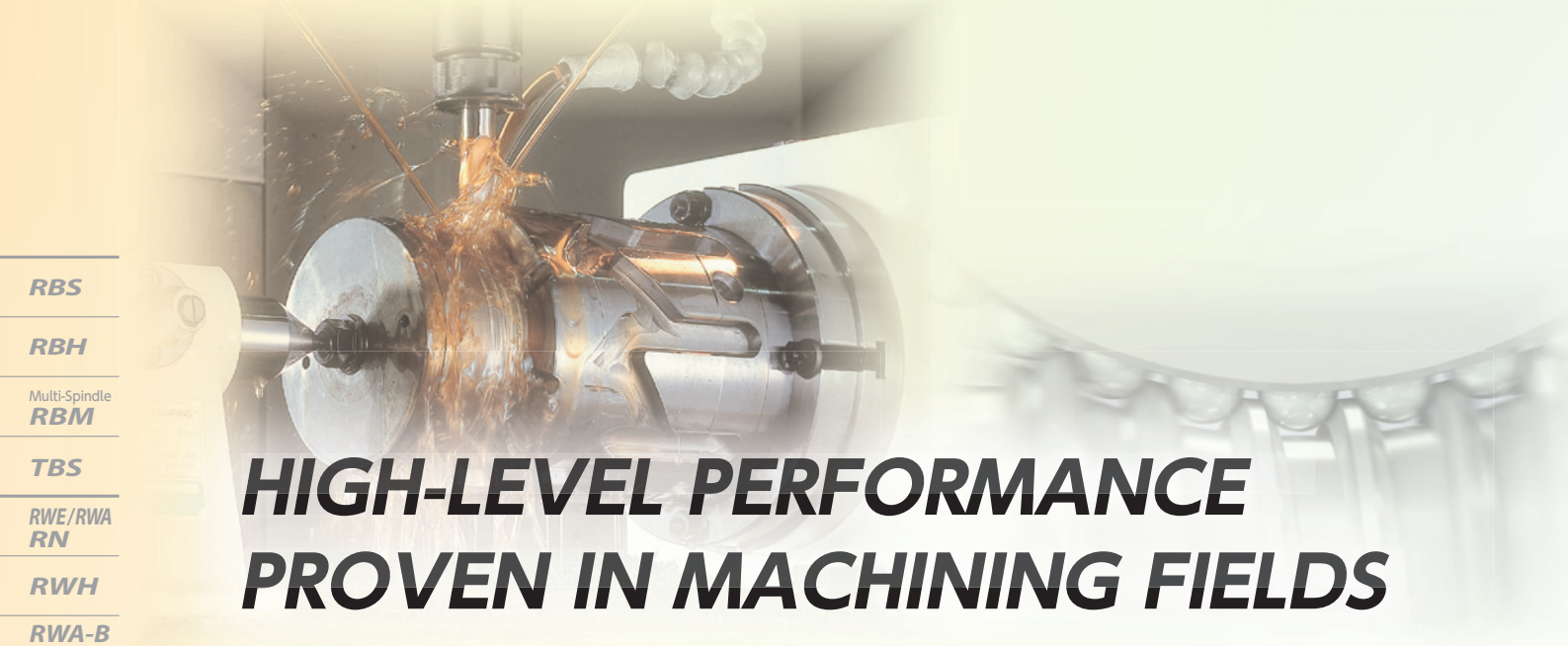


Conventional type



TSUDAKOMA





HIGH-LEVEL PERFORMANCE PROVEN IN MACHINING FIELDS

BallDrive NC Rotary Tables

Basic model

RBS/TBS-series

High-performance model with the drive system uniquely developed

No backlash

Ideally meshing rolling of steel balls with cam shaft achieves no backlash, 'play' at drive parts. It realizes the highest accuracy level for both indexing accuracy and repeatability.

High Speed

It enables smaller speed reduction ratio comparing with other drive system and more than twice as fast as worm gear. ※

High rigidity

High rigidity of BallDrive enables strong clamp and no-clamp machining at a light load.

※In-house comparison

Direct Drive NC Tilting Rotary Tables

Milling and Turning Model

TDS/TDB

Turning and Milling in One Chucking! Process Integration with this One Unit

High Speed

DD motor drive enables high-speed indexing and simultaneous 5-axis machining.

Turning and Milling

Enables turning at MAX 3,000 min^{-1}.
The turning and indexing/milling machining processes, previouly done in separate processes, are now integrated in a single machine. Machining in one chucking reduces setup time between different processes and increases workpiece accuracy.

No backlash

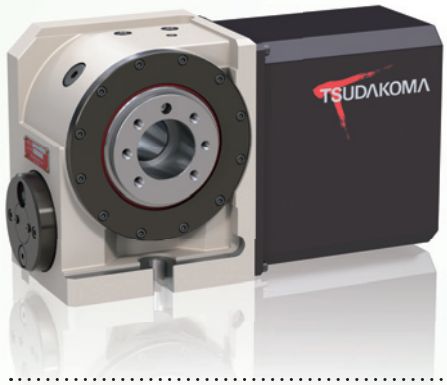
Achieve high-precision machining without backlash due to DD motor drive.
No reduction mechanism and no wear. Maintenance is basically unnecessary.

NC Rotary Tables

Basic models

RWE/RWA-series

New standard for the ultimate in power and speed



High Speed

The specially designed double-lead worm gear system with full-depth teeth of increased torque transfer efficiency minimizes the speed reduction ratio, improving the indexing speed.
The machining cycle time is reduced.

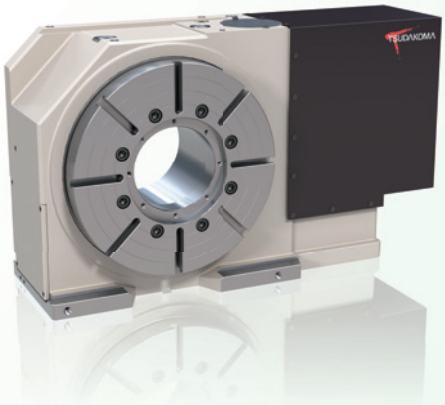
Strong Clamp Torque(RWA-series)

The newly developed clamp mechanism using pneumatic pressure realizes powerful clamping.
The cutting feed speed is increased.
Responsivity is also increased.

Big bore models

RWB-series

Flagship models of single-axis NC table



Newly developed strong hydraulic clamping system

New clamping system enables 25% stronger clamping torque than previous model. It realizes stable machining at a distance from rotary center.

Strong strength of worm gears

Strength of worm gears improves 70% to 130% higher than previous model. It realizes 1 size stronger strength than previous model, which provides downsizing of the model.

Indexing accuracy 14 sec.(the sum) guaranteed

Our high quality control enable us to take an another step forward to elevate the indexing accuracy.

NC Tilting Rotary Tables

Basic tilting models

TWA/TN-series

Best partner for five-axis machining

High Speed

The specially designed double-lead worm gear system with full-depth teeth of increased torque transfer efficiency minimizes the speed reduction ratio, improving the indexing speed.
The machining cycle time is reduced.

Strong Clamp Torque

The newly developed clamp mechanism using pneumatic pressure realizes powerful clamping.
It is rigid enough for machining even at a position far from the tilting axis.

Variety of Options

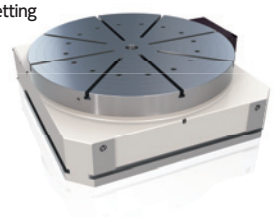
In addition to the automatic work mounting and dismounting arrangements by a pull-stud device as well as pneumatic or hydraulic rotary joint, high precision specifications using a scale is also available.

INDEX

Large models

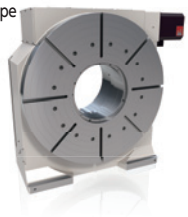
A top-seller large-capacity model when combined with large-sized double column, or 5-face machining centers

For horizontal setting
RCH
RNC



RCH-800 P.30
RCH-1000
RCH-1250
RNC-1501
RNC-2001

Horizontal motor mounting type
RCV



RCV-800 P.32
RCV-1000
RCV-1250
RCV-1600

Multi-spindle models

High production model capable of multiple workpieces machining

Multi-spindle type
RWM

P.34
RWM-160-2/3/4
RWM-200-2/3/4
RWM-250-2/3/4
RWM-320-2/3/4

NC Tilting Rotary Tables

Machining of aluminum components for automobiles electronic devices and blades for jet engines

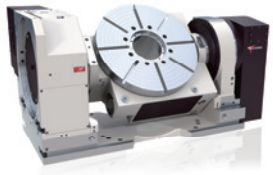
Basic models

High speed indexing and strong clamp torque for 5-axis machining

Standard type
TWA/TN

TWA-100 P.36
TWA-130
TWA-160
TWA-200
TN-320
TN-450

Standard type
TWB
TTNC



TWB-320 P.38
TWB-630
TWB-1000
TTNC-1500

Multi-spindle models

High production model capable of multiple workpieces machining

Multi-spindle type
TWM

TWM-100 P.40
TWM-160
TWM-250

Direct Drive NC Rotary tables•Speciality Rotary Tables

SmartDD
RDS

RDS-200 P.42
RTV-202 P.43
RTT-112

Specialty rotary table
RTV・RTT

Direct Drive NC Tilting Rotary Tables

Milling and Turning Model
TDS
TDB

TDS-200 P.44
TDB-200

Single-axis NC Controllers

NC table can be controlled with M-signals from the machining centers

For small NC rotary tables
TPC-Jr

TPC-Jr K2 P.46
TPC-Jr K3

For large NC rotary tables
TPC5

TPC5 SR6 P.48
TPC5 SR12
TPC5 SR30

Accessories

P.58

Chuck
Scroll chuck

Power chuck

Tailstock
Manual tailstock

Hydraulic tailstock

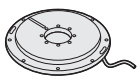
Support spindle

Face plate

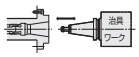
Optional Specifications

P.64

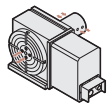
Rotary encoders and MP scales for high precision



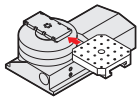
Pull-stud



Rotary joint



Pallet clamp



Air-hydraulic Booster

Standard type

RBS RBS-160•250•320

We provide you the top productivity and high-grade machining with no backlash and high indexing speed, two times faster than previous model.

RBS-160R,H

Specifications

Unit: mm

			RBS-160,H	RBS-250,H	RBS-320,H
Handedness		R	○	○	○
		L	○	○	○
Spindle diameter			ϕ100	ϕ140	ϕ180
Table diameter			ϕ160 or ϕ200 (Option)	ϕ250 (Option)	ϕ320 (Option)
Center height			160	210	255
Center bore	Nose diameter		ϕ55H7×45	ϕ80H7×45	ϕ115H7×45
	Through-bore		ϕ40	ϕ50	ϕ85
Table T-slot width			12H8	12H8	14H8
Guide block width			14h7	18h7	18h7
Servo motors (for FANUC)			αiS4	αiS8	αiS12
Inertia converted into motor shaft		$\times10^{-3}$kg·m^2	0.19	0.42	2.24
Net weight		kg	60	110	210
Speed reduction ratio			1/36	1/36	1/36
Table max. rpm (Motor rpm: 3,000min^{-1})		min^{-1}	83.3	83.3	83.3
Indexing accuracy (the sum)		sec	15	15	15
Clamp system			Pneumatic	Pneumatic	Pneumatic
Clamp torque ／pneumatic pressure 0.49MPa		N·m	500	1,000	1,500
Allowable work weight	Vertical setting ( ):with tailstock	kg	100 (200)	125 (250)	175 (350)
	Horizontal setting	kg	200	250	350
Allowable load (when table is clamped)	F	N	10,800	14,400	24,800
	F×L	N·m	500	1,000	1,500
	F×L	N·m	780	1,900	4,700
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$	kg·m^2	0.64	1.95	4.48

CE correspondence model

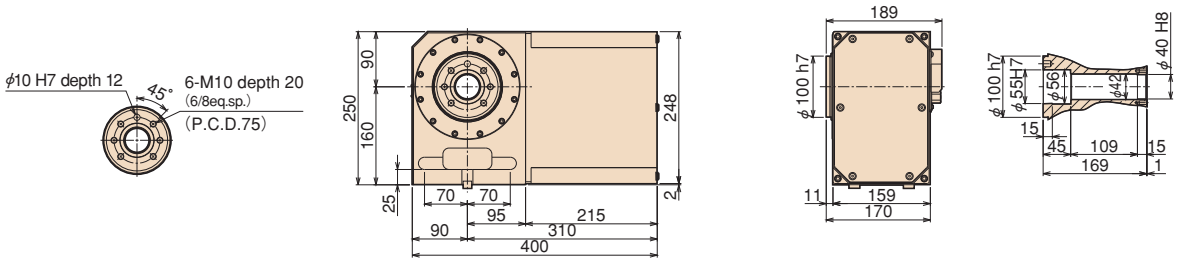
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64 Rotary Joint P.66

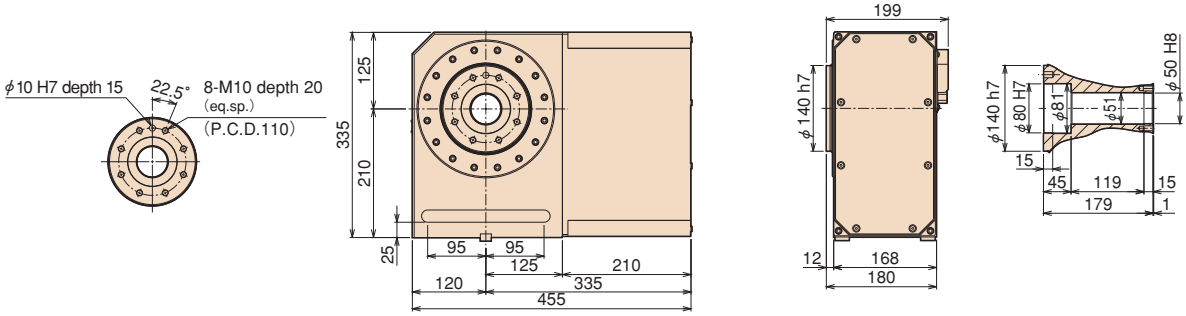
Dimensions

Unit:mm

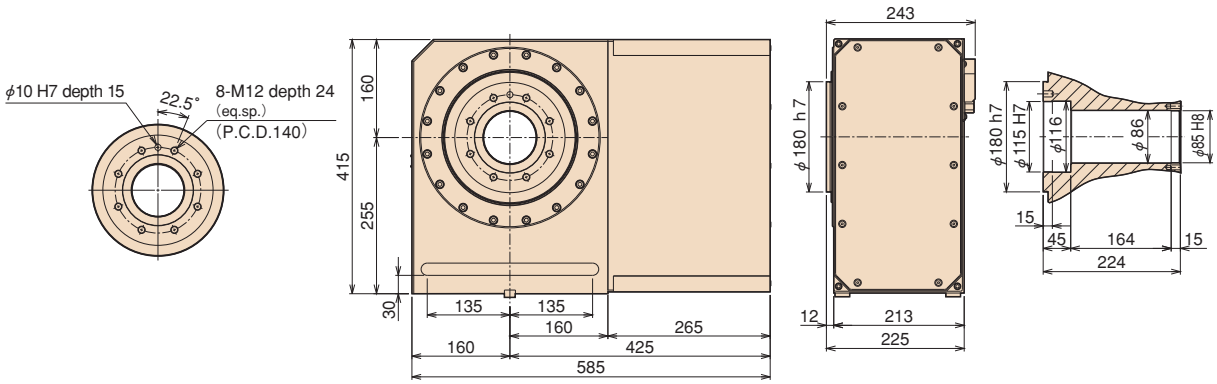
RBS-160R



RBS-250R



RBS-320R



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

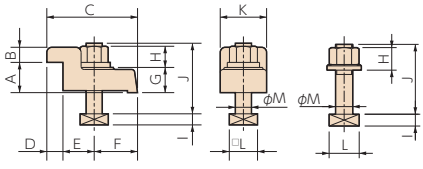
Clamping block and bolt

Unit: mm

	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RBS-160	2	—	14	—	—	—	—	—	—	—	17	8	60	—	23	12
RBS-250	4	40 to 120	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RBS-320	4	55 to 147	18	30	15	90	16	31	43	25	21	11	70	46	28	16

Note 1: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)
Note 2: Clamping blocks are not included with the RBS-160.

Type I



Standard type－Hydraulic－

RBH RBH-160•250•320

TSUDAKOMA BallDrive NC rotary table with new hydraulic clamp specification.
Selection can be made according to the fluid in the operating environment.
Increase machining efficiency and productivity of various workpieces.

RBH-250R

仕　様

Unit: mm

		RBH-160	RBH-250	RBH-320
Handedness	R	○	○	○
	L	○	○	○
Spindle diameter		φ100	φ140	φ180
Table diameter		φ160 or φ200 (Option)	φ250 (Option)	φ320 (Option)
Center height		160	210	255
Center bore	Nose diameter	φ55H7×45	φ80H7×45	φ115H7×45
	Through-bore	φ40	φ50	φ85
Table T-slot width		12H8	12H8	14H8
Guide block width		14h7	18h7	18h7
Servo motors (for FANUC)		αiS4	αiS8	αiS12
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	0.19	0.42	2.24
Net weight	kg	60	110	210
Speed reduction ratio		1/36	1/36	1/36
Table max. rpm (Motor rpm: 3,000min^{-1})	min^{-1}	83.3	83.3	83.3
Indexing accuracy (the sum)	秒	15	15	15
Clamp system		Hydraulic	Hydraulic	Hydraulic
Clamp torque ／Hydraulic pressure 3.5Mpa	N·m	500	1,000	1,500
Allowable work weight	Vertical setting ( ):with tailstock	100 (200)	125 (250)	175 (350)
	Horizontal setting	200	250	350
Allowable load (when table is clamped)	F	10,800	14,400	24,800
	F×L	500	1,000	1,500
	F×L	780	1,900	4,700
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$	0.64	1.95	4.48

CE correspondence model

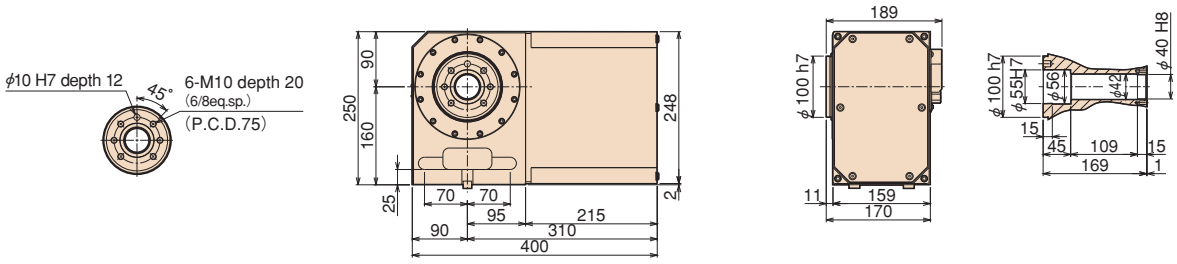
Tech.Info. Servo motors of other manufacturers P.68　When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64　Rotary Joint P.66

Dimensions

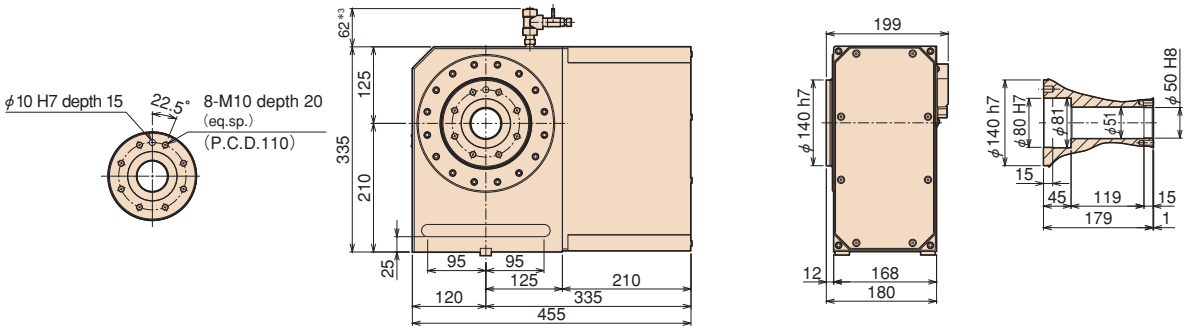
Unit:mm

RBH-160R



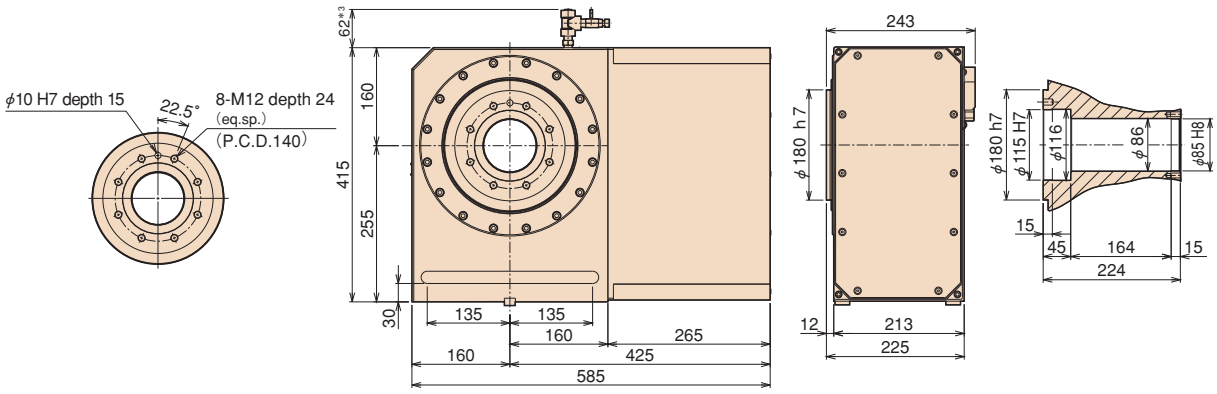
・Size 160 is for vertical setting only.

RBH-250R



＊3　Hydraulic feed port and bleed plug are attached to the top of the frame for horizontal setting only.
・Size 250 can be used either horizontally or vertically. It cannot be used both horizontally and vertically.

RBH-320R



＊3　Hydraulic feed port and bleed plug are attached to the top of the frame for horizontal setting only.
・Size 320 can be used either horizontally or vertically. It cannot be used both horizontally and vertically.

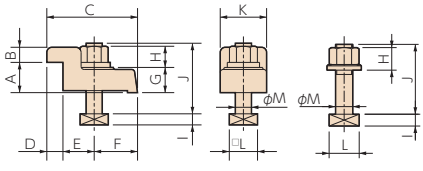
Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Clamping block and bolt

Unit: mm

	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RBH-160	2	—	14	—	—	—	—	—	—	—	17	8	60	—	23	12
RBH-250	4	40 to 120	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RBH-320	4	55 to 147	18	30	15	90	16	31	43	25	21	11	70	46	28	16

Type I

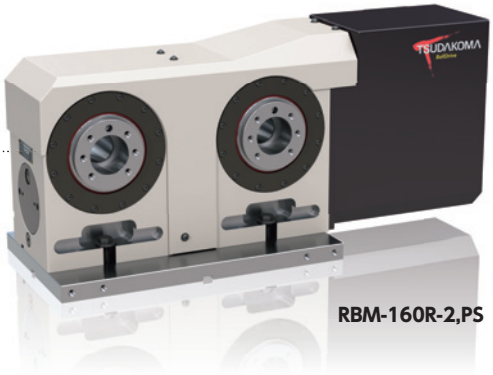


Note 1: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)
Note 2: Clamping blocks are not included with the RBH-160.

Multi-spindle Type

RBM RBM-160-2

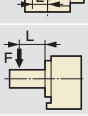
In addition to high-speed indexing with the BallDrive system and high productivity and high quality machining with no backlash, RBM-160 enables simultaneous machining of multiple units, further increases production efficiency.



RBM-160R-2,PS

Specifications

Unit: mm

		RBM-160-2
Handedness	R	○
	L	○
Spindle diameter		ϕ100h7
Table diameter		ϕ160 or ϕ200 (Option)
Distance between spindles		250 (PS) 320 (PL)
Center height (without base plate)		160
Center bore	Nose diameter	ϕ55H7
	Through-bore	ϕ40
Guide block width		14 h 7
Servo motors (for FANUC)		αiF8
Number of axis		2-axis
Inertia converted into motor shaft	$\times 10^{-3}$kg·m^2	0.87
Net weight	kg	150 (PS) 160 (PL)
Speed reduction ratio		1/36
Table max. rpm (Motor rpm: 3,000min^{-1})	min^{-1}	83.3
Clamp system		Pneumatic
Clamp torque ／pneumatic pressure 0.49MPa	N·m	500
Indexing accuracy (the sum)	sec	15
Allowable work weight 	kg/axis	100
Allowable load (when table is clamped) 	N	10,800
	N·m	500
	N·m	780
Allowable work inertia (per single-axis) $J=\frac{W \cdot D^2}{8}$ 	kg·m^2	0.64

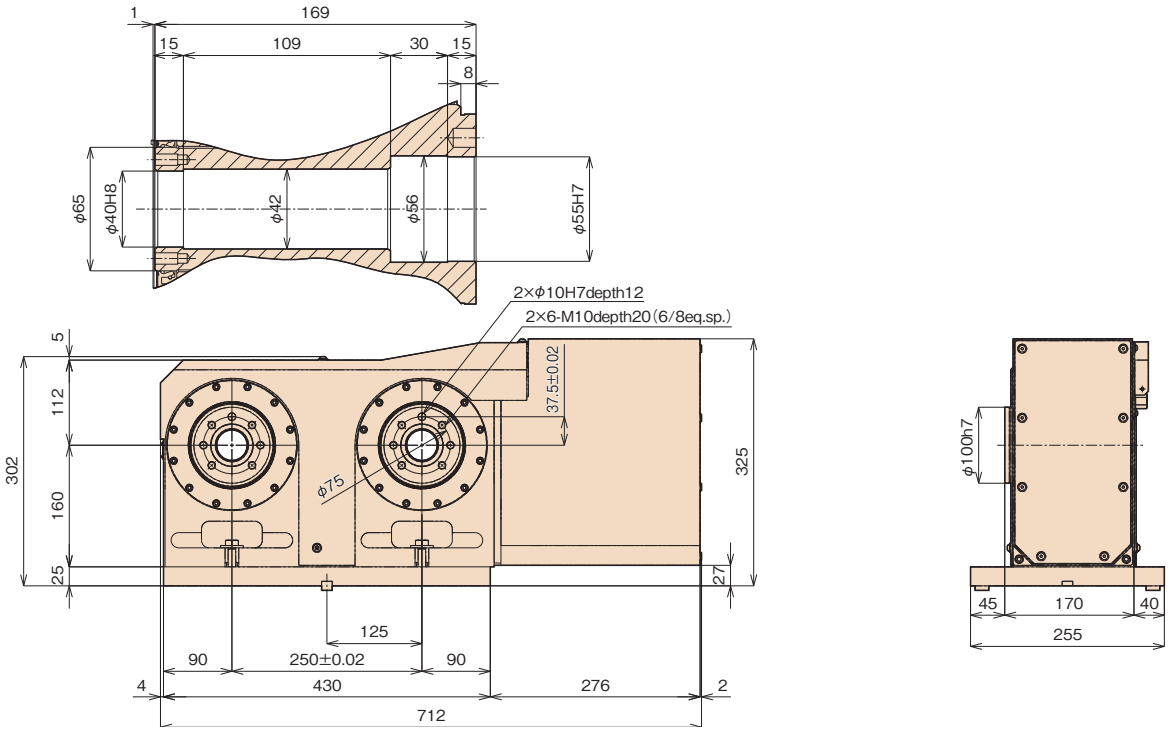
CE correspondence model

Tech.Info. Servo motors of other manufacturers P.68
When assembling a faceplate or a fixture with the main spindle P.79
Option Rotary Joint P.66

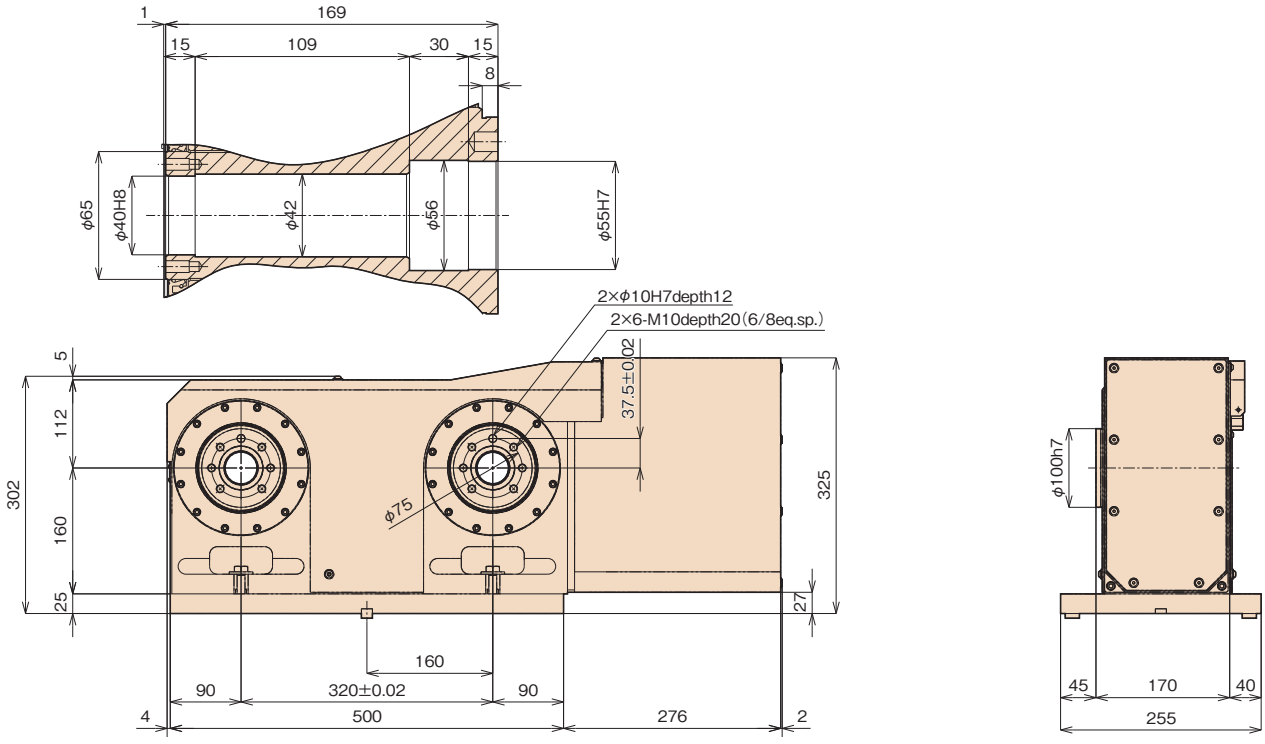
Dimensions

Unit: mm

RBM-160R-2,PS



RBM-160R-2,PL



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Standard type

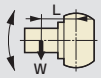
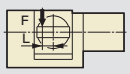
TBS TBS-130•160•250

The latest technology, tilting rotary tables with TSUDAKOMA BallDrive system are joined in our line-up to provide perfect performance in 5-axis machining and to contribute to improve productivity.

TBS-160,H

Specifications

Unit: mm

		TBS-130,H		TBS-160,H		TBS-250,H	
Tilt range		-30° to +110°		-30° to +110°		-30° to +110°	
Spindle diameter		φ90 h7		φ100 h7		φ140 h7	
Table diameter		φ135 (Option)		φ160 or 200 (Option)		φ250 (Option)	
Table height at 0° position		225 (250 w/face plate)		270 (300 w/face plate)		290 (320 w/face plate)	
Center height at 90° position		160		200		235	
Center bore	Nose diameter	φ55 H7 (φ40 H7 w/face plate)		φ55 H7 (φ50 H7 w/face plate)		φ80 H7 (φ75 H7 w/face plate)	
	Through-bore	φ40		φ40		φ50	
Table T-slot width		12H8 (w/face plate)		12H8 (w/face plate)		12H8 (w/face plate)	
Guide block width		14h7		18h7		18h7	
Servo motors (for FANUC)		Rotary axis	Tilt axis	Rotary axis	Tilt axis	Rotary axis	Tilt axis
		αiS2	αiS2	αiS2	αiS4	αiS8	αiS8
Inertia converted into motor shaft	×10^{-3}kg·m^2	0.121	0.140	0.155	0.168	0.586	0.465
Speed reduction ratio		1/48	1/60	1/60	1/60	1/45	1/60
Table max. rpm	min^{-1} (Motor rpm: 3,000min^{-1})	62.5	50	50	50	66.6	50
Clamp system Supplied pressure		Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
Clamp torque / pneumatic pressure 0.49MPa	N·m	500	500	500	500	1,000	1,000
Indexing accuracy (the sum)	arc sec	20	—	20	—	20	—
Tilting accuracy Tilt 0° to 90°	arc sec	—	30	—	30	—	40
Net weight	kg	120		160		280	
Allowable work weight	0° (Horizontal)  kg	35		60		135	
	0° to 90° (Tilting)  kg	20		40		85	
Allowable work moment	W×L  N·m	61.1		59.6		186.7	
Allowable load (when table is clamped)	F  N	3,920		10,800		14,400	
	F×L  N·m	500		500		1,000	
	F×L  N·m	500		500		1,000	
Allowable work inertia	$J=\frac{W \cdot D^2}{8}$  kg·m^2	0.08		0.19		1.05	

CE correspondence model

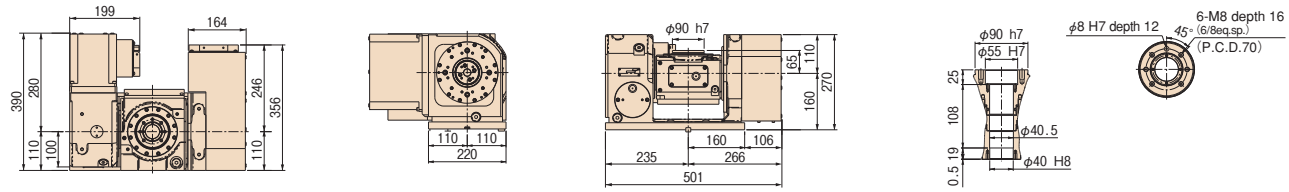
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64 Rotary Joint P.66 Pull Stud P.66

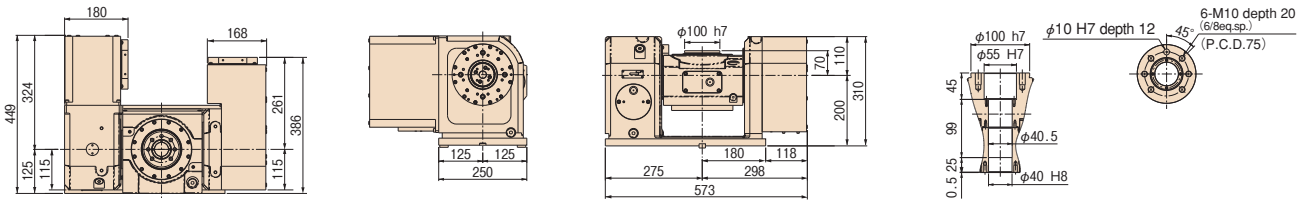
Dimensions

Unit:mm

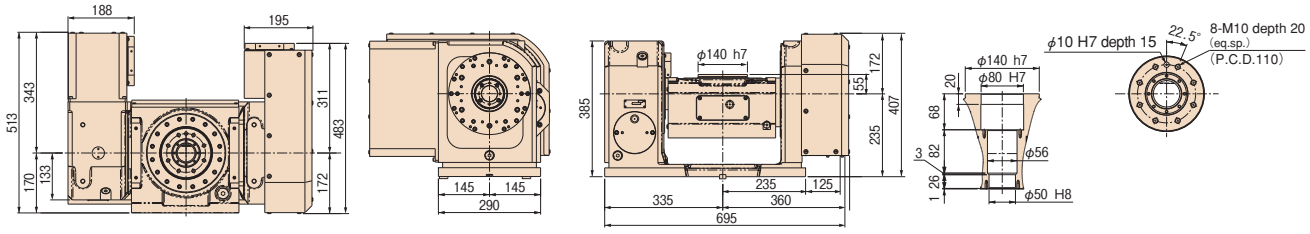
TBS-130



TBS-160



TBS-250



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

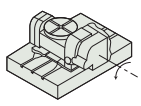
Clamping block and bolt

Unit:mm

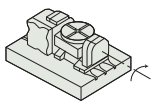
	Type	Q'ty	Layout	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
TBS-130	I	4	a b	40 to 134 *	14	20	12	70	10	35	25	20	17	8	55	35	23	12
TBS-160	I	4	a b	78 to 152 63 to 107	18	20	12	70	10	35	25	17	15	11	55	35	28	16
TBS-250	I	4	a b	130 to 215 78 to 125	18	25	12	80	12	33	35	22	21	11	65	40	28	16

Note 1: *In the case of layout b, contact us for the details about mounting.
Note 2: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

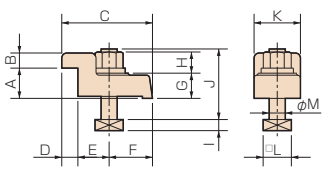
Layout a



Layout b



Type I

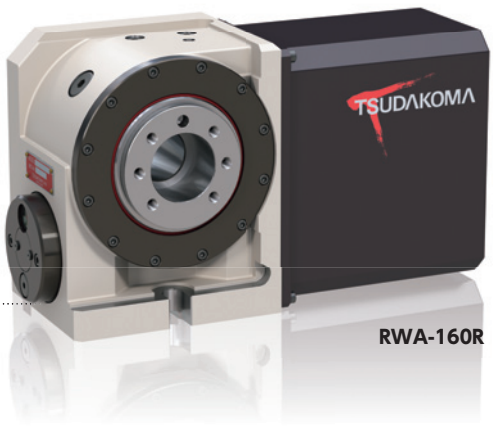


Standard type

RWE/RWA

RWE-160•200
RWA-160•200•250•320

RN RN-100



RWA-160R

The RWE/RWA series, an improvement on the best-selling, has remarkably improved cost efficiency due to its high-speed operation for use in drill and tapping machines.

