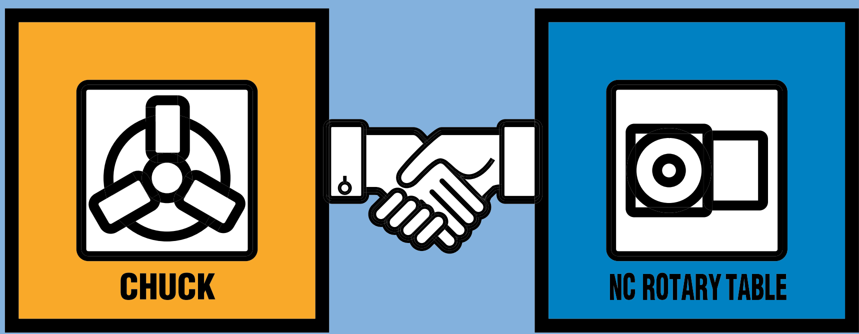
NC ROTARY TABLE

KITAGAWA
Machine Tool Accessories

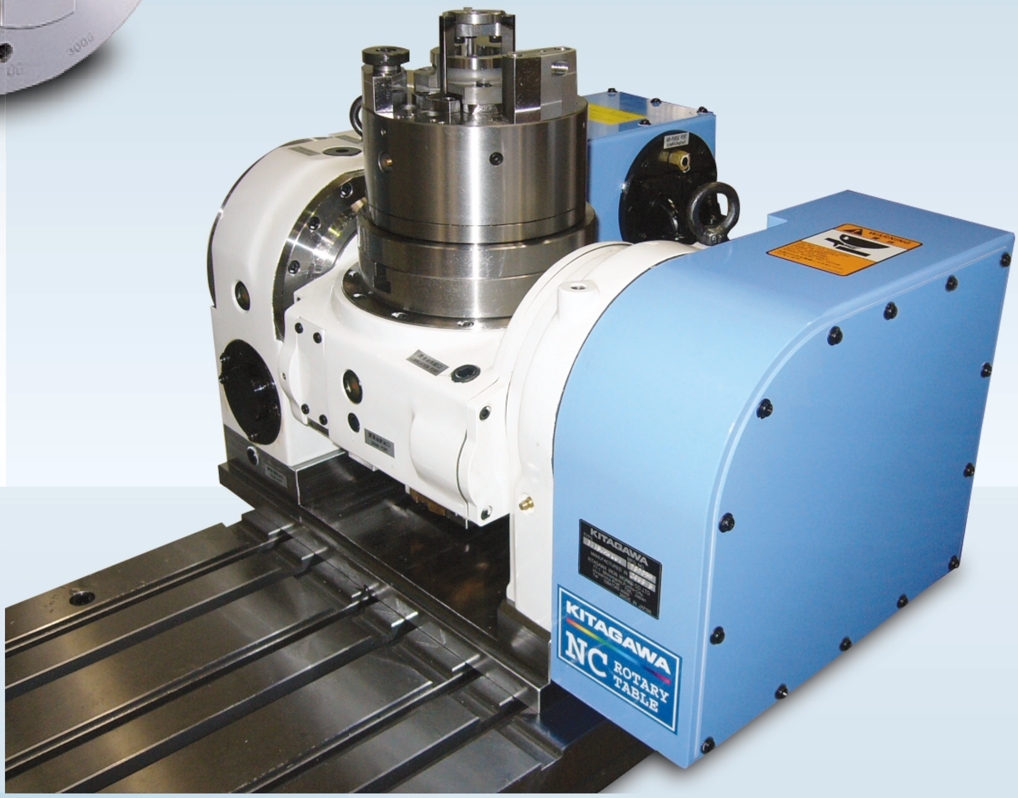
NC ROTARY TABLE

ClassNK
ISO 9001
JAB CM 005
Head Quarters, Motoyama factory

Technology to create the future



KITAGAWA
Machine Tool Accessories



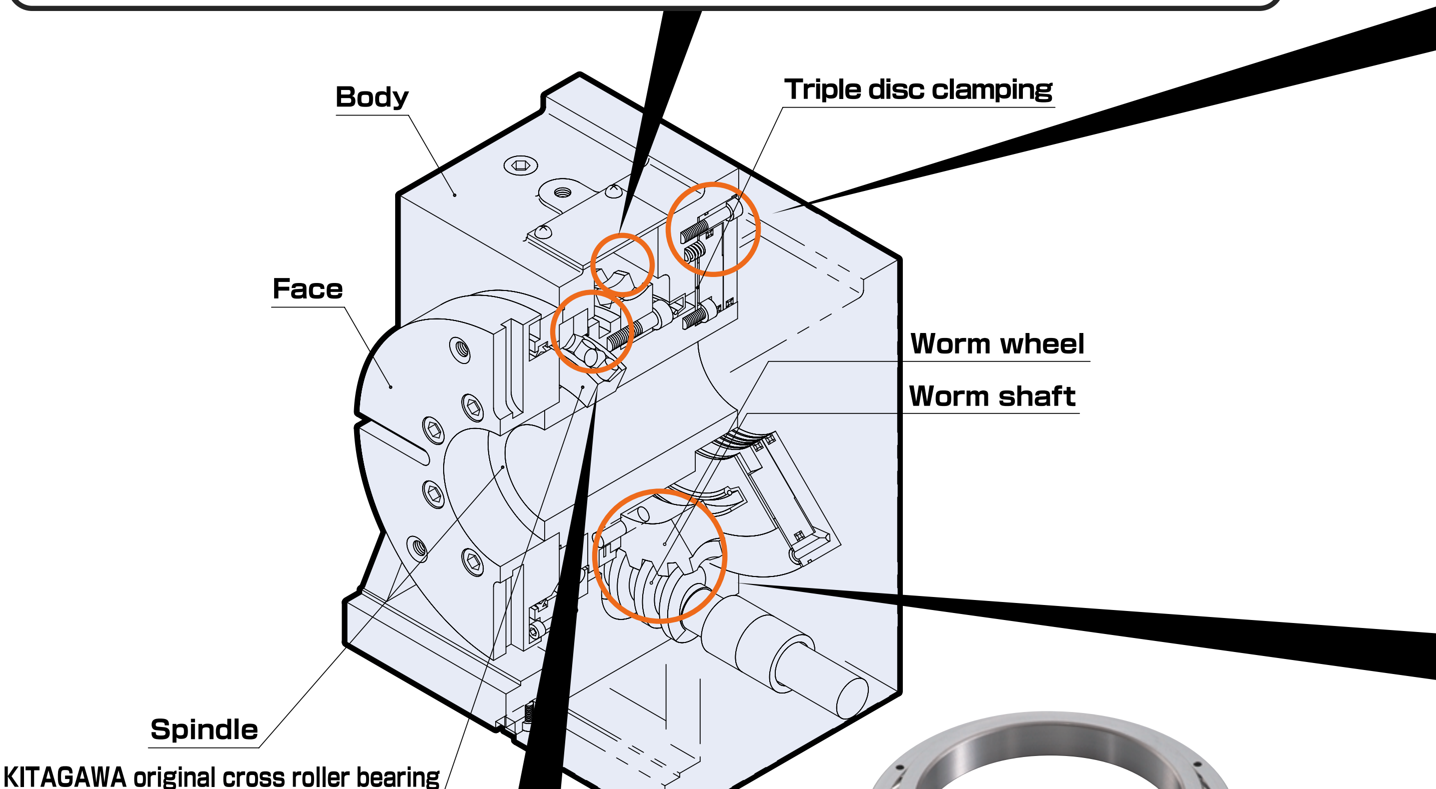
High clamping torque,high accuracy and high rigidity.
Certain technology produces KITAGAWA NC rotary tables.

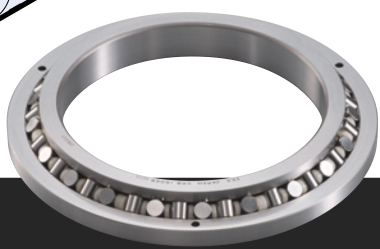
NC ROTARY TABLE FEATURES

High clamping torque, high accuracy and high rigidity KITAGAWA NC Rotary tables feature proven technology

