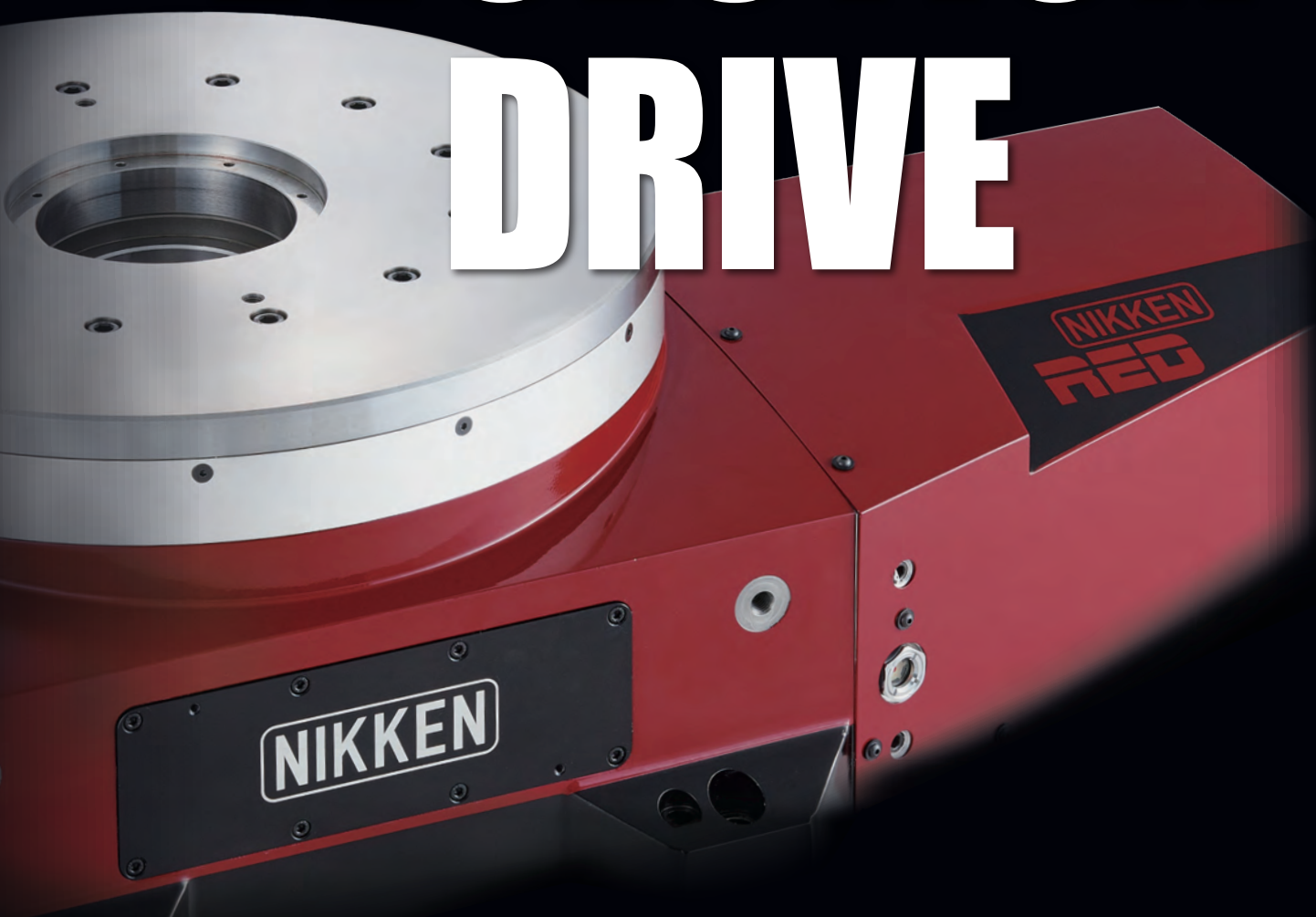


NIKKEN

Equipped with
The New RED Mechanism
New NIKKEN CNC Rotary Table

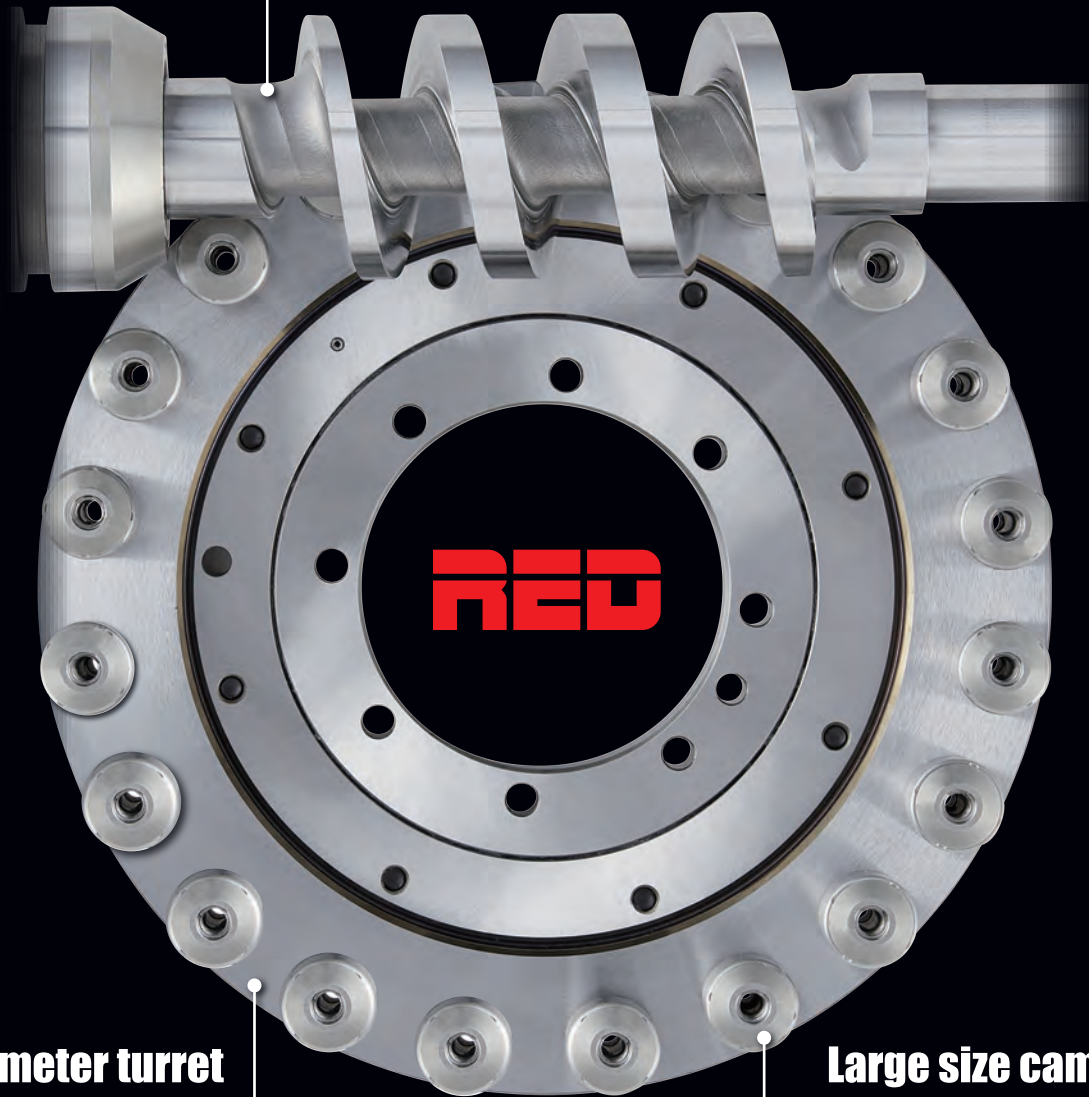
ROLLER EVOLUTION DRIVE



NIKKEN KOSAKUSHO WORKS, LTD.
CAT. NO. 8810

Equipped with The New RED Barrel Cam Mechanism

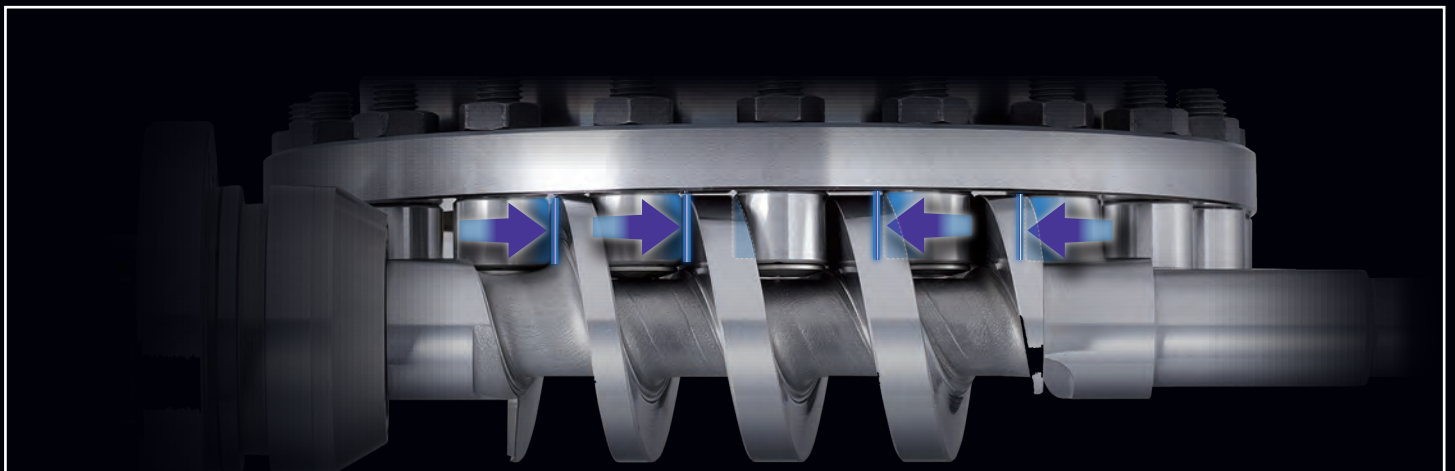
Straight type cam shaft



Large diameter turret

Large size cam follower

No backlash is achieved by preloading the contact area between the cam follower and cam shaft.



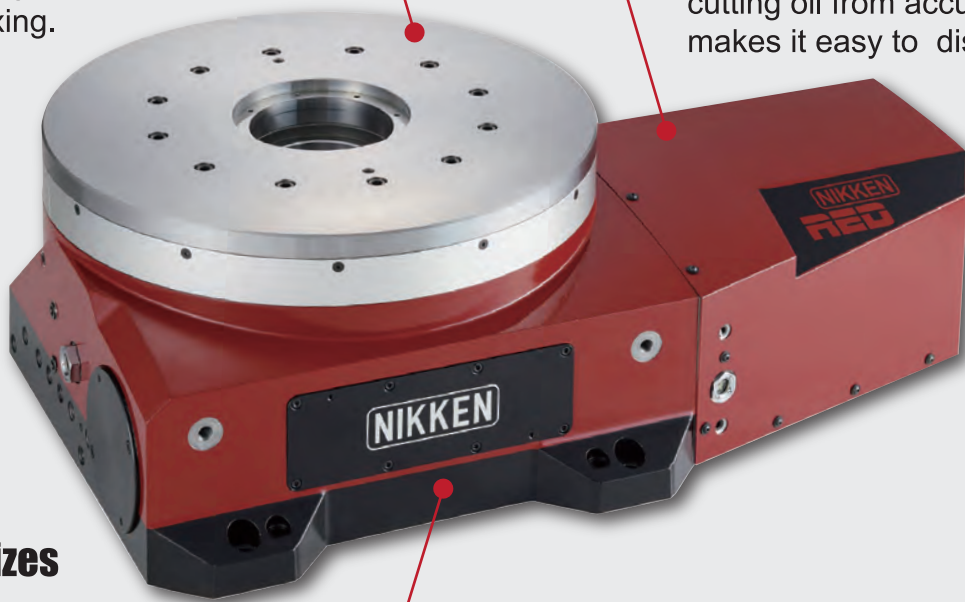
The cam shaft (input) and turret (output) are in rolling contact from both sides via cam followers that are appropriately preloaded. Since torque is transmitted while rotating, the