Specifications

Unit: mm

		RWE/RWA-160	RWE/RWA-200	RWA-250	RWA-320	RN-100
Handedness	R	○	○	○	○	○
	L	○	○	○	○	○
	K	○(RWA only)	○(RWA only)	—	—	—
Spindle diameter		ϕ100	ϕ120	ϕ140	ϕ180	ϕ80
Table diameter*1		ϕ160 or 200 (Option)	ϕ200 or 250 (Option)	ϕ250 (Option)	ϕ320 (Option)	ϕ135 (Option)
Center height		135	160	160	210	110
Center bore	Nose diameter	ϕ55H7×45	ϕ65H7×45	ϕ80H7×45	ϕ115H7×45	ϕ50H7×45
	Through-bore	ϕ40	ϕ45	ϕ50	ϕ85	ϕ30
Table T-slot width		12H8	12H8	12H8	14H8	10H8
Guide block width		14h7	18h7	18h7	18h7	14h7
Servo motors (for FANUC)		αiS2	αiS4	αiS8	αiS8	αiF2
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	0.09	0.17	0.41	0.52	0.23
Net weight	kg	40	61	80	150	28
Speed reduction ratio		1/72	1/72	1/90	1/120	1/36
Table max. rpm	min^{-1} (Motor rpm: 3,000min^{-1})	41.6	41.6	33.3	25	83.3
Indexing accuracy (the sum)		25	20	20	20	45
Clamp system		Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
Clamp torque ／pneumatic pressure 0.49MPa	N·m	250 (RWE)	400 (RWE)	1,000	1,500	80
		500 (RWA)	800 (RWA)			
Strength of worm gears	N·m	206	288	596	939	176
Allowable work weight	Vertical setting  ( ):with tailstock kg	100 (200)	125 (250)	125 (250)	175 (350)	25 (50)
	Horizontal setting  kg	200	250	250	350	50
Allowable load (when table is clamped)	F  N	10,800	14,400	14,400	24,800	5,880
	F×L  N·m	250 (RWE)	400 (RWE)	1,000	1,500	80
		500 (RWA)	800 (RWA)			
	F×L  N·m	780	1,900	1,900	4,700	156
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$  kg·m^2	0.64	1.25	1.95	4.48	0.10

CE correspondence model

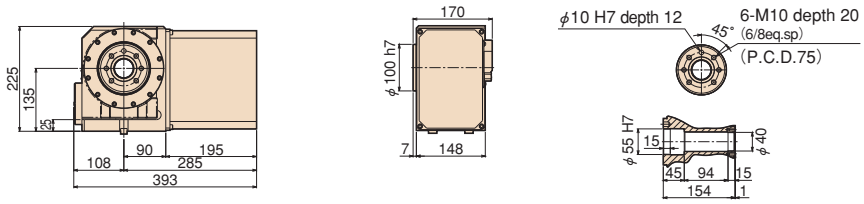
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64 Rotary Joint P.66

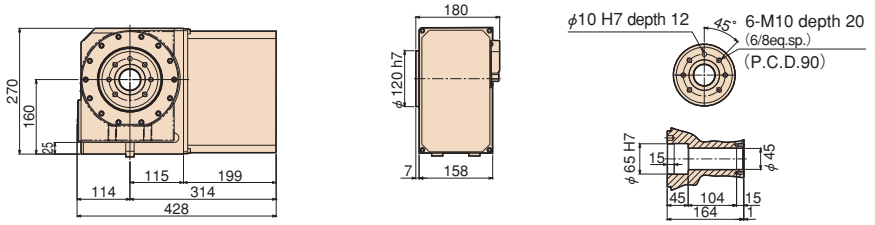
Dimensions

Unit:mm

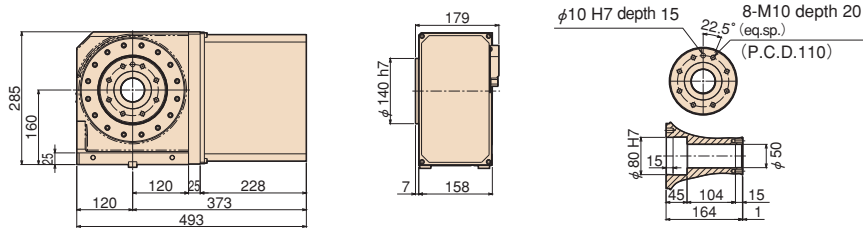
RWE/RWA-160



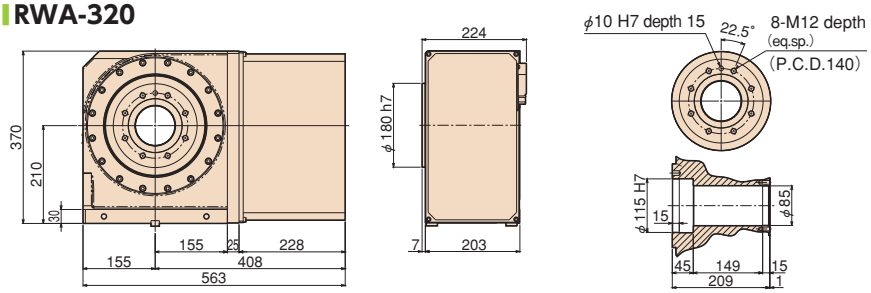
RWE/RWA-200



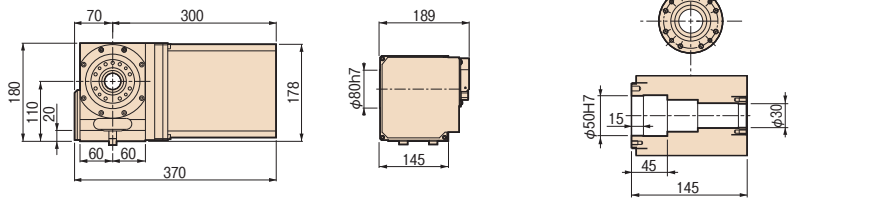
RWA-250

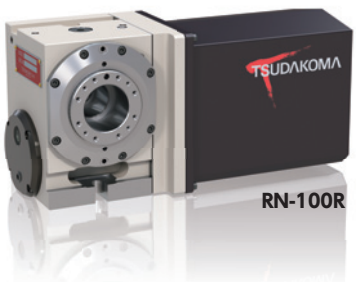


RWA-320



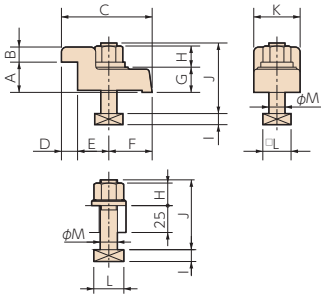
RN-100R





Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Type I



Clamping block and bolt

Unit: mm

	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RWE/RWA-160	—	2	–	14	–	–	–	–	–	–	–	17	8	60	–	23	12
RWE/RWA-200	—	2	–	18	–	–	–	–	–	–	–	21	11	65	–	28	16
RWA-250	I	4	50 to 100	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RWA-320	I	4	50 to 132	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RN-100	—	2	–	14	–	–	–	–	–	–	–	17	8	55	–	23	12

Note 1: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)
Note 2: Clamping blocks are not included with the RWE/RWA-160 and RWE/RWA-200 and RN-100.

Standard type—Hydraulic—

RWH RWH-160•200•250•320

New hydraulic clamp specification is added to the basic model, which was only available in air clamp specification. Selection can be made according to the fluid in the operating environment.

RWH-200R

Unit: mm

Specifications

		RWH-160	RWH-200	RWH-250	RWH-320
Handedness	R	○	○	○	○
	L	○	○	○	○
Spindle diameter		ϕ100	ϕ120	ϕ140	ϕ180
Table diameter		ϕ160 or 200 (Option)	ϕ200 or 250 (Option)	ϕ250 (Option)	ϕ320 (Option)
Center height		135	160	160	210
Center bore	Nose diameter	ϕ55H7×45	ϕ65H7×45	ϕ80H7×45	ϕ115H7×45
	Through-bore	ϕ40	ϕ45	ϕ50	ϕ85
Table T-slot width		12H8	12H8	12H8	14H8
Guide block width		14h7	18h7	18h7	18h7
Servo motors (for FANUC)		αiS2	αiS4	αiS8	αiS8
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	0.09	0.17	0.41	0.52
Net weight	kg	40	61	80	150
Speed reduction ratio		1/72	1/72	1/90	1/120
Table max. rpm (Motor rpm: 3,000min^{-1})	min^{-1}	41.6	41.6	33.3	25
Indexing accuracy (the sum)	秒	25	20	20	20
Clamp system		Hydraulic	Hydraulic	Hydraulic	Hydraulic
Clamp torque ／Hydraulic pressure 3.5Mpa	N·m	500	800	1,000	1,500
Strength of worm gears	N·m	206	288	596	939
Allowable work weight — Vertical setting ( ):with tailstock	kg	100 (200)	125 (250)	125 (250)	175 (350)
Allowable work weight — Horizontal setting	kg	200	250	250	350
Allowable load (when table is clamped) — F	N	10,800	14,400	14,400	24,800
Allowable load (when table is clamped) — F×L	N·m	500	800	1,000	1,500
Allowable load (when table is clamped) — F×L	N·m	780	1,900	1,900	4,700
Allowable work inertia $J=\frac{W\cdot D^2}{8}$	kg·m^2	0.64	1.25	1.95	4.48

CE correspondence model

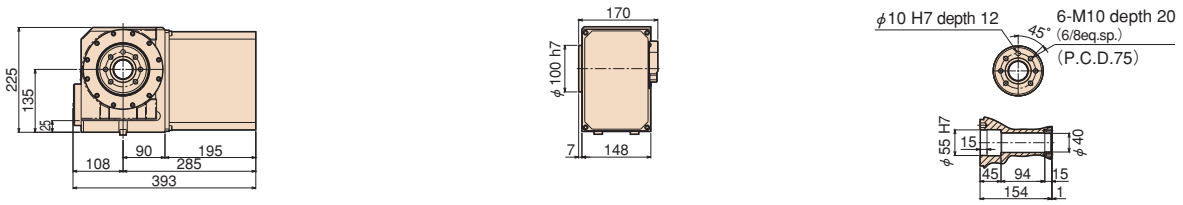
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64 Rotary Joint P.66

Dimensions

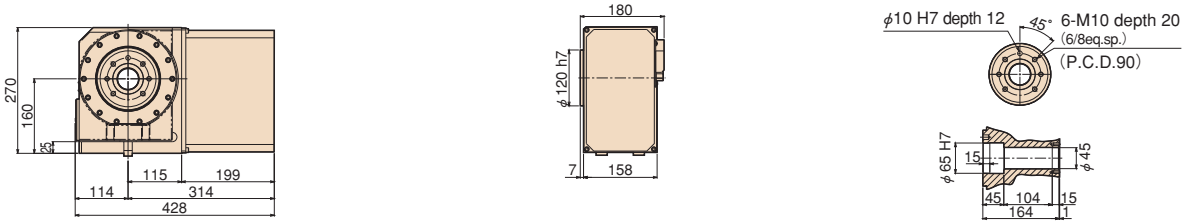
Unit:mm

RWH-160



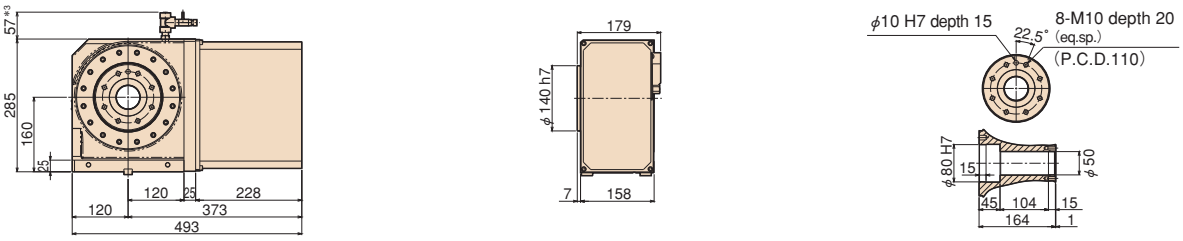
・Size 160 is for vertical setting only.

RWH-200



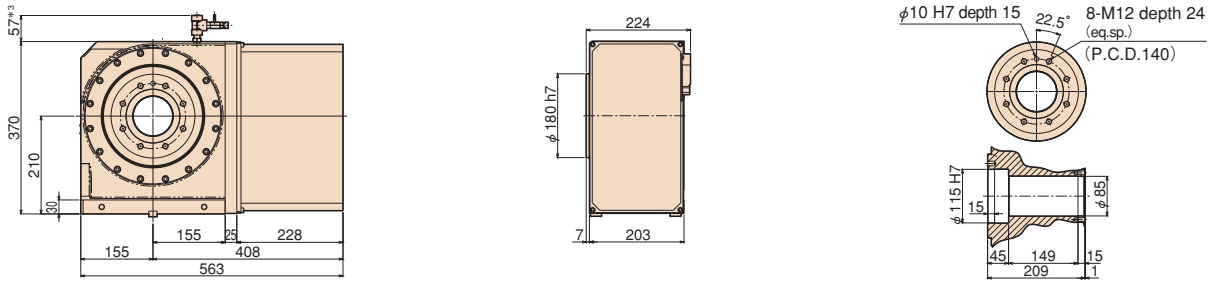
・Size 200 is for vertical setting only.

RWH-250



＊3　Hydraulic feed port and bleed plug are attached to the top of the frame for horizontal setting only.
・Size 250 can be used either horizontally or vertically. It cannot be used both horizontally and vertically.

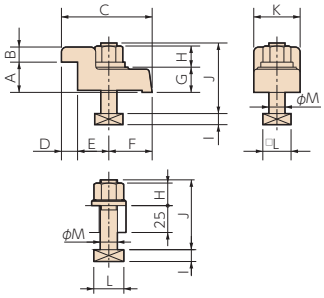
RWH-320



＊3　Hydraulic feed port and bleed plug are attached to the top of the frame for horizontal setting only.
・Size 320 can be used either horizontally or vertically. It cannot be used both horizontally and vertically.

Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Type I



Clamping block and bolt

Unit: mm

	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RWH-160	—	2	–	14	–	–	–	–	–	–	–	17	8	60	–	23	12
RWH-200	—	2	–	18	–	–	–	–	–	–	–	21	11	65	–	28	16
RWH-250	I	4	50 to 100	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RWH-320	I	4	50 to 132	18	30	15	90	16	31	43	25	21	11	70	46	28	16

Note 1: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)
Note 2: Clamping blocks are not included with the RWH-160 and RWH-200.

Rear motor mounting type

RWA-B

RWA- 160R,B•200R,B•250R,B•320R,B

RNCV-B

RNCV-401R,B

One of the most popular rear motor mounting types. Suitable for mounting on a compact machine tool for space saving.

RWA-160R,B

Specifications

Unit: mm

		RWA-160R,B	RWA-200R,B	RWA-250R,B	RWA-320R,B	RNCV-401R,B
Handedness	R	○	○	○	○	○
	L	—	—	—	—	—
Spindle diameter		ϕ100	ϕ120	ϕ140	ϕ180	—
Table diameter		ϕ160 or 200 (Option)	ϕ200 or 250 (Option)	ϕ250 (Option)	ϕ320 (Option)	ϕ400
Center height		135	160	160	210	255
Center bore	Nose diameter	ϕ55H7×45	ϕ65H7×45	ϕ80H7×45	ϕ115H7×45	ϕ40H7×21
	Through-bore	ϕ40	ϕ45	ϕ50	ϕ85	ϕ40
Table T-slot width		12H8	12H8	12H8	14H8	14H8
Guide block width		14h7	18h7	18h7	18h7	18h7
Servo motors (for FANUC)		αiS2	αiS4	αiS8	αiS8	αiF12
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	0.56	0.64	0.97	0.84	4.01
Net weight	kg	55	77	95	165	330
Speed reduction ratio		1/72	1/72	1/90	1/120	1/180
Table max. rpm (Motor rpm: 3,000min^{-1})	min^{-1}	41.6	41.6	33.3	25	11.1
Indexing accuracy (the sum)	sec	25	20	20	20	15
Clamp system		Pneumatic	Pneumatic	Pneumatic	Pneumatic	Hydraulic or air-hydraulic (Option)
Clamp torque ／pneumatic pressure 0.49MPa	N·m	500	800	1,000	1,500	1,764 (Hydraulic pressure 3.5Mpa)
Strength of worm gears	N·m	206	288	596	939	1,666
Allowable work weight	Vertical setting  ( ):with tailstock	100 (200)	125 (250)	125 (250)	175 (350)	200 (500)
Allowable load (when table is clamped)	F  N	10,800	14,400	14,400	24,800	39,200
	F×L  N·m	500	800	1,000	1,500	1,764
	F×L  N·m	780	1,900	1,900	4,700	2,450
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$  kg·m^2	0.64	1.25	1.95	4.48	9.7

CE correspondence model (excluding RNCV-B)

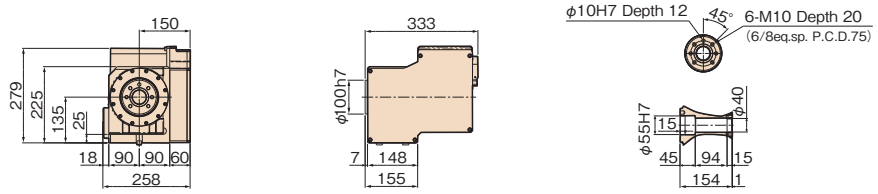
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64

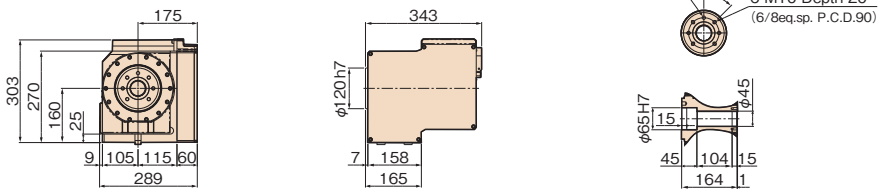
Dimensions

Unit: mm

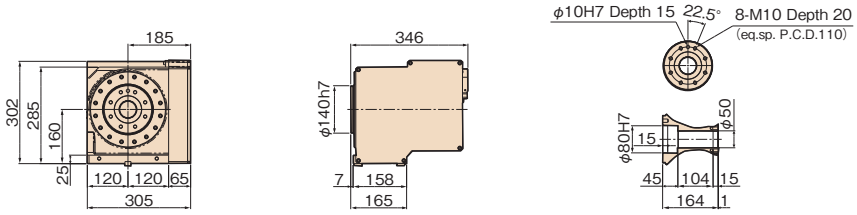
RWA-160R,B



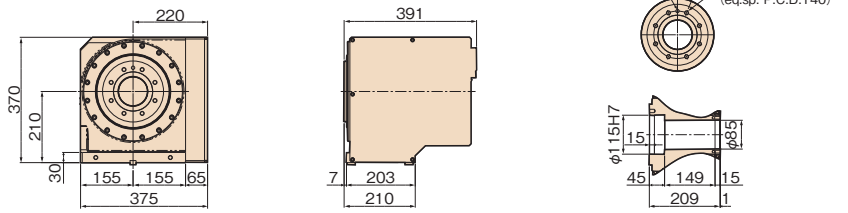
RWA-200R,B



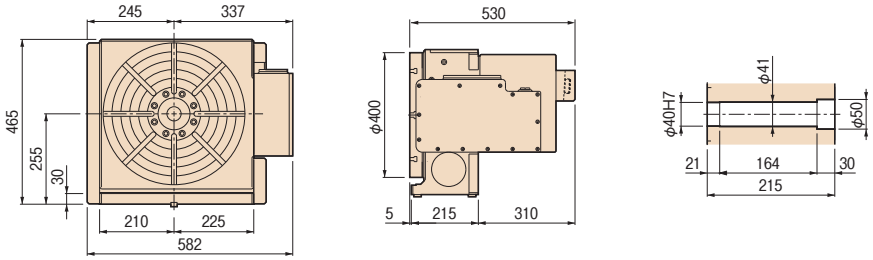
RWA-250R,B



RWA-320R,B



RNCV-401R,B



RNCV-401R,B

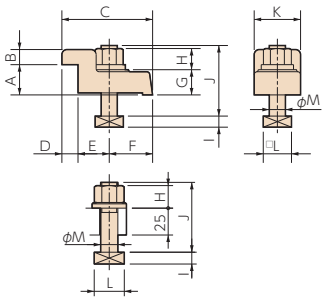
Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Clamping block and bolt

Unit: mm

	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RWA-160R,B	—	2	–	14	–	–	–	–	–	–	–	17	8	60	–	23	12
RWA-200R,B	—	2	–	18	–	–	–	–	–	–	–	21	11	65	–	28	16
RWA-250R,B	I	4	50 to 100	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RWA-320R,B	I	4	50 to 132	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RNCV-401R,B	I	4	55 to 155	18	30	15	90	16	31	43	25	21	11	70	46	28	16

Type I



Note 1: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)
Note 2: Clamping blocks are not included in the RWA-160R,B and RWA-200R,B.

Big bore type

RWB

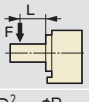
RWB- 250•320• 400•500•630

Our flagship models equipped with state-of-the-art TSUDAKOMA technology. It realizes stronger clamping torque and strength of worm gears than previous model. A larger through-bore size enables more ports number of rotary joint.

RWB-400R

Specifications

Unit: mm

		RWB-250	RWB-320	RWB-400	RWB-500	RWB-630
Handedness	R	○	○	○	○	○
	L	○	○	○	○	—
Table diameter		ϕ250	ϕ320	ϕ400	ϕ500	ϕ630
Center height		160	210	255	310	400
Center bore	Nose diameter	ϕ105H7	ϕ150H7	ϕ200H7	ϕ220H7	ϕ220H7
	Through-bore	ϕ80	ϕ120	ϕ160	ϕ181	ϕ181
Table T-slot width		12H7	14H7	14H7	18H7	18H7
Guide block width		18h7	18h7	18h7	18h7	18h7
Servo motors (for FANUC)		αiF8	αiF12	αiF12	αiF12	αiF22
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	1.27	3.53	4.63	4.25	4.36
Net weight	kg	125	250	360	620	800
Speed reduction ratio		1/90	1/120	1/120	1/180	1/180
Table max. rpm	min^{-1} (Motor rpm: 2,000min^{-1})	22.2	16.6	16.6	11.1	11.1
Indexing accuracy (the sum)	sec	14	14	14	14	14
Clamp system		Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)
Clamp torque ／Hydraulic pressure 3.5Mpa	N·m	1,300 (3.5MPa) 2,000 (4.9MPa)	3,100 (3.5MPa) 4,700 (4.9MPa)	5,500 (3.5MPa) 8,000 (4.9MPa)	7,600 (3.5MPa) 11,000 (4.9MPa)	7,600 (3.5MPa) 11,000 (4.9MPa)
Strength of worm gears	N·m	1,011	2,127	3,958	5,601	5,601
Allowable work weight	Vertical setting  kg	175	250	300	600	600
	Vertical setting (with tailstock)	350	500	600	1,200	1,200
	Vertical setting (with SSB)	900	1,500	1,800	3,600	3,600
	Horizontal setting  kg	350	500	600	1,200	1,200
Allowable load (when table is clamped)	F  N	35,000	89,000	109,000	240,000	240,000
	F×L  N·m	1,300 (3.5MPa) 2,000 (4.9MPa)	3,100 (3.5MPa) 4,700 (4.9MPa)	5,500 (MPa) 8,000 (MPa)	7,600 (3.5MPa) 11,000 (4.9MPa)	7,600 (3.5MPa) 11,000 (4.9MPa)
	F×L  N·m	1,500	5,300	7,800	17,000	17,000
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$  kg·m^2	7	19	36	112	112

CE correspondence model

For tables with a diameter of 800 or more, please order a big bore type of the following models:

Tables diameter	Model	Center bore	Specifications
ϕ 800	**RCV-800**	ϕ360	P.32
ϕ1000	**RCV-1000**	ϕ410	P.32
ϕ1250	**RCV-1250**	ϕ500	P.32

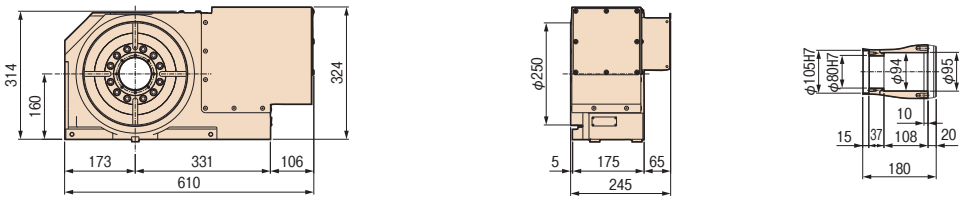
Tech.Info. Servo motors of other manufacturers P.68

Option High-precision Spec. P.64 Pull Stud P.66
Rotary Joint P.66 Air-hydraulic Booster P.67

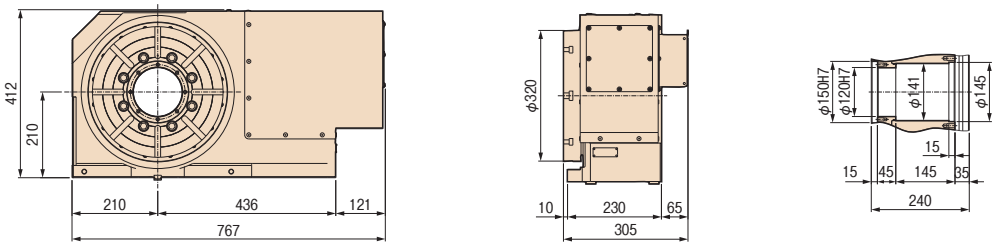
Dimensions

Unit: mm

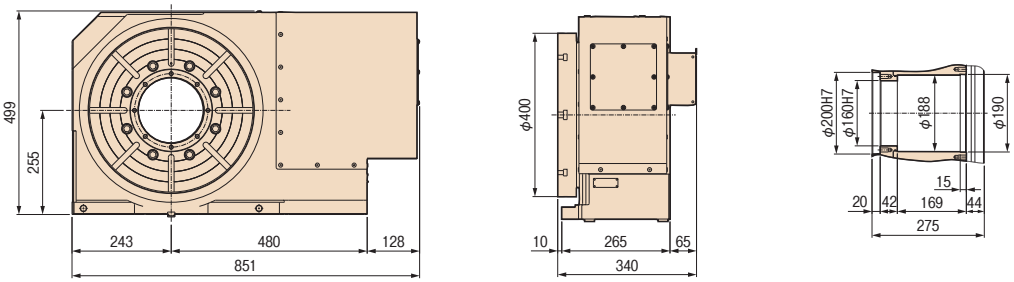
RWB-250R



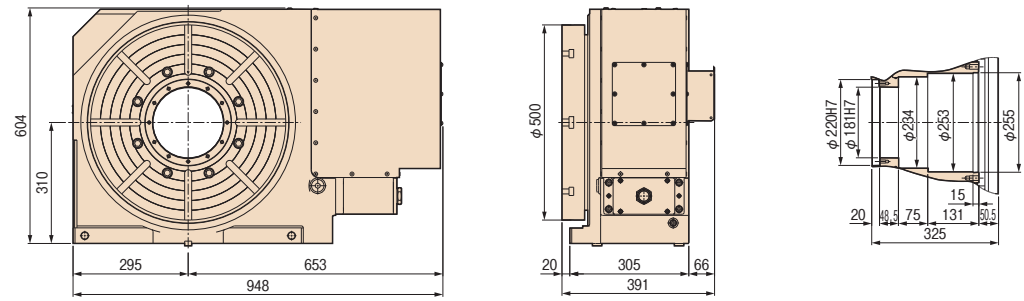
RWB-320R



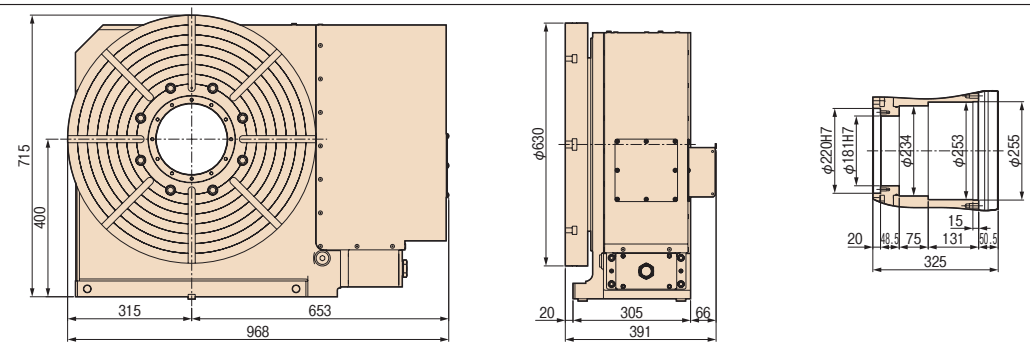
RWB-400R



RWB-500R



RWB-630



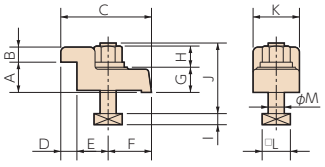
Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Clamping block and bolt

Unit: mm

	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RWB-250	I	4	50 to 125	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RWB-320	I	4	73 to 162	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RWB-400	I	4	73 to 193	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RWB-500	I	4	73 to 233	18	40	20	110	18	42	50	25	21	11	70	46	28	16
RWB-630	I	4	73 to 233	18	40	20	110	18	42	50	25	21	11	70	46	28	16

Type I



Note: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

For horizontal machining centers

RWB-K

RWB-250K•320K•400K•500K

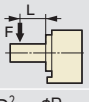
RNCK RNCK-631

Flagship model with highest-class specifications exclusively for horizontal machining centers. A popular for the aircraft, automobile and cutting tool industries. A larger through-bore size enables more ports number of rotary joint than previous model.