Special material to eliminate worm wheel wear

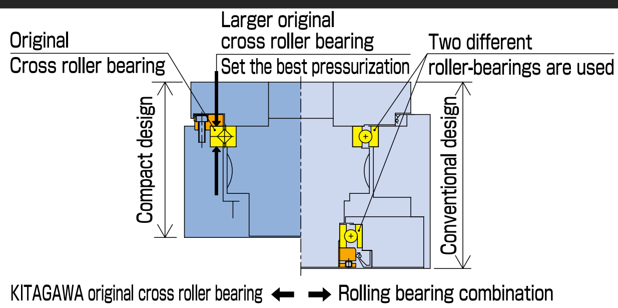
Kitagawa's special material contains hard inter-metallic compounds to give improved wear characteristics over conventional models.





Original Kitagawa cross roller bearing

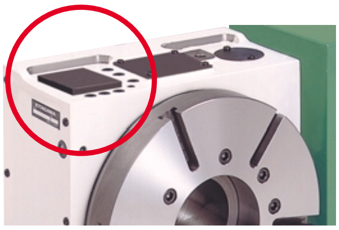
KITAGAWA original cross roller bearing supports the main spindle. Construction of the original bearing has high rigidity compared with conventional types, and the original bearing allows the body design to be compact. With over 20 years experience using the original bearing the best pressurization is set meaning high accuracy and high rigidity.