structure has a low coefficient of friction and is resistant to wear, eliminating the need for backlash adjustment such as periodic maintenance. The cam shaft is precision-machined to a theoretically calculated shape so that the cam follower position matches the theoretical position in the preloaded condition, achieving high rotational and indexing accuracy.

High-speed, high-precision indexing with no backlash

Backlash-free cam drive and rolling contact with rollers realize high-speed, high-precision indexing.

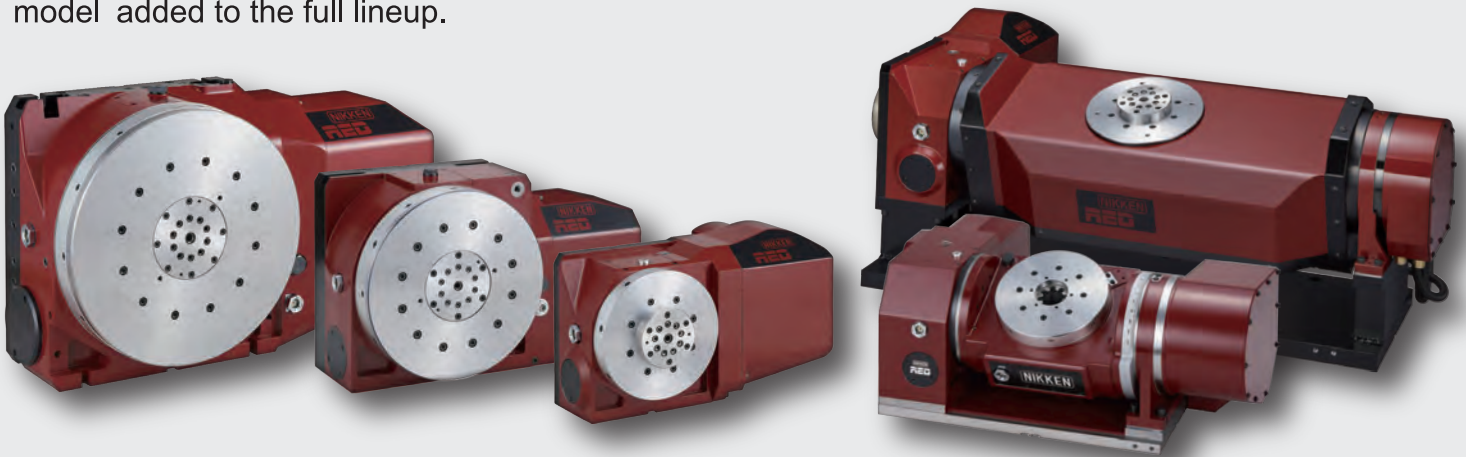
NEW design contributes to automation

New design that prevents chips and cutting oil from accumulating, and makes it easy to discharge them.