RWB-400K

Specifications

Unit: mm

		RWB-250K	RWB-320K	RWB-400K	RWB-500K	RNCK-631
Table diameter		ϕ250	ϕ320	ϕ400	ϕ500	ϕ630
Center height		160	210	255	310	400
Center bore	Nose diameter	ϕ105H7	ϕ150H7	ϕ200H7	ϕ220H7	ϕ60H6
	Through-bore	ϕ80	ϕ120	ϕ160	ϕ181	ϕ60
Table T-slot width*1		12H7	14H7	14H7	18H7	18H7
Guide block width		18h7	18h7	18h7	18h7	18h7
Servo motors (for FANUC)		αiF8	αiF12	αiF12	αiF12	αiF12
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	1.27	3.53	4.63	4.25	5.55
Net weight	kg	130	250	370	590	800
Speed reduction ratio		1/90	1/120	1/120	1/180	1/180
Table max. rpm	min^{-1} (Motor rpm: 2,000min^{-1})	22.2	16.6	16.1	11.1	11.1
Indexing accuracy (the sum)	sec	14	14	14	14	15
Clamp system		Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)
Clamp torque ／Hydraulic pressure 3.5Mpa	N·m	1,300 (3.5MPa) 2,000 (4.9MPa)	3,100 (3.5MPa) 4,700 (4.9MPa)	5,500 (3.5MPa) 8,000 (4.9MPa)	7,600 (3.5MPa) 11,000 (4.9MPa)	4,410 (3.5MPa)
Strength of worm gears	N·m	1,011	2,127	3,958	5,601	4,116
Allowable work weight	Vertical setting  kg	175	250	300	600	400
	Vertical setting (with tailstock)	350	500	600	1,200	800
	Vertical setting (with SSB)	900	1,500	1,800	3,600	—
Allowable load (when table is clamped)	F  N	35,000	89,000	109,000	240,000	49,000
	F×L  N·m	1,300 (3.5MPa) 2,000 (4.9MPa)	3,100 (3.5MPa) 4,700 (4.9MPa)	5,500 (MPa) 8,000 (MPa)	7,600 (3.5MPa) 11,000 (4.9MPa)	4,410
	F×L  N·m	1,500	5,300	7,800	17,000	7,840
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$  kg·m^2	7	19	36	112	49.6

CE correspondence model (excluding RNCK)

For tables with a diameter of 800 or more, please order a big bore type of the following models:

Tables diameter	Model	Center bore	Specifications
ϕ 800	RCV-800 (Motor mounted on top)	ϕ360	P.32
ϕ1000	RCV-1000 (Motor mounted on top)	ϕ410	P.32
ϕ1250	RCV-1250 (Motor mounted on top)	ϕ500	P.32

Note: For the RNCK-631, a basic model (for vertical machining centers) is also available. (for standard bore)

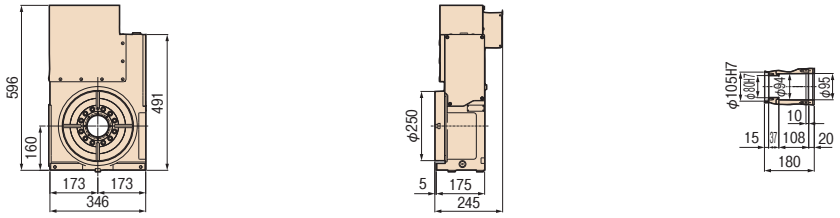
Tech.Info. Servo motors of other manufacturers P.68

Option
High-precision Spec. P.64
Pull Stud P.66
Rotary Joint P.66
Air-hydraulic Booster P.67

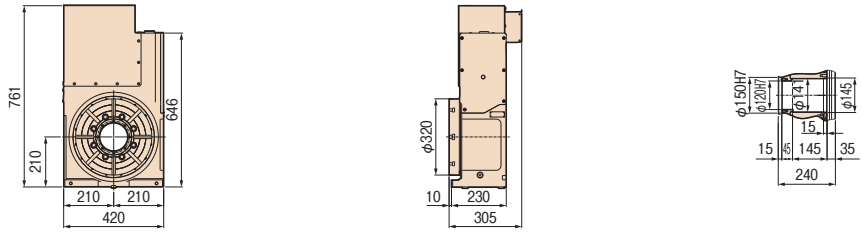
Dimensions

Unit: mm

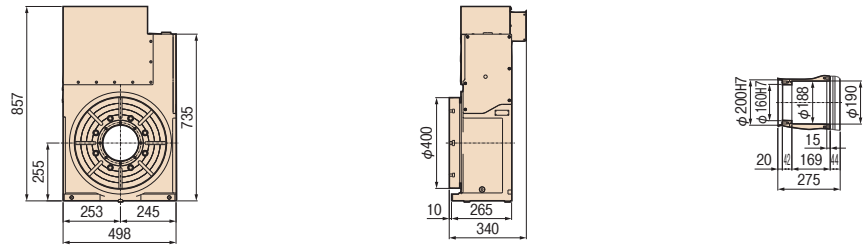
RWB-250K



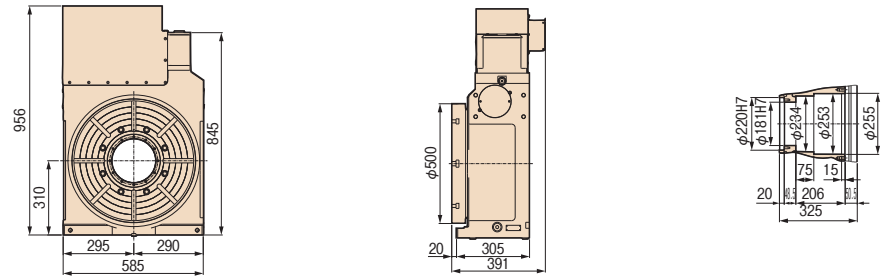
RWB-320K



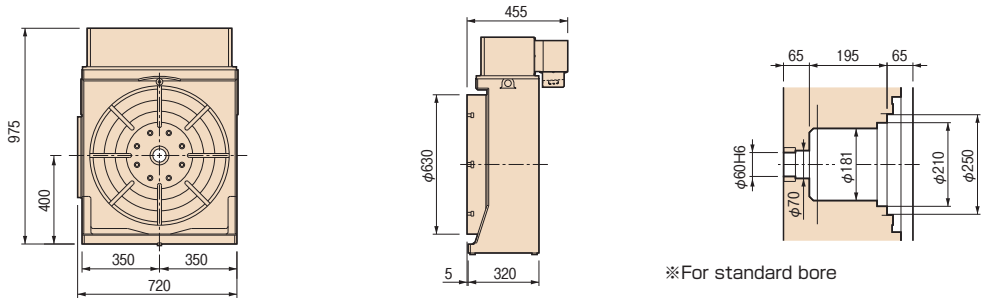
RWB-400K



RWB-500K



RNCK-631



※For standard bore

Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

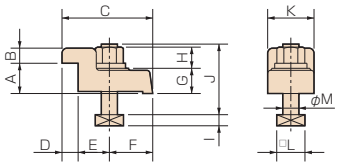
Clamping block and bolt

Unit: mm

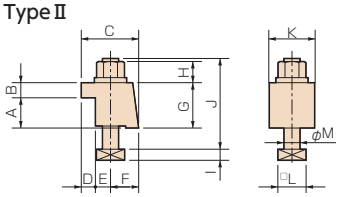
	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RWB-250K	I	4	50 to 125	18	25	12	80	12	33	35	22	21	11	65	40	28	16
RWB-320K	I	4	73 to 162	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RWB-400K	I	4	73 to 160	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RWB-500K	I	4	73 to 200	18	40	20	110	18	42	50	25	21	11	70	46	28	16
RNCK-631	II	4	100 to 255	18	40	18	63	18	15	30	58	21	11	105	60	28	16

Note: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

Type I



Type II



Big bore type

RCB RCB-350•450•550

Main spindle with highly rigid bearings and table with high overall rigidity enable machining of hard materials such as aircraft components. Machining at a position closer to the face plate is made possible by inserting the workpiece through the large bore.

RCB-550R

Specifications

Unit: mm

		RCB-350	RCB-450	RCB-550
Handedness	R	○	○	○
	L	—	—	—
	K	○	○	○
Table diameter		ϕ350	ϕ450	ϕ550
Center height		255	310	350
Center bore	Nose diameter	ϕ245H7	ϕ295H7	ϕ345H7
	Through-bore	ϕ216	ϕ265	ϕ315
Table T-slot width		14H7	14H7	18H7
Guide block width		18h7	18h7	18h7
Servo motors (for FANUC)		αiF12	αiF22	αiF22
Inertia converted into motor shaft	$\times 10^{-3}$kg·m^2	3.48	6.14	5.84
Net weight	kg	330	520	720
Speed reduction ratio		1/90	1/90	1/120
Table max. rpm	min^{-1} (Motor rpm: 2,000min^{-1})	22.2	22.2	16.6
Indexing accuracy (the sum)	sec	15	15	15
Clamp system		Hydraulic	Hydraulic	Hydraulic
Clamp torque ／hydraulic pressure 3.5MPa	N·m	3,300	4,700	6,500
Strength of worm gears	N·m	1,942	3,276	4,716
Allowable work weight	Vertical setting ( ):with tailstock  kg	400 (800)	700 (1,400)	1,000 (2,000)
Allowable load (when table is clamped)	F  N	50,000	85,000	150,000
	F×L  N·m	3,300	4,700	6,500
	F×L  N·m	3,600	7,300	15,000
Allowable work inertia	$J=\frac{W \cdot D^2}{8}$  kg·m^2	6.1	17.7	37.8

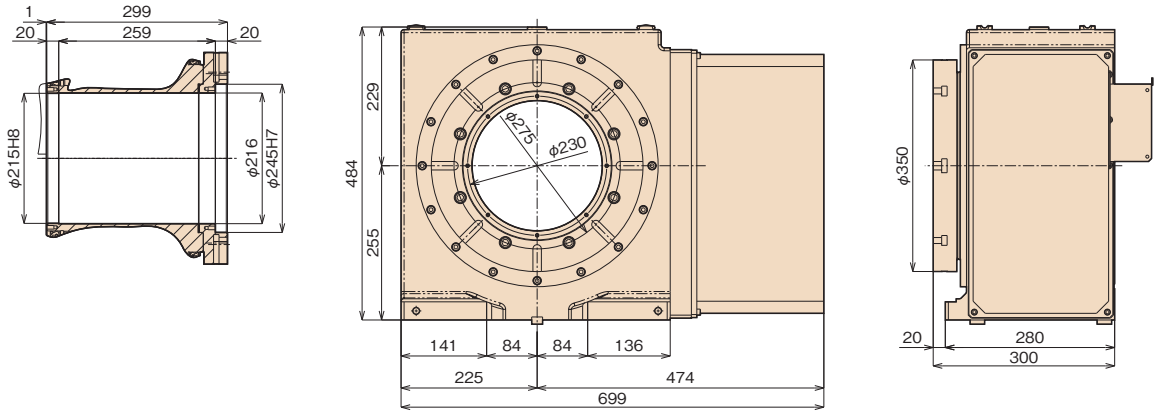
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option Air-hydraulic Booster P.67

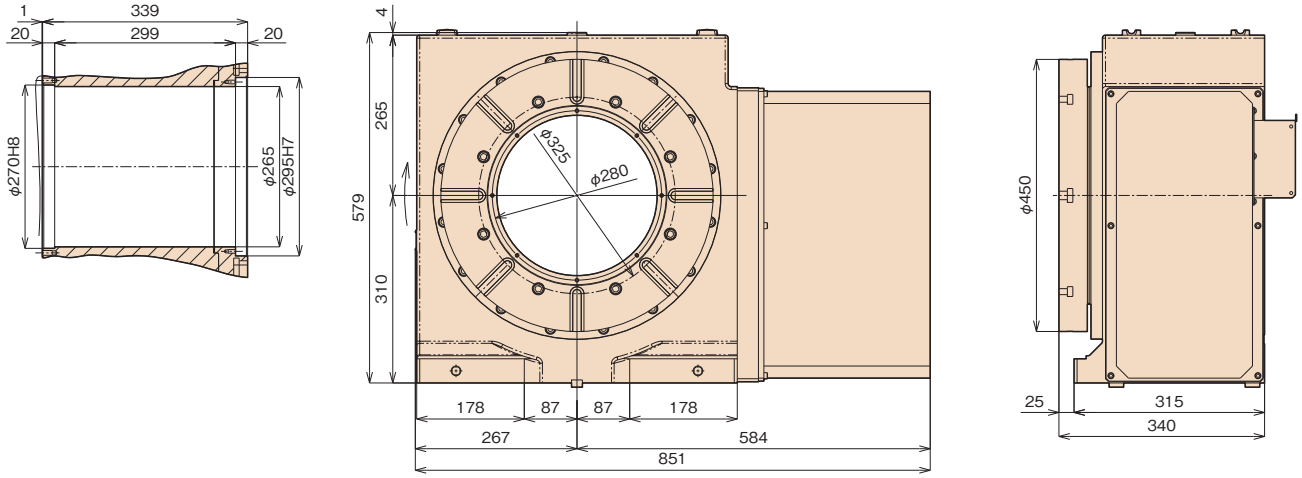
Dimensions

Unit: mm

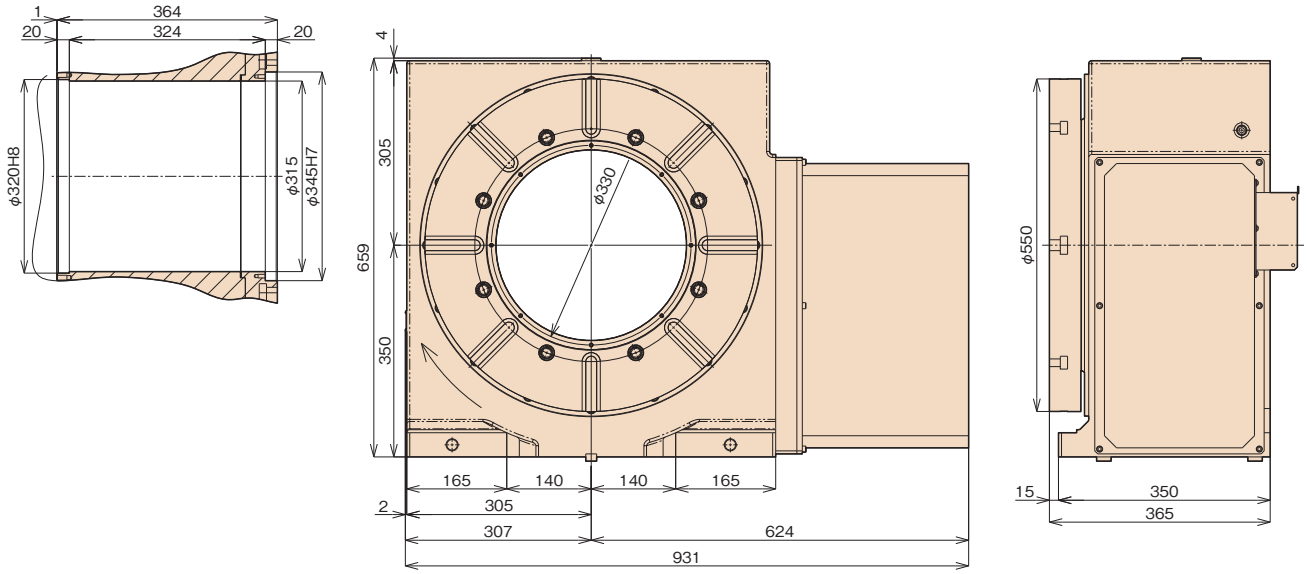
RCB-350R



RCB-450R



RCB-550R



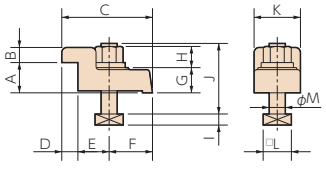
Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Clamping block and bolt

Unit: mm

	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RCB-350	I	4	107 to 197	18	30	15	90	16	31	43	25	21	11	70	46	28	16
RCB-450	I	4	113 to 242	18	40	20	110	18	42	50	25	21	11	70	46	28	16
RCB-550	I	4	163 to 282	18	40	20	110	18	42	50	25	21	11	70	46	28	16

Type I



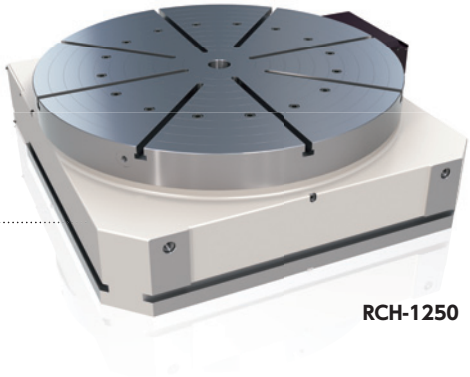
Note: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

For horizontal setting

RCH RCH-800•1000•1250

RNC RNC-1501•2001

Horizontal large-capacity model with high rigidity is good for machining heavy workpieces with large size double column and 5-face M/C.



RCH-1250

Specifications

Unit: mm

	RCH-800	RCH-1000	RCH-1250	RNC-1501	RNC-2001
Table diameter ( ) : option	φ800 (φ1,000)	φ1,000 (φ1,200)	φ1,250 (φ1,500)	φ1,500	φ2,000
Table height	320	330	410	400	620
Center bore / Nose diameter	φ75H7×30	φ75H7×30	φ75H7×30	φ75H7	φ225H7
Table T-slot width	18H7	22H7	22H7	28H7	28H7
Guide block width	22h7	22h7	22h7	—	—
Servo motors (for FANUC)	αiF12	αiF22	αiF22	αiF22	αiF30
Inertia converted into motor shaft ×10^{-3}kg·m^2	4.72	8.24	5.04	5.6	17.2
Net weight kg	1,150	1,700	3,100	3,600	8,000
Speed reduction ratio	1/360	1/360	1/720	1/720	1/720
Table max. rpm min^{-1} (Motor rpm: 2,000min^{-1})	5.5	5.5	2.7	2.7	2.7
Indexing accuracy (the sum) sec	15	15	15	15	15
Clamp system	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)
Clamp torque ／Hydraulic pressure 3.5Mpa N·m	16,000	20,000	33,000	9,800	19,600
Strength of worm gears N·m	7,840	13,230	25,000	21,560	49,000
Allowable work weight Horizontal setting kg	4,000	7,000	14,000	8,000	10,000
Allowable load (when table is clamped) F N	100,000	185,000	383,000	49,000	58,800
Allowable load (when table is clamped) F×L N·m	16,000	20,000	33,000	9,800	19,600
Allowable load (when table is clamped) F×L N·m	11,600	22,900	56,700	24,500	34,300
Allowable work inertia $J=\frac{W \cdot D^2}{8}$ kg·m^2	320	874	2,734	2,255	4,900

CE correspondence model (excluding RNC)

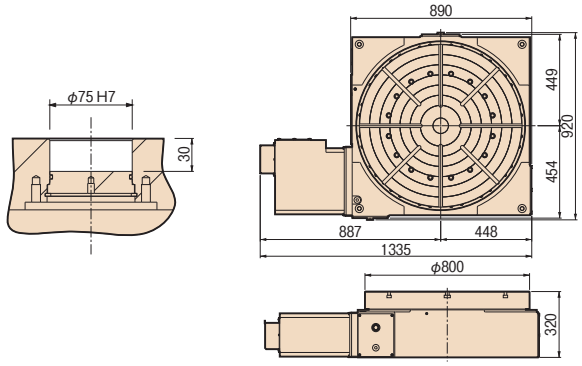
Tech.Info. Servo motors of other manufacturers P.68

Option High-precision Spec. P.64 Air-hydraulic Booster P.67

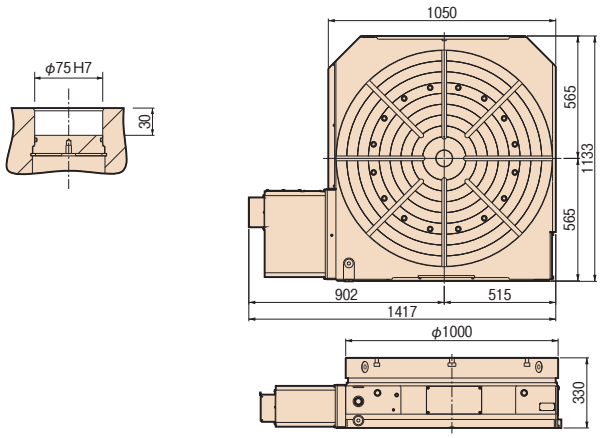
Dimensions

Unit: mm

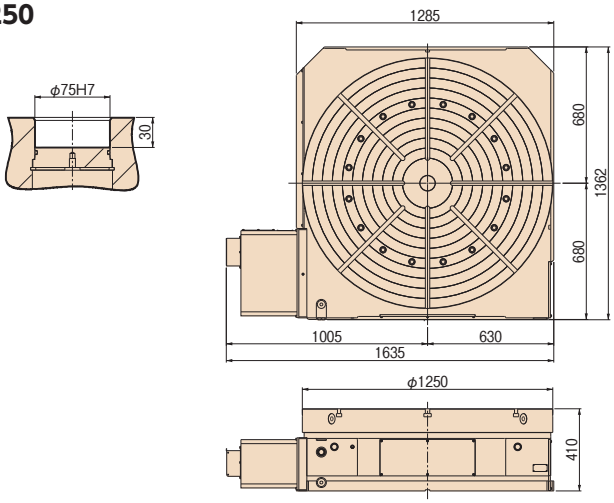
RCH-800



RCH-1000



RCH-1250



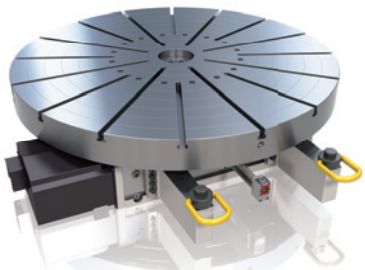
Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

RNC-2001

Large NC rotary table with a diameter of 2,000mm.
Used for the position detecting device for controlling the posture of artificial satellites and other devices.
Indexing accuracy: ±3 sec
Minimal angular indication: 0.5 sec

RTH-911

Large NC rotary table with a faceplate diameter of 2,000 mm



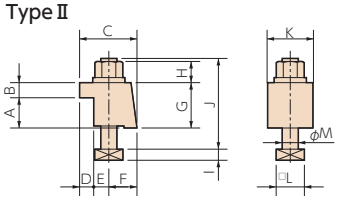
Clamping block and bolt

Unit: mm

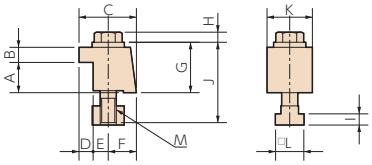
	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RCH-800	Ⅱ	4	80 to 400	22	40	20	85	24	20	41	60	27	13	115	80	32	20
RCH-1000	Ⅱ	4 to 8	80 to 320	22	40	20	85	24	20	41	60	27	13	115	80	32	20
RCH-1250	Ⅱ	4 to 8	80 to 450	22	50	20	74	20	18	36	70	27	13	130	70	32	20
RNC-1501	Ⅳ	4 to 8	80 to 255	28	50	20	74	20	18	36	77	15	17.5	120	70	41.3	24

Note: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

Type Ⅱ



Type Ⅳ



Horizontal motor mounting type

RCV RCV-800•1000•1250•1600

Standard model with the motor mounted horizontally onto the side of the body. A powerful hydraulic clamping mechanism is also equipped with this model.

RCV-1250R

Specifications

Unit: mm

		RCV-800	RCV-1000	RCV-1250	RCV-1600
Handedness	R	○	○	○	○
	L	—	—	—	—
	K	○	○	○	○
Table diameter ( ):option		φ800 (φ1,000)	φ1,000 (φ1,200)	φ1,250 (φ1,500)	φ1,600
Center height		530	625	775	950
Center bore	Nose diameter	φ360H7×45	φ410H7×75	φ500H7×25	φ67H7
	Through-bore	φ310	φ360	φ450	—
Table T-slot width		18H7	22H7	22H7	28H7
Guide block width		22h7	22h7	22h7	22h7
Servo motors (for FANUC)		αiF12	αiF22	αiF22	αiF22
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	4.89	8.24	5.04	6.14
Net weight	kg	1,350	2,500	4,200	7,200
Speed reduction ratio		1/360	1/360	1/720	1/720
Table max. rpm (Motor rpm: 2,000min^{-1})	min^{-1}	5.5	5.5	2.7	2.7
Indexing accuracy (the sum)	sec	15	15	15	15
Clamp system		Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic
Clamp torque ／Hydraulic pressure 3.5Mpa	N·m	16,000	20,000	33,000	41,000
Strength of worm gears	N·m	7,840	13,230	25,000	25,000
Allowable work weight — Vertical setting ( ):with tailstock	kg	2,000 (4,000)	3,500 (7,000)	7,000 (14,000)	10,000 (20,000)
Allowable work weight — Horizontal setting	kg	4,000	7,000	14,000	20,000
Allowable load (when table is clamped) — F	N	100,000	185,000	383,000	754,000
Allowable load (when table is clamped) — F×L	N·m	16,000	20,000	33,000	41,000
Allowable load (when table is clamped) — F×L	N·m	11,600	22,900	56,700	153,000
Allowable work inertia $J=\frac{W\cdot D^2}{8}$	kg·m^2	320	874	2,734	6,400

CE correspondence model

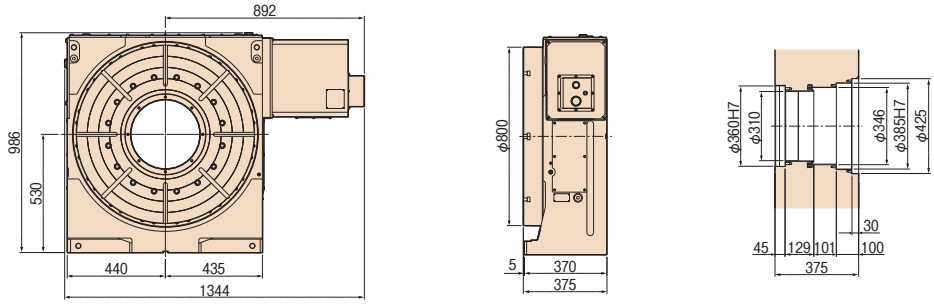
Tech.Info. Servo motors of other manufacturers P.68

Option High-precision Spec. P.64 Air-hydraulic Booster P.67

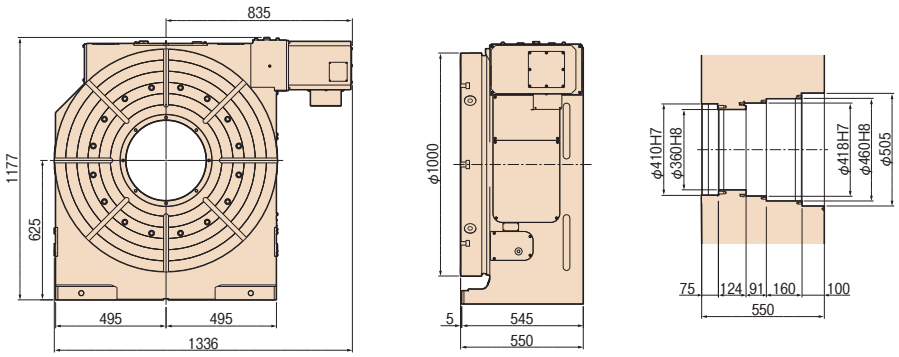
Dimensions

Unit: mm

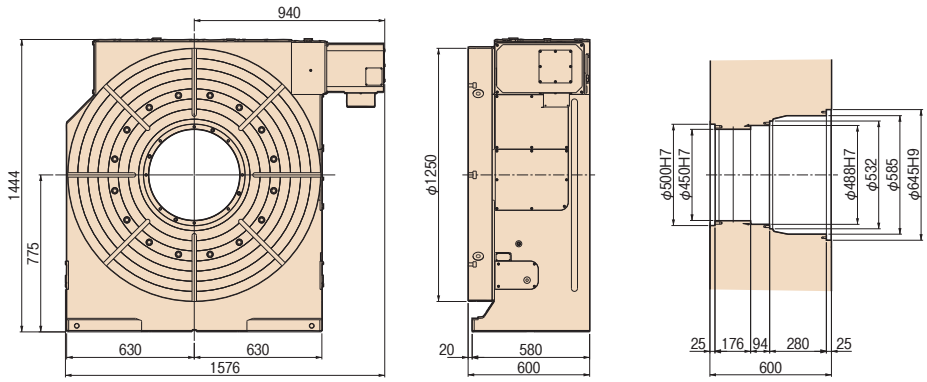
RCV-800R



RCV-1000R



RCV-1250R

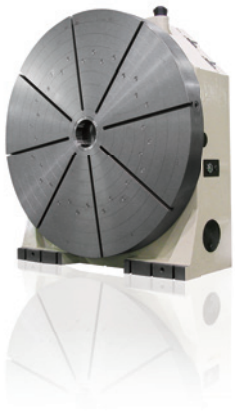


Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Specialty rotary table

Largest Vertical NC Rotary Table

Table diameter : ϕ 2,000 mm
Allowable work weight : 30 t
(with support spindle)
Indexing accuracy : 15 sec



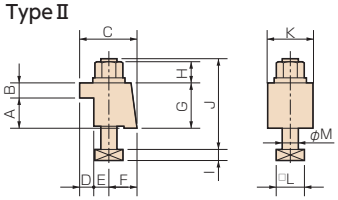
Clamping block and bolt

Unit: mm

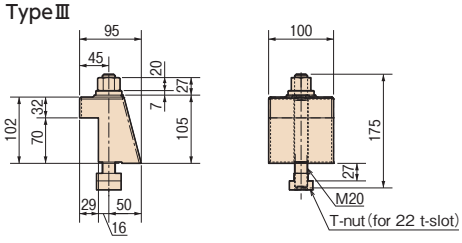
	Type	Q'ty	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
RCV-800	Ⅱ	4	80 to 350	22	60	28	95	29	16	50	88	27	13	145	100	32	20
RCV-1000	Ⅱ	4	80 to 400	22	60	28	95	29	16	50	88	27	13	145	100	32	20
RCV-1250	Ⅱ	8	—	22	60	28	95	29	16	50	88	27	13	145	100	32	20
RCV-1600	Ⅲ	10	—	22	See below												

Note: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

Type Ⅱ



Type Ⅲ



Multi-spindle Type

RWM

RWM-160-2/3/4
RWM-200-2/3/4
RWM-250-2/3/4
RWM-320-2/3/4

RWM-160R-2,PS

High-productivity model for multi-piece/multi-face machining. The RWM-160, the smallest of the RN-series, assures the fastest operation and meets the requirements for drilling and tapping machines.

Specifications

Unit: mm

		RWM-160			RWM-200			RWM-250			RWM-320		
Handedness	R	○			○			○			○		
	L	○			○			○			○		
Spindle diameter		φ100h7			φ120h7			φ140h7			φ180h7		
Table diameter		φ160、φ200 (Option)			φ200、φ250 (Option)			φ250 (Option)			φ320 (Option)		
Distance between spindles		215 or 250			250 or 320			320 or 400			400 or 500		
Center height		135			160			160			210		
Center bore	Nose diameter	φ55H7			φ65H7			φ80H7			φ115H7		
	Through-bore	φ40			φ45			φ50			φ85		
Guide block width		14h7			18h7			18h7			18h7		
Servo motors (for FANUC)		αiF4	αiF8		αiF8			αiF8			αiF8		
Number of axis		2-axis	3-axis	4-axis	2-axis	3-axis	4-axis	2-axis	3-axis	4-axis	2-axis	3-axis	4-axis
Inertia converted into motor shaft $\times 10^{-3}$kg·m^2 (When spindle pitch is minimum)		0.31	0.43	0.56	0.46	0.64	0.85	0.55	0.82	1.09	1.07	1.61	2.15
Net weight (When spindle pitch is minimum and with base plate)	kg	105	150	200	155	225	295	210	310	435	380	600	880
Speed reduction ratio		1/72			1/72			1/120			1/120		
Table max. rpm (Motor rpm: 3,000min^{-1})	min^{-1}	41.6			41.6			16.6			16.6		
Clamp system		Pneumatic			Pneumatic			Pneumatic			Pneumatic		
Clamp torque ／pneumatic pressure 0.49MPa	N·m	500			800			1,000			1,500		
Indexing accuracy (the sum)	sec	25			20			20			20		
Strength of worm gears	N·m	206			288			596			939		
Allowable work weight	Vertical setting  ( ):with tailstock	kg/axis	100 (200)			125 (250)			125 (250)			175 (350)	
Allowable load (when table is clamped)	F 	N	10,800			14,400			14,400			24,800	
	F×L 	N·m	500			800			1,000			1,500	
	F×L 	N·m	780			1,900			1,900			4,700	
Allowable work inertia (per single-axis)	$J=\frac{W \cdot D^2}{8}$ 	kg·m^2	0.64			1.25			1.95			4.48	

CE correspondence model

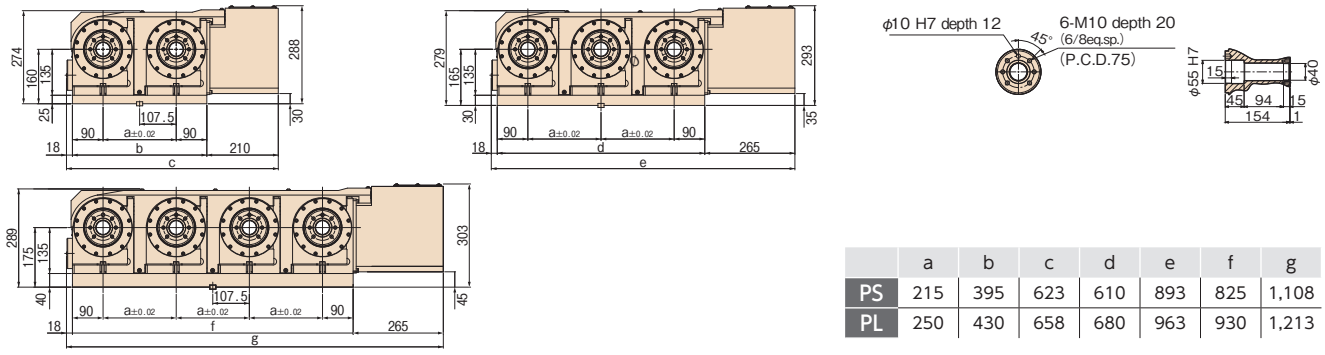
Tech.Info. Servo motors of other manufacturers P.68

Option Rotary Joint P.66

Dimensions

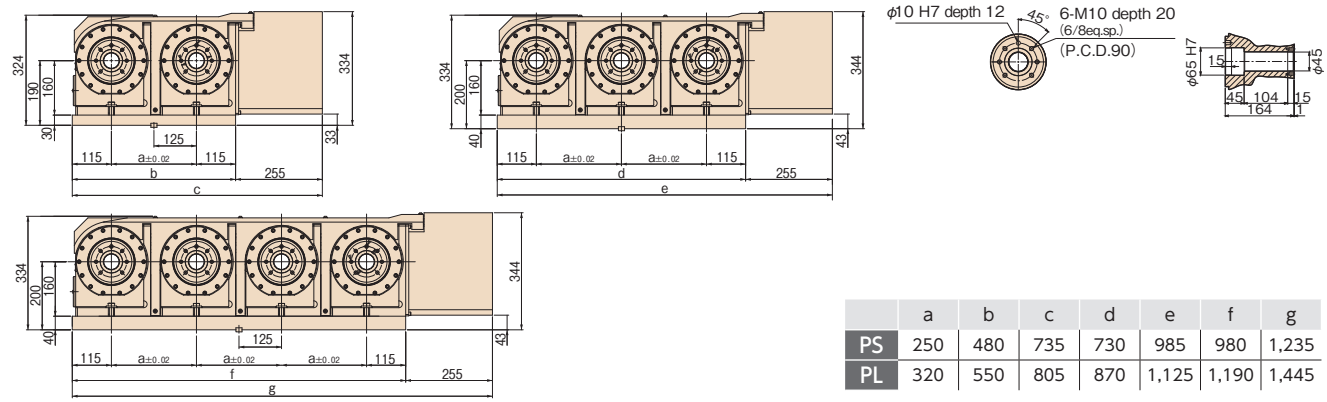
Unit: mm

RWM-160R-2/3/4



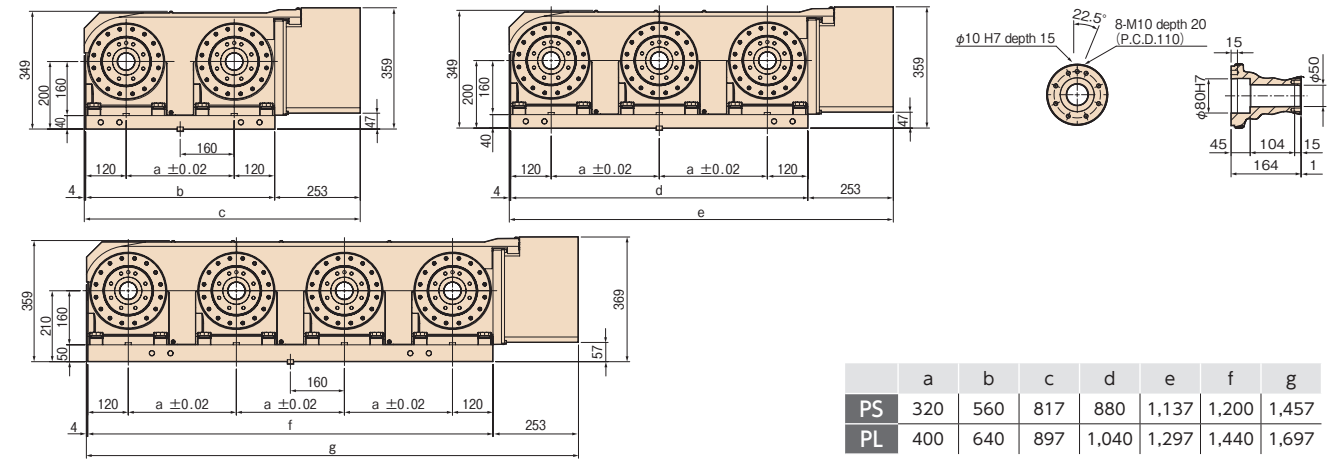
	a	b	c	d	e	f	g
PS	215	395	623	610	893	825	1,108
PL	250	430	658	680	963	930	1,213

RWM-200R-2/3/4



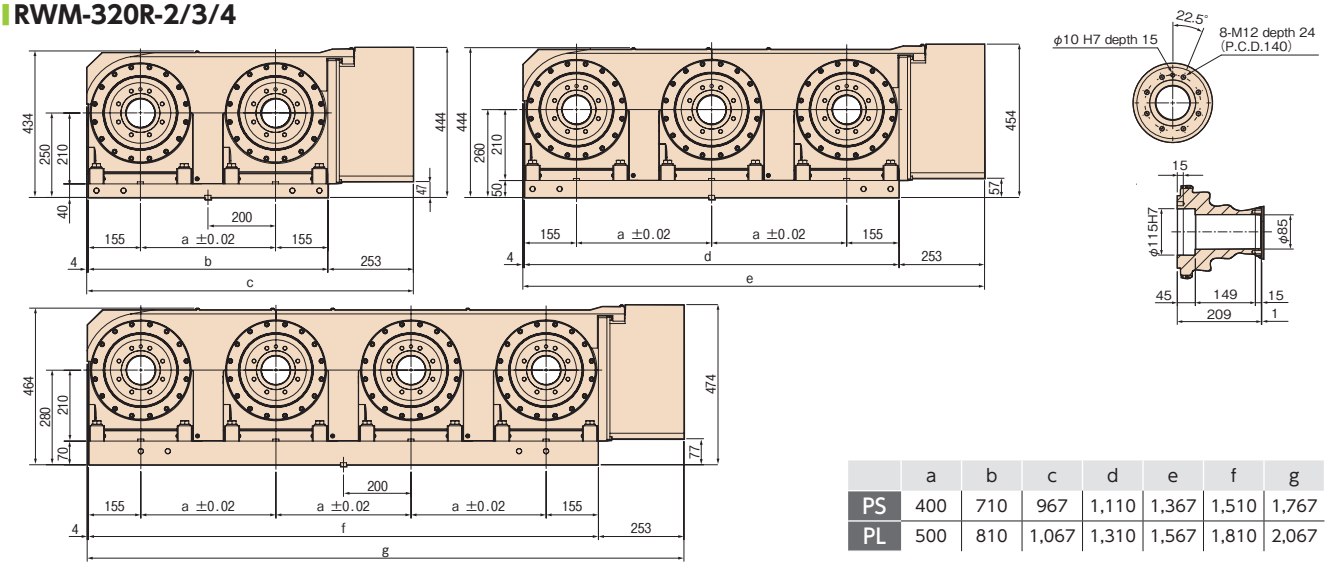
	a	b	c	d	e	f	g
PS	250	480	735	730	985	980	1,235
PL	320	550	805	870	1,125	1,190	1,445

RWM-250R-2/3/4



	a	b	c	d	e	f	g
PS	320	560	817	880	1,137	1,200	1,457
PL	400	640	897	1,040	1,297	1,440	1,697

RWM-320R-2/3/4



	a	b	c	d	e	f	g
PS	400	710	967	1,110	1,367	1,510	1,767
PL	500	810	1,067	1,310	1,567	1,810	2,067

Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Standard type

TWA/TN

TWA-100•130•160•200
TN-320•450

Compact tables for speedy and powerful five-axis machining.
TWA-100 and TWA-130 are the most suitable models for drilling and tapping machines.