High clamping brake system

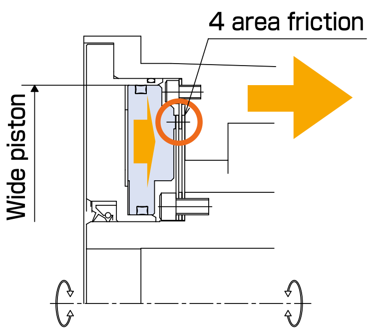
●Air-hydro high clamping system. (T•X series)

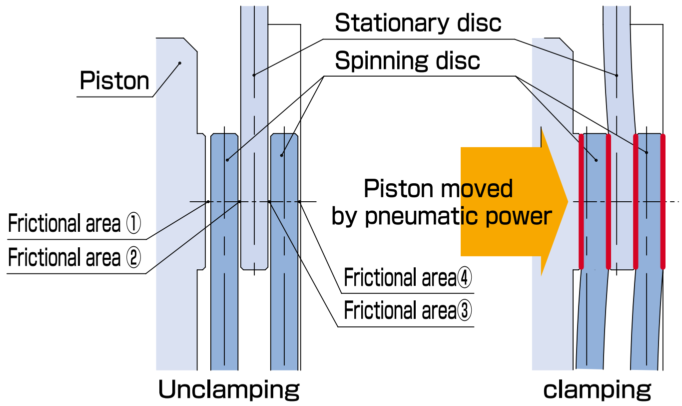
Powerful clamping torque can be achieved within a compact design using integrated air-hydraulic booster.
(Part enclosed by a red circle in right figure.)



●Triple disc brake system (MR series)

Triple disc brake system with 4 friction surfaces enables increased clamping torque when compared to conventional air clamped models.



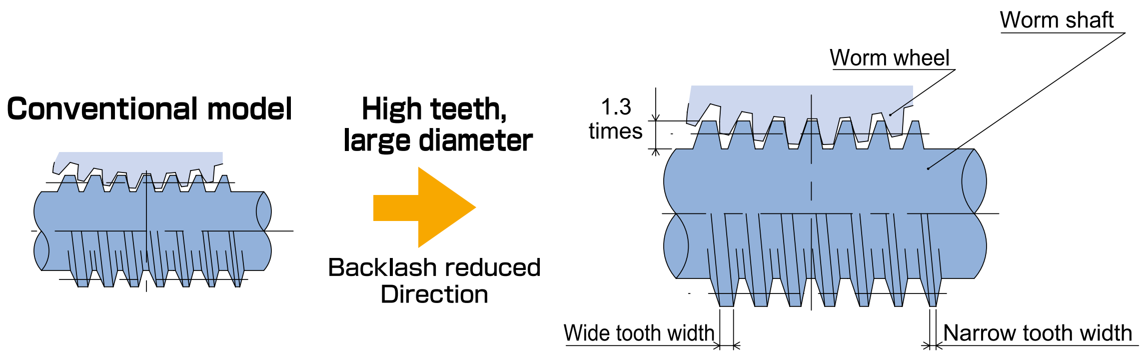


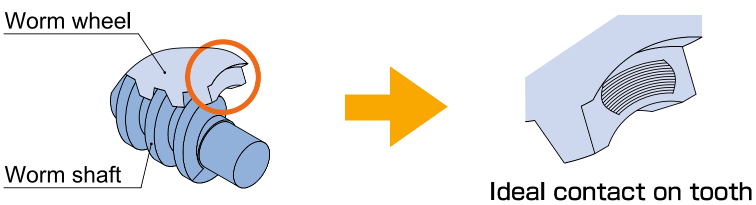
Large diameter gear with high teeth offering increased strength

Large diameter worm wheel and high gear teeth reduces the pressure on the teeth surfaces.
This achieves high accuracy with reduced processing load and wear.

Double-lead worm shaft

Double-lead worm shaft creates ideal contact between the worm shaft and worm wheel.
This allows for simple backlash adjustment and high indexing accuracy.





NC ROTARY TABLE

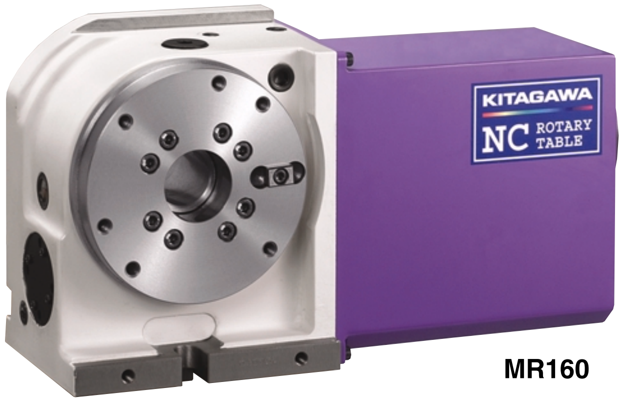
INDEX [Product description]

NC ROTARY TABLE

NC Rotary Table
MR series MR120·MR160·MR200

Industry standard compact rotary table (Purple)

- ●Minimum size in its class
- ●Pneumatic spec
- ●Powerful pneumatic clamping torque by triple disk brake system
- ●High speed rotation
- ●High accuracy
- ●Rotary Joint built in as option
- ●Ideal for compact machining centres

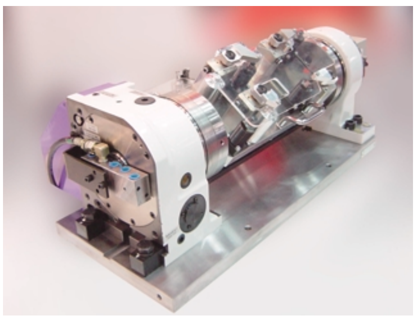


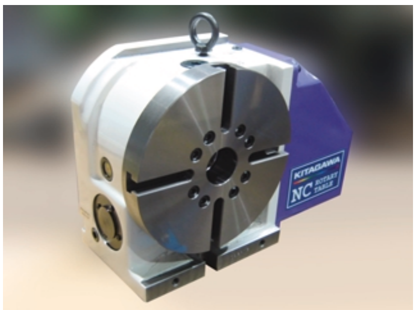
MR160

MRM160
(With Kitagawa own controller)

MRM160
(Rotary Joint built in as option)

Sample Application


▲Various trunnion systems available. (See P.73).