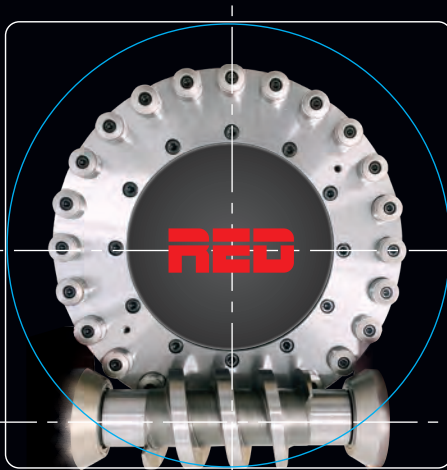


Wide range of sizes and full lineup

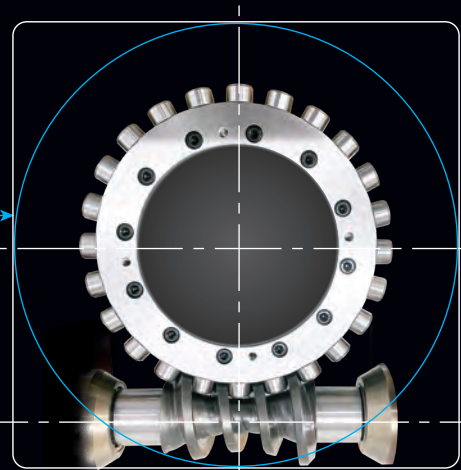
A wide range of table sizes from 206 to 500 mm in diameter are available. Long-awaited 5AX model added to the full lineup.



In general roller gear cam mechanisms, cam followers are arranged radially to the turret. In the barrel cam mechanism used in Nikken RED rotary tables, the cam followers are arranged perpendicular to the turret. Therefore, this provides the 125% of rigidity when compared with a rotary table of roller gear cam system of the same faceplate diameter.



Same size
faceplate diameter



Barrel cam mechanism adopted by RED

Roller gear cam mechanism

High rigidity structure of the new RED barrel cam mechanism

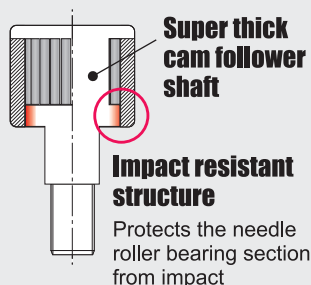
Comparison of design values for the same faceplate dia. (e.g. $\phi 400$)

	Barrel cam	Roller gear cam	Dimensional expansion ratio
Cam follower mounting dia.	152.5	123	120%
Cam shaft size (cam shaft center dia.)	56	31	180%
Cam shaft size (cam shaft center dia.)	26	22	120%

Compared to the roller gear cam mechanism, the barrel cam mechanism has the advantage of being able to design a larger cam follower mounting diameter. As a result, the pitch between adjacent cam followers can be wider, allowing for larger cam followers. Also, in terms of the cam shaft shape, the roller gear cam mechanism has a drum shape and its rigidity is limited to the smallest diameter in the center, whereas the barrel cam mechanism has a thick, uniform, straight shape.

Nikken's unique ultra-thick, high-rigidity cam followers

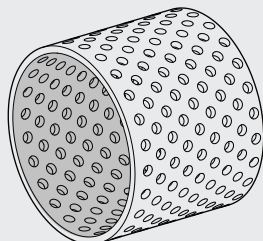
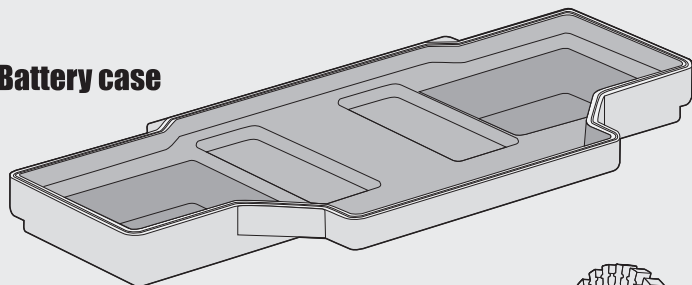
The RED rotary table uses ultra-thick, high-rigidity cam followers to increase the life and rigidity of the needle roller by increasing its diameter, and to increase the rigidity of the coupling with the turret by increasing the size of the cam follower fixing bolt.



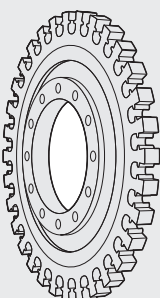
Work piece example

High-speed indexing performance is utilized for high-speed indexing of lightweight, large, and thin-walled workpieces, such as EV-related workpieces.

Battery case

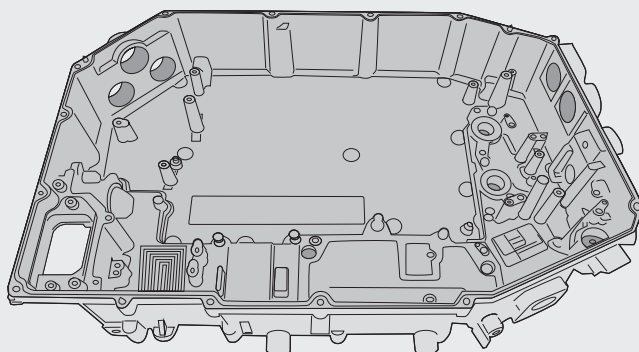
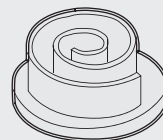


Retainers



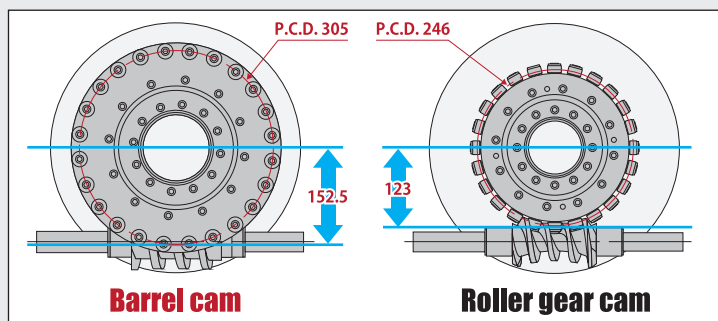
Various gears

Scroll cam for compressor

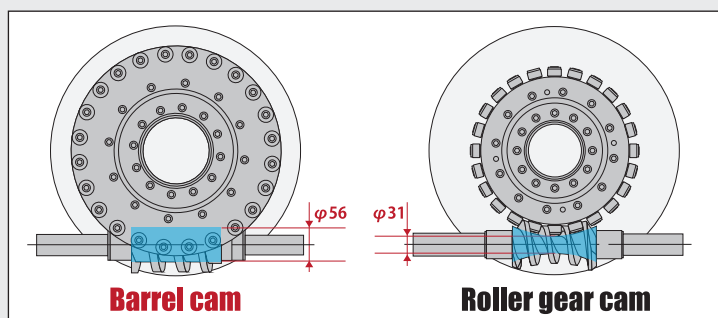


Inverter case

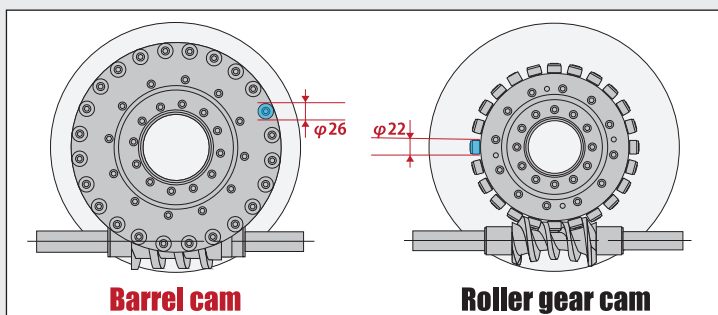
Comparison of cam follower mounting dia.