TWA-130

Specifications

Unit: mm

		TWA-100	TWA-130	TWA-160	TWA-200	TN-320	TN-450
Tilt range		−17° to +107°	−17° to +107°	−30° to +110°	−30° to +110°	−30° to +110°	−10° to +95°
Spindle diameter		ϕ86h7	ϕ90h7	ϕ100h7	ϕ120h7	—	—
Table diameter		ϕ135 (Option)	ϕ135 (Option)	ϕ160 or 200 (Option)	ϕ200 or 250 (Option)	ϕ320	ϕ450
Table height at 0° position		180 (205 w/face plate)	210 (235 w/face plate)	235 (260 w/face plate)	270 (300 w/face plate)	355	425
Center height at 90° position		135	150	180	210	255	425
Center bore	Nose diameter	ϕ55H7 (ϕ40H7 w/face plate)	ϕ55H7 (ϕ40H7 w/face plate)	ϕ55H7 (ϕ50H7 w/face plate)	ϕ65H7 (ϕ60H7 w/face plate)	ϕ105H7	ϕ170H7
	Through-bore	ϕ35	ϕ37	ϕ40	ϕ45	ϕ102	ϕ136
Table T-slot width		12H8 (w/face plate)	12H8 (w/face plate)	12H8 (w/face plate)	12H8 (w/face plate)	14H7	14H7
Guide block width		14h7	14h7	18h7	18h7	18h7	18h7
Servo motors (for FANUC)		Rotary axis: αiS2	Tilt axis: αiS2	Rotary axis: αiS2	Tilt axis: αiS2	Rotary axis: αiS2	Tilt axis: αiS2
		Rotary axis: αiS2	Tilt axis: αiS2	Rotary axis: αiS2	Tilt axis: αiS2	Rotary axis: αiF4	Tilt axis: αiF4
		Rotary axis: αiF8	Tilt axis: αiF8	Rotary axis: αiF22	Tilt axis: αiF22		
Inertia converted into motor shaft	×10⁻³kg·m²	0.072	0.078	0.074	0.072	0.17	0.18
		0.38	0.45	0.82	0.45	5.34	3.00
Speed reduction ratio		1/60	1/120	1/60	1/120	1/72	1/120
		1/45	1/90	1/120	1/240	1/90	1/180
Table max. rpm (Motor rpm: 2,000min⁻¹)	min⁻¹	41.6 (Motor rpm: 2,500min⁻¹)	16.6	41.6 (Motor rpm: 2,500min⁻¹)	16.6	27.7	16.6
		44.4	22.2	16.6	8.3	22.2	11.1
Clamp system Supplied pressure		Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic	Pneumatic
		Pneumatic	Pneumatic	Pneumatic	Pneumatic	Hydraulic	Hydraulic
		Hydraulic	Hydraulic	Hydraulic	Hydraulic		
Clamp torque / pneumatic pressure 0.49MPa•hydraulic pressure 3.5MPa	N·m	200	300	500	500	500	800
		800	1,000	2,200	2,200	3,700	7,400
Indexing accuracy (the sum)	arc sec	40	—	40	—	30	—
		30	—	20	—	15	—
Tilting accuracy Tilt 0° to 90°	arc sec	—	45	—	45	—	45
		—	45	—	45	—	90
Net weight	kg	75		85		135	
		195		440		1,200	
Strength of worm gears (Rotary axis)	N·m	152		152		200	
		450		931		1,940	
Allowable work weight: 0° (Horizontal)	kg	35		35		60	
		120		150		500	
Allowable work weight: 0° to 90° (Tilting)	kg	20		20		40	
		70		100		300	
Allowable work moment: W×L	N·m	24		24		39.2	
		53.7		163.3		288.2	
Allowable load (when table is clamped): F	N	3,920		3,920		7,840	
		13,720		19,600		39,200	
Allowable load (when table is clamped): F×L	N·m	200		500		500	
		800		2,200		3,700	
Allowable load (when table is clamped): F×L	N·m	300		500		800	
		1,000		2,200		7,400	
Allowable work inertia: $J=\frac{W \cdot D^2}{8}$	kg·m²	0.08		0.08		0.19	
		0.59		1.53		9.38	

CE correspondence model (excluding TN)

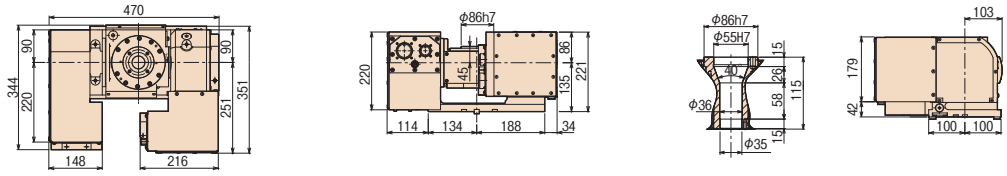
Tech.Info. Servo motors of other manufacturers P.68 When assembling a faceplate or a fixture with the main spindle P.79

Option High-precision Spec. P.64 Pull Stud P.66 Rotary Joint P.66

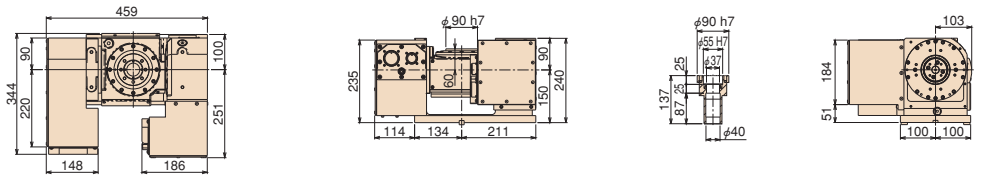
Dimensions

Unit: mm

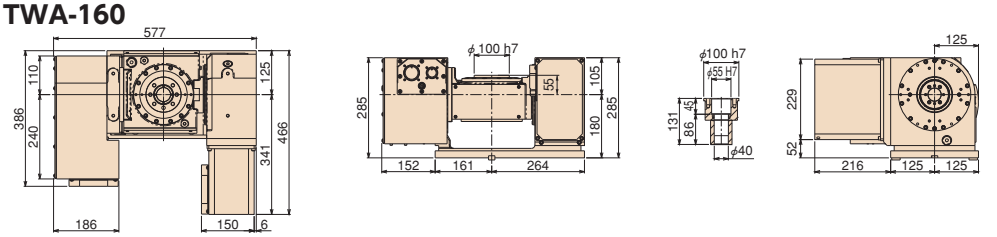
TWA-100



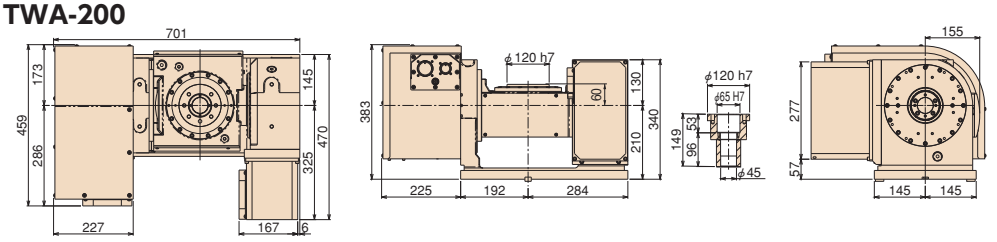
TWA-130



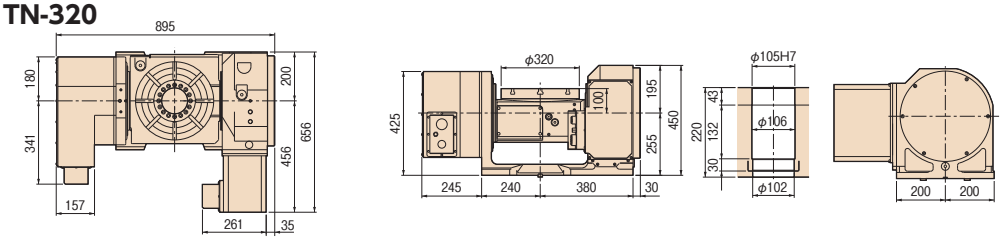
TWA-160



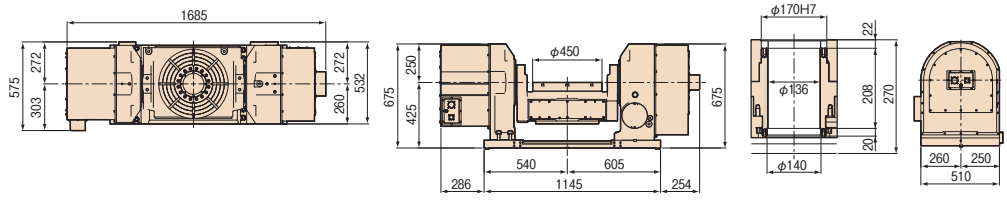
TWA-200



TN-320



TN-450



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

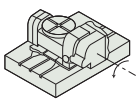
Clamping block and bolt

Unit: mm

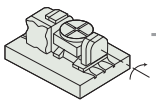
	Type	Q'ty	Layout	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
TWA-100	I	4	a b	40 to 160 *	14	20	12	70	10	35	25	20	12	8	50	35	23	12
TWA-130	I	4	a b	40 to 190 *	14	20	12	70	10	35	25	20	17	8	55	35	23	12
TWA-160	I	4	a b	78 to 150 63 to 117	18	20	12	70	10	35	25	17	15	11	55	35	28	16
TWA-200	I	4	a b	80 to 180 78 to 125	18	25	12	80	12	33	35	22	21	11	65	40	28	16
TN-320	I	4	a b	140 to 190 95 to 180	18	25	12	80	12	33	35	22	21	11	65	40	28	16
TN-450	Ⅳ	4	a b	80 to 250 *	18	50	20	74	20	18	36	75	10	11	105	70	28	16

Note 1: *In the case of layout b, contact us for the details about mounting.
Note 2: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

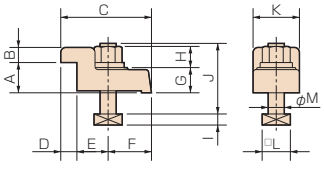
Layout a



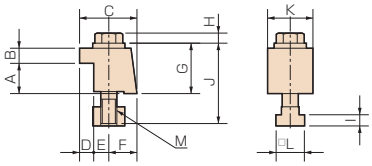
Layout b



Type I



TypeⅣ

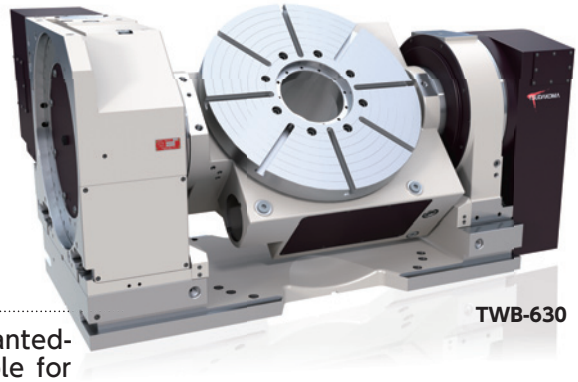


Standard type

TWB

TWB-320•630•1000

TTNC TTNC-1500


TWB-630

Large tilting models that enable 5-face machining and slanted-hole machining with single chucking of workpiece. Suitable for machining of component parts for heavy industries such as aircraft, power generator and construction machine industry.

Specifications

Unit: mm

		TWB-320		TWB-630		TWB-1000		TTNC-1500*1	
Tilt range		−30° to +110°		−110° to +110°		−30° to +110°		−5° to +95°	
Table diameter		ϕ320		ϕ630		ϕ1,000		ϕ1,500	
Table height at 0° position		355		585		650		1,155	
Center height at 90° position		255		450		650		1,055	
Center bore	Nose diameter	ϕ105H7		ϕ220H7		ϕ360H7		ϕ75H7	
	Through-bore	ϕ80		ϕ181		ϕ310		—	
Table T-slot width		14H7		18H7		18H7		28H7	
Guide block width		18h7		18h7		—		—	
Servo motors (for FANUC)		Rotary axis	Tilt axis	Rotary axis	Tilt axis	Rotary axis	Tilt axis	Rotary axis	Tilt axis
		αiF8	αiF12	αiF12	αiF12	αiF12	αiF30	TPC5-SR30	TPC5-SR30
Inertia converted into motor shaft	$\times10^{-3}$kg·m^2	1.8	2.95	3.45	2.13	5.24	7.01	5.37	7.46
Speed reduction ratio		1/90	1/120	1/180	1/360	1/360	1/360	1/720	1/1,440
Table max. rpm (Motor rpm: 2,000min^{-1})	min^{-1}	22.2	16.6	16.6 (Motor rpm: 3,000min^{-1})	8.3 (Motor rpm: 3,000min^{-1})	8.3	5.5	1.38 (Motor rpm: 1,000min^{-1})	0.69 (Motor rpm: 1,000min^{-1})
Clamp system Supplied pressure		Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic or air-hydraulic (Option)	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Clamp torque	N·m	2,200 (3.5MPa) 3,000 (4.9MPa)	3,100 (3.5MPa) 4,700 (4.9MPa)	7,600 (3.5MPa)	13,100 (3.5MPa)	16,000 (3.5MPa)	32,000 (3.5MPa)	12,000 (3.5MPa)	25,000 (3.5MPa)
Indexing accuracy (the sum)	arc sec	20	—	15	—	15	—	20	—
Tilting accuracy Tilt 0° to 90°	arc sec	—	60	—	60	—	60	—	45
Net weight	kg	470		1,750		6,000		12,000	
Strength of worm gears (Rotary axis)	N·m	1,011		5,601		7,840		21,560	
Allowable work weight	0° (Horizontal) W	kg	350		1,000		4,000		2,500
	0° to 90° (Tilting) W	kg	175		500		2,000		1,500
Allowable work moment	W×L W	N·m	190		2,000		5,360		7,840
Allowable load (when table is clamped)	F F	N	35,000		34,000		100,000		49,000
	F×L F L	N·m	2,200 (3.5MPa) 3,000 (4.9MPa)		7,600		16,000		12,000
	F×L F L	N·m	3,100 (3.5MPa) 4,700 (4.9MPa)		13,100		32,000		25,000
Allowable work inertia	$J=\frac{W\cdot D^2}{8}$ ϕD W	kg·m^2	2		50		320		2,255

CE correspondence model (excluding TTNC)

＊1 Above specifications are for one of experienced production. Those might be changed depending on use conditions.

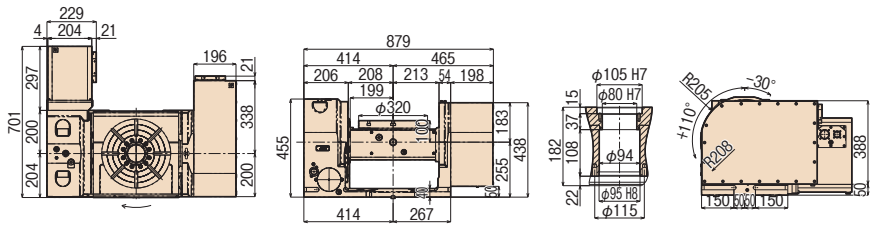
Tech.Info. Servo motors of other manufacturers P.68

Option High-precision Spec. P.64 Pull Stud P.66
Rotary Joint P.66 Air-hydraulic Booster P.67

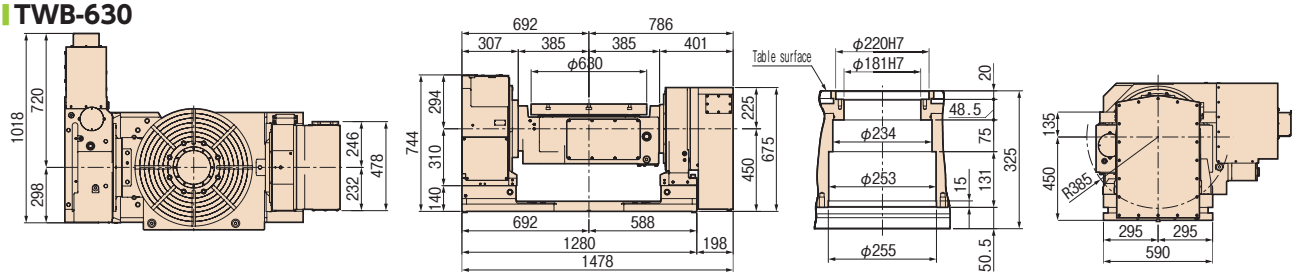
Dimensions

Unit: mm

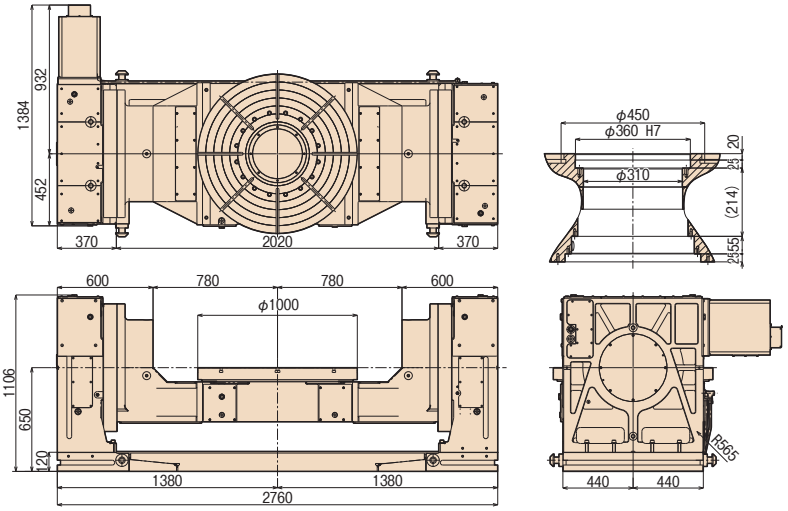
TWB-320

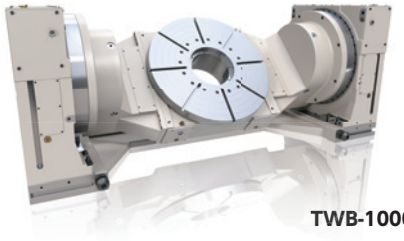


TWB-630

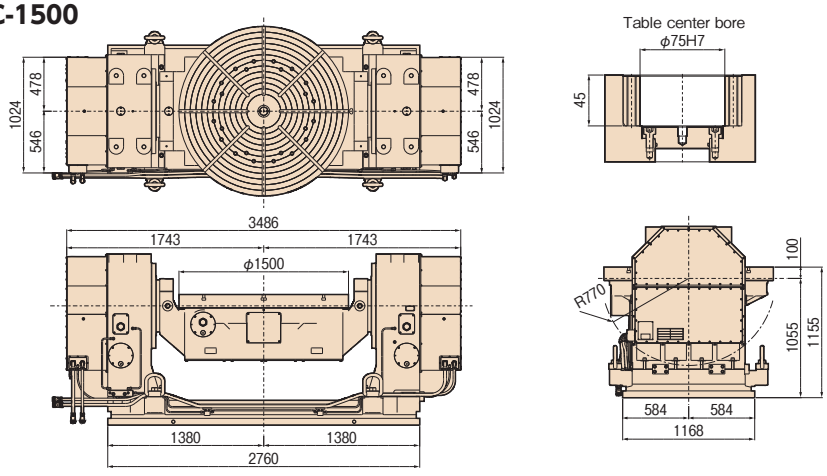


TWB-1000





TTNC-1500



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

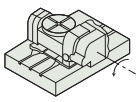
Clamping block and bolt

Unit: mm

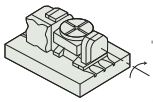
	Type	Q'ty	Layout	T-slot pitch	T-slot width	A	B	C	D	E	F	G	H	I	J	K	L	M
TWB-320	I	4	a b	140 to 190 70 to 150	18	25	12	80	12	33	35	22	21	11	65	40	28	16
TWB-630	I	4	a b	168 to 450 80 to 267	18	40	20	110	18	42	50	25	21	11	70	46	28	16
TWB-1000	Ⅳ	8	—	—	24	40	18	63	18	15	30	58	20	14	105	60	38.2	20
TTNC-1500	Ⅱ	10	—	—	28	60	28	95	29	16	50	95	22	17.5	146	100	41.3	24

Note: When using a machine with a T-slot pitch other than the above, use suitable clamping blocks and bolts that are available on the market, or order custom-made ones from TSUDAKOMA. (Option)

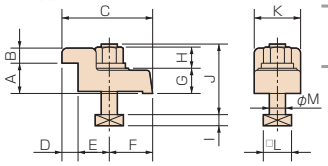
Layout a



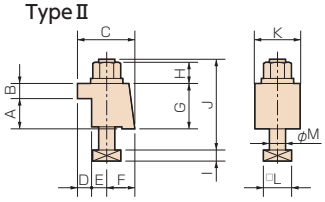
Layout b



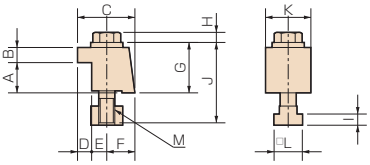
Type Ⅰ



Type Ⅱ



Type Ⅳ



Multi-spindle Type

TWM

TWM-100•160•250

Tilt type multi-spindle enables highly productive machining. Simultaneous machining of multiple workpieces with complex shapes and 5-face machining is possible.

TWM-160, PS

Specifications

Unit: mm

		TWM-100,PS		TWM-160		TWM-250	
Tilt range		−17° to +107°		−30° to +110°		−30° to +110°	
Spindle diameter		ϕ90h7		ϕ100h7		ϕ140h7	
Table diameter		ϕ135 (Option)		ϕ160 or ϕ200 (Option)		ϕ250 (Option)	
Distance between spindles		140		250 or 320		320 or 400	
Table height at 0° position		220 (245 w/face plate)		250 (280 w/face plate)		325 (355 w/face plate)	
Center height at 90° position		160		190		260	
Center bore	Nose diameter	ϕ55H7		ϕ55H7		ϕ80H7	
	Through-bore	ϕ40		ϕ40		ϕ50	
Guide block width		14h7		18h7		18h7	
Servo motors (for FANUC)		Rotary axis	Tilt axis	Rotary axis	Tilt axis	Rotary axis	Tilt axis
Inertia converted into motor shaft	×10^{-3}kg·m^2	αiF2	αiF2	αiF4	αiF8	αiF8	αiF12
Speed reduction ratio		0.13	0.14	0.52	0.50	0.69	4.40
Table max. rpm	min^{-1} (Motor rpm: 3,000min^{-1})	1/60	1/120	1/60	1/90	1/90	1/90
Clamp system Supplied pressure		50	25	50	33.3	33.3	33.3
Clamp torque	N·m	Pneumatic 0.49MPa	Pneumatic 0.49MPa	Pneumatic 0.49MPa	Pneumatic 0.49MPa	Pneumatic 0.49MPa	Hydraulic or air-hydraulic (Option) 3.5MPa
Clamp torque	N·m	200	500	500	1,000	1,000	3,100
Indexing accuracy (the sum)	arc sec	40	—	30	—	20	—
Tilting accuracy	Tilt 0° to 90° arc sec	—	45	—	60	—	60
	Tilt −30° to 90° arc sec	—	—	—	75	—	75
Net weight	kg	110		240 (PS) / 260 (PL)		550 (PS) / 595 (PL)	
Strength of worm gears (Rotary axis)	N·m	152		200		596	
Allowable work weight	0° (Horizontal) kg/axis	35		40		100	
	0° to 90° (Tilting) kg/axis	20		40		100	
Allowable work moment	W×L N·m	24		55.8		347.4	
Allowable load (when table is clamped)	F N	3,920		10,800		14,400	
	F×L N·m	200		500		1,000	
	F×L N·m	500		1,000		3,100	
Allowable work inertia (per single-axis)	$J=\frac{W \cdot D^2}{8}$ kg·m^2	0.05		0.13		0.9	

CE correspondence model

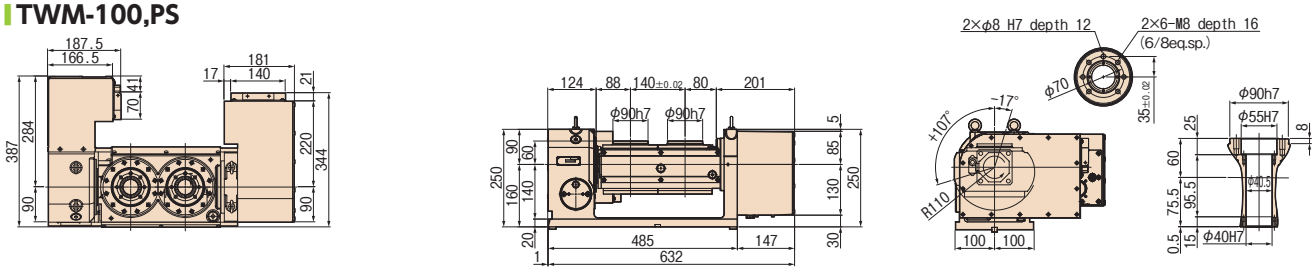
Tech.Info. Servo motors of other manufacturers P.68

Option Rotary Joint P.66

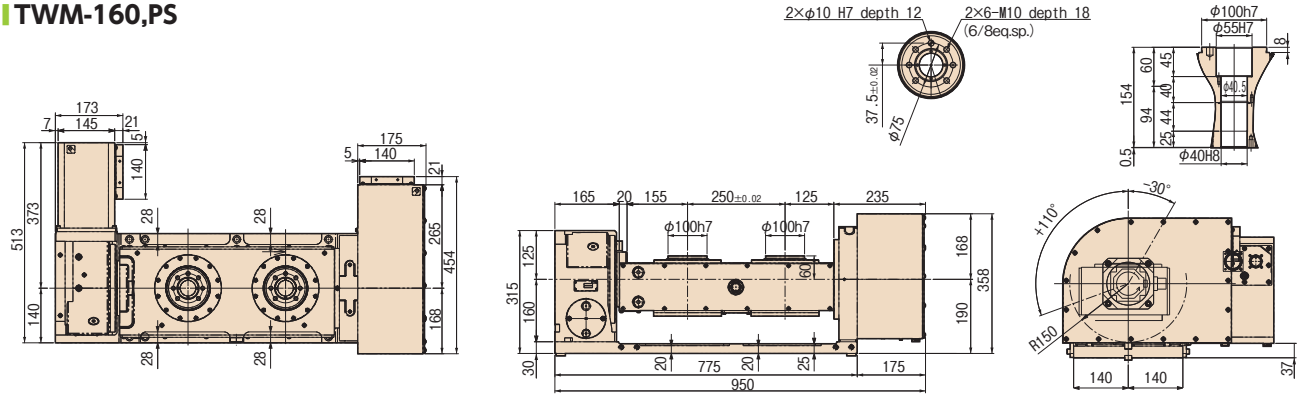
Dimensions

Unit: mm

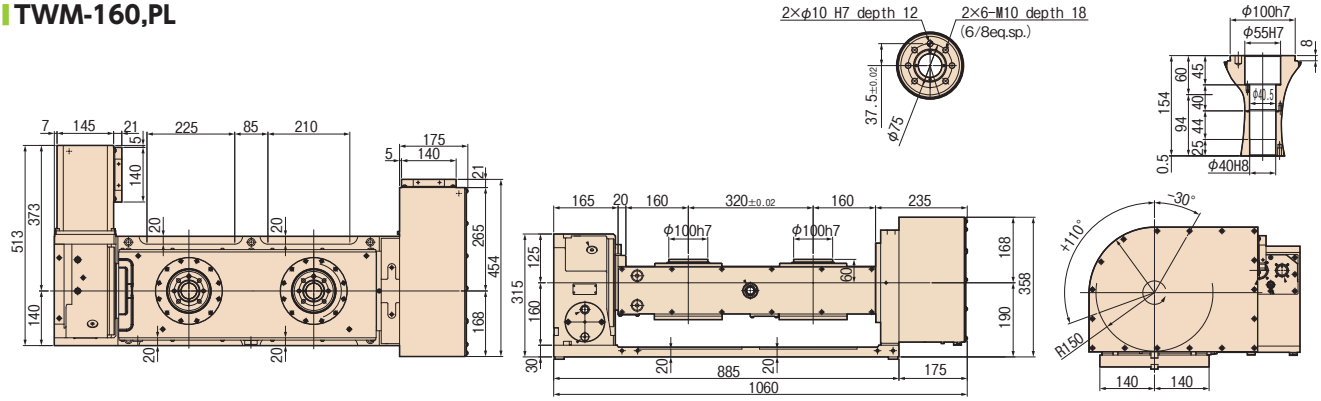
TWM-100,PS



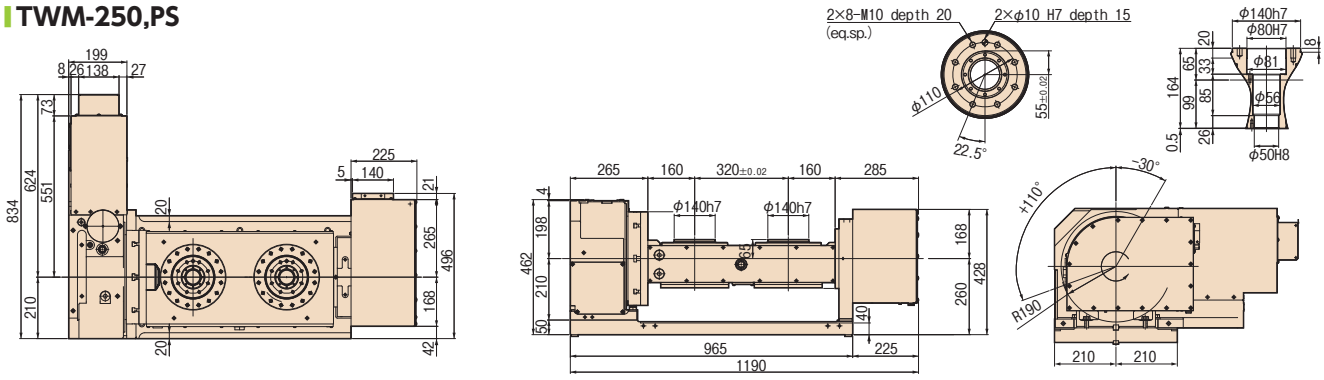
TWM-160,PS



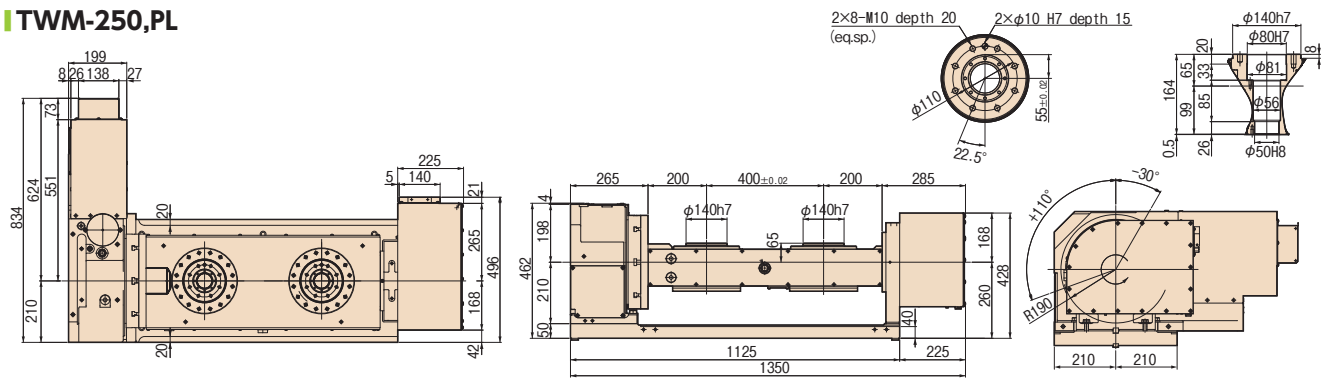
TWM-160,PL



TWM-250,PS



TWM-250,PL



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

RBS
RBH
Multi-Spindle RBM
TBS
RWE/RWA RN
RWH
RWA-B RNCV-B
RWB
RWB-K RNCK
RCB
RCH RNC
RCV
Multi-Spindle RWM
TWA/TN
TWB TTNC
Multi-Spindle TWM
RDS
RTV RTT
TDS TDB
NC Controllers
Accessories
Options
Technical Information

SmartDD

RDS RDS-200


RDS-200

Smart slim body provides full use of machining area with various features of DD motor including high speed rotation. This is the best model for mass-production of automobile and computer parts at small machining centers.
Additional axis control is possible with FANUC and Mitsubishi-controlled machines.
The RDS dedicated single axis controller (TPC-DD*) can be used with the M signal of the machining center.

Specifications

Unit: mm

			RDS-200
Spindle diameter		mm	ϕ83
Center height		mm	160
Center bore	Nose diameter		ϕ55
	Through-bore		ϕ45
Motor type			TSUDA-02
Net weight		kg	65
Speed reduction ratio			1/1
Indexing accuracy (the sum)		sec	20※
Clamp system			Pneumatic
Clamp torque ／pneumatic pressure 0.49MPa		N·m	600
Clamp torque ／Pneumatic pressure interception		N·m	40
Table max. rpm	Steady rotation	min^{-1}	100
	Max rotation	min^{-1}	300
Allowable work weight		kg	100
Allowable load (when table is clamped)	F 	N	6,860
	F×L 	N·m	600
	F×L 	N·m	350

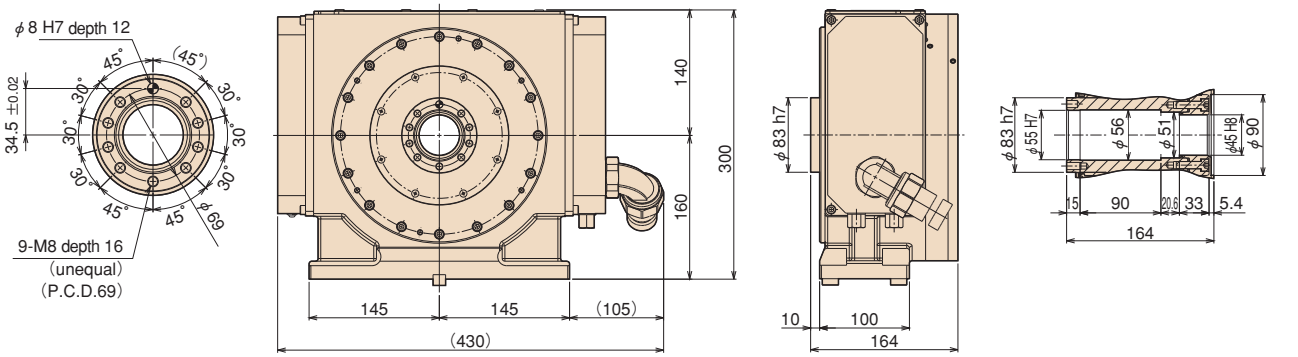
CE correspondence model

※Pitch error corrected
＊Please contact us for more information about TPC-DD.