▲Table with T-slot can also be offered.


▲Only Kitagawa can offer this combination of NC Rotary Table and chuck

4th axis specifications

MR 160 L A * * *

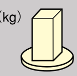
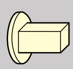
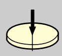
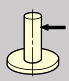
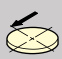
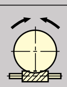
- MR: Type
- 160: Table Size — 120・160・200
- L: Right/left hands — R: Right hand, L: Left hand
- A: Clamping method — Only Pneumatic
- *: Motor type
- * *: Design No.

M signal specification

MR M 160 R 2 * *

- MR: Type
- M: Kitagawa own controller
- 160: Table Size — 120・160・200
- R: Right/left hands — R: Right hand, L: Left hand
- 2: Kitagawa own controller — 2：MAC mini i, 4：MAC mini iH
- * *: Design No.

■Specifications

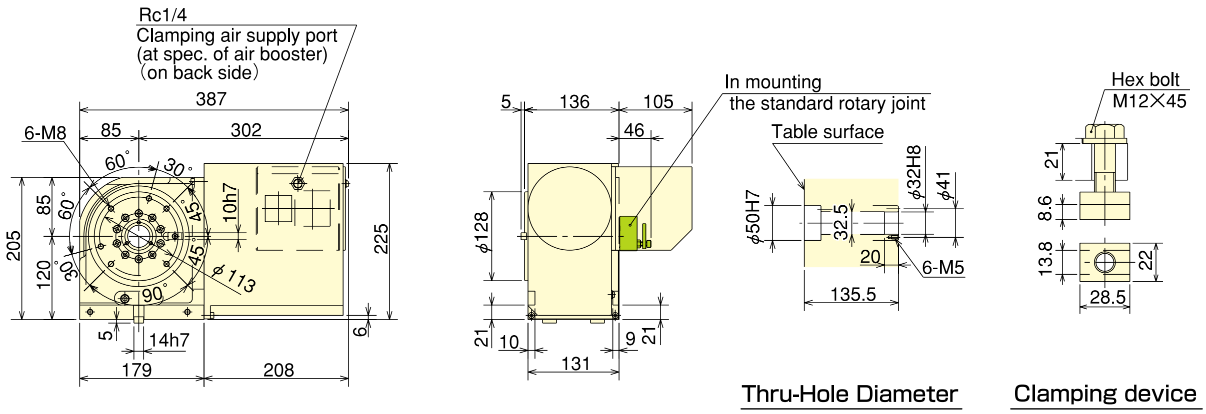
Model		MR120	MR160	MR200
Right hand		○	○	○
Left hand		○	○	○
Table dia (mm)		ϕ128	ϕ165	ϕ202
Register diameter on Face Plate (mm)		ϕ50H7	ϕ50H7	ϕ65H7
Spindle through hole diameter (mm)		ϕ32	ϕ40	ϕ45
Centre Height (mm)		120	140	140
Clamping method		Pneumatic	Pneumatic	Pneumatic
Clamping torque (N·m) (In pneumatic 0.5MPa)		150	310	350
Motor axis reduced inertia (kg·m²)		0.00004	0.00008	0.00017
Servomotor (for FANUC specification)		αiF 2/5000	αiF 2/5000	αiF 4/4000
Gear ratio		1/60	1/72	1/90
Max. spindle speed	FANUC specification (for min^{-1}/motor3000min^{-1})	50	41.6	33.3
	M signal specification (for min^{-1}/motor3000min^{-1})	50	41.6	33.3
Allowable work inertia (kg·m²)		0.22	0.51	1.00
Indexing accuracy (sec)		20	20	20
Repeatability (sec)		4	4	4
Mass of product (kg)		33	41	61
Manual Tailstock (as an option・P69 reference)		MR120RN	MR160RN	MR200RN
Tail Spindle (as an option・P73 reference)		TSR121A	TSR142A	TSR142A
Rotary Joint (as an option・P77 reference)		RJ32-12Q04 Pneumatic3-port	RJ40H16Q Hydraulic/Pneumatic4-port	RJ40H20Q02 Hydraulic/Pneumatic4-port
Allowable Load	Horizontal (kg) 	120	160	200
	Vertical (kg) 	60	80	100
Allowable load	F (kN) 	8	10	17
	F×L (N·m) 	350	600	1100
	F×L (N·m) 	150	310	350
Allowable cutting torque	T (N·m) 	180	220	270

Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. The solenoid valve for the table clamp is incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. In the port part on the table surface jig side of a rotary joint, MR120 or 200 is fixed to the rotary table side and MR160 to jig side. 5. Because a mounting pitch varies with the machines, refer to the pitch of the table spindle size drawing on P71. 6. Each product mass is determined by a Kitagawa M signal spec.