Comparison of cam shaft size (cam shaft center dia.)



Comparison of cam follower size (cam follower outer dia.)

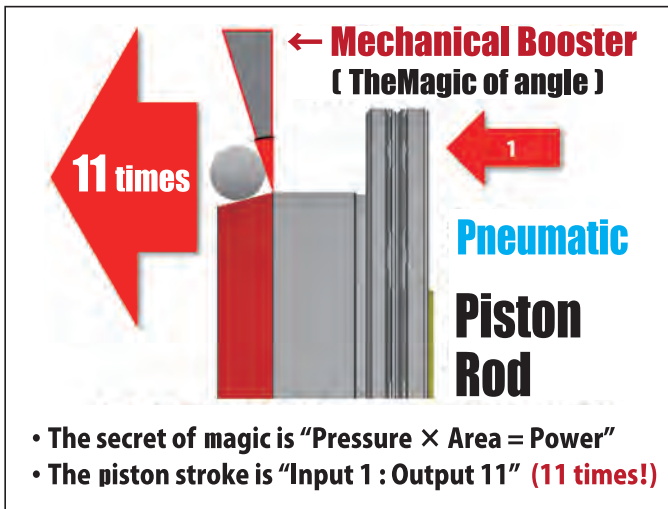


Lightweight and compact rotary table for powerful, large-size machining

Equipped with "Mechanical Booster" for no backlash + strong clamping

Compact models such as RED200/300 and 5AX-RED200 are newly equipped with a mechanical brake mechanism named "mechanical booster" that provides powerful clamping force even on machines without a hydraulic source. The brake torque that can withstand machining propulsion away from the swivel center, such as machining of large workpieces that exceed the table diameter, is achieved only by supplying air. Compared with the conventional small rotary table, the "Mechanical Booster" can significantly improve machining conditions and machining content.

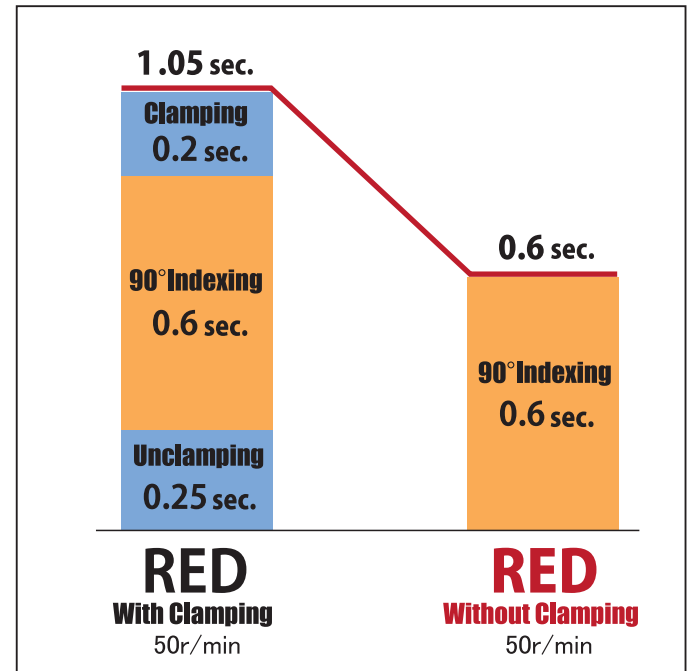
Conceptual diagram



Brakeless machining is also available to significantly reduce machining time.

Brakeless machining with servo lock is also possible, depending on the workpiece material and machining conditions. The barrel cam mechanism, which is driven by appropriate preload with no back lash and no rattle, contributes to productivity improvement by drastically reducing machining time.

Comparison of indexing time



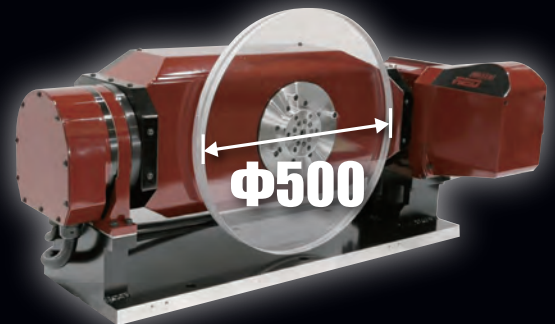
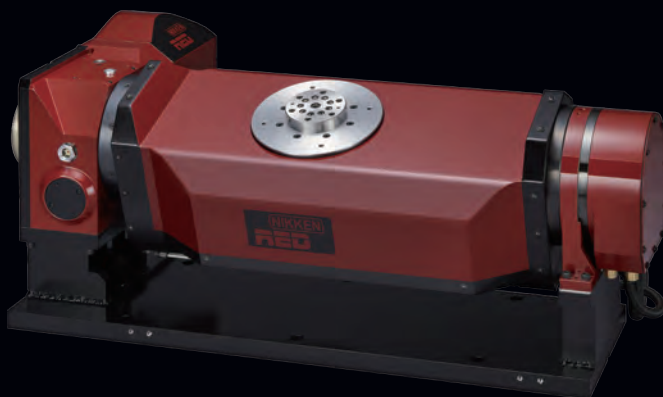
★ The above figures are for RED200.

★ The time for both clamping and unclamping includes the time for the confirmation timer.

New model enables machining of large workpieces with a compact M/C

5-axis machining of large workpieces with BT30 machine!!

- Lightweight and compact body enables machining of workpieces up to $\Phi 500$ in diameter with a small M/C.
- Large size but light weight, assisting highly efficient machining of EV-related aluminum workpieces, etc.