Dimensions

Unit:mm

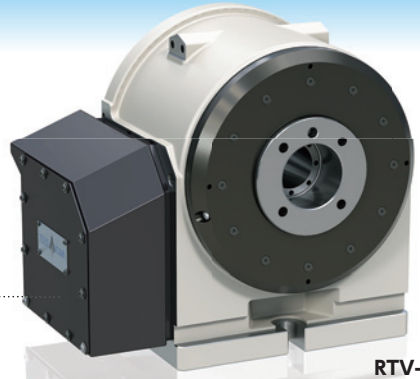
RDS-200



Specialty rotary table

RTV·RTT

RTV-202
RTT-112



RTV-202

DD (Direct Drive) motors realize high speed, high acceleration and no backlash operation.
Most suitable for high speed and high quality machining for various impellers, blades and medical equipment, and for high speed indexing operation for automotive parts.
We provide optimum ideas of products and various applications based on our great experiences.

Specifications

Unit: mm

		RTV-202	RTT-112	
Controll axis		1 -axis	2-axis	
		Vertical setting only	Rotary axis	Tilt axis
Table diameter (Spindle diameter)	mm	(ϕ120)	ϕ100	—
Servo motors (for FANUC)		Dis260/300	Dis60/400	Dis150/300
Type of scale		αiCZ512A	αiCZ512A	αiCZ512A
Table max. rpm	min^{-1}	150	150	100
Clamp torque	N·m	300 (Pneumatic pressure 0.49MPa)	—	80 (Pneumatic pressure 0.49MPa)
Center height	mm	190	280	
Rotary joint		—	—	
Allowable work weight	kg	50	30	
Net weight	kg	90	190	

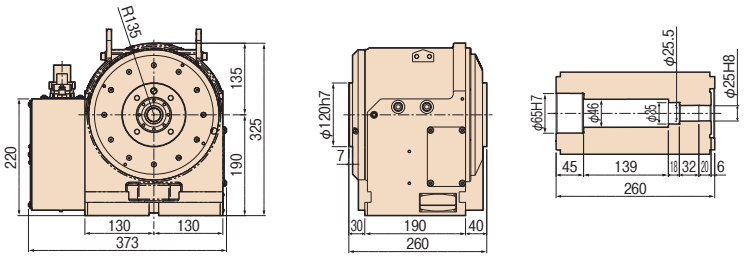
＊Contact us for the following models.
Vertical type DD Table ϕ100 to ϕ500
Tilting type DD Table ϕ100 to ϕ630

＊Applicable for various kinds of DD motors which depend upon the type of controllers. Contact us for details.

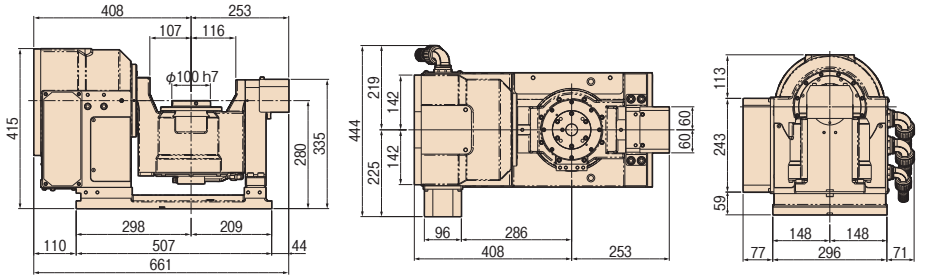
Dimensions

Unit:mm

RTV-202



RTT-112

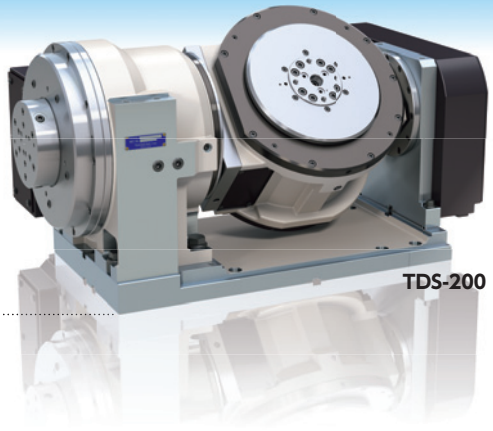


RTT-112

RBS
RBH
Multi-Spindle RBM
TBS
RWE/RWA RN
RWH
RWA-B RNCV-B
RWB
RWB-K RNCK
RCB
RCH RNC
RCV
Multi-Spindle RWM
TWA/TN
TWB TTNC
Multi-Spindle TWM
RDS
RTV RTT
TDS TDB
NC Controllers
Accessories
Options
Technical Information

Milling and Turning Model

TDS TDS-200
TDB TDB-200


TDS-200

Achieves both turning at a maximum of 3,000 min^{-1} and milling by positioning in one chucking. Contributes to labor savings, automation, and improved processing efficiency.

Specifications

Unit: mm

			TDS-200		TDB-200R,F	
Tilt range			−100° to +10°		−100° to +10°	
Table diameter			ϕ90		ϕ90	
Table height at 0° position			325		325	
Center height at 90° position			225		225	
Center bore		Nose diameter	ϕ20		ϕ20	
		Through-bore	—		—	
Motor type			Rotary axis	Tilt axis	Rotary axis	Tilt axis (BallDrive)
			TSUDA-01	Dis120/600-230-B	TSUDA-01	αis4
Type of scale			αiCZ512A		αiCZ512A	—
Speed reduction ratio			1/1		1/1	1/60
Table max. rpm		min^{-1}	3,000	100	3,000	50 (Motor rpm:3,000 min^{-1})
Clamp system			Pneumatic		Pneumatic	
Clamp torque ／pneumatic pressure 0.49MPa		N·m	400	500	400	500
Net weight		kg	195		180	
Allowable work weight	0° (Horizontal)	kg/axis	50		50	
	0° to 90° (Tilting)	kg/axis	50		50	
Allowable work moment	W×L	N·m	—		57	
Allowable load (when table is clamped)	F	N	2,940		2,940	
	F×L	N·m	400		400	
	F×L	N·m	500		500	
Allowable work inertia	$J=\frac{W \cdot D^2}{8}$	kg·m^2	0.3		0.3	

CE correspondence model

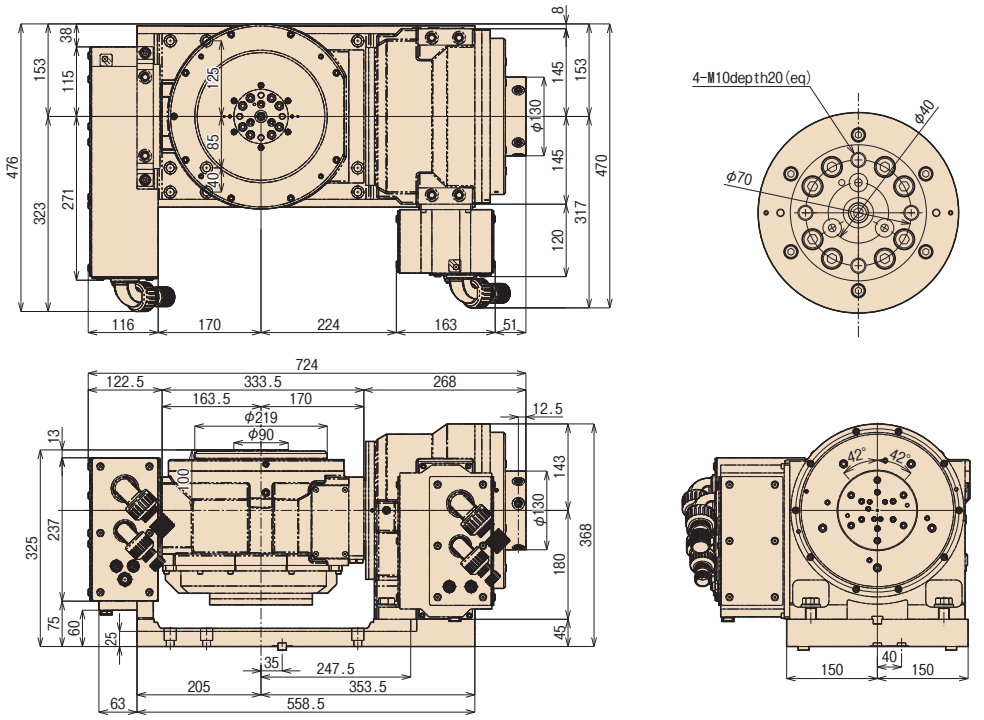
Note: Customers are required to prepare oil cooling unit for installation.


TDB-200R,F

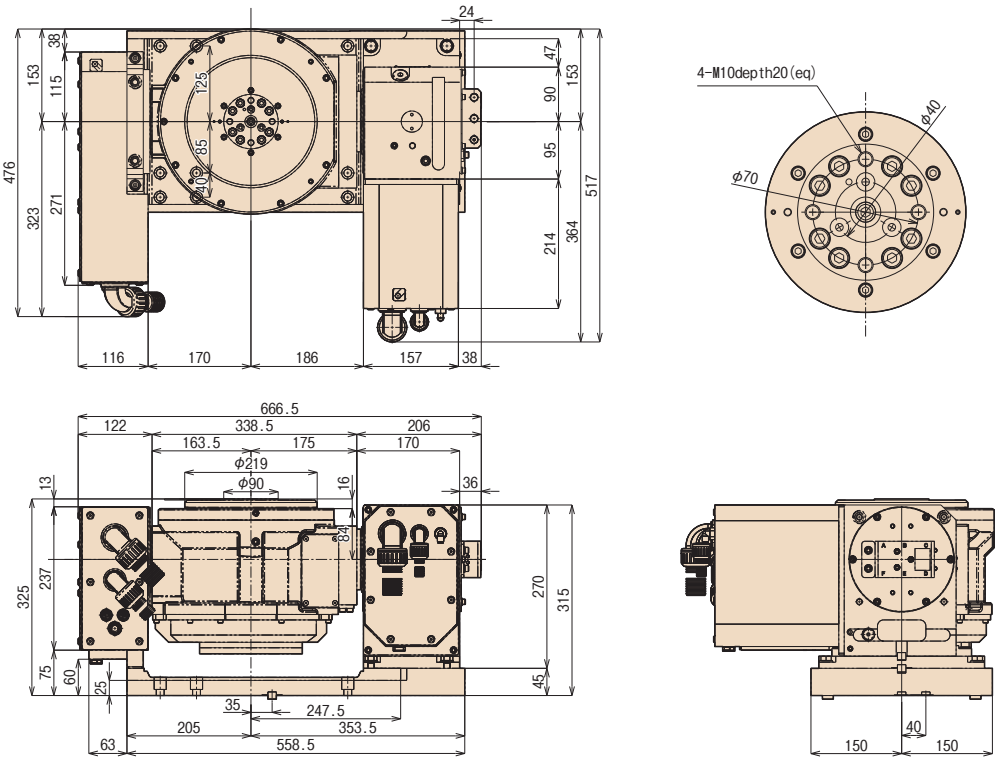
Dimensions

Unit: mm

TDS-200



TDB-200R,F



Note: The above dimensions are for FANUC servo motors. The dimensions of servo motors of other manufacturers may be larger.

Single axis NC controllers equipped with advanced functions for M-signal

Single axis NC table controllers that operate by means of M-signals from the machining center.
Operation can be programmed by machining center under "Remote mode + M" specification.

For small-sized rotary tables

TPC-Jr K2／K3

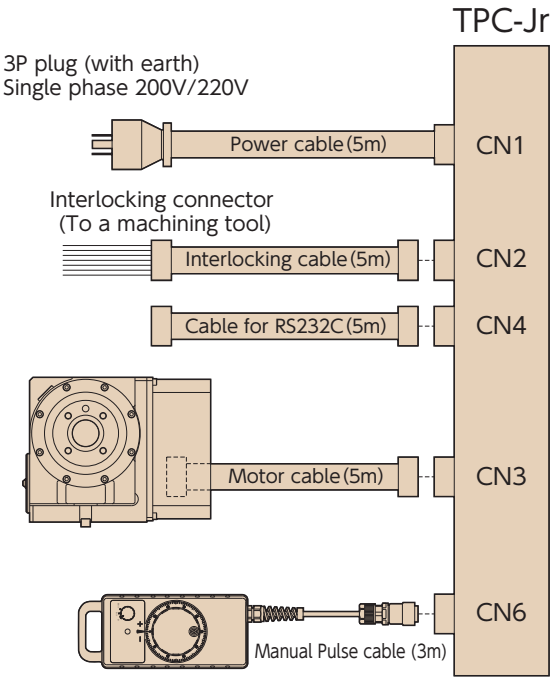
- Single axis NC controllers that operate small-sized TSUDAKOMA NC rotary tables by means of M-signals from machining center.
- TSUDAKOMA rotary tables equipped with super-compact AC servo motors are the most compact among similar models.
- Operation can be programmed by machining center.
  With "Remote mode + M" specification (Parameter change) ☞ P.52
  ※Corresponding to Cable option

Applicable models

	K2	K3
RN-100	●	
RWE/RWA-160	●	
RWE/RWA-200		●
RWA-250*		●
RWA-320*		●
TWA-100	●	
TWA-130	●	
TWA-160	●	
TWA-200		●
TWM-100*	●	
TWM-160*		●
TBS-130	●	
TBS-160	●(R)	●(T)
TDB-200		●(T)

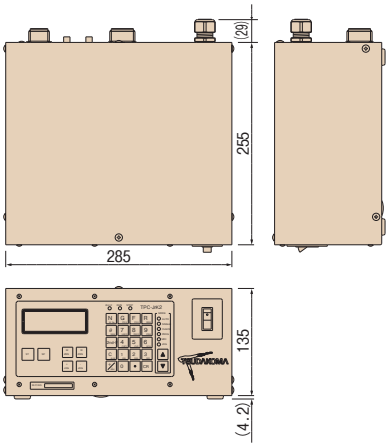
＊Table maximum rotation speed is limited.

Cables



Note: The cable for RS232C is an optional item.
Note: Manual pulse generator is an optional item.

Dimensions



TPC-Jr FUNCTIONS

Operation panel

OPERATION MODE

AUTO AUTO :
Automatic operation by an M signal from the machining center.

SINGLE SINGLE :
Single operation of TPC-Jr. By pressing ST , positioning is performed once.

CHECK CHECK :
Block number call, program check and self-diagnosis.

PROG Program mode :
For inputting and editing the program.

MDI MDI mode :
For setup operation. Ten blocks of programs can be carried out.

JOG JOG mode :
For manual feed and step feed.

HANDLE Handle mode :
Manual pulse operation.

Program edit keys

2nd·F + N W No. Workpiece No. (Program No.)
0000 to 9999
100 programs registerable

N W No. Block No.
000 to 999

G PRO Operation command
G0 to G4: Movement command
G5 to G9: Assistance function

F POS Feed rate select command
F0: Rapid positioning speed
F1 to F9: Cutting feed rate

R REM Assistance code for codes

θ DGN Travel distance command (angle, divided number)
Block No./Sub-program No.

G-code		R-code		θ-code	
No.	Command	No.	Command	Command	Setting
G0	Direct angle command	001 to 999	Number of Repetition (INC command)	Command angle	±000.001° to 999.999°
		000	(ABS command)	Command angle	±000.000° to 360.000°
G1	Direct indexing number command	001 to 999	Number of repetitions	Number of divisions for 360°	±1 to 999999div.
G2	Arc-indexing number command	001 to 999	Number of divisions, Number of repetitions	Arc-angle indexed	±000.001° to 360.000°
G3	Lead cutting command	000 to 100	Number of table rotations	Command angle	±0° to 360.000°
G4	Zero point return command	000	1st zero point return (mechanical zero point)	Not required	
		001	2nd zero point return		
		002	3rd zero point return		
G5	Sub-program call command	001 to 999	Number of repetitions	Sub-program No.	0000 to 9999
G6	Subprogram return command	Not required		Not required	
G7	Program end command	Not required		Target address	000 to 999
G8	Workpiece coordinate system setting command	Not required		Reference coordinate	±0° to 360.000°
G9	Declaration command	000	No operation	Not required	
		001/002	Clamp OFF/ON		
		003/004	Dowel OFF/ON	Dwell time	000 to 999 (×10m sec)
		005/006	Indexing group control OFF/ON	Not required	
		007/008	Directional positioning OFF/ON		
		009/010	Completion signal control command OFF/ON	Completion signal selection	
		011	Program display selection command	Not required	
		012	Current position display selection command		
		013	Remaining angle display selection command		

For large-sized tables

TPC5 SR6／SR12／SR30

Single axis NC controllers automatically start large-sized TSUDAKOMA NC rotary tables by receiving M-signals from machining center.

Easy programming by simple input of the interactive system.
In increments of 0.001° (standard), 0.0001° or 1 sec.

Ready to set optional functions easily.

- With an optional function of B signal, the workpiece number, block number and tilting angle command can be entered from machining center.
- Operation can be programmed by machining center.
  With "remote mode + M" specification (Parameter change) ☞ P.52
  ※Corresponding to Cable option


MDI unit

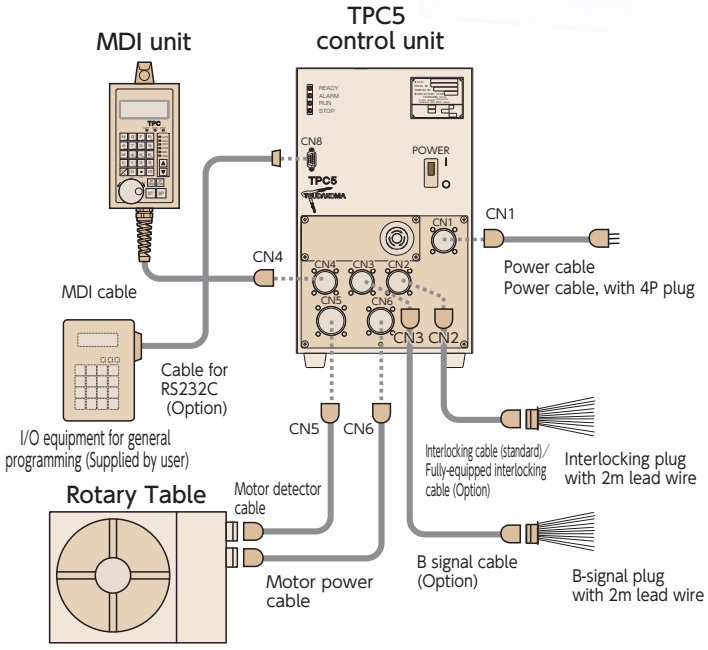
TPC5 control unit

Applicable models

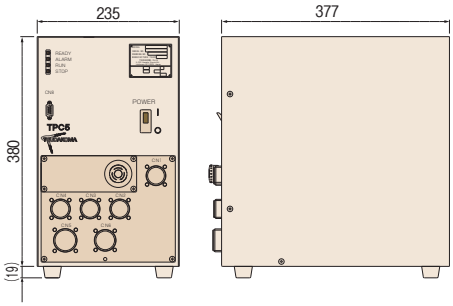
	SR6	SR12	SR30
RWB-250	●		
RWB-320,400,500		●	
RWM-160	●		
RWM-200／250／320-2	●		
RCH/RCV-800		●	
RCH/RCV-1000,1250			●
RCV-1600			●
RNC-2001,1501			●
TN-320	●		
TN-450			●
TWB-320	●(R)	●(T)	
TWB-630		●	
TWM-250*	●(R)	●(T)	
RBS/RBH-160	●		
RBS/RBH-250	●		
RBS/RBH-320		●	
RBM-160*	●		
TBS-250	●		

*Table maximum rotation speed is limited.
RBH requires special TPC5.

Cables

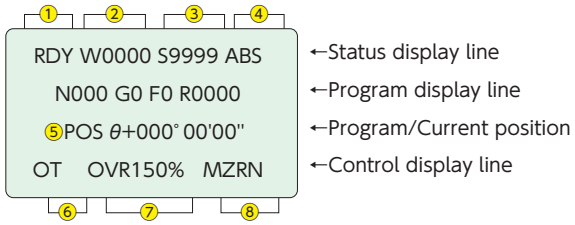


Dimensions



TPC5 FUNCTIONS

Operation panel



Status display line: ①TPC status ②Workpiece number ③Subprogram number ④Command system

Program display line: TPC5 program in 2 lines ⑤Current position/remaining (POS/REM)

Control display line: ⑥Overtravel ⑦Override/machine lock/manual interrupt ⑧Zero point return MZRN/WZRN/TZRN

OPERATION MODE

- **AUTO** AUTO : Automatic operation interlocked with machining center
- **SINGLE** SINGLE : Single operation of TPC5
- **CHECK** CHECK : Program check and self-diagnosis
- **PROG** Program mode : Program entry
- **MDI** MDI mode : Setup operation
- **HANDLE** Handle mode : Manual pulse operation/jog mode

Program edit keys

2nd·F + N W No. **Workpiece No. (Program No.)**
0000 to 9999
100 programs registerable

N W No. **Block No.** 000 to 999

G PRO **Operation command**
G0 to G4 : Movement command
G5 to G9 : Assistance function

F POS **Feed rate select command**
F0 : Rapid positioning speed
F1 to F9 : Cutting feed rate

R REM **Assistance code for codes**

θ DGN **Travel distance command (angle, divided number)**

G-code		R-code		θ-code	
No.	Command	No.	Command	Command	Setting
G0	Direct angle command	0001 to 9999	Number of Repetition (INC command)	Command angle	±000.001° to 999.999°
		0000	(ABS command)	Command angle	±000.000° to 360.000°
G1	Direct indexing number command	0001 to 9999	Number of repetitions	Number of divisions for 360°	±1 to 999999div.
G2	Arc-indexing number command	0001 to 9999	Number of divisions, Number of repetitions	Arc-angle indexed	±000.001° to 360.000°
G3	Lead cutting command	0000 to 0100	Number of table rotations	Command angle	±0° to 360.000°
G4	Zero point return command	0000	1st zero point return (mechanical zero point)	Not required	
		0001	2nd zero point return		
		0002	3rd zero point return		
G5	Sub-program call command	0000 to 9999	Number of repetitions	Sub-program No.	0000 (0001) to 9999
G6	Subprogram return command		Not required	Not required	
G7	Program end command		Not required	Target address	000 to 999
G8	Workpiece coordinate system setting command		Not required	Reference coordinate	±0° to 360.000°
G9	Declaration command	0000	No operation	Not required	
		0001/0002	Clamp OFF/ON		
		0003/0004	Dowel OFF/ON	Dwell time	001 to 999 (×10m sec)
		0005/0006	Indexing group control OFF/ON	Not required	
		0007/0008	Directional positioning OFF/ON		
		0009/0010	Completion signal control command OFF/ON	Completion signal selection	
		0011	Program display selection command	Not required	
		0012	Current position display selection command		
		0013	Remaining angle display selection command		

Specifications of TPC

	TPC-Jr	TPC5
Control axis	1 axis	
Servo motor	AC servo: ABS detector	
Command unit	0.001°(Decimal)	1 sec,0.001°,0.0001°(Decimal)
Indexing number Direct indexing	1 to 999999 even indexing	
Indexing number Arc-indexing	1 to 999 even indexing	1 to 9999 even indexing
Max. command angle	±999.999°	±999°59'59'',±999.999°,±999.9999°
Command system	INC, ABS, Shortcut ABS, INC/ABS mixed system	
Input system	MDI	
Program control	Workpiece No. (W0000 to 9999)	
Program capacity	1,000 blocks (Total of main and sub programs)	2,000 blocks (Total of main and sub programs)
Positioning speed	Max. motor rotation speed: 3,000rpm	Max. motor rotation speed: 2,000rpm
Operation Mode	AUTO: Operation interlocked with a machining center SINGLE: Single operation of TPC CHECK: Program check and call PROG: Program edit MDI: Setup operation JOG: Manual feed, step feed HANDLE: Manual pulse operation	AUTO: Operation interlocked with a machining center SINGLE: Single operation of TPC CHECK: Program check and call PROG: Program edit MDI: Setup operation HANDLE: Manual pulse operation
Display	OELD 20 figures× 4lines	Liquid crystal display 20 figures×4lines
Direct indexing number command	Move angle is directly commanded	
Repetition	Command of number of move amount repetitions 999(TPC-Jr) 1 to 9999(TPC5)	
Direct indexing number command	Indexing number of six digits for 360 degrees	
Arc-indexing number command	Command of arbitrary 3-digit angle(TPC-Jr)or 4-digit angle(TPC5)	
Lead cutting command	Interlocked operation with one axis of the machining center in the open loop status	
Zero point return command	Allows return to the first, second or third-zero point	
Feedrate command	F0: positioning speed F1 to 9: cutting feedrate	
Feedrate setting	1. By radius and surface speed setting 2. By move amount per second	
Sub-program	Up to eight levels of nesting are possible	
Workpiece coordinate system setting	Allows a workpiece coordinate to be set at any point	
Dwell	Allows output of a positioning completion signal to be delayed	
Single directional positioning	Allows positioning in one direction	
Backlash compensation	In increments of 0.001°	Setting by command unit
Soft limit function	Sets a soft limit measured from the 1st zero position	
Automatic setting at power ON	1. Mode selection, AUTO/CHECK 2. Workpiece number setting 3.Block number setting	
Edit function	1. Insert 2. Delete 3. COPY	
Alarm	1. Program format errors 2. Program memory errors 3. Communication errors 4. Soft limit alarms 5. Overtravel 6. Servo motor alarms 7. Overheat in the cabinet(TPC5)	
Override function	×	5 to 200% 5% steps
JOG/HANDLE feeding	Manual pulse feed, Jog feed, step feed	Manual pulse feed, jog feed
Overtravel	The rotation range of the rotary table can be limited by limit switches. (Standard tilting axis)	
Manual 2nd zero setting	Enables the 2nd zero position to be set and changed at any point in the JOG(HANDLE)mode	
Input/output signal check	○	
Power	1φ200/220V±10% 50/60Hz	3φ200/220V±10% 50/60Hz
Earth (less than 100 ohm earth resistance)	Model / Power capacity / Fuse rating Jr K2 1.2KVA 10A Jr K3 1.9KVA 15A	Model / Power capacity / Fuse rating TPC5-SR6 2.3KVA 10A TPC5-SR12 4.0KVA 15A TPC5-SR30 5.9KVA 20A
Environmental conditions	Ambient temperature: 0-40 degree Relative humidity: 20-80%(no condensation) Vibration: 0.3G or less, No corrosive gas	
Weight	**Jr K2 unit** Weight: 7.0kg 285mm(W)×255mm(D)×135mm(H) **Jr K3 unit** Weight: 7.6kg 285mm(W)×255mm(D)×135mm(H)	**Control unit** Weight: 15kg 235mm(W)×377mm(D)×380mm(H) **MDI unit** Weight: 0.5kg 111mm(W)×30mm(D)×199mm(H)
External output signal	From TPC to machining center Contact ratings: DC24V, 0.1A or less	

	TPC-Jr	TPC5
FIN1	Positioning completion signal during interlocking operation	
	●	●
FIN2	Output of G7 completion or workpiece number setting completion (selectable by parameters)	
	●(AUTO mode)	◇
FIN3	Output of G7 completion or workpiece number setting completion (selectable by parameters)	
	×	◇
FIN4	Output of zero position (selectable by parameters)	
	×	◇
Workpiece number setting completion	Output at workpiece number setting completion (selectable by parameters)	
	●	◇
In AUTO mode	Output in AUTO mode	
	×	◇
LEVEL	Output during positioning (selectable by parameters)	
	●(Rotary table zero position)	◇
ALARM	Output in when alarm detected	
	●	◇
External input signal	From machining center to TPC (External power DC24V is also available.)	
START	Positioning start signal during interlocking operation (M-signal)	
	●	●
STOP	Input to stop rotary table	
	●	●
INTERLOCK	Input to interlock rotary table	
	×	◇
Selection of outer program	Workpiece number can be set externally	
	●	◇
BF (Strobe signal)	Strobe signal for setting workpiece number externally	
	●	◇
M-signal	M signal data fixed input system	
	●(6 points)	◇(16 points)
MDI lock	Input for locking MDI key operation	
	×	◇
Zero point return	1st zero return command	
	●	◇
Manual pulse generator	Manual operation can be performed with a manual pulse generator	
	Movement magnification:×1,×10,×100	
	◆	●
Full-closed feedback control	×	Enable full-closed control (highly precise) with the Inductosyn or rotary encoder
MP scale	Detecting unit 0.0001°(360poles) or 0.00005°(720poles)	
	×	◆
Encoder	Detecting unit 0.0001°or 0.00005°	
	×	◆
Serial channel	TPC program, feed rate and parameters can be stored in an external device	
	Format: ISO	Format: ISO
	◆(RS232C)	◆(RS232C)
Cable supplied (standard)	Between rotary table and TPC-Jr(1 pc) For Motor: 5m	Between rotary table and TPC5(2 pcs.) For motor power supply: 5m For motor detector: 5m
	–	Between TPC5 and MDI unit: 7m
	Power cable: 5m	Power cable: 5m
	Interlocking cable: 5m	Interlocking cable: 5m
Cable supplied (Option)	Cables of different length are available	
	RS232C cable: 5m	Interlocking cable: 5m
	Manual pulse generator (cable) 3m	B signal cable: 5m
	–	RS232C cable: 5m

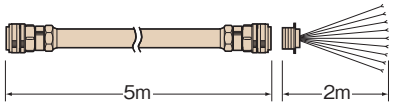
●:Standard
◇:Optional interlocking cables are supplied
◆:Optional units and parts are supplied

TPC Option

TPC5

Full-featured interlocking cable

☞ P.55



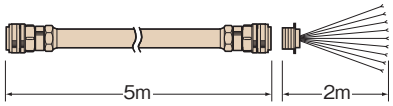
Required for the following functions:

- Stop or interlock input signal
- Positioning completion 2,3,4
- AUTO mode
- Positioning
- Alarm signal

● Full-featured interlocking cable
(Standard length: 5m)

TPC5

B signal cable



Required for the following functions:

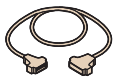
- External input of workpiece numbers
- External input of angles
- Fixed data input through M-signal

※ For using B signal cable,internal harness shall be added.

● Bsignal cable
(Standard length: 5m)

TPC-Jr
TPC5

RS232C cable



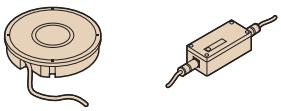
Input and output of program, parameter and feed data for TPC5 and TPC-Jr, and data printout are carried out through external equipment, which is to be prepared by the customer. Also, the cables can be arranged by the customer.

● RS232C cable
(Standard length: 5m)

TPC5

High resolution capability Rotary Encoder type

☞ P.64



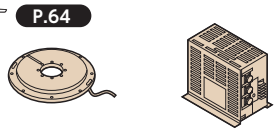
Fully-closed loop control is possible by the feed-back from the rotary encoder.

● Rotary encoders
● IBV unit
(by HEIDENHAIN)
● TPC5 RE

TPC5

High resolution capability MP Scale type

☞ P.64

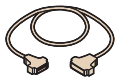


Fully-closed loop control is possible by the feed-back from the MP scale.

● MP scale
● A/D converter
(NIDEC MACHINE TOOL CORPORATION)
● TPC5 RI

TPC-Jr
TPC5

"Remote Mode" specification



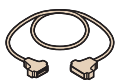
Available for measuring system construction. To be connected with a personal computer using serial channel.

● RS232C cable

TPC-Jr
TPC5

"Remote Mode + M" specification

☞ P.52



To unify the program to start the rotary table by M-signal, by feeding a command for the indexing angle from the RS232C port at the NC controller of the machining center.

Note: This function may not be available for some machining centers. For details, ask the M/C manufacturer.

●RS232C cable

TPC-Jr

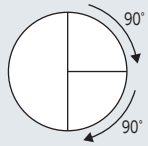
Manual pulse generator

Handle feed is available by turning the dial of a manual pulse generator. A dial rotation can feed 100 pulse and the magnification of step feeding angle can be selected among x1, x10 and x100.

●Manual pulse generator
(Cable length 3m)

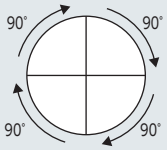
TPC Machining Program Examples by TPC Controller

Direct angle command : G0



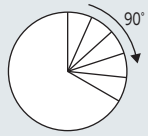
N W No. 000	G PRO 0	F POS 0	R REM 002	θ DGN 90.000	CR	Positioning at 90° twice
		Quick	Number of Repetition	Indexing angle/time		
N W No. 001	G PRO 7			θ DGN 000	CR	Return to N W No. 000 at the program end
	End of program					

Direct indexing number command(even indexing) : G1



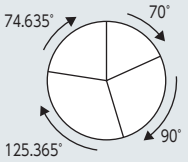
N W No. 000	G PRO 1	F POS 0	R REM 004	θ DGN 000004d	CR	Dividing 360° by 4, four times
				360° is divided into quarters		
N W No. 001	G PRO 7			θ DGN 000	CR	Return to N W No. 000 at the program end

Arc-indexing number command(even indexing by an arbitrarily-set angle) : G2



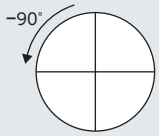
N W No. 000	G PRO 2	F POS 0	R REM 005	θ DGN 120.000	CR	Dividing 120° by 5, five times
			Indexing number	Angle for indexing		
N W No. 001	G PRO 7			θ DGN 000	CR	Return to N W No. 000 at the program end

Uneven indexing



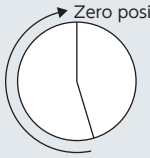
N W No. 000	G PRO 0	F POS 0	R REM 001	θ DGN 70.000	CR	Positioning at 70° once
N W No. 001	G PRO 0	F POS 0	R REM 001	θ DGN 90.000	CR	Positioning at 90° once
N W No. 002	G PRO 0	F POS 0	R REM 001	θ DGN 125.365	CR	Positioning at 125.365° once
N W No. 003	G PRO 0	F POS 0	R REM 001	θ DGN 74.635	CR	Positioning at 74.635° once
N W No. 004	G PRO 7			θ DGN 000	CR	Return to N W No. 000 at the program end

(−) direction indexing



N W No. 000	G PRO 0	F POS 0	R REM 001	θ DGN −90.000	CR	Positioning at −90° once
				Reverse		
N W No. 001	G PRO 7			θ DGN 000	CR	Return to N W No. 000 at the program end

Zero point return command : G4

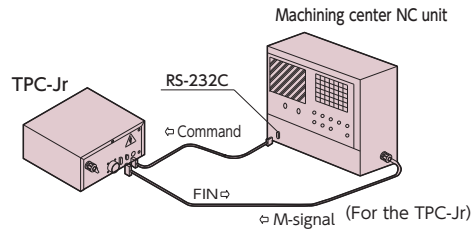


N W No. 000	G PRO 4	R REM 000	Return to 1st zero position
	Zero return	To 1st zero position	

Remote mode + M specification(Parameter change) ※Corresponding to cable option

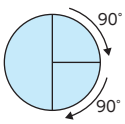
The rotary table is controlled by TPC with M-signal sent from a machining center through RS232C.

Note: This function may not be available for some machining centers. For details, ask the M/C manufacturer.