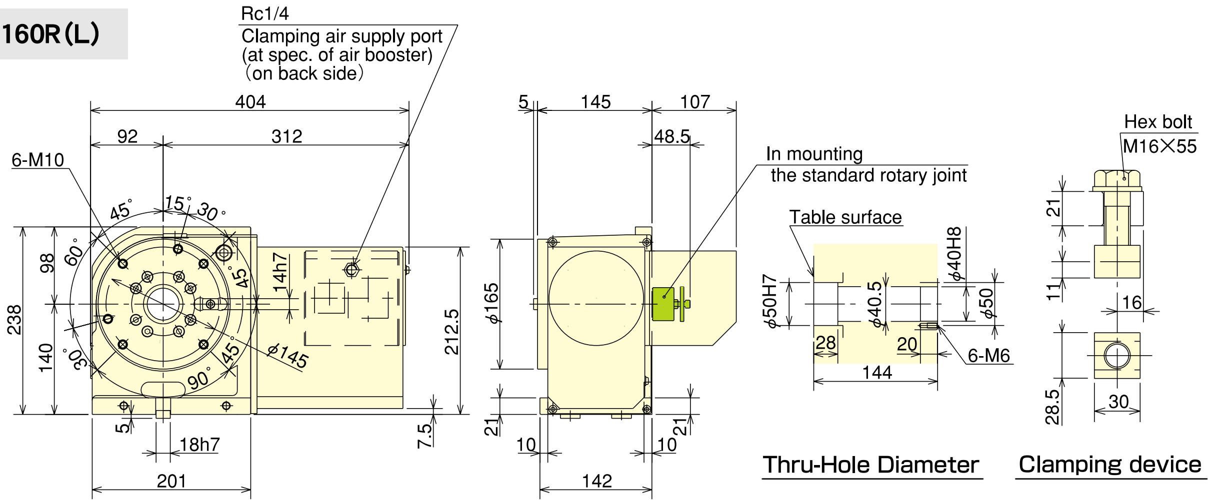
NC ROTARY TABLE **MR** series MR120・MR160・MR200

■Dimensions【4th axis specifications】

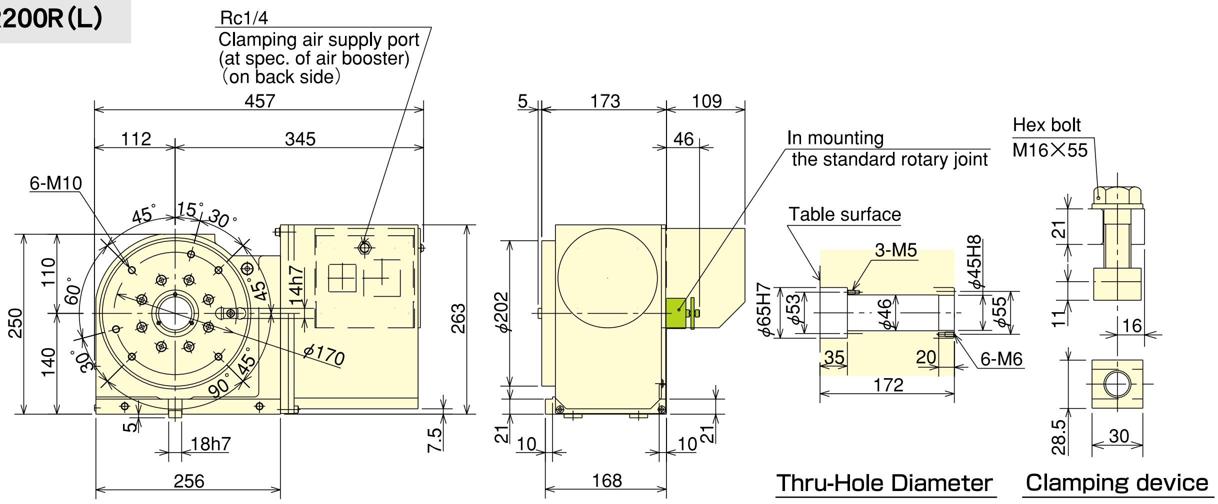
MR120R(L)



MR160R(L)



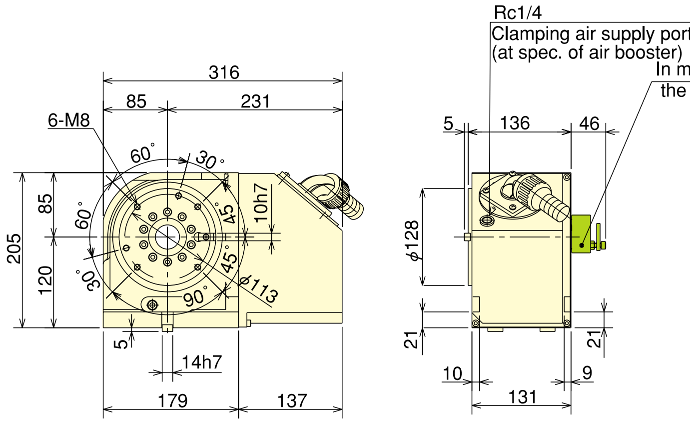
MR200R(L)

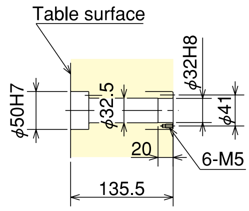


※The above dimensions are the same as FANUC specifications.
In case of other maker motor specifications, dimensions may differ in length.
R is a right hand spec. and L is a left hand spec.