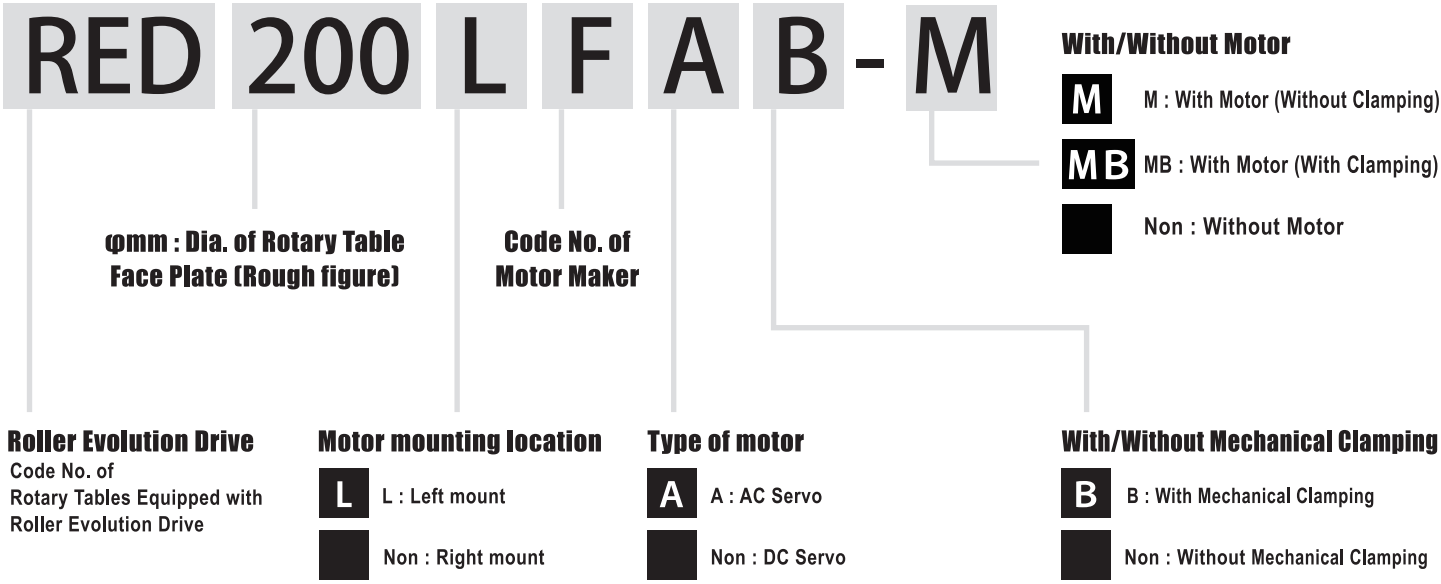
NEW

Equipped with Roller Evolution Drive Tilting Rotary Table
5AX-RED200-500



Equipped with Roller Evolution Drive Rotary Table

Product Model Example : RED200LFAB-M



★ No mechanical brake setting is available only for RED200 and RED300. RED400 and RED500H are always with brake.

Specification

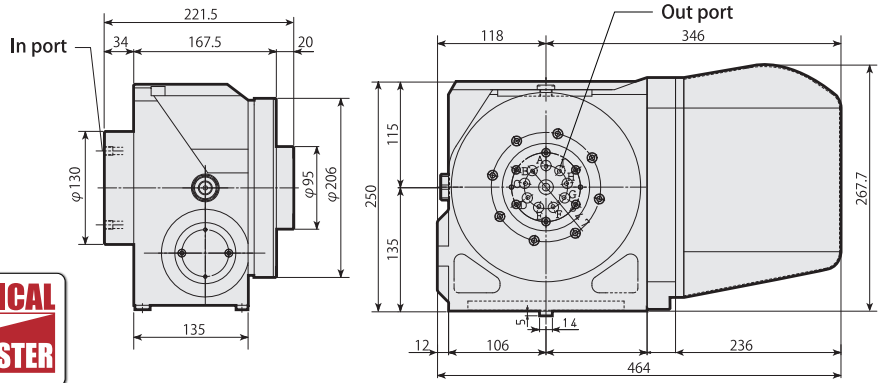
Item / Code No.		RED200	RED300	RED400	RED500H
Diameter of Table	φ mm	206	310	406	500
Diameter of Spindle Hole	φ mm	φ60H7	φ90H7	φ105H7	φ130H7
Center Height	mm	135	170	230	310
Width of T Slot *1	mm	—	—	—	—
Clamping System		Pneumatic (0.5MPa)	Pneumatic (0.5MPa)	Hydraulic (3.5MPa)	Hydraulic (3.5MPa)
Clamping Torque	N·m	600	1430	2000	5000
Servo Motor (with brake)		αiS4/5000-B	αiS8/4000-B	αiS22/4000-B	αiS40/4000-B
MIN. Increment		0.001°	0.001°	0.001°	0.001°
Total Reduction Ratio		1/60	1/60	1/60	1/60
Rotation Speed *2 *3	r/min	50(60)	50(60)	50(60)	50(60)
Indexing Accuracy	sec	±20	±15	±15	±10
Repeatability	sec	4	4	4	4
MAX. Work Load on the Table	Vertical	100	175	250	—
	Horizontal	200	350	500	1000
Guide Line of MAX. Unbalancing Load *3		35	100	200	—
MAX. Work Inertia *3	Vertical	2.09	8.6	15.4	53.2
Driving Torque *3		216	432	1188	2160
Optional (Flange plate type) Rotary Joint max. number of ports		9+1	10+1	10+1	12+1
Net Weight	kg	65	123	250	400

* 1 : T-slotted faceplate is available as an option. Please order as required.
 * 2 : The standard rotation speed of motor is 3000min⁻¹. The rotation speed in () is for the rotation speed of a motor is 3600min⁻¹. It is possible to accommodate some workpieces and jig fixture shapes.
 * 3 : Table speed, allowable work inertia, continuous holding torque, and maximum unbalance load are values for FANUC motors.

Faceplate diameter: 206mm, Vertical/horizontal use model

RED200

Rotary joint (max. number of ports: 9+1) and Nikken's most powerful pneumatic brake mechanism, named "mechanical booster", can also be mounted.

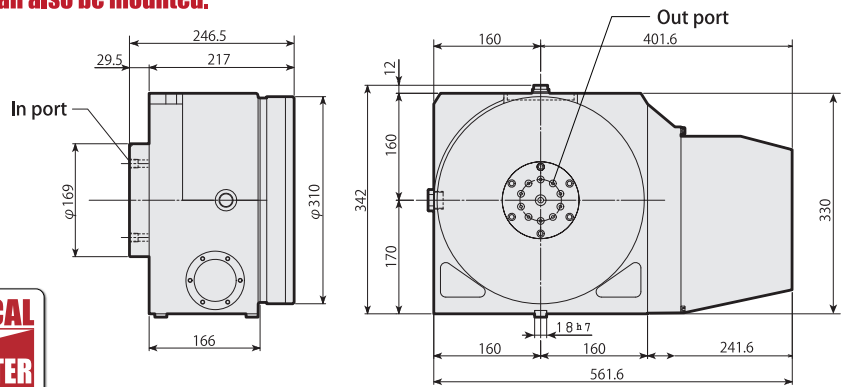


Faceplate diameter: 310mm, Vertical/horizontal use model

★ The photo and figure show the model with optional rotary joint.

RED300

Rotary joint (Max. number of ports: 10+1), Nikken's most powerful pneumatic brake mechanism, named "mechanical booster", can also be mounted.

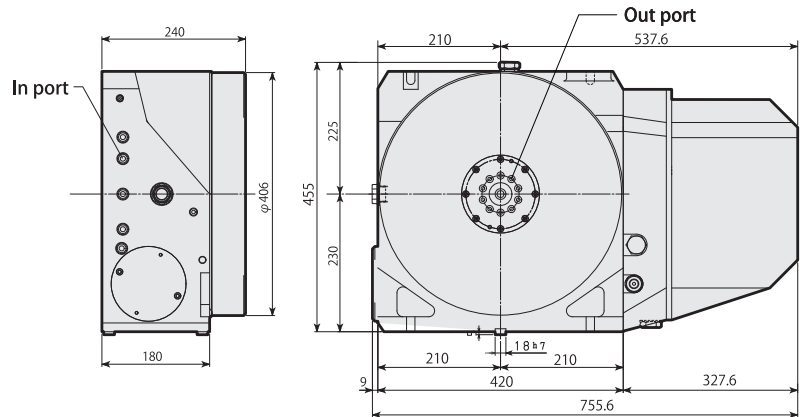


Faceplate diameter: 406mm, Vertical/horizontal use model

★ The photo and figure show the model with optional rotary joint.

RED400

Rotary joint (max. number of ports: 10+1) can be mounted.

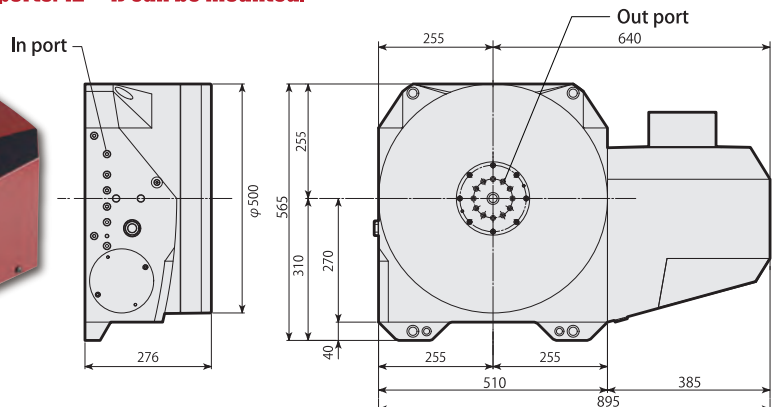
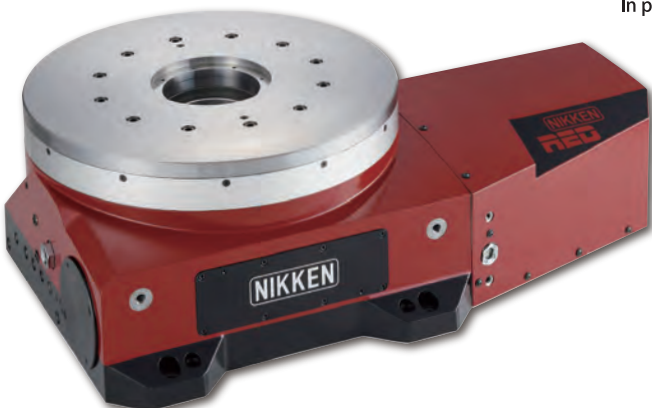


Faceplate diameter: 500mm, horizontal use only model

★ The photo and figure show the model with optional rotary joint.

RED500H

Rotary joints (maximum number of ports: 12 + 1) can be mounted.



★ The figure shows the model with optional rotary joint.

Product Model Example : 5AX-RED200-250FAB-M

5AX - RED 200 - 250 F A B - M

- 5AX Series**
Code No. of Tilting Rotary Tables
- Roller Evolution Drive**
Code No. of Rotary Tables Equipped with Roller Evolution Drive
- Work Swing Dia.**
250 ϕ 200mm
500 ϕ 500mm
- Code No. of Motor Maker**
- With/Without Motor**
M : With Motor (Without Clamping)
MB : With Motor (With Clamping)
Non : Without Motor
- With/Without Mechanical Clamping**
B : With Mechanical Clamping
Non : Without Mechanical Clamping
- Type of motor**
A : AC Servo
Non : DC Servo

Specification

Item / Code No.		5AX-RED200-250		5AX-RED200-500	
Diameter of Table	ϕ mm	206		206	
Diameter of Spindle Hole	ϕ mm	ϕ 60H7		ϕ 60H7	
Center Height (90°)	mm	180		290	
Table Height in Horizontal Position (0°)	mm	260		363.5	
Width of T Slot *1		—		—	
Axis			Tilting (0°~105°)	Rotary	Tilting (0°~105°)
Clamping System		Pneumatic (0.5MPa)	Pneumatic (0.5MPa)	Pneumatic (0.5MPa)	Pneumatic (0.5MPa)
Clamping Torque	N·m	600	600	600	600
Servo Motor (with brake)		α iS4/5000-B	α iS4/5000-B	α iS4/5000-B	α iS8/4000-B
MIN. Increment		0.001°	0.001°	0.001°	0.001°
Total Reduction Ratio		1/60	1/60	1/60	1/60
Rotation Speed *2 *3	r/min	50(60)	50(60)	50(60)	50
Indexing Accuracy	sec	\pm 20	60 (Cumulative)	\pm 20	60 (Cumulative)
Repeatability	sec	4	\pm 6	4	\pm 6
MAX. Work Load on the Table	0° to 30°	60		100	
	30° to 90°	40		100	
MAX. Work Inertia	*3	2.09		2.09	
Driving Torque	*3	216		216	
Optional (Flange plate type) Rotary Joint max. number of ports		5+1		9+1	
Net Weight	kg	164		246	

*1 : T-slotted faceplate is available as an option. Please order as required.

*2 : The standard rotation speed of motor is 3000min⁻¹. The rotation speed in () is for the rotation speed of a motor is 3600min⁻¹. It is possible to accommodate some workpieces and jig fixture shapes.

*3 : Table speed, allowable work inertia, and continuous holding torque are values for FANUC motors.

Faceplate diameter: 206 mm, work swing diameter: 250 mm, rotary/tilting model

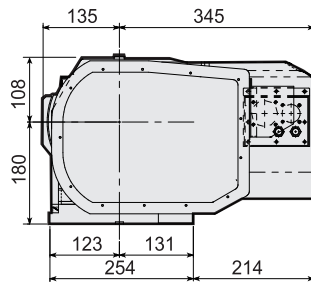
5AX-RED200-250

Rotary joint (max. number of ports: 5+1) and Nikken's most powerful pneumatic brake mechanism, named "mechanical booster", can also be mounted.

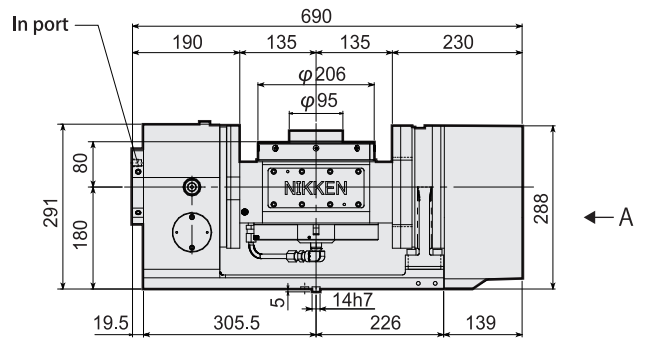
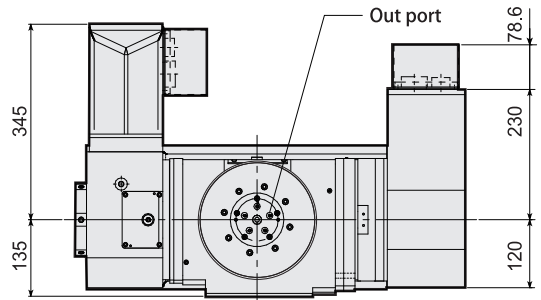
NEW



MECHANICAL
inside
BOOSTER



Arrow view : A



★ The figure shows a model with an optional rotary joint.

Faceplate diameter: 206mm, work swing diameter: 500mm, rotating and tilting models

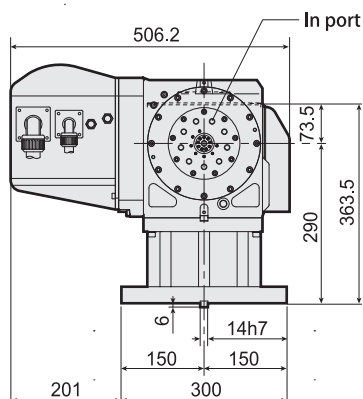
5AX-RED200-500

Rotary joint (max. number of ports: 9+1) and Nikken's most powerful pneumatic brake mechanism, named "mechanical booster", can also be mounted.

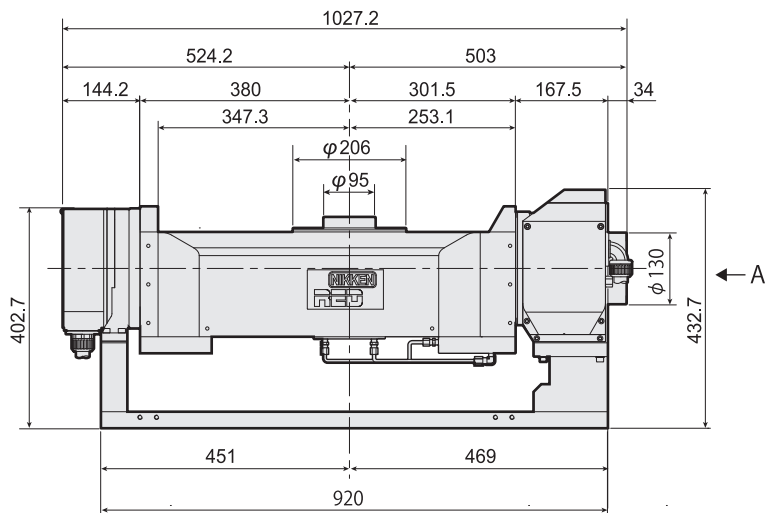
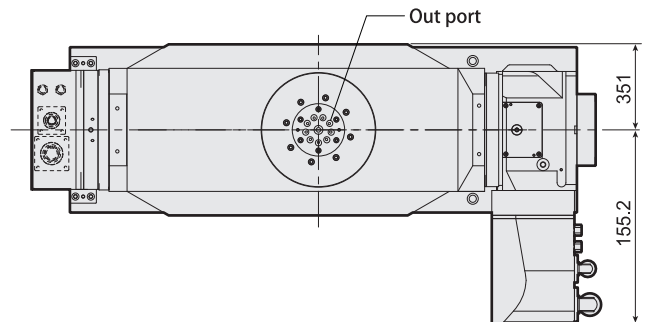
NEW



MECHANICAL
inside
BOOSTER



Arrow view : A



★ The photo and figure show the model with optional rotary joint.

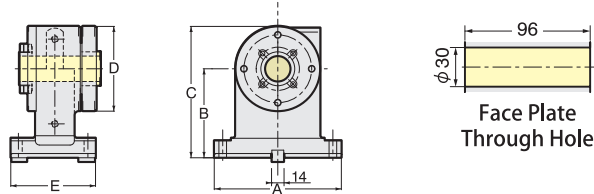
Support Tables line-up

Table Model	Center Height	Without Clamping	With Clamping		With Clamping Slim design
			Pneumatic (0.5MPa)	Hydraulic (3.5MPa)	
RED200	135	CST100-135	TAT-170N	—	TAS-100N
RED300	170		TAT-200N*/250N		—
RED400	230		—	TAT-321N/401N	TAT-403N

*

CST100-135

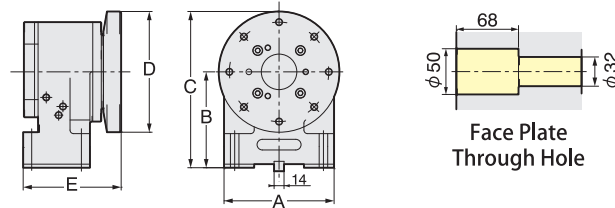
Without Clamping



Code No.	A	B	C	D	E	Weight (kg)
CST100-135	150	135	185	100	100	8

TAT-170N

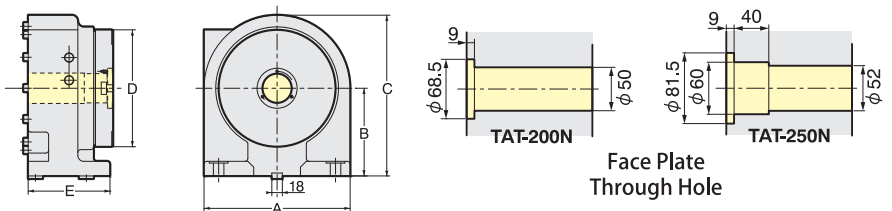
Pneumatic : 0.5MPa
Clamping Torque : 205N•m



Code No.	A	B	C	D	E	Weight (kg)
TAT-170N	155	135	220	170	138	25

TAT-200N, 250N

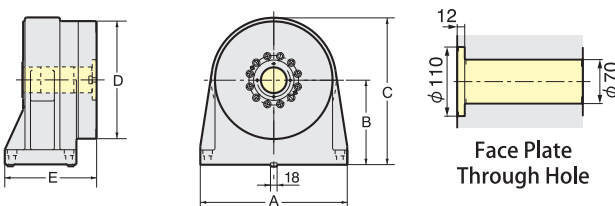
Pneumatic : 0.5MPa, Hydraulic : 3.5MPa
Clamping Torque Pneumatic : 112N•m
Hydraulic : 784N•m



Code No.	A	B	C	D	E	Weight (kg)
TAT-200N	250	150	275	200	145	43
TAT-250N	250	170	295	250	145	50

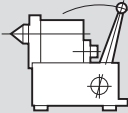
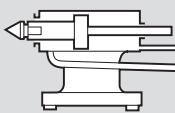
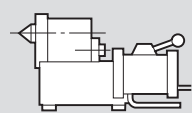
TAT-321N, 401N

Hydraulic : 3.5MPa
Clamping Torque : 1470N•m

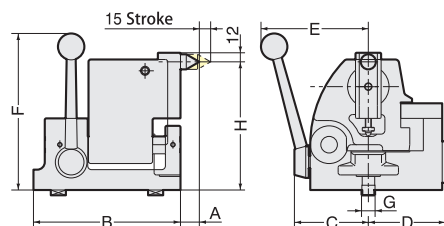


Code No.	A	B	C	D	E	Weight (kg)
TAT-321N	400	230	400	320	250	120
TAT-401N	400	230	430	400	250	140

Tailstocks line-up

Table Model	Center Height	MANUAL	PNEUMATIC / HYDRAULIC	HYDRAULIC	
					Stroke : 15mm
RED200	135	P-125 S	PBA-135	—	
RED300	170	P-170S	PBA-170	H-170S	
RED400	230	P-230S	—	H-230S	

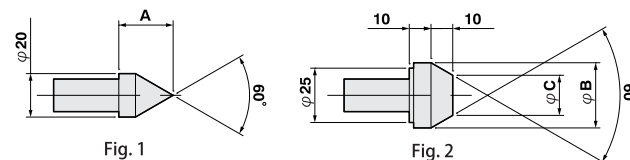
Manual Tailstock



Code No.	H: Center Height	A	B	C	D	E	F	G	Weight (kg)
P-125S	130~140	27	150	76	74	120	210	14	11.5
P-170S	160~180	25	195	98	102	145	210	18	22.5
P-230S	220~240	25	195	98	102	145	250	18	27

- ★ The center height can be adjusted. Please refer to Center Height H on the table.
- ★ Left hand type is available for all models.
- ★ For P-170S and P-230S, 5 pcs of changeable centers are included.
- ★ Live center can be applied.

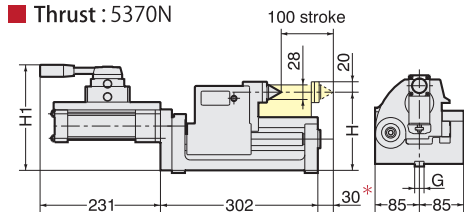
Changeable Center



Code No.	Fig.	A	B	C
PC-2	1	25	—	—
PC-3	1	50	—	—
PC-4	2	—	30	18.45
PC-5	2	—	40	28.45
PC-6	2	—	50	38.45

Hydraulic Tailstocks

- Hydraulic : 3.5MPa
- Thrust : 5370N

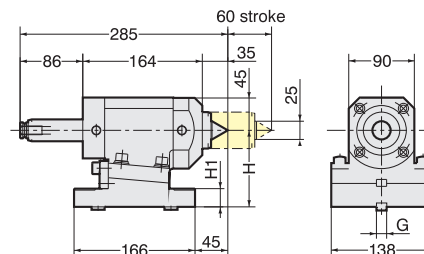


Code No.	H: Center Height	H ₁	G	Weight (kg)
H-170S	160~180	211	18	35
H-230S	220~240	271	18	45

- ★ The center height can be adjusted. Please refer to Center Height H on the table.
- ★ The rotary center is built-in.
- * MAX. work piece diameter must be smaller than φ130mm, when the stroke of changing the work piece is more than 30mm marked.

Pneumatic / Hydraulic both usable Tailstocks

- Pneumatic : 0.5MPa, Hydraulic : 2MPa
- Thrust Pneumatic : 1176N, Hydraulic : 4733N



Code No.	H: Center Height	H ₁	G	Weight (kg)
PBA-135	135	55	14	20
PBA-170	170	90	18	24.5

- ★ The center height can be adjusted. (Adjustable range : 0.35mm)
- ★ The rotary center is built-in.
- ★ MT (Morse Taper) type quill is also available. Please contact with us.
- ★ The different length of the stroke is available. Please contact us.

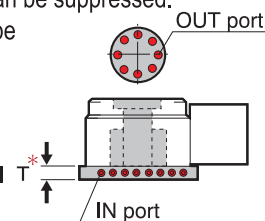
Rotary Joints line-up

Table Model	Type	MAX. Number of Ports	T*	Rotary Joint Code. No.
RED200	Flange mount type	9+1	34	RN- RE200 SD-9 +1-F
RED300	Flange mount type	10+1	29.5	RN- RE300 SD-10+1-F
RED400	Built-in type	10+1	—	RN- RE400 SD-10+1-B
RED500H	Built-in type	12+1	—	RN- RE500 SD-12+1-B
5AX-RED200-250	Flange mount type	5+1	32	RN-AXRE2025SD- 5+1-A
5AX-RED200-500	Flange mount type	9+1	34	RN-AXRE2050SD- 9+1-A

Flange mount type rotary joints

The rearward protrusion can be suppressed. The IN port positions can be selected from 4 sides, and can be placed on a side without interference.

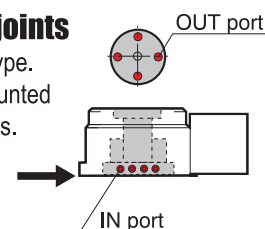
Dimensional Change : Small



Built-in type rotary joints

The most space-efficient type. The rotary joint can be mounted on the standard dimensions.

Dimensional Change : Non





Accuracy Standard

CNC Rotary Table for both of Vertical and Horizontal Use

Tilting Rotary Table

Measuring Item	Measuring Method	RED200	RED300	RED400
Parallelism between table surface and frame bottom surface (Concave)		0.015mm	0.02mm	0.02mm
Runout of table surface		0.01mm	0.015mm	0.015mm
Concentricity of center bore		0.01mm	0.01mm	0.01mm
Squareness of table surface (Minus deviation at upper part is not permitted.)		At the full length 0.02mm	0.02mm	0.02mm
Parallelism between center line of test bar and key way		At 150mm 0.02mm	0.02mm	0.02mm
Parallelism between frame bottom surface and table center line		At 150mm 0.02mm	0.02mm	0.02mm
Indexing accuracy	—	±20"	±15"	±15"
Repeatability	—	4"	4"	4"

Measuring Item	Measuring Method	5AX-RED200
Parallelism between table surface and frame bottom at tilting angle 0° (Concave)		0.015mm
Deviation of table surface at tilting angle 0°		0.01mm
Deviation of table center hole at tilting angle 0°		0.01mm
Displacement of center when moving from 0° to 90° at tilting angle 90°		0.015mm
Parallelism between table surface and center line of guide key at tilting angle 90°		At the full length 0.015mm
Indexing accuracy of rotary axis	—	±20"
Repeatability of rotary axis	—	4"
Indexing accuracy of tilting axis (Cumulative)	—	60"
Repeatability of tilting axis	—	±6"

CNC Rotary Table only for Horizontal Use

Measuring Item	Measuring Method	RED500H
Parallelism between table surface and frame bottom surface (Concave)		0.02mm
Runout of table surface at horizontal position		0.015mm
Concentricity of center bore		0.01mm
Indexing accuracy	—	±10"
Repeatability	—	4"

List of recommended servo motors (for additional axis specifications)

- The servo motors in the vertical row are almost equivalent.
- Servo motors other than those listed below can also be mounted. Please contact us with the external dimensions and specifications of the servo motor to be used. We will select the most suitable servo motor.
- The specifications of servo motors vary slightly from manufacturer to manufacturer. The specifications of RED rotary tables may differ depending on the servo motor used.

		RED200 5AX-RED200-500 Rotary axis 5AX-RED200-250 Rotary/Tilting axis	RED300 5AX-RED200-500 Tilting axis	RED400	RED500H
Stall Torque		4N.m	8N.m	22N.m	40N.m
Rotation Speed		3000r/min	3000r/min	3000r/min	3000r/min
Maker	FANUC	α IS4/5000-B	α IS8/4000-B	α IS22/4000-B	α IS40/4000-B
	MELDAS	HG104BT-D	HG154BT-D	HG354BS-D	HG453BS-D
	YASNAC	SGM7G-09A7A6E	SGM7G-13A7A6E	SGM7G-44A7A2E	SGM7G-75A7A2E
	OSP	BL-MT40M-40TB	BL-MT80M-40TB	BL-MT200M-40SB	BL-MT400M-40SB
	Brother	R2AAB8100HCR03	R2AA13180HCR00	—	—
	SIEMENS	IFK-7042	IFK-7062	IFK-7084	IFK-7105

- ★ Basically, you need to select either a motor without brake or a motor with brake when selecting a motor for the RED rotary table. If the brake of a motor cannot be controlled, select a motor without brake. However, RED rotary table may rotate depending on the balancing of the jig fixture and workpiece in the event of a power failure.
- ★ For light machining application, the servo can be turned ON to hold the position without mechanical brake. However, RED rotary table may rotate when the power is turned off or when a servo alarm occurs, depending on the balancing of the jig fixture or workpiece.
- ★ When selecting a motor without brake, select for horizontal specifications or when the unbalancing is small. For large unbalancing or cradle specifications, a motor with brake is highly recommended.