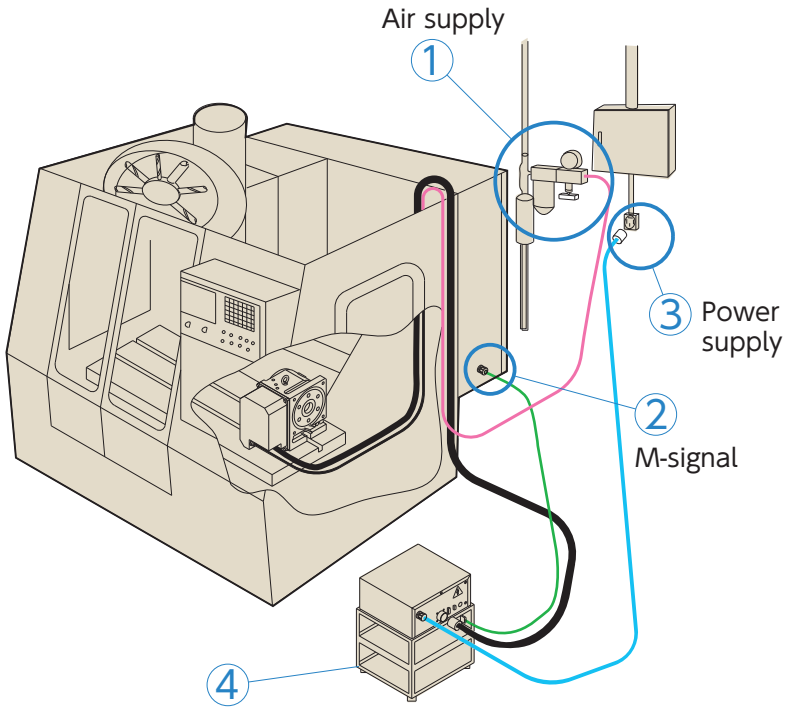
Machining center :

Program using Custom Macro Necessary equipment TPC-Jr : Software for remote mode RS232C/interlock cable, RS232C cross cable
NC unit for a machining tool : RSS232C connector and Custom Macro B (optional) (for FANUC).
For details, ask the machine manufacturer.



POPEN ;	DPRNT[/MOVA180.] ;	RS232C port opens
DPRNT[/MOVA90.] ;	M70 ;	Command of absolute positioning at 90 is transmitted to TPC
M70 ;	GO1Z100.F200 ;	Positioning starts
GO1Z100.F200 ;	PCLOS ;	Machining center in operation
		Command of absolute positioning at 180 is transmitted to TPC
		Positioning starts
		Machining center in operation
		RS232C port closes

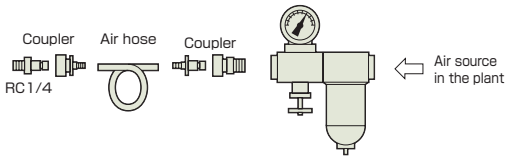
Installation of TPC controller



The figure shows an example for the TPC-Jr controller.

To be provided by customers

① Air supply

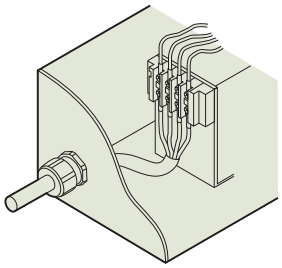


Air supply is necessary the pneumatic or air-hydraulic clamp system of the NC rotary tables with the TPC5 or TPC-Jr controller.

The following are to be provided by customers:
- Air filter and regulator (Air pressure:0.49 MPa)
- Air hose or air tube
- Joint coupler (RC 1/4 for the table)

Some models need a 6mm diameter tube for connection.

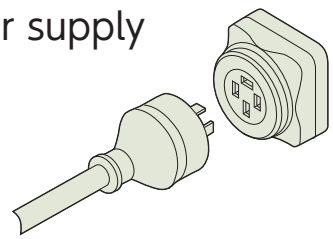
② M-signal



When the machining center controls the rotary table, it uses M-signals. Be sure to confirm with the machine manufacturer that M-signals or M-signal completion signals are transferred to the terminal block of the machine controller. If not, ask the manufacturer to do the required work.

☞ For the connection with an interlocking cable, refer to the examples shown on P.54

③ Power supply



A socket for the TPC controller is necessary. A 3P plug is equipped with the TPC controller, and is recommended. The outlet for the connection is required.

TPC side connector WF4420(Panasonic)
Outer power supply connector WF1420 or the others(Panasonic)
In case of the different type of connector, shall be arranged by the customer.

☞ For the power capacity of each controller, refer to P.50

Conduct grounding (less than 100 ohm earth resistance)

④ Stand

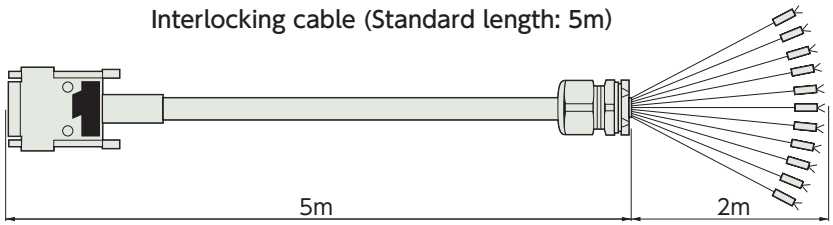
A stand for the TPC controller is to be provided by the customer.

☞ For the dimensions and weight of the controller, refer to P.46 to 48 P.50

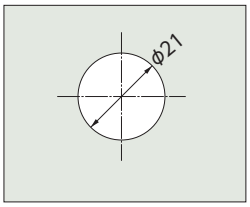
TPC Controllers to Interlock with Machining Tools

TPC-Jr

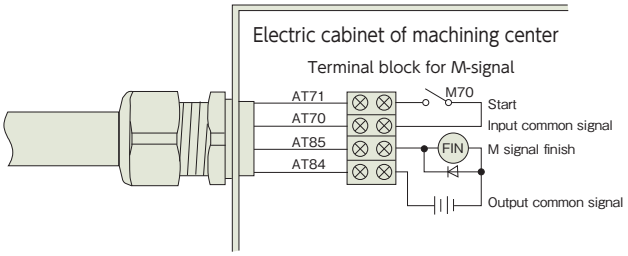
Interlocking cable (Standard length: 5m)



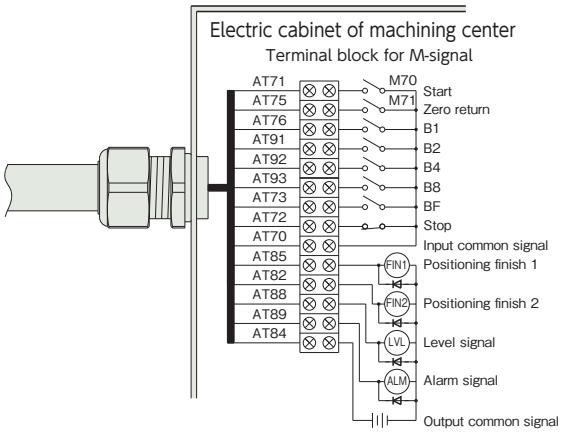
Connector dimension
(on machining center)



a) When a start signal and an indexing completion signal are used:



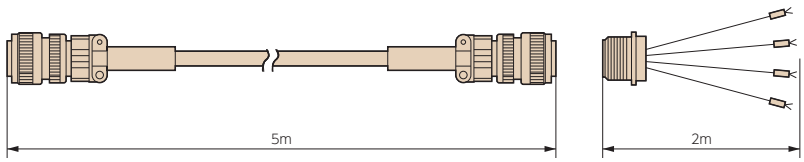
b) When all the signals through interlocking cables are used:



Note 1: When completion signals are received by a relay, the power supply should be 24VDC. Do not apply 100VAC or 200VAC.
Note 2: By changing the switch in the controller, a start signal is also available with the external power supply of 24VDC.
Note 3: Be sure to take countermeasures against electric noise by attaching surge protectors to relays for a machining center.

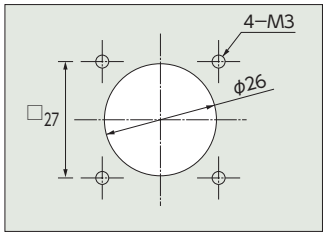
TPC5

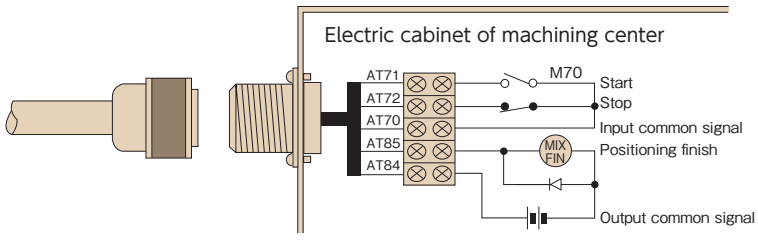
Interlocking cable(Standard length: 5m)



a) Standard interlock cable For interlocking only with M-signal and the completion signal

Connector dimension
(To machining center)



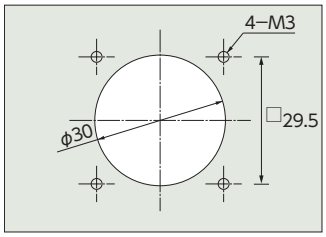


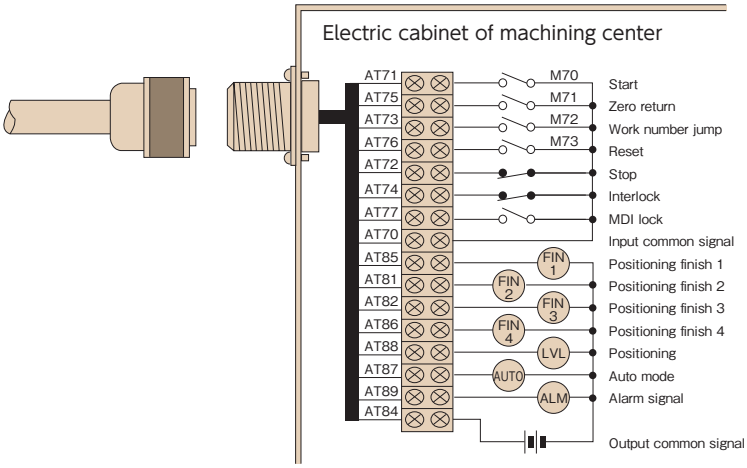
TPC Controllers to Interlock with Machining Tools

b) Fully-equipped interlocking cable (Option)

A variety of signals such as a stop or interlock input signal and a level or alarm output signal are available with this cable.
B signal cable is required when the setting functions for the workpiece number and angle data are used, or when the fixed indexing angle input system by an M-signal is used.
If you want to see some examples of the connections with this cable, please contact Tsudakoma.

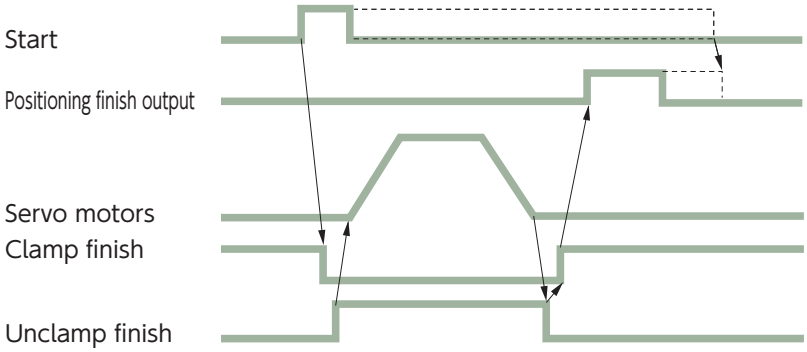
Connector dimension
(To machining center)





Note 1: When completion signals are received by a relay, the power supply should be 24VDC.Do not apply 100VAC or 200VAC.
Note 2: By changing the switch in the controller, a start signal is also available with the external power supply of 24VDC.
Note 3: Be sure to take countermeasures against electric noise by attaching surge protectors to relays for a machining center.

Time Chart



Note 1: A start input signal, in the form of either a pulse signal (of more than 10 msec) or level signal, can be accepted.
Note 2: During the interlocking operation with a machining center carried out through an M-signal, the M-signal should be completed by the positioning completion signal.

TPC Standard Cable Specifications

The tables below shows the maximum outer diameter and the curved radius of standard cables which are supplied with the rotary tables ready for the TPC5 or TPC-Jr controller.

Unit: mm

	Cable	Order Code	Max. outer diameter	Min. curved radius
TPC5	Motor power cable	NS#20 (SANKEI MANUFACTURING CO.,LTD.)	20	90
	Motor signal cable			
TPC-Jr	Motor cable	NS#25 (SANKEI MANUFACTURING CO.,LTD.)	25	100

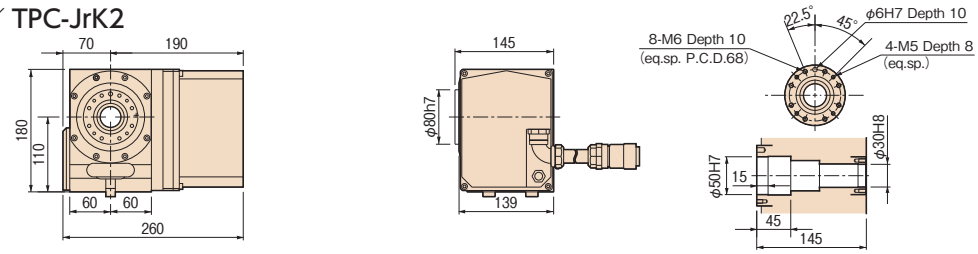
Model number, maximum outer diameter and curved radius may differ depending on specifications.

NC Rotary Tables／TPC-Jr Dimensions and Specifications

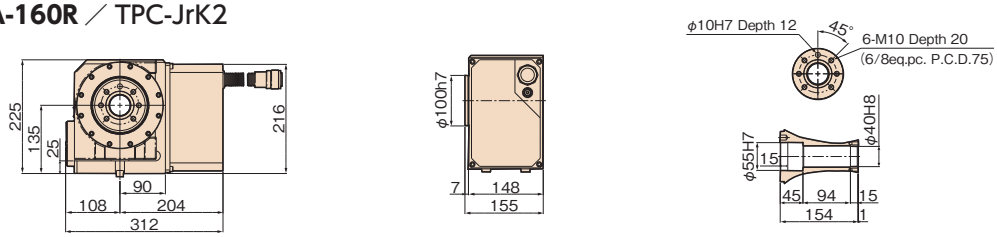
NC Rotary Tables／TPC-Jr

Unit: mm

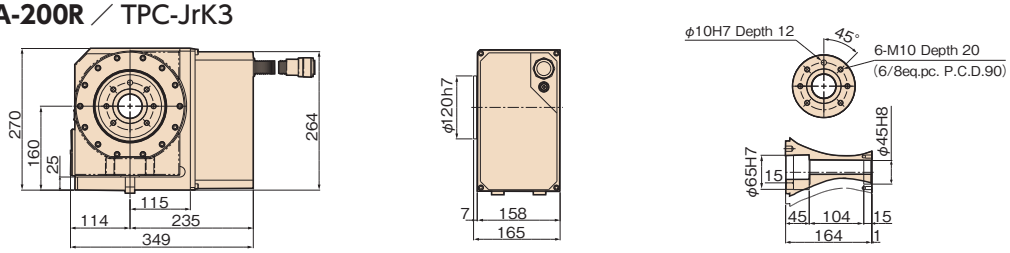
RN-100R ／ TPC-JrK2



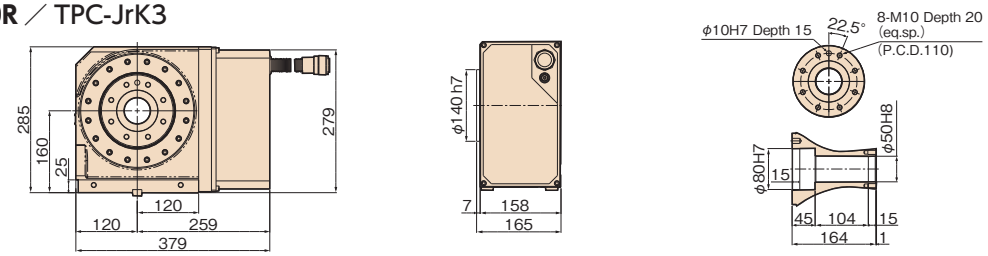
RWE/RWA-160R ／ TPC-JrK2



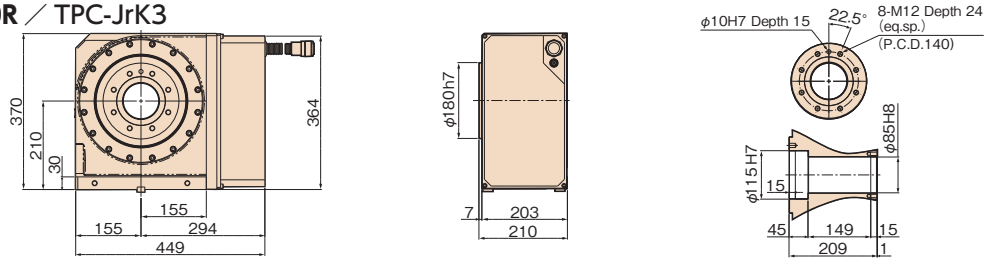
RWE/RWA-200R ／ TPC-JrK3



RWA-250R ／ TPC-JrK3



RWA-320R ／ TPC-JrK3



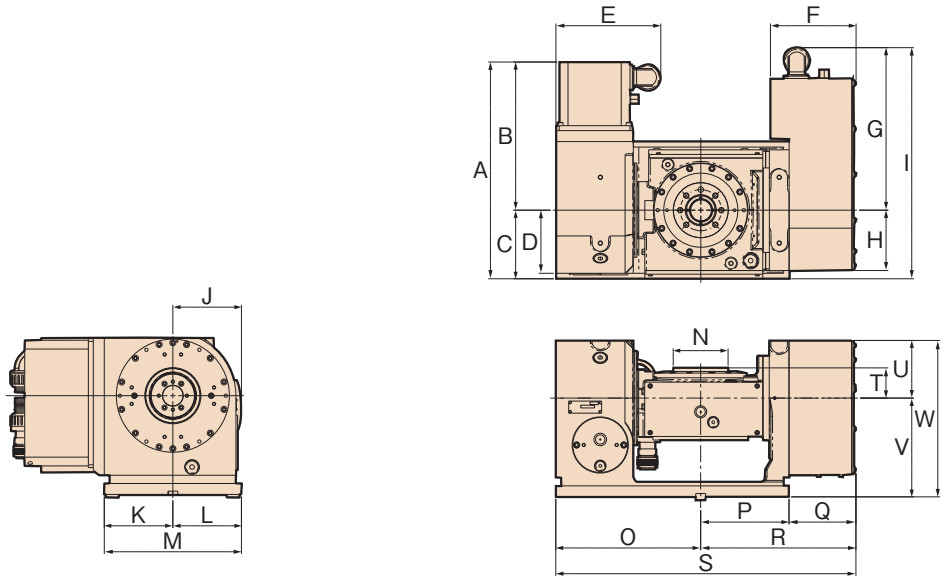
NC Table Specifications (with TPC-Jr)

	RN-100	RWE/RWA-160	RWE/RWA-200	RWA-250	RWA-320
TPC-Jr	K2	K2	K3	K3	K3
Reduction ratio	1/36	1/72	1/72	1/120	1/180
Max. rpm min^{-1}	66.6/ Motor 2,400	41.6/ Motor 3,000	41.6/ Motor 3,000	25/ Motor 3,000	16.6/ Motor 3,000

Note 1: Other specifications P.18
Note 2: Contact us before an eccentric load is applied to the table due to continuous cutting feed or jigs.

NC Tilting Rotary Tables／TPC-Jr

Unit: mm



NC Tilting Tables Specifications (with TPC-Jr)

		TPC	Reduction ratio	Max.rpm min^{-1}/ Motor rotation condition
TWA-100	Rotary	K2	1/60	41.6/2,500
	Tilt		1/120	16.6/2,000
TWA-130	Rotary	K2	1/60	41.6/2,500
	Tilt		1/120	16.6/2,000
TWA-160	Rotary	K2	1/72	41.6/3,000
	Tilt		1/120	16.6/2,000
TWA-200	Rotary	K3	1/45	44.4/2,000
	Tilt		1/90	22.2/2,000
TBS-130	Rotary	K2	1/48	62.5/3,000
	Tilt		1/60	50/3,000
TBS-160	Rotary	K2	1/60	50/3,000
	Tilt	K3	1/60	50/3,000

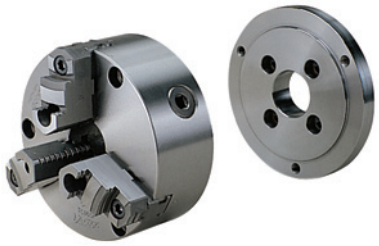
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
TWA-100	327	224	103	90	198	145	276	90	379	103	100	100	200	Φ86h7	195	134	111	245	440	45	85	135	220
TWA-130	324	224	100	90	208	145	276	90	379	103	100	100	200	Φ90h7	211	134	111	245	456	60	90	150	240
TWA-160	395	270	125	115	191	156	296	110	421	125	125	125	250	Φ100h7	264	161	122	283	547	55	105	180	285
TWA-200	435	280	155	135	208	157	321	135	476	155	145	145	290	Φ120h7	284	192	157	349	633	60	135	210	345
TBS-130	375	265	110	100	189	150	281	110	391	—	110	110	22	Φ90h7	235	160	92	252	487	65	110	160	270
TBS-160	364	249	115	—	215	168	296	115	421	—	125	125	250	Φ100h7	275	180	118	298	573	70	110	200	310

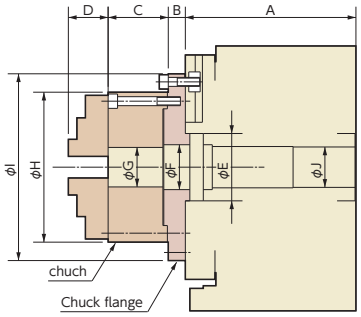
Note 1: Other specifications P.16 P.36
Note 2: Contact us before an eccentric load is applied to the table due to continuous cutting feed or jigs.

PDF/DXF/3D drawings can be downloaded from the official website.

Chuck

Scroll Chuck





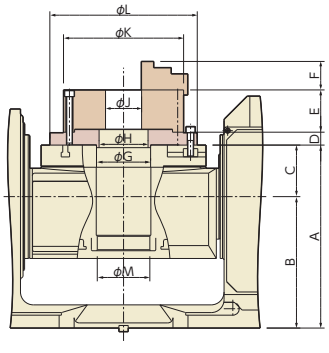
Chuck size (inch)	Chuck type	Outer chucking range (mm)	Inner chucking range (mm)
4	TC110F	2 to 106	36 to 102
5	TC130F	3 to 130	42 to 123
6	TC165F	3 to 156	52 to 148
7	TC190F	3 to 184	56 to 174
9	TC230F	4 to 214	64 to 202
10	TC273F	10 to 246	72 to 230
12	TC310F	10 to 275	82 to 265
15	TC385F	15 to 345	100 to 327
18	TC460F	15 to 410	152 to 436

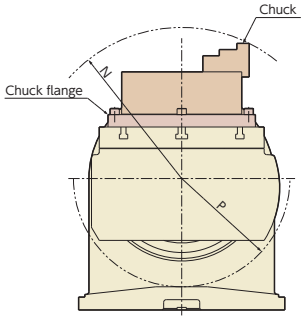
Note 1: The values in the table above are the dimensions with hardened jaws. (Soft jaws are optional.)
Note 2: Some workpieces, even in the chucking range, may not be chucked due to jaw configuration.

Unit: mm

	Chuck size (inch)	A	B	C	D	E	F	G	H	I	J
RBS/RBH-160	4	170	18	58	31.3	55	45	24	112	112	40
	5			60	37.3			32	132	132	
	6			66	44.3			44	167	167	
	7		18	75	46.3			54	192	192	
RBS/RBH-250	5	180	18	60	37.3	80	65	32	132	132	50
	6		18	66	44.3			44	167	167	
	7		18	75	46.3			54	192	192	
	9		25	82	55.3			70	233	233	
RBS/RBH-320	6	225	18	66	44.3	115	100	44	167	167	85
	7		18	75	46.3			54	192	192	
	9		25	82	55.3			70	233	233	
	10		25	86	53.3			100	274	274	
	12		25	92	59.3			110	310	310	
RN-100	4	145	10	58	31.3	50	50	24	112	112	30
	5			60	37.3			32	132	132	
RWE/RWA/ RWH-160	4	155	18	58	31.3	55	45	24	112	112	40
	5			60	37.3			32	132	132	
	6			66	44.3			44	167	167	
	7			75	46.3			54	192	192	
RWE/RWA/ RWH-200	5	165	18	60	37.3	65	55	32	132	132	45
	6		18	66	44.3			44	167	167	
	7		18	75	46.3			54	192	192	
	9		25	82	55.3			70	233	233	
RWA/RWH-250	5	165	18	60	37.3	80	65	32	132	132	50
	6		18	66	44.3			44	167	167	
	7		18	75	46.3			54	192	192	
	9		25	82	55.3			70	233	233	
RWA/RWH-320	6	210	18	66	44.3	115	100	44	167	167	85
	7		18	75	46.3			54	192	192	
	9		25	82	55.3			70	233	233	
	10		25	86	53.3			100	274	274	
	12		25	92	59.3			110	310	310	
RWB-250	6	180	18	66	44.3	105	65	44	167	208	80
	7		18	75	46.3		65	54	192	236	
	9		25	82	55.3		76	70	233	233	
RWB-320	6	240	18	66	44.3	150	101	44	167	216	120
	7		18	75	46.3			54	192	246	
	9		25	82	55.3			70	233	286	
	10		25	86	53.3			100	274	318	
	12		25	92	59.3			110	310	318	
RWB-400	7	275	20	75	46.3	200	151	54	192	286	160
	9		25	82	55.3			70	233	286	
	10		25	86	53.3			100	274	336	
	12		25	92	59.3			110	310	370	
	15		30	100	70.3			150	385	385	
RWB-500	9	325	25	82	55.3	220	170	70	233	356	182
	12		25	92	59.3		210	110	310	386	
	15		30	100	70.3		210	150	385	460	
	18		35	114	79.8		210	180	460	500	

Note 1: The above dimensions refer to power chucks by KOBAYASHI IRON WORKS CO., LTD.
Note 2: The flange type and the method of attaching the flange fixing bolt differ depending on the rotary table and the chuck size.





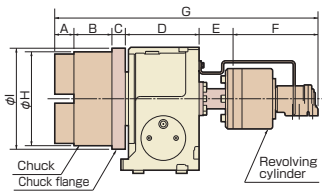
Unit: mm

型式	Chuck size (inch)	A	B	C	D	E	F	G	H	J	K	L	M	N	P
TBS-130	5	225	160	65	18	60	37.3	55	45	32	132	132	40	R198	R127
TBS-160	4	270	200	70	18	58	31.3	55	45	24	112	112	40	R191	R145
	5					60	37.3			32	132	132		R204	
	6					66	44.3			44	167	167		R223	
	7					75	46.3			54	192	192		R241	
TWA-100	4	180	135	45	15	58	31.3	55	45	24	112	112	35	R164	R106
	5					60	37.3			32	132	132		R177	
TWA-130	5	210	150	60	18	60	37.3	55	45	32	132	132	35	R193	R114
TWA-160	4	235	180	55	18	58	31.3	55	45	24	112	112	40	R176	R135
	5					60	37.3			32	132	132		R189	
	6					66	44.3			44	167	167		R208	
	7					75	46.3			54	192	192		R226	
TWA-200	5	270	210	60	18	60	37.3	65	55	32	132	132	45	R200	R148
	6					66	44.3			44	167	167		R219	
	7					75	46.3			54	192	192		R236	
	9				25	82	55.3			70	233	233		R258	
TN-320	6	355	255	100	18	66	44.3	105	95	44	167	256	102	R254	R210
	7					75	46.3			54	192	256		R271	
	9				25	82	55.3			70	233	286		R294	
	10					86	53.3			100	274	318		R303	
	12					92	59.3			110	310	318		R323	
TN-450	9	425	425	0	25	82	55.3	170	150	70	233	316	136	R213	R375
	10					86	53.3			100	274	336		R222	
	12					92	59.3			110	310	370		R244	
	15				30	100	70.3			150	385	445		R288	

Note 1: The above dimensions refer to power chucks by KOBAYASHI IRON WORKS CO., LTD.
Note 2: The flange type and the method of attaching the flange fixing bolt differ depending on the rotary table and the chuck size.

Power chuck

Chuck size (inch)	Chuck type	Outer chucking range (mm)	Hydraulic cylinder type	Pneumatic cylinder type
4	H01MA 4	6 to 110	HH4C 80	H05CH100
5	H01MA 5	15 to 135	HH4C 80	H05CH150
6	H01MA 6	20 to 165	HH4C 80	H05CH175
8	H01MA 8	18 to 210	HH4C100	H05CH250
10	H01MA10	24 to 254	HH4C125	H05CH300



Hydraulic cylinder dimensions

Unit: mm

	Chuck size (inch)	A	B	C	D	E	F	G	H	I
RBS/RBH-160	4	27	52	18	170	50	175	492	110	—
	5	27	52			64		506	135	—
	6	43	72			50		528	165	—
RBS/RBH-250	4	27	52	20	180	67	175	521	110	—
	5	27	52	20		64		518	135	—
	6	44	72	24		64		559	165	—
RBS/RBH-320	6	44	72	24	225	76	175	616	165	—
	8		85	35			190	655	210	—
	10		95	35			197	672	254	—
RWA/RWE/ RWH-160	4	27	52	18	155	50	175	477	110	—
	5	27	52			64		491	135	—
	6	43	72			50		513	165	—
RWA/RWE/ RWH-200	4	27	52	20	165	50	175	489	110	—
	5	27	52	20		64		503	135	—
	6	43	72	24		50		529	165	—
RWA/RWH-250	4	27	52	20	165	50	175	489	110	—
	5	27	52	20		64		503	135	—
	6	43	72	24		50		529	165	—
RWA/RWH-320	6	43	72	24	210	76	175	600	165	—
	8		85	35			190	639	210	—
	10		95	35			197	656	254	—
RWB-250	4	27	52	20	180	65	175	519	110	185
	5	27	52	20				519	135	185
	6	43	72	24				559	165	205
RWB-320	6	44	72	24	240	-15	175	540	165	245
	8		85	35		-15	190	579	210	245
	10		95	35		45	197	656	254	254
RWB-400	8	44	85	35	275	-24	190	605	210	305
	10		95				197	622	254	

Example of pneumatic power chuck use

Pneumatic cylinder dimensions

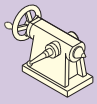
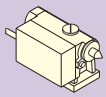
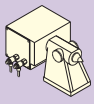
Unit: mm

	Chuck size (inch)	A	B	C	D	E	F	G	H
RBS/RBH-160	4	27	52	18	170	50	182	499	110
	5	27	52			64	190	521	135
	6	43	72			64	190	557	165
RBS/RBH-250	4	27	52	20	180	67	182	528	110
	5	27	52			64	190	533	135
	6	44	72			64	190	570	165
RBS/RBH-320	6	44	72	24	225	76	190	631	165
	8		85	35			243	708	210
	10		95	35			258	733	254
RWA/RWE/ RWH-160	4	27	52	18	155	50	182	484	110
	5	27	52			64	190	506	135
	6	43	72			64	190	542	165
RWA/RWE/ RWH-200	4	27	52	20	165	67	182	513	110
	5	27	52			64	190	518	135
	6	43	72			64	190	554	165
RWA/RWH-250	4	27	52	20	165	67	182	513	110
	5	27	52			64	190	518	135
	6	43	72			64	190	554	165
RWA/RWH-320	6	43	72	24	210	76	190	615	165
	8	43	85	35			243	692	210
	10	43	95	35			258	717	254

Note: The above dimensions refer to power chucks by HOWA MACHINERY, LTD. A front-mounting pneumatic chuck is also available.

Tailstock

Compatible Rotary Tables

Tailstock type / NC Rotary Table	Manual	Hydraulic	Pneumatic
			
RN-100	TL-110M	—	—
RWE/RWA/RWH-160 RWM-160	TL-135M	TLH-135	TLP-135M
RBS/RBH-160 RBM-160 RWE/RWA/RWH-200 RWA/RWH-250 RWB-250 RWM-200/250	TL-160M	TLH-160	TLP-160M
RBS/RBH-250 RWA/RWH-320 RWB-320 RWM-320	TL-210M	TLH-210	—
RBS/RBH-320 RWB-400	TL-255M	TLH-255	—
RWB-500	TL-310M	—	—
RWB-630 RNCK-631	TL-400M	—	—
RCV-800	TL-530M	—	—

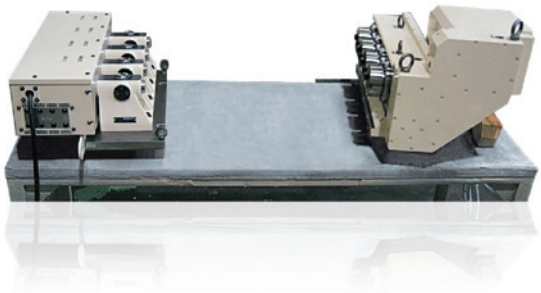
Order Code

T L □ - 1 6 0 M

Center height

Alphabet	Type
N/A	Manual
H	Hydraulic
P	Pneumatic

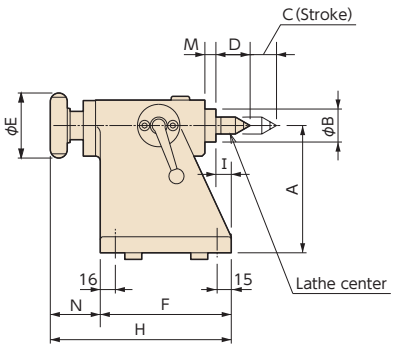
Example of Pneumatic Tailstock

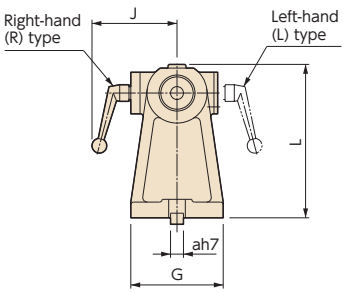


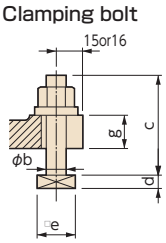
Manual Tailstock

TL-110M,135M

TL-135M

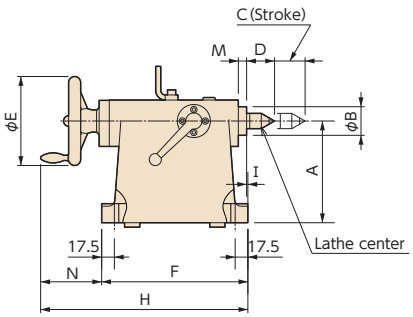


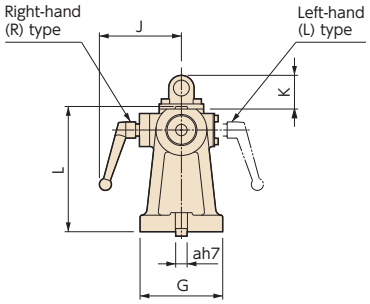


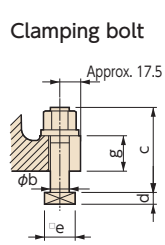


TL-□□□M

TL-160M







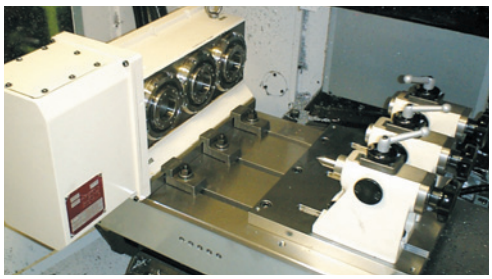
Dimensions

Unit: mm

Order Code	Morse taper	Center height A	Center dia. B	Stroke C	Lathe center D	Handle dia. E	Base dimensions F×G	H	I	J	K	L	M	N	a	b	c	d	e	g	Weight kg
TL-110M	MT2	110	35	28	36	70	139×100	192	16	92	–	141	12	53	14	12	55	8	23	20	8
TL-135M	MT2	135	35	28	36	70	139×100	192	16	92	–	166	12	53	14	12	55	8	23	20	9
TL-160M	MT3	160	45	47	44	140	230×130	328	2	129	53	197	13	98	18	16	75	11	28	30	22
TL-190M	MT3	190	45	47	44	140	230×140	328	2	129	53	227	13	98	18	16	75	11	28	30	24
TL-210M	MT3	210	45	47	44	140	230×146	328	2	129	53	247	13	98	18	16	75	11	28	30	26
TL-235M	MT4	235	50	51	52.5	160	270×160	381	12	132	53	274	8	113	18	16	80	11	28	35	30
TL-255M	MT4	255	50	51	52.5	160	270×170	381	12	132	53	294	8	113	18	16	80	11	28	35	38
TL-310M	MT4	310	60	51	52.5	180	315×220	422	15.5	154	68	354	9.5	107	18	16	85	11	28	40	63
TL-400M	MT4	400	60	51	52.5	180	315×240	422	15.5	154	68	444	9.5	107	18	16	85	11	28	40	76
TL-530M	MT4	530	80	66	52.5	225	410×290	528	29	165	68	594	6	118	22	20	95	13	32	40	138

TLP-135M

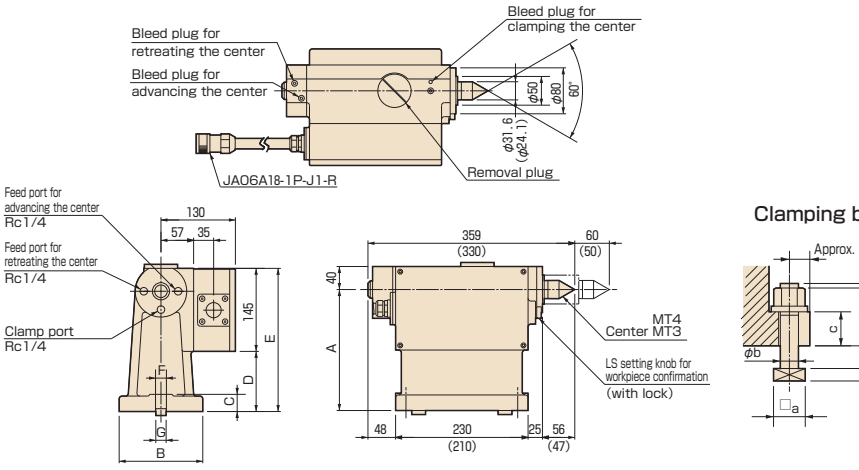
Example



Hydraulic Tailstock

TLH-□□□

TLH-160



Note 1: Dimensions in parentheses are for the TLH-135.
Note 2: Specify the cable length when placing an order.

Dimensions and specifications

Unit: mm

Order Code	A	B	C	D	E	F	Carbide center	Hydraulic MPa	Center thrust force N	Center clamp torque N	Weight kg
TLH-135	135	110	25	30	175	19	MT3	1.5 to 6.8	1,670	2,450	28
TLH-160	160	130	30	55	200	19	MT4		2,352		33
TLH-210	210	146	30	105	250	19	MT4		2,352		36
TLH-255	255	170	35	150	295	19	MT4		2,352		40

*The table above shows the center thrust force and clamp torque when the hydraulic pressure is 3.5MPa.

Clamping bolt dimensions

Unit: mm

Order Code	G	a	b	d	e	f
TLH-135	14	23	12	42	60	8
	16	26	16	46	70	10
	18	28	16	46	70	11
TLH-160 TLH-210	14	23	12	47	65	8
	16	26	16	51	75	10
	18	28	16	51	75	11
TLH-255	16	26	16	56	75	10
	18	28	16	56	80	11
	20	32	18	60	90	11

Support Spindle

User friendly renewal allows mounting of compact rotary joint and the top surface design of the spindle is the same as the basic models RWA/RWE/RWA-160.

☞Rotary joint P.66

Compatible Rotary Tables

NC Rotary Table \ Support spindle type	No clamp	Pneumatic clamp	Hydraulic clamp	Strong hydraulic clamp
RWE/RWA/RWH-160	SS-135	SE-135	SH-135	—
RBS/RBH-160 RWE/RWA/RWH-200 RWA/RWH-250 RWB-250	SS-160	SE-160	SH-160	SSB-160
RBS/RBH-250 RWA/RWH-320 RWB-320	SS-210	SE-210	SH-210	SSB-210
RWB-400	—	—	—	SSB-255
RWB-500	—	—	—	SSB-310

Order Code

S S - 1 3 5

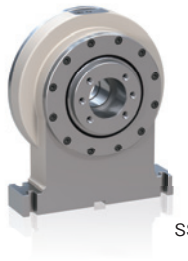
Center height

Alphabet	Clamp
S	No clamp
E	Pneumatic
H	Hydraulic

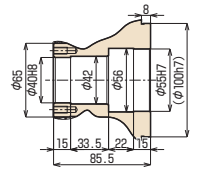
S S B - 1 6 0

Center height

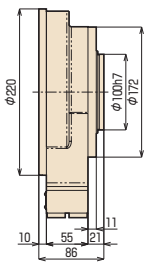
SS-□□□ (No clamp)

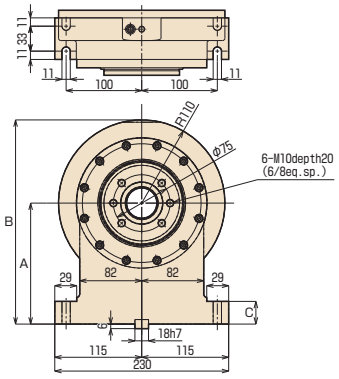


SS-160



Sectional view of Support spindle

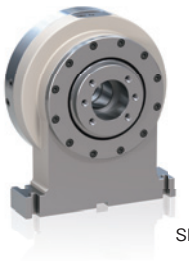




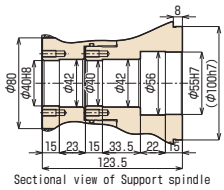
Unit: mm

Order Code	A	B	C	Weight kg
SS-135	135	245	25	19
SS-160	160	270	30	21
SS-210	210	320	30	24

SE-□□□ (Pneumatic clamp)

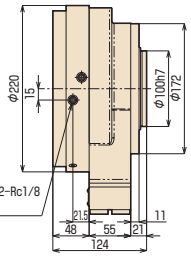


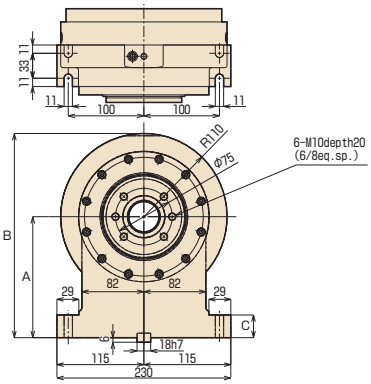
SE-160



Sectional view of Support spindle

Pneumatic feed port for clamp op.:2-Rc1/8 (both sides)



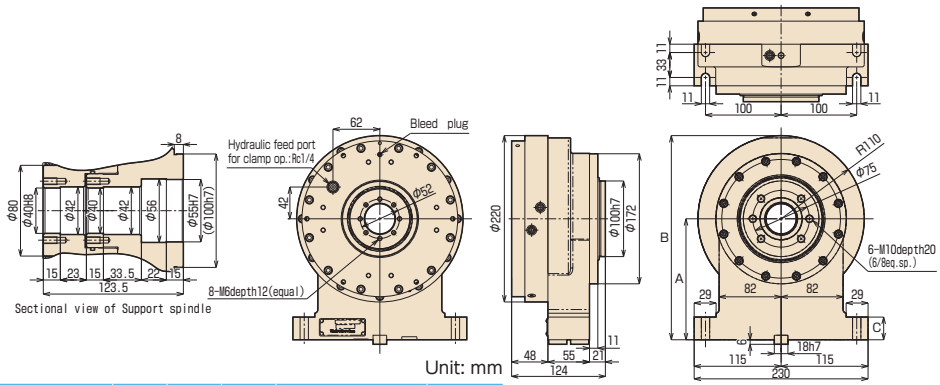


Unit: mm

Order Code	A	B	C	Clamping Torque (N·m) (0.49MPa)	Weight kg
SE-135	135	245	25	400	28
SE-160	160	270	30		30
SE-210	210	320	30		33

SH-□□□ (Hydraulic clamp)

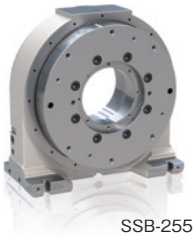
SH-160



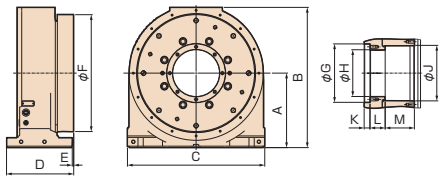
Unit: mm

Order Code	A	B	C	Clamping Torque (N·m) (3.5MPa)	Weight kg
SH-135	135	245	25	800	28
SH-160	160	270	30		30
SH-210	210	320	30		33

SSB-□□□



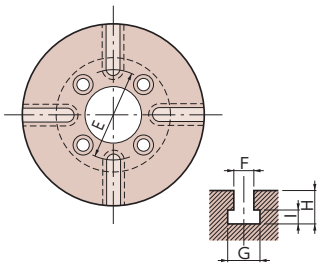
SSB-255



Unit: mm

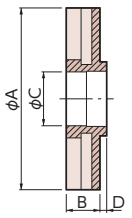
Order Code	A	B	C	D	E	F	G	H	J	K	L	M	Clamping Torque (N·m) 3.5MPa	Clamping Torque (N·m) 4.9MPa	Weight kg
SSB-160	160	303	290	175	5	250	105H7	80H7	95H8	15	42	66	1,300	2,000	60
SSB-210	210	396	380	210	5	320	150H7	120H7	145H8	15	50	90	3,100	4,700	120
SSB-255	255	480	470	230	5	400	200H7	160H7	190H8	20	52	100	5,500	8,000	185
SSB-310	310	560	470	230	5	500	200H7	160H7	190H8	20	52	100	5,500	8,000	230

Face Plate

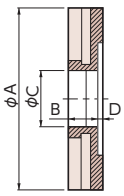


Unit: mm

	A Face plate diameter	B	C	D	E	F	G	H	I
RN-100	ϕ135	25	ϕ50H7	5	(ϕ50 through T-slot)	10H8	16^{+2}_{0}	17	7^{+1}_{0}
TBS-130 TWA-100/130 TWM-100	ϕ135	25	ϕ40H7	5	ϕ70	12H8	19^{+2}_{0}	19	8^{+1}_{0}
RBS/RBH-160 RWA/RWE/RWH-160 RWM-160	ϕ160	30	ϕ50H7	3	ϕ80	12H8	19^{+2}_{0}	19	8^{+1}_{0}
TBS-160 TWA-160 TWM-160	ϕ200	30	ϕ50H7	3	ϕ80	12H8	19^{+2}_{0}	19	8^{+1}_{0}
RWA/RWE/RWH-200 RWM-200 TWA-200	ϕ200	30	ϕ60H7	3	ϕ90	12H8	19^{+2}_{0}	19	8^{+1}_{0}
	ϕ250	30	ϕ60H7	3	ϕ90	12H8	19^{+2}_{0}	19	8^{+1}_{0}
RBS/RBH-250 RWA/RWH-250 RWM-250 TBS-250 TWM-250	ϕ250	30	ϕ75H7	5	ϕ110	12H8	19^{+2}_{0}	19	8^{+1}_{0}
RBS/RBH-320 RWA/RWH-320 RWM-320	ϕ320	40	ϕ110H7	5	ϕ180	14H8	23^{+2}_{0}	23	9^{+2}_{0}



Mount by fitting inner dia. of the spindle.



Mount by fitting outer dia. of the spindle. For RN-100 only

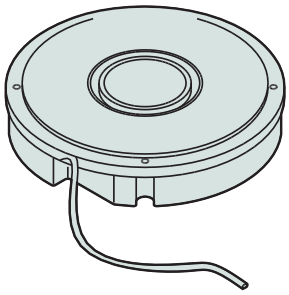
Example

* Only face plate for RN-100 is mounted by fitting outer diameter of the spindle.
* TSUDAKOMA reccomends the face plate to fit inner diameter of the spindle. TWA-160/TBS-160 also has a face plate for fitting outer diameter of the spindle, so please check the face plate of your existing machine when purchasing a repeat unit.

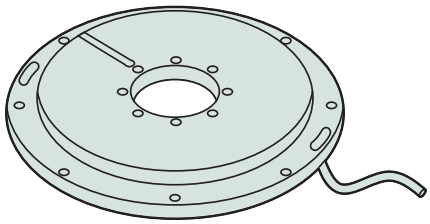
High-precision Specification by Rotary Encoders or MP Scales

Indexing accuracy can be upgraded by attaching a rotary encoder or MP scale to the spindle of the rotary table. The sum of the cumulative indexing accuracy of the rotary encoder or the MP scale and electrically divided errors of the pre-amplifier or the waveform shaping unit is referred to as the indexing accuracy of the rotary tables with scales. The indexing accuracy is guaranteed by TSUDAKOMA.

Rotary encoder



MP scale

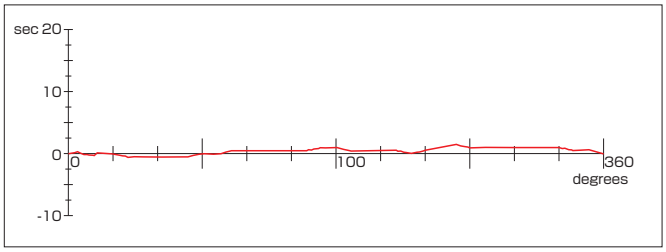


Model Description

"RWB-□□□R,□□"

- **RE** (Rotary encoders)
- **RI** (MP scales)

Example of measurement indexing accuracy with scale



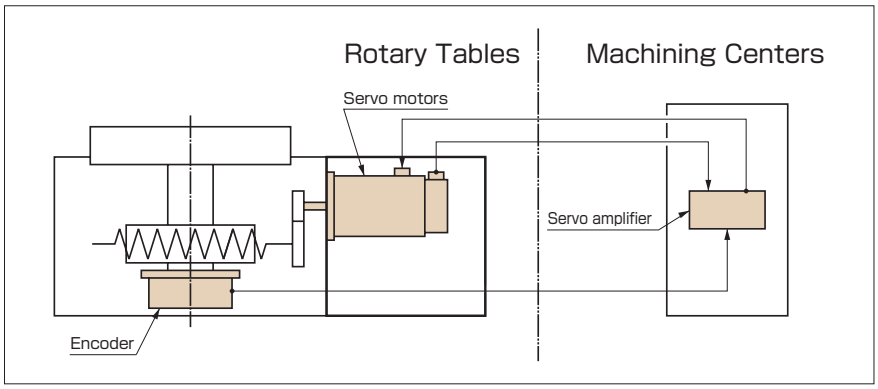
Indexing accuracy with scale

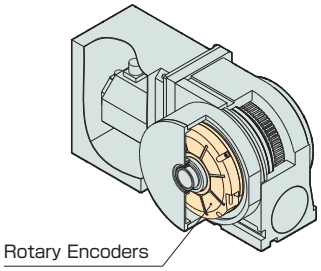
		Rotary encoders		MP scales	
		Order Code	Accuracy with scale	Order Code	Accuracy with scale
RN-100	Rotary axis	RCN23*1, RCN25*1	15sec	–	–
RBS/RBH-160 RWE/RWA/RWH-160,200	Rotary axis	RCN23*1 or RU77-4096A	15sec	MPI 536A	15sec
RBS/RBH-250,320 RWA/RWH-250,320	Rotary axis	RCN83*1, RCN85*1 or RS97-1024	10sec/RCN83*1, RS97-1024 6sec/RCN85*1	MPI 736B	10sec
RWB-250	Rotary axis	RCN83*1, RCN85*1 or RS97-1024	10sec/RCN83*1, RS97-1024 6sec/RCN85*1	MPI 736B	10sec
RWB-320	Rotary axis			MPI 1072B	8sec
RWB-400,500,630 RNCK-631 RCH-800,1000,1250 RCV-800,1000,1250,1600	Rotary axis			MPI 1272B	8sec
TWA-130	Rotary axis※ Tilt axis	RCN23*1 or RU77-4096A	15sec	MPI 536A	15sec
TWA-160	Rotary axis Tilt axis				
TWA-200	Rotary axis Tilt axis				
TBS-130	Rotary axis※ Tilt axis				
TBS-160	Rotary axis Tilt axis				
TBS-250	Rotary axis			MPI 736B	10sec
	Tilt axis	RCN23*1 RCN83*1, RCN85*1 or RU77-4096A RS97-1024	15sec/RCN23*1, RU77-4096A 10sec/RCN83*1, RS97-1024 6sec/RCN85*1		
TN-320	Rotary axis Tilt axis	RCN83*1, RCN85*1 or RS97-1024	10sec/RCN83*1, RS97-1024 6sec/RCN85*1	MPI 736B MPI 1072B	10sec 10sec
TN-450	Rotary axis Tilt axis			MPI 1272B	8sec
TWB-320	Rotary axis	RCN23*1 RCN83*1,RCN85*1	15sec/RCN23*1 10sec/RCN83*1 6sec/RCN85*1	MPI 736B	10sec
	Tilt axis			MPI 1072B	15sec
TWB-630	Rotary axis	RCN23*1,RCN25*1 RCN83*1,RCN85*1	15sec/RCN23*1 10sec/RCN25*1,RCN83*1 6sec/RCN85*1	MPI 1272B	8sec
	Tilt axis				15sec
TWB-1000	Rotary axis Tilt axis	RCN83*1,RCN85*1	10sec/RCN83*1 6sec/RCN85*1		8sec 15sec

☞For other accuracy standard. from P.74

Accuracy differs depending on the specifications of the tables. Ask us for further information.
※Rotary encoders are unavailable.

Specifications of rotary encoders





HEIDENHAIN

Rotary Encoders	RON886	RCN23*1	RCN83*1	RCN85*1
Interface unit	IBV102	Not required	Not required	Not required
Recommended resolution	0.0005°	26bit ABS	29bit ABS	29bit ABS

Model RCN and corresponding Interface

RCN 23 △ 1 □

Interface	△	□
FANUC	9	F
MITSUBISHI ELECTRIC	9	M
EnDat 2.2	1	—

Magnescale

Rotary Encoders	RU77-4096A	RS97-1024
Recommended resolution	23bit ABS	23bit ABS

Model RU77 and corresponding Interface

RU77-4096A ☆ G

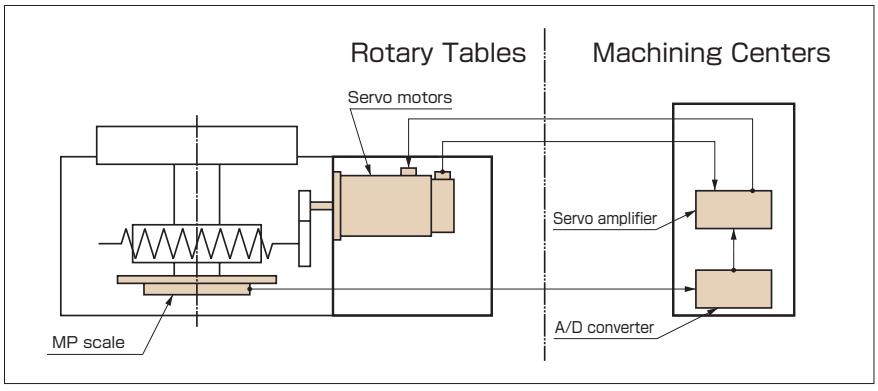
Interface	☆
FANUC	A
MITSUBISHI ELECTRIC	D
YASKAWA ELECTRIC	F

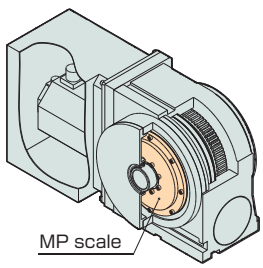
Model RS97 and corresponding Interface

RS97-1024EG ★

Interface	★
FANUC	A
MITSUBISHI ELECTRIC	D

Specifications of MP scales (by NIDEC MACHINE TOOL CORPORATION)



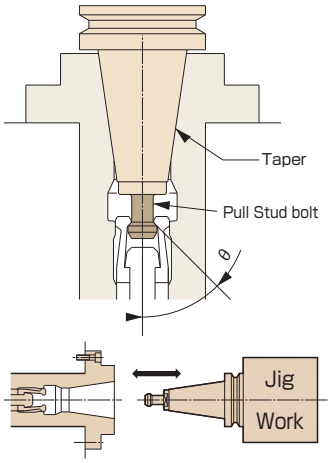


MP scale	MPI 536A	MPI 736B	MPI 1072B	MPI 1272B
Recommended resolution	0.0001°	0.0001°	0.00005°	0.00005°
A/D converter	ADB-20J10:A/B/Z phase square wave ADB-20J60:Serial I/F ADB-K60F:FANUC serial I/F ADB-K60M:Mitsubishi Electric Serial I/F			

Note 1:AD converter (corresponding to the serial output interface) is necessary in the MPRZ series.
Note 2:Preamplifiers are necessary for MPR-series.
Note 3:When using preamplifiers for MPR-series other than those of NIDEC MACHINE TOOL CORPORATION, please consult us.

Pull Stud

A unit to position and fix a fixture and a workpiece on the rotary table by using the taper shank with a pull stud. This unit can be combined with a robot or a work loader to create an unmanned machining system.



＊With clamp/unclamp confirmation switch

Applicable models and specifications

Unit: mm

Order Code	Taper shank
RWB-250	BT-50
RWB-320	
RWB-400	
RWB-500	

Order Code	Taper shank
TWA-160	BT-40
TWA-200	BT-50
TBS-250	
TN-320	
TWB-320	BT-40
	BT-50

Specify the pull stud type.

Taper	Pull stud type	
	θ	
BT-50	45°	Ⅰ
BT-40	60°	Ⅱ
	90°	Others

Rotary Joint

A rotary joint unit to supply hydraulic or pneumatic pressure to workpieces or actuators mounted on the rotary tables. Automatic loading and unloading of workpieces are possible.

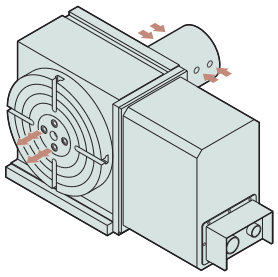
Applicable models and specifications

Order Code	Size	Max. number of ports		Rated supplied pressure MPa
		Internal mount type	External mount type	
RBS/RBH/RBM/ RWE/RWA/ RWH/RWM	160/200/250	6	6+1	Standard:6.9 High pressure:21.0
	320	6	8+1	
RWB	250	10+1	—	
	320	12+1	—	
	400/500/600	16+1	—	
RDS	200	6	—	
TBS/TWA/TWS	130/160/200/250	6	—	
TWB	320	8+1	—	
	630/1000	12+1	—	
TWM	100	3	—	
	160/250	6	—	

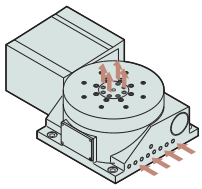
*Please contact us for models not listed.

*The maximum number of ports "6" are all Compact Rotary Joints with a maximum input pressure of 21 MPa.

External mount type

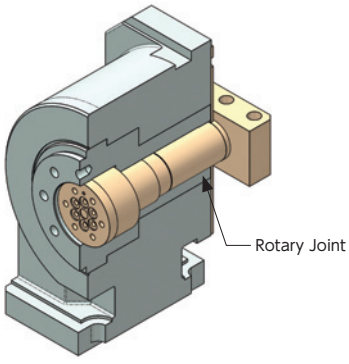


Internal mount type



Example of use

Compact Rotary Joint

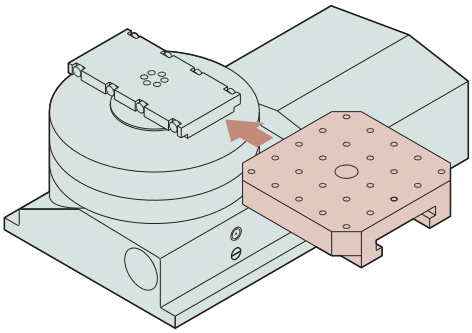


【Specifications】
Max. number of ports：6 port
Rated supplied pressure：21.0MPa

【Applicable models】
Compatible with models with center hole Φ40 mm (through hole) or larger.
RBS/RBH/RBM, RWE/RWA/RWH/RWM, TBS, TWA/TWM series, SS/SE/SH series.
*Please contact us for more information about TWM.

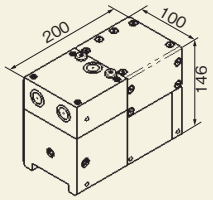
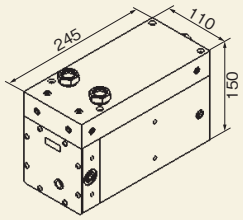
Pallet Clamp

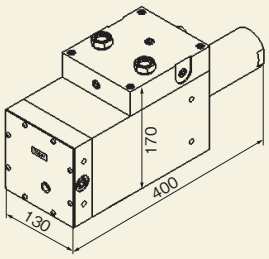
An NC rotary table with a built-in pallet clamp is available. This type of rotary table enables fast and highly accurate positioning of workpieces at any angle. Attachment of an auto-coupler makes it possible to apply hydraulic or pneumatic pressure to the top surface of pallets. By combining with a pallet-changer, setup, transfer and exchange can be carried out automatically.



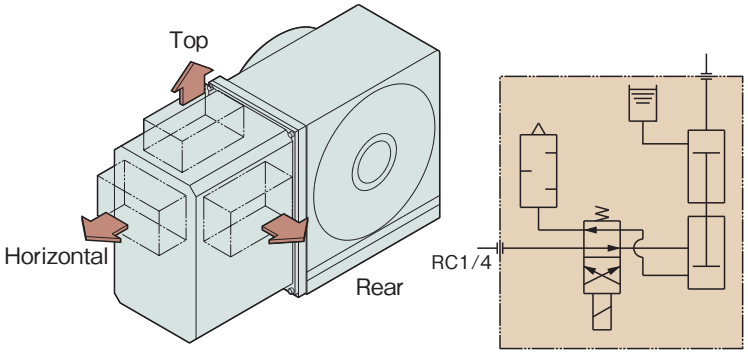
Air-hydraulic Booster

Air-hydraulic boosters are available for machines without a hydraulic source, which convert pneumatic pressure into hydraulic pressure for clamping.

Type	Applicable model	Dimensions
TB-80	RWB-250 RWB-250 + SSB-160 RWB-320 RWB-400 RCB-350 RCB-450 TWB-320	
TB-100	RWB-320 + SSB-210 RWB-400 + SSB-255 RWB-500 RWB-500 + SSB-310 RWB-630 RWB-630 + SSB-310 RCB-550 TWB-630	

Type	Applicable model	Dimensions
TB-115	RCH/RCV-800 RCH/RCV-1000 RCH/RCV-1250	

Mounting position



Please specify the following items:

1. Mounting position of the Air-hydraulic booster
2. Control voltage for the solenoid of the Air-hydraulic unit: 100VAC or 24VDC (This voltage depends on the machine to be attached)

Applicable Servo Motors

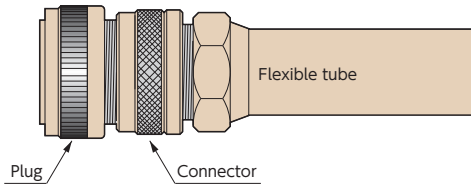
FANUC αi type servo motors are specified for each NC table model in the specifications table. The table below shows other servo motors, which have equivalent capacity to those of FANUC αi motors.

FANUC	αiF2／5000	αiF4／5000	αiF8／3000	αiF12／4000	αiF22／3000
	(αiS2／5000)	(αiS4／5000)	(αiS8／4000)	(αiS12／4000)	(αiS22／4000)
MITSUBISHI	HG75T	HG54T	HG104T	HG204S	HG354S
YASKAWA	SGM7P-04	SGM7G-05	SGM7G-09	SGM7G-20	SGM7G-30
OKUMA	BL-ME24M	BL-MT40M	BL-MT80M	BL-MT150M	BL-MT200M
SIEMENS	1FK7042	1FK7060	1FK7063	1FK7083	1FK7101
HEIDENHAIN	QSY96A	QSY116C	QSY116E	QSY155B	QSY155D

Note 1: Some motors have speed reduction ratio (max rpm) or outline dimensions different from those of FANUC motors.
Note 2: The motors shown above are classified according to motor torque capacity. The motor which is suitable for your machines depends on the specifications of your machine NC controllers. Contact the machine manufacturer about motor selection.

Applicable Cable Connectors

All cable plugs and connectors for Tsudakoma's NC rotary tables should be waterproof. Refer to the table below.



Example of cable plug connectors

		Rotary table receptacle	Cable plug	Connector	Flexible tube
For signal cable	Fanuc	N／MS3102A20-29PW (Japan Aviation Electronics Industry, Ltd.)	JA06A20-29SW-J1-R (Japan Aviation Electronics Industry, Ltd.)	KMKD22-20 (SANKEI MANUFACTURING CO.,LTD.)	KPF-22 (SANKEI MANUFACTURING CO.,LTD.)
	MITSUBISHI ELECTRIC	N／MS3102A22-14P (Japan Aviation Electronics Industry, Ltd.)	JA06A22-14S-J1-R (Japan Aviation Electronics Industry, Ltd.)	KMKD22-22 (SANKEI MANUFACTURING CO.,LTD.)	
For power cable		N／MS3102A28-11P (Japan Aviation Electronics Industry, Ltd.)	JA06A28-11S-J1-R (Japan Aviation Electronics Industry, Ltd.)	KMKD28-28 (SANKEI MANUFACTURING CO.,LTD.)	KPF-28 (SANKEI MANUFACTURING CO.,LTD.)

CE Example of cable plug connectors (with a FANUC αiF motor)

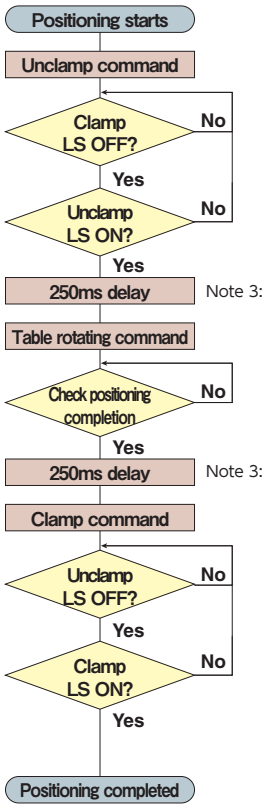
	Rotary table receptacle	Cable plug	Connector	Flexible tube
For signal cable	N／MS3102A20-29PW (Japan Aviation Electronics Industry, Ltd.)	JA06A20-29SW-J1-R (Japan Aviation Electronics Industry, Ltd.)	NBKD-20-20 (SANKEI MANUFACTURING CO.,LTD.)	NSBS＃20 (SANKEI MANUFACTURING CO.,LTD.)
For power cable	JL04V-2A28-11PE-R (Japan Aviation Electronics Industry, Ltd.)	JL04V-6A28-11SE-R (Japan Aviation Electronics Industry, Ltd.)	NBKD-32-28 (SANKEI MANUFACTURING CO.,LTD.)	NSBS＃32 (SANKEI MANUFACTURING CO.,LTD.)

Note: JA06A□□ plug is waterproof when the plug is inserted.

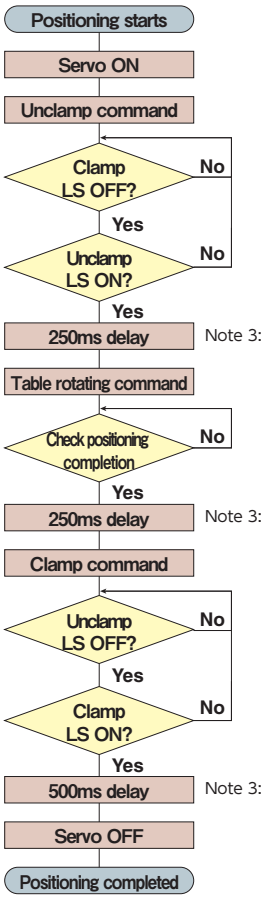
Flow Chart of Control System

It is recommended to control with the servo ON for semi-closed loops in principle.
In case of fully-closed loop, control with servo OFF.
A recommended example is shown on the right.

a) Semi-closed loop control



b) Fully-closed loop control



Note 1: In a semi-closed loop control operation, do not turn the Servo motor OFF even when the rotary table is clamped.

Note 2: In a semi-closed operation, when the eccentric load increases in size, and a large current (70% or more of the rated current) is being applied, turn the Servo motor OFF and follow the steps for the full-closed loop control.

Note 3: Delay time is our recommended time. Parameters may differ depending on the specifications. Ask us for further information.

Indexing Cycle Time

The graphs below show the required indexing time which includes the time for the control command for the machine tools. This information helps you examine the cycle time of your process with the rotary table. Table rotation speed and acceleration and deceleration constants may differ depending on the model of the rotary table. If any data other than that shown below is required, please ask us.

A : Without clamp command
B : For hydraulic clamp (0.4Sec)
C : For pneumatic clamp (0.6Sec)
D : For air-hydraulic clamp (1.0Sec)

※ ( ) shows Clamp & Un-clamp reguired time

Table rpm 8000deg/min (22.2min^{-1})
Acceleration/deceleration constant : 150ms

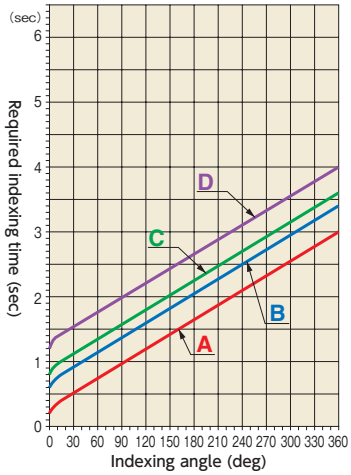
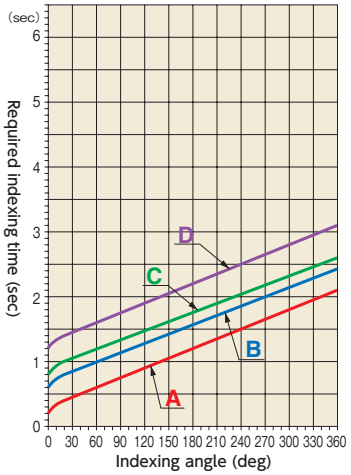


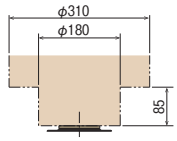
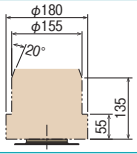
Table rpm 12000deg/min (33.3min^{-1})
Acceleration/deceleration constant : 150ms



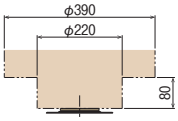
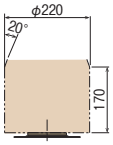
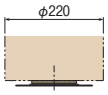
Note: For the above B and C cases, the indexing time includes the time to respond to the clamp and unclamp confirmation signals.

Workpiece mounting space for tilting rotary tables

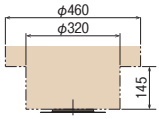
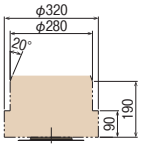
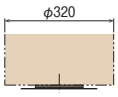
TBS-130

0 to +90°	0 to +110°	−30° to 0
		

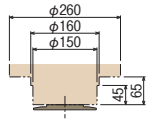
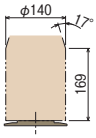
TBS-160

0 to +90°	0 to +110°	−30° to 0
		

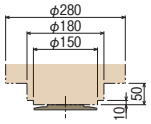
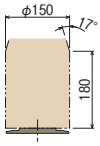
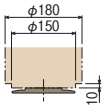
TBS-250

0 to +90°	0 to +110°	−30° to 0
		

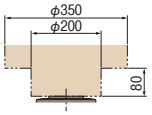
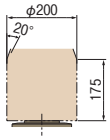
TWA-100

0 to +90°	0 to +107°	−17° to 0
		

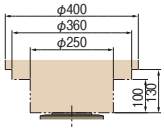
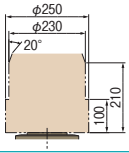
TWA-130

0 to +90°	0 to +107°	−17° to 0
		

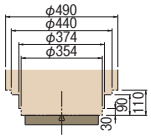
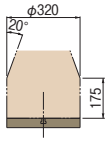
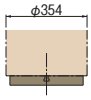
TWA-160

0 to +90°	0 to +110°	−30° to 0
		

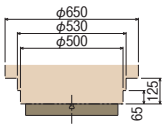
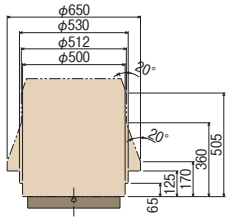
TWA-200

0 to +90°	0 to +110°	−30° to 0
		

TN-320

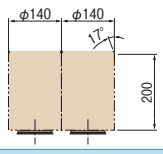
0 to +90°	0 to +110°	−30° to 0
		

TN-450

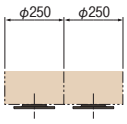
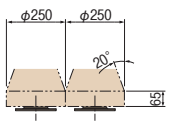
−10° to +95°	−15° to +100°
	

※Emergency stop angle
Loading area is set taking the inertia of 10° from the emergency stop position into consideration.

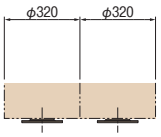
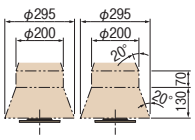
TWM-100,PS

−17° to +90°	0 to +107°
	

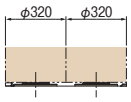
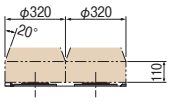
TWM-160,PS

−30° to +90°	0 to +100°
	

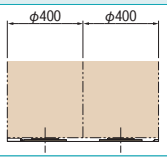
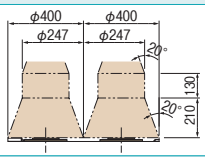
TWM-160,PL

−30° to +90°	0 to +100°
	

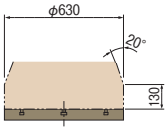
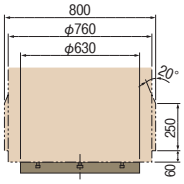
TWM-250,PS

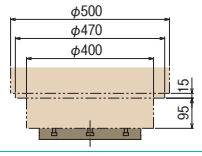
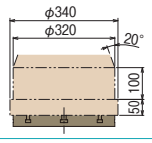
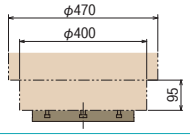
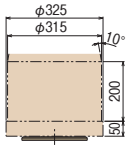
−30° to +90°	0 to +100°
	

TWM-250,PL

−30° to +90°	0 to +100°
	

TWB-630

−110° to +110°	−90° to +90°
	

TWB-320			TDB-200/TDS-200
0 to +90°	0 to +110°	−30° to 0	−100° to +10°
			

Note 1: If the tilting angle is over the above range or the table stops by emergency stop, check the unit.
Note 2: Be sure to remove the eye bolts used for lifting before using the rotary table.

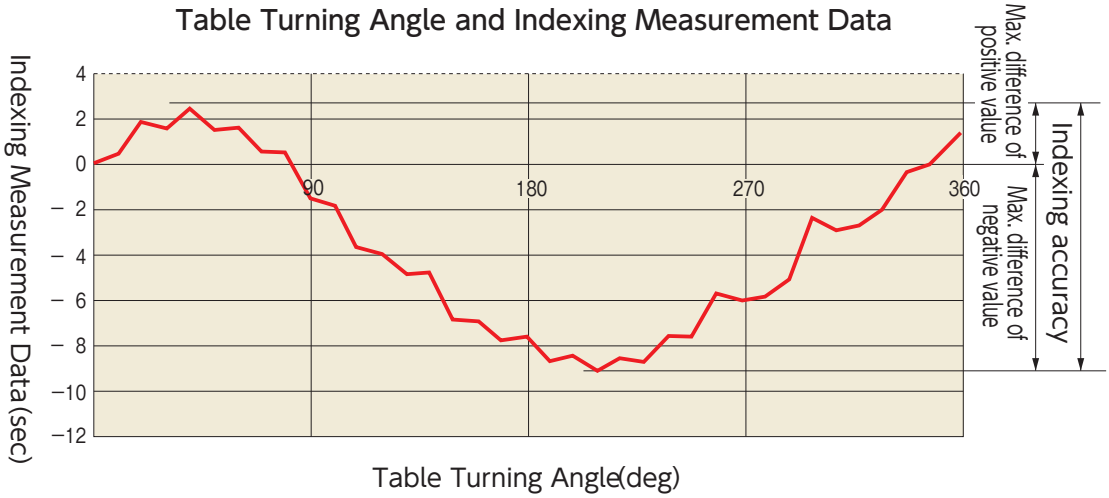
Explanation of Technical Terms

In order to help you understand Tsudakoma's products, here are some explanations about the main specifications.

Indexing Accuracy

After indexing one rotation of the table equally according to the tooth number of the worm gear, obtain the difference between the theoretical turning angle and the measured angle. The indexing accuracy is the sum of the maximum difference in positive values and that in negative values (absolute values).

Table Turning Angle and Indexing Measurement Data



Clamp Torque

Clamp torque is only the force of the clamping mechanism, which does not include force caused by self-locking of a worm gear. The clamp torque shown in the catalog is the figure obtained when the rated pressure (3.5 MPa for hydraulic pressure, and 0.49 MPa for pneumatic pressure) is supplied to the working fluid. When a larger clamp torque is required, increase the pressure gradually up to the maximum allowable pressure (4.9 MPa for hydraulic pressure, 0.69 MPa for pneumatic pressure) to increase the clamp torque.

Worm Gear Strength

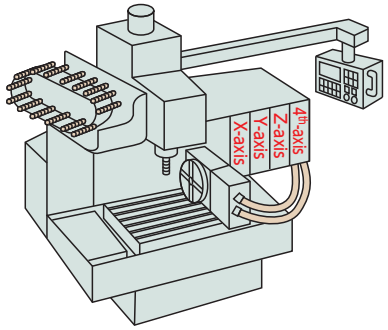
Worm gear strength is the allowable wheel torque when table rpm is 1 min-1. The allowable torque for the worm wheel is calculated according to the standards stipulated by the Japan Gear Manufactures Association.

To make the best use of TSUDAKOMA NC rotary tables

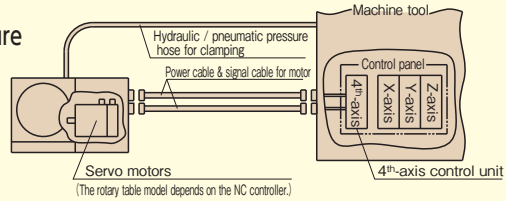
1 First of all, determine the NC controller system that best controls the NC rotary tables.

NC control system 1

A control unit for the 4th axis (or 5th axis) should be installed in the NC controller of the machine tool.



Structure

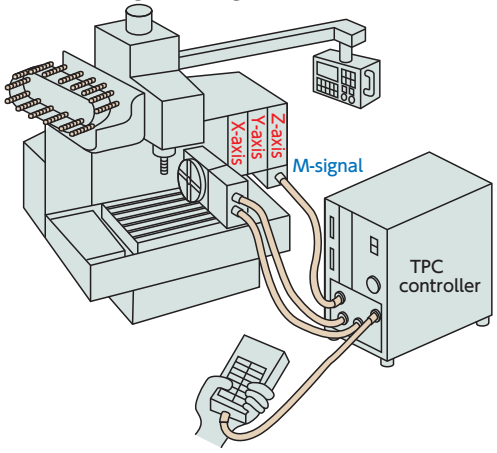


Features

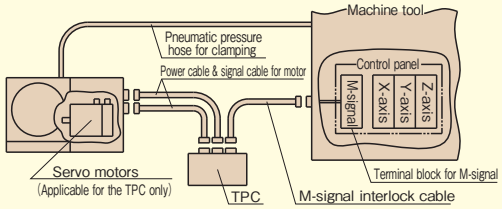
- Simultaneous and continuous circular cutting on the X, Y, and Z-axes is possible depending on the specifications of the machine tool.
- The program of the rotary table should be input at the machine tool.

NC control system 2

The TPC single axis NC controller of TSUDAKOMA is applied, receiving an M-signal from the machine tool.



Structure

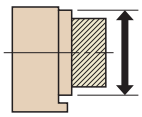


Features

- Even if the 4th (or 5th) axis cannot be installed on a machine tool, the TPC controller can be used with an M-signal.
- Basically, this control system is only for indexing.
- Program for a rotary table should be input directly to the TPC. At the machine tool, an M-signal is input as a start command.

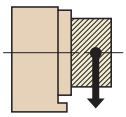
2 Please select the most suitable model of NC rotary tables, depending on the workpiece and cutting conditions.

● Workpiece diameter



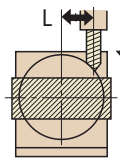
Within the rotary table diameter

● Workpiece weight



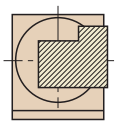
Should not be bigger than allowable as specified.

● Workpiece positioning



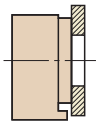
The value of (F×L) should be within the clamp force.

● When an eccentric load is applied:



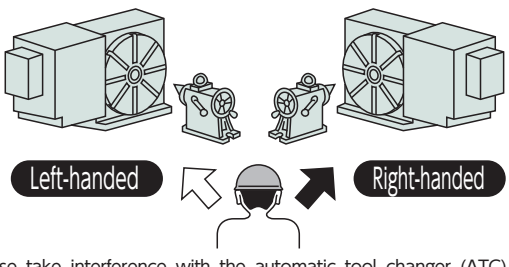
- The workpiece inertia should be within the allowable value.
- Pay attention to any interference with the machine tool.

● Workpiece of larger diameter, but lighter weight



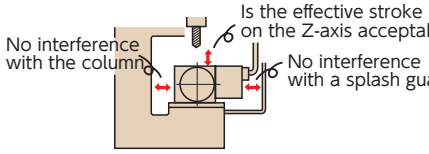
- The workpiece inertia should be within the allowable value.
- Pay attention to any interference with the machine tool.

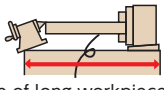
3 Please select the handedness of the NC rotary tables.



Please take interference with the automatic tool changer (ATC) and easy operation into consideration when you make your selection.

4 Please take interference with a machining center into consideration when selecting a table.





- No interference with the ATC? (Select L-type or R-type.)
- Are workpieces within the allowable load of the table?

In the case of long workpieces, check that the workpiece length is within the table length.

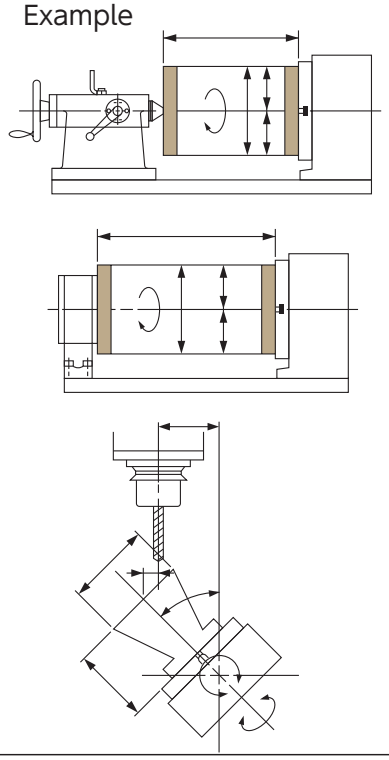
If you need our help to select the best model for you:

Inform TSUDAKOMA of the information below, and TSUDAKOMA will suggest the best model for you.

Fill in this page and send it to a local distributor or TSUDAKOMA. Fax : +81-76-294-5157

1. Customer _____ Tel _____
2. Model considering _____ Unit _____
3. **Machine** Manufacturer _____
   Model _____ (New ・ Installed)
   NC controller _____
4. Coolant oil Not used Used (Oil ・ Water) (Normal ・ High Pressure)
5. Workpiece Kind _____ Material _____ Weight _____
   Dimensions Height (_____) × Length (_____) × Width (_____) mm
   Inner dia (_____) × Outer dia (_____) × Length (_____) mm
6. Layout of workpiece and fixture (Write the detailed dimensions from the top surface or the center of the face plate)

Example

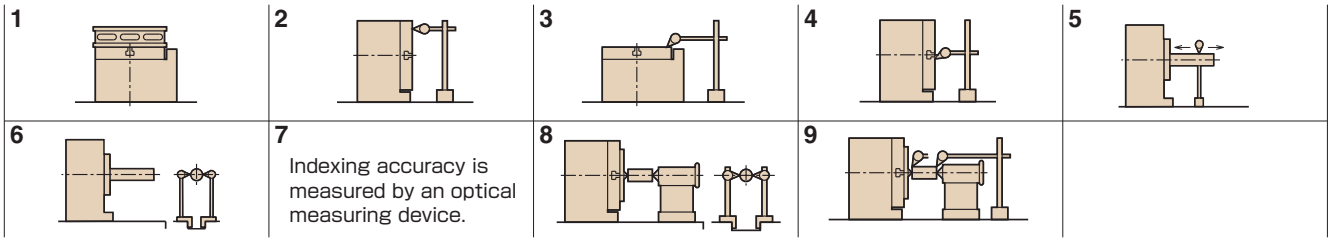


7. Cutting conditions

Cutting point	Cutter ／ teeth number	Cutting speed (V)	Cutting feed rate mm／min	Cutting depth mm／time	Cutting process (Indexing or continuous cutting)
a					
b					
c					
d					

Inspection Standard

NC Rotary Tables



RBS/RBH

Unit: mm

No.	Inspection items			Tolerance					
				RBS/RBH-160		RBS/RBH-250		RBS/RBH-320	
				Standard	With a scale	Standard	With a scale	Standard	With a scale
2	Spindle top runout	—	—	0.01		0.01		0.01	
3	Parallelism top to frame bottom	Per 200mm	Horizontal	0.02		0.02		0.02	
4	Center bore runout	Spindle nose	—	0.01		0.01		0.01	
5	Parallelism of rotary axis center line to frame bottom	Per 200mm	Vertical	0.02		0.02		0.02	
6	Parallelism of rotary axis center line to guide blocks	Per overall length	Vertical	0.02		0.02		0.02	
7	Indexing accuracy (arc sec.)	Cumulative	—	15	15	15	10	15	10
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	Vertical	0.02		0.02		0.02	
9	Height difference of both center lines of rotary table and tailstock	—	Vertical	0.02		0.02		0.02	

Note: The indexing accuracy above is for tables with MP scales. See P.64 for indexing accuracy of HEIDENHAIN rotary encoders.

RWE/RWA/RWH

Unit: mm

No.	Inspection items			Tolerance					
				RWE/RWA/RWH-160		RWE/RWA/RWH-200		RWA/RWH-250,320	
				Standard	With a scale	Standard	With a scale	Standard	With a scale
2	Spindle top runout	—	—	0.01		0.01		0.01	
3	Parallelism top to frame bottom	Per 200mm	Horizontal	0.02		0.02		0.02	
4	Center bore runout	Spindle nose	—	0.01		0.01		0.01	
5	Parallelism of rotary axis center line to frame bottom	Per 200mm	Vertical	0.02		0.02		0.02	
6	Parallelism of rotary axis center line to guide blocks	Per overall length	Vertical	0.02		0.02		0.02	
7	Indexing accuracy (arc sec.)	Cumulative	—	25	15	20	15	20	10
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	Vertical	0.02		0.02		0.02	
9	Height difference of both center lines of rotary table and tailstock	—	Vertical	0.03		0.03		0.03	

Note: The indexing accuracy above is for tables with MP scales. See P.64 for indexing accuracy of HEIDENHAIN rotary encoders.

RWB

Unit: mm

No.	Inspection items			Tolerance					
				RWB-250,320		RWB-400,500		RWB-630	
				Standard	With a scale	Standard	With a scale	Standard	With a scale
1	Table top flatness (concaye)	Per overall length	—	0.01	0.01	0.02	0.01	0.03	0.01
2	Table top runout	—	—	0.015	0.01	0.015	0.01	0.02	0.01
3	Parallelism of table top to frame bottom	Per overall length	Horizontal	0.02	0.01	0.02	0.01	0.03	0.02
4	Center bore runout	Spindle nose	—	0.01	0.005	0.01	0.005	0.01	0.01
5	Parallelism of rotary axis center line to frame bottom	Per 300mm	Vertical	0.02	0.01	0.015	0.01	0.015	0.01
6	Parallelism of rotary axis center line to guide blocks	Per 300mm	Vertical	0.02	0.01	0.015	0.01	0.015	0.015
7	Indexing accuracy (arc sec.)	Cumulative	—	14	8	14	8	14	8
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	Vertical	0.02	0.01	0.02	0.01	0.02	0.01
9	Height difference of both center lines of rotary table and tailstock (tailstock center line should be higher)	—	Vertical	0.02	0.01	0.02	0.01	0.02	0.01

Note1: The indexing accuracy above is for tables with MP scales. See P.64 for indexing accuracy of HEIDENHAIN rotary encoders.
Note2: For RWB-K,No.3 is not required.

RCV

Unit: mm

No.	Inspection items			Tolerance					
				RCV-800		RCV-1000		RCV-1250	RCV-1600
				Standard	With a scale	Standard	With a scale	Standard	Standard
1	Table top flatness (concaye)	Per overall length	—	0.03	0.02	0.04	0.02	0.04	0.04
2	Table top runout	—	—	0.02	0.01	0.03	0.02	0.03	0.03
3	Parallelism of table top to frame bottom	Per overall length	Horizontal	0.03	0.02	0.04	0.02	0.04	0.04
4	Center bore runout	Spindle nose	—	0.01	0.01	0.01	0.01	0.01	0.01
5	Parallelism of rotary axis center line to frame bottom	Per overall length	Vertical	0.03	0.02	0.04	0.03	0.04	0.04
6	Parallelism of rotary axis center line to guide blocks	Per overall length	Vertical	0.03	0.03	0.04	0.03	0.04	0.04
7	Indexing accuracy (arc sec.)	Cumulative	—	15	8	15	8	15	15
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	Vertical	0.02	0.02	0.02	0.02	0.03	0.03
9	Height difference of both center lines of rotary table and tailstock (tailstock center line should be higher)	—	Vertical	0.02	0.02	0.02	0.02	0.04	0.04

Note: The indexing accuracy above is for tables with MP scales. See P.61 for indexing accuracy of HEIDENHAIN rotary encoders.

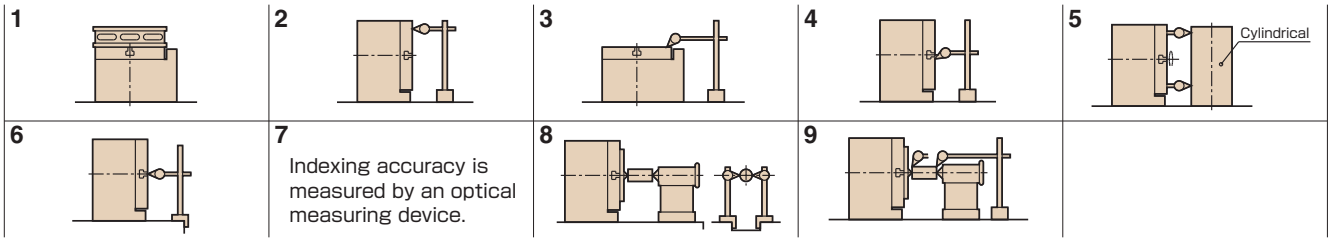
RDS-200

Unit: mm

No.	Inspection items		Tolerance
			RDS-200
1	Spindle end flatness (concave)	Per overall length	0.010
2	Spindle end runout	—	0.010
4	Spindle center runout	Spindle nose	0.010
5	Parallelism of rotary axis center line to frame bottom	Per 200mm	0.020
6	Parallelism of rotary axis center line to guide blocks	Per overall length	0.020
7	Indexing accuracy (Including pitch error compensation)	Cumulative	20
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	0.020
9	Height difference of both center lines of rotary table and tailstock (tailstock center line should be higher)	—	±0.030

Inspection Standard

NC Rotary Tables



RN

Unit: mm

No.	Inspection items			Tolerance RN-100
2	Spindle top runout	—	—	0.01
3	Parallelism top to frame bottom	Per overall length	Horizontal	0.015
4	Center bore runout	Spindle nose	—	0.01
5	Perpendicularity of spindle top to frame bottom	Per overall length	Vertical	0.02
6	Perpendicularity of spindle to frame bottom guide blocks	Per overall length	Vertical	0.02
7	Indexing accuracy (arc sec.)	Cumulative	—	45
9	Height difference of both center lines of rotary table and tailstock	—	Vertical	0.03

RCB

Unit: mm

No.	Inspection items		Tolerance RCB-350	RCB-450	RCB-550
1	Table top flatness (concaye)	Per overall length	0.010	0.020	0.020
2	Table top runout	—	0.015	0.015	0.015
4	Center bore runout	Spindle nose	0.010	0.010	0.010
5	Perpendicularity of table top and frame bottom	Per overall length	0.020	0.020	0.020
6	Perpendicularity of table top to frame bottom guide blocks	Per overall length	0.020	0.020	0.020
7	Indexing accuracy (arc sec.)	Cumulative	15	15	15
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	0.020	0.020	0.020
9	Height difference of both center lines of rotary table and tailstock (tailstock center line should be higher)	—	0.020	0.020	0.020

RNCK

Unit: mm

No.	Inspection items		Tolerance RNCK-631	
			Standard	With a scale
1	Table top flatness (concaye)	Per overall length	0.03	0.02
2	Table top runout	—	0.02	0.01
4	Center bore runout	Spindle nose	0.01	0.005
5	Perpendicularity of table top and frame bottom	Per overall length	0.03	0.02
6	Perpendicularity of table top to frame bottom guide blocks	Per overall length	0.03	0.03
7	Indexing accuracy (arc sec.)	Cumulative	15	8
8	Parallelism of center line between rotary table and tailstock to frame bottom guide blocks	Per 300mm	0.02	0.02
9	Height difference of both center lines of rotary table and tailstock (tailstock center line should be higher)	—	0.02	0.02

Note: The indexing accuracy above is for tables with MP scales. See P.61 for indexing accuracy of HEIDENHAIN rotary encoders.

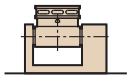
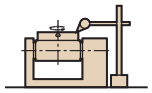
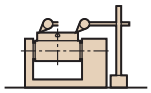
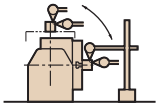
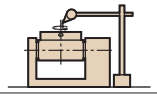
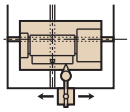
RCH/RNC

Unit: mm

No.	Inspection items		Tolerance RCH-800		RCH-1000,1250 RNC-1501		RNC-2001	
			Standard	With a scale	Standard	With a scale	Standard	With a scale
1	Table top flatness (concaye)	Per overall length	0.03	0.02	0.04	0.02	0.04	0.03
2	Table top runout	—	0.02	0.01	0.03	0.02	0.03	0.02
3	Parallelism of table top to frame bottom	Per overall length	0.03	0.02	0.04	0.02	0.04	0.03
4	Center bore runout	Spindle nose	0.01	0.01	0.01	0.01	0.01	0.01
7	Indexing accuracy (arc sec.)	Cumulative	15	8	15	8	15	8

Note: The indexing accuracy above is for tables with MP scales.

NC Tilting Rotary Tables

1	2	3	4	5
				
6・7 Tilting angle and indexing accuracy are measured by means of optical equipment.	**8** 			

TBS

Unit: mm

No.	Inspection items		Tolerance		
			TBS-130	TBS-160	TBS-250
			Standard	Standard	Standard
2	Spindle (Table) top runout	—	0.01	0.01	0.01
3	Parallelism of spindle (table) top to frame bottom	Per overall length	0.015	0.015	0.015
4	Parallelism of tilt axis cenrer to frame bottom	Per overall length	0.02	0.02	0.02
5	Center bore runout	Spindle nose	0.01	0.01	0.01
6	Tilting accuracy (arc sec.)	Cumulative (0° to +90°)	30	30	40
		Cumulative (−30° to +90°)	40	40	50
7	Indexing accuracy (arc sec.)	Cumulative	20	20	20
8	Parallelism (Perpendicularity) of rotary axis center line to guide blocks	Per overall length (90 degree)	0.015	0.015	0.015

TWA/TN

Unit: mm

No.	Inspection items		Tolerance					
			TWA-100	TWA-130	TWA-160	TWA-200	TN-320	TN-450
			Standard	Standard	Standard	Standard	Standard	Standard
1	Table top flatness (concaye)	Per overall length	—	—	—	—	0.01	0.02
2	Spincle (Table) top runout	—	0.01	0.01	0.01	0.01	0.015	0.015
3	Parallelism of spindle (table) top to frame bottom	Per overall length	0.015	0.015	0.015	0.015	0.02	0.02
4	Parallelism of tilt axis center to frame bottom	Per overall length	0.02	0.02	0.02	0.02	0.02	0.02
5	Center bore runout	Spindle nose	0.015	0.01	0.01	0.01	0.01	0.01
6	Tilting accuracy (arc sec.)	Cumulative (0° to +90°)	45	45 (15)	45	45	45	90
		Cumulative (−30° to +90°)	—	—	60	60	60	—
7	Indexing accuracy (arc sec.)	Cumulative	40	40 (15)	30	30	20	15
8	Parallelism (Perpendicularity) of rotary axis center line to guide blocks	Per overall length (90 degree)	0.015	0.015	0.015	0.015	0.02	0.02

Note 1: For No. 8, values differ depending on the mounting direction of the guide block. Note 2: For TWA, the "table top" is the "spindle top".
Note 3: Values in ( ) for TWA-130 are accuracy for tables with rotary encoders and MP scales for high precision. (Please see P.61)

TWB

Unit: mm

No.	Inspection items		Tolerance		
			TWB-320	TWB-630	TWB-1000
1	Table top flatness (concaye)	Per overall length	0.010	0.030	0.040
2	Table top runout	—	0.015	0.020	0.030
3	Parallelism of table top to base bottom	Per overall length	0.020	0.030	0.040
4	Parallelism of tilt axis center to base bottom	Per overall length	0.020	0.030	0.040
5	Center bore runout	Spindle nose	0.010	0.010	0.010
6	Tilting accuracy (arc sec.)	0° to +90°	45	—	60
		−30° to +90°	60	—	—
		−110° to +110°	—	60	—
7	Indexing accuracy (arc sec.)	Cumulative	20	15	15
8	Parallelism (Perpendicularity) of rotary axis center line to guide blocks	Per overall length (90 degree)	0.020	0.020	—

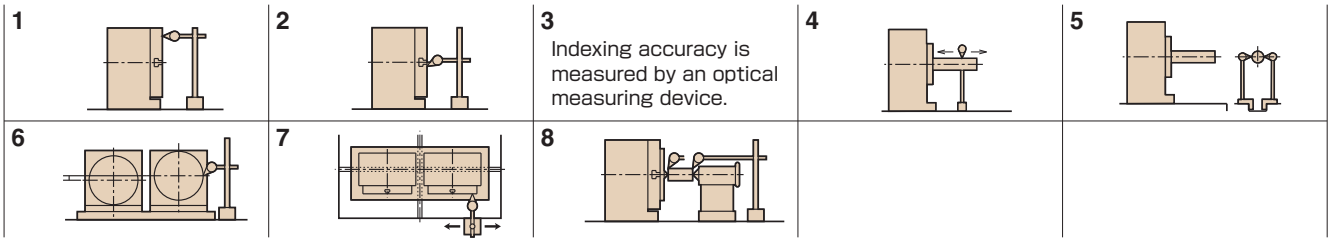
TDS/TDB

Unit: mm

No.	Inspection items		Tolerance	
			TDS-200	TDB-200
2	Spindle top runout	—	0.010	0.010
3	Parallelism of Spindle top to base bottom	Per overall length	0.020	0.020
4	Parallelism of tilt axis center to base bottom	Per overall length	0.020	0.020
5	Center bore runout	Spindle nose	0.010	0.010
6	Tilting accuracy (arc sec.)	−100° to +10°	20	40
7	Indexing accuracy (arc sec.)	Cumulative	20	20
8	Parallelism (Perpendicularity) of rotary axis center line to guide blocks	Per overall length (90 degree)	0.020	0.020

Inspection Standard

NC Rotary Tables / Multi-Spindle



RBM

Unit: mm

No.	Inspection items		Tolerance RBM-160
1	Spindle top runout	—	0.010
2	Center bore runout	Spindle nose	0.010
3	Indexing accuracy (arc sec.)	Cumulative	15
4	Parallelism of rotary axis center to base bottom	Per overall length	0.010
5	Parallelism of rotary axis center to bottom guide blocks(Perpendicularity)	Per overall length	0.020
6	Difference between both center heights	—	0.020
7	Difference of spindle end	—	0.020
8	Height difference of both center lines of rotary table and tailstock	—	0.020

Note 1: If the base has no guide block, "base bottom guide block" in the above instructions (No. 5) should be construed as "base bottom".

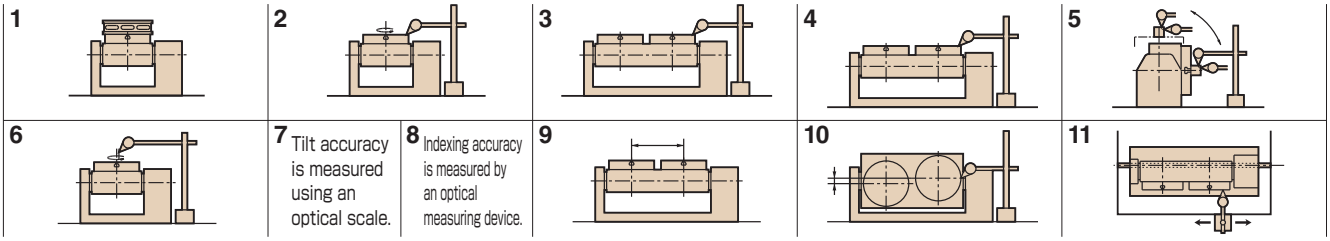
RWM

Unit: mm

No.	Inspection items		Tolerance RWM-160	RWM-200	RWM-250	RWM-320
1	Spindle top runout	—	0.01	0.01	0.01	0.01
2	Center bore runout	Spindle nose	0.01	0.01	0.01	0.01
3	Indexing accuracy (arc sec.)	Cumulative	25	20	20	20
4	Parallelism of rotary axis center to base bottom	Per overall length	0.02	0.02	0.02	0.02
5	Parallelism of rotary axis center to bottom guide blocks(Perpendicularity)	Per overall length	0.02	0.02	0.02	0.02
6	Difference between both center heights	—	0.02	0.02	0.02	0.02
7	Difference of spindle end	—	0.02	0.02	0.02	0.02
8	Height difference of both center lines of rotary table and tailstock	—	0.03	0.03	0.03	0.03

Note 1: If the base has no guide block, "base bottom guide block" in the above instructions (No. 5) should be construed as "base bottom".

NC Tilting Rotary Tables / Multi-Spindle



TWM

Unit: mm

No.	Inspection items		Tolerance TWM-100	TWM-160	TWM-250
1	Spindle top flatness (concave)	Per overall length	0.01	0.01	0.01
2	Spindle top runout	—	0.01	0.01	0.01
3	Difference between average heights of both spindle tops	0 degree	0.02	0.02	0.02
4	Parallelism of spindle top to base bottom	Per overall length	0.015	0.015	0.015
5	Parallelism of tilt axis center to base bottom	Per overall length	0.02	0.02	0.02
6	Center bore runout	Spindle nose	0.015	0.01	0.01
7	Tilting accuracy (arc sec.)	0° to +90°	45	60	60
8	Indexing Accuracy (arc sec.)	Cumulative	40	30	20
9	Table center distance	—	±0.02	±0.02	±0.02
10	Difference between both center heights	90 degree	0.02	0.02	0.02
11	Parallelism of tilt axis center to frame bottom guide blocks.	Per 300mm (90 degree)	0.015	0.015	0.015

NOTES

OPERATION ENVIRONMENT AND MAINTENANCE RECOMMENDED TO KEEP PERFORMANCE AND FUNCTION

- **Do not use any coolant of chlorine or strong alkaline.**
- Do not use any corrosive gas, water, steam or chemicals damaging sealing parts.
- **Lubricant is indispensable** in order to operate a rotary table smoothly and to maintain its functions for a long time. **Supply a recommended lubricant (in the operation manual) to the rotary table before operation. If a designated brand is listed, use only the designated brand of lubricant. Change all the lubricant periodically.**
- If a lot of cutting chips, (generated by machining,) accumulate on some sections of rotary table, install adequate covers for protection.
- Operate a rotary table within the specified range of temperature.
- Depending upon the operation environment, there is a possibility of dew condensation which may cause a malfunction or a rust problem of electrical components, so provide air-purging inside the motor cover. (Do not close the outlet of exhaust air.) **See Fig. 1.**
- When assembling a faceplate or a fixture with the main spindle, make the inner diameter section as the reference for fitting as shown in **Fig. 2.**
- Keep the clearance with 5mm or more between a Faceplate or a fixture and a Rotary table. Otherwise, cutting chips may impede the rotation of the main spindle or the waterproof capability of the seals. **See Fig. 2.**

Fig. 1

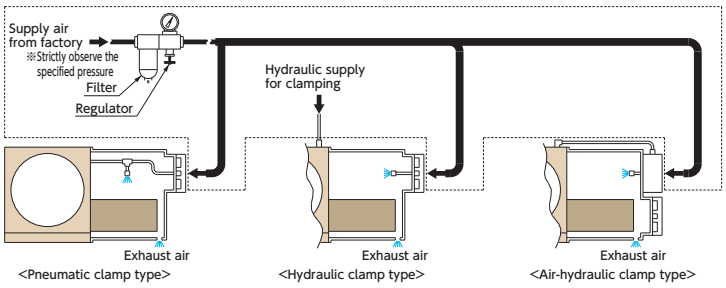
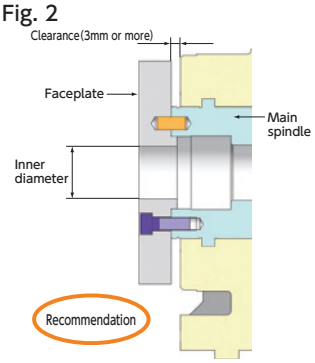


Fig. 2



SETTING ON MACHINE TOOL AND PREPARATION BEFORE USE

- When moving a rotary table by a hanging method, observe the specified method in the operation manual.
- To fix a rotary table on a machine tool, use the specified fixing parts and follow the specified method.
- Connect each interface cable in accordance with the instructions on the electrical drawing.
- Provide protective measures to avoid adding extraordinary force to any piping or any joint for each interface cable and each connector, to induce any damage, during the operation of a machine tool with a rotary table.
- Each piping is to be connected to the specified input port (connecting port) stated in the outlook drawing.
- Regarding each fluid to be supplied to a rotary table, make sure that **maximum pressure does not exceed the specified pressure** even if there is a pressure variation due to the pressure source or other factors.
- Refer to the recommendable flow chart on Page 69 for the NC control at the time of table clamping.

DAILY OPERATION, PERIODICAL CHECK AND OTHERS

- Make sure that the weight and size of the workpiece does not exceed the specified value of the workable force during machining.
- In case any abnormality is realized during operation, stop machining immediately.
- When any human work is carried out within the operational area of machine tool, be sure to turn off the power for the machine tool as well as the Tsudakoma controller.
- When restarting from a long stoppage, perform a warm-up operation of the rotary table.
- Do not make any conversion of a rotary table without Tsudakoma's consent.

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