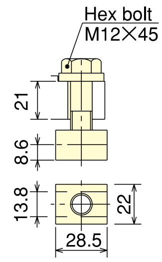
■Dimensions [Kitagawa own controller]

MRM120R (L)



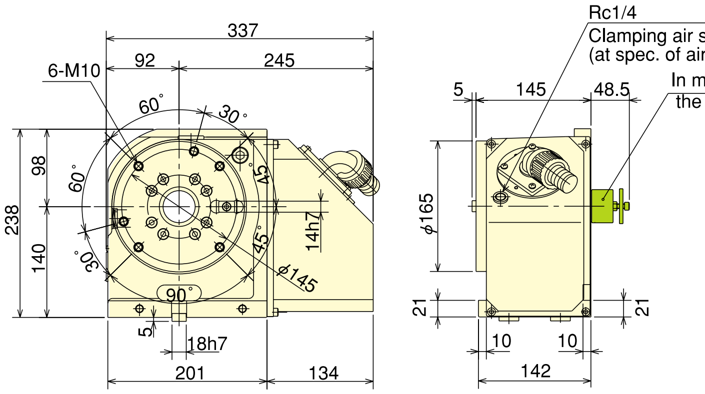


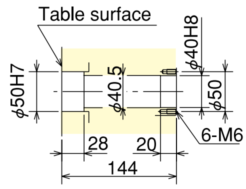
Thru-Hole Diameter



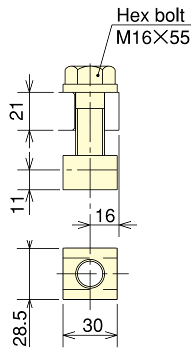
Clamping device

MRM160R (L)



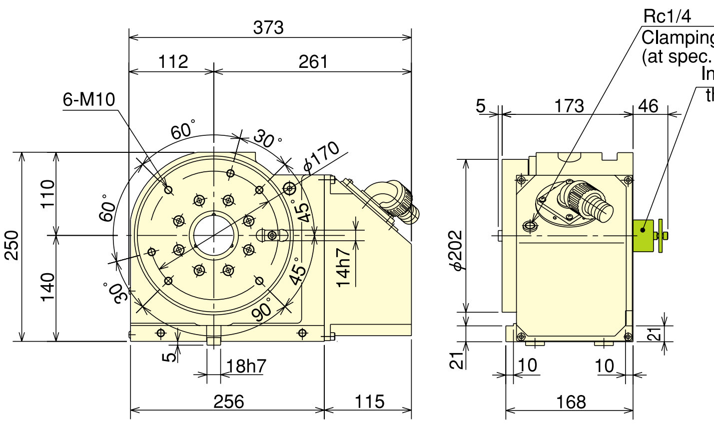


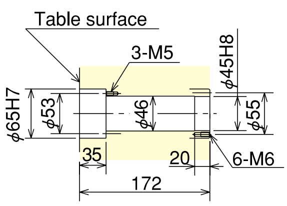
Thru-Hole Diameter



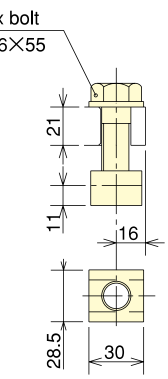
Clamping device

MRM200R (L)





Thru-Hole Diameter



Clamping device

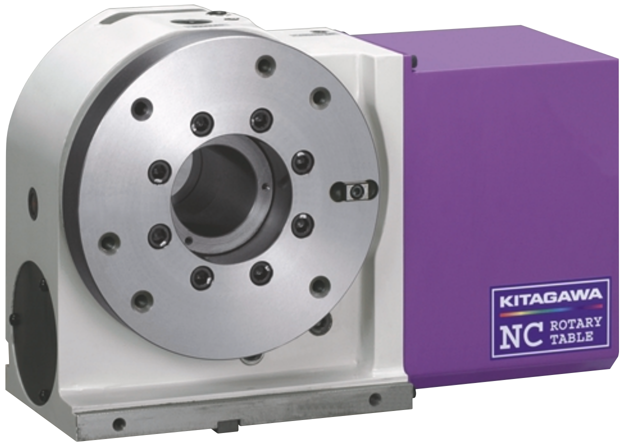
※R is a right hand spec. and L is a left hand spec.

NC ROTARY TABLE

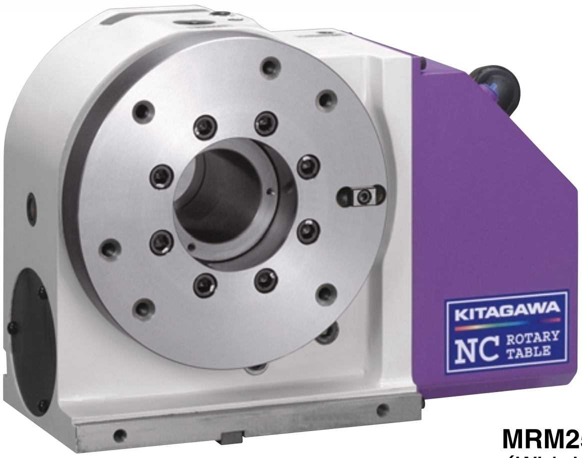
NC Rotary Table
MR series　MR250・MR320

Industry standard compact rotary table (Purple)

- ●Compact design
- ●Pneumatic spec
- ●Powerful pneumatic clamping torque by triple disk brake system
- ●High speed rotation
- ●High accuracy
- ●Rotary Joint built in as option
- ●Ideal for compact machining centres

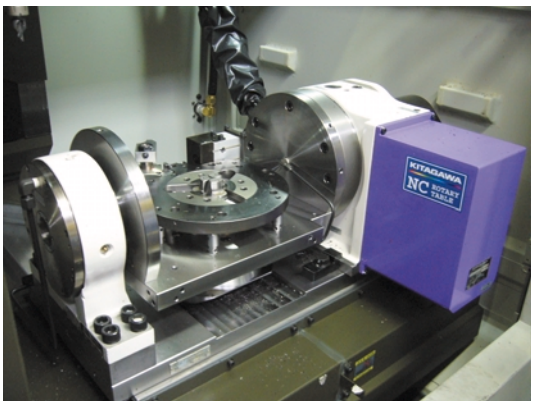


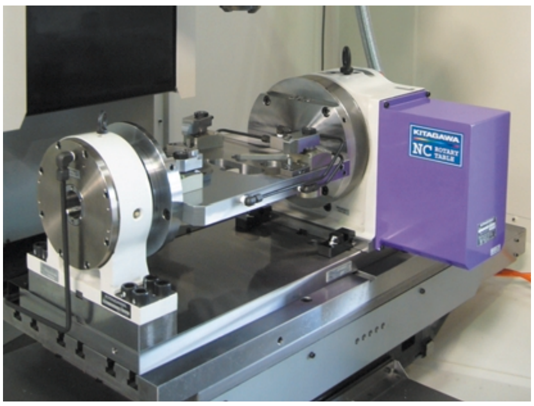
MR250



MRM250
(With Kitagawa own controller)

Sample Application





▲Specialist trunnion systems allow for multi surface or simultaneous machining.

4th axis specifications

MR 250 L A ＊ ＊＊

- **Type**: MR
- **Table Size**: 250・320
- **Right/left hands**: R: Right hand / L: Left hand
- **Clamping method**: Only Pneumatic
- **Motor type**
- **Design No.**

M signal specification

MR M 250 R 2 ＊＊

- **Type**: MR
- **Kitagawa own controller**: M
- **Table Size**: 250・320
- **Right/left hands**: R: Right hand / L: Left hand
- **Kitagawa own controller**: 2：MAC mini i / 4：MAC mini iH
- **Design No.**

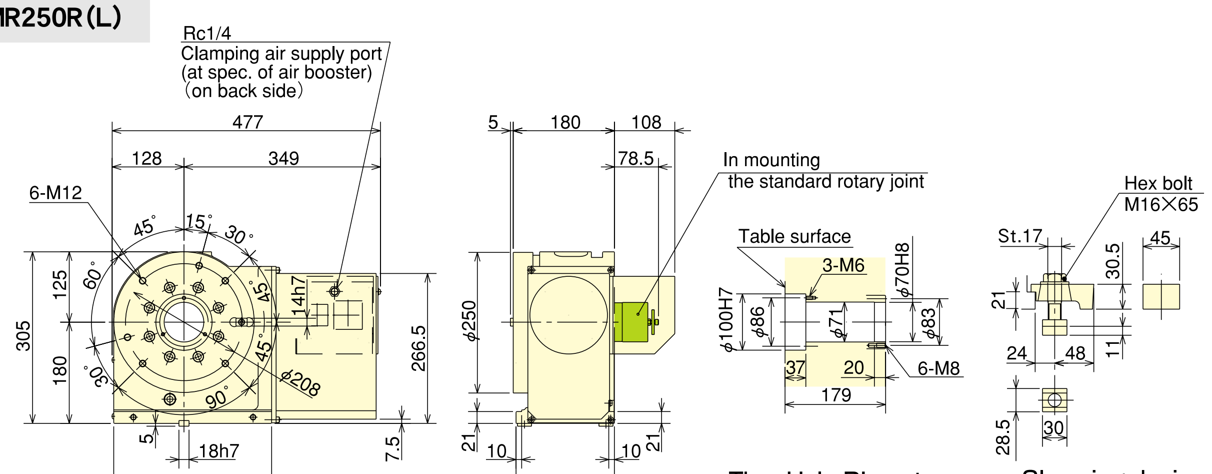
■Specifications

Model		MR250	MR320
Right hand		○	○
Left hand		○	○
Table dia (mm)		ϕ250	ϕ320
Register diameter on Face Plate (mm)		ϕ100H7	ϕ130H7
Spindle through hole diameter (mm)		ϕ70	ϕ105
Centre Height (mm)		180	225
Clamping method		Pneumatic	Pneumatic
Clamping torque (N・m) (In pneumatic 0.5MPa)		600	1200
Motor axis reduced inertia ($kg・m^2$)		0.00031	0.00031
Servomotor (for FANUC specification)		αiF 4/4000	αiF 8/3000
Gear ratio		1/90	1/120
Max. spindle speed	FANUC specification (for min^{-1}/motor3000min^{-1})	33.3	25
	M signal specification	33.3 (3000min^{-1})	16.6 (2000min^{-1})
Allowable work inertia ($kg・m^2$)		1.95	4.49
Indexing accuracy (sec)		20	20
Repeatability (sec)		4	4
Mass of product (kg)		85	135
Manual Tailstock (as an option・P69 reference)		MR250RN	MR320RN
Tail Spindle (as an option・P73 reference)		TSR180A	TSR180A-45
Rotary Joint (as an option・P77 reference)		RJ70H25Q02 Hydraulic/Pneumatic6-port	RJ70H32Q01 Hydraulic/Pneumatic6-port
Allowable Load	Horizontal (kg)	250	350
	Vertical (kg)	125	180
Allowable load	F (kN)	21	25
	F×L (N・m)	1600	2400
	F×L (N・m)	600	1200
Allowable cutting torque	T (N・m)	480	800

Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. The solenoid valve for the table clamp is incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. In the port part on the table surface jig side of a rotary joint, MR120 or 320 is fixed to the rotary table side. 5. Because a mounting pitch varies with the machines, refer to the pitch of the table spindle size drawing on P71. 6. Each product mass is determined by a Kitagawa M signal spec.

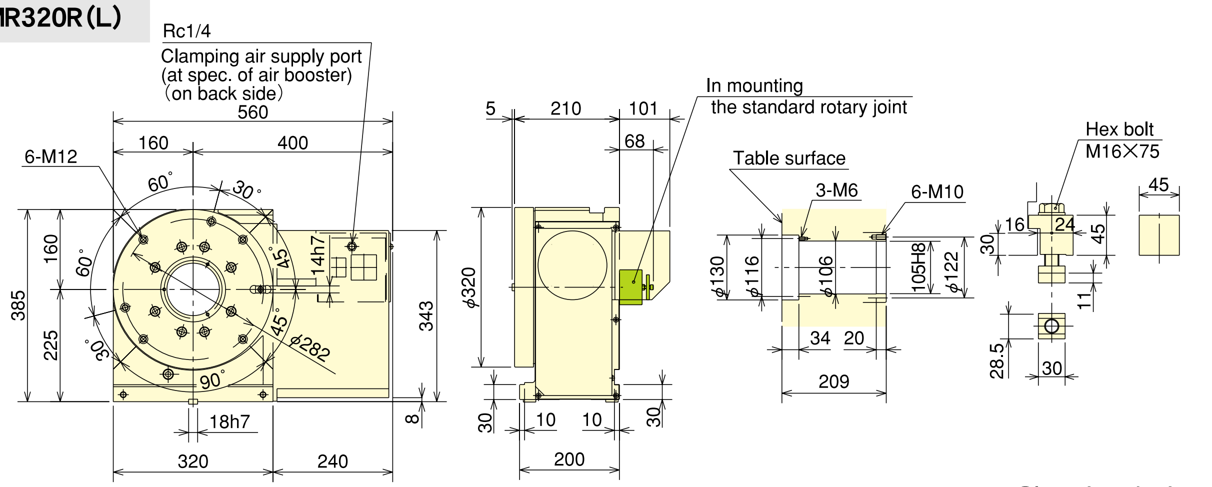
■Dimensions【4th axis specifications】

MR250R(L)



Thru-Hole Diameter　　Clamping device

MR320R(L)

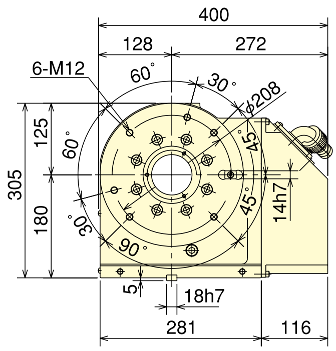


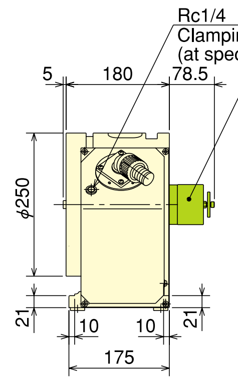
Thru-Hole Diameter　　Clamping device

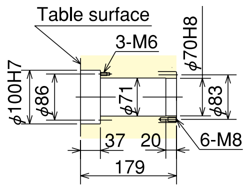
※The above dimensions are the same as FANUC specifications.
In case of other maker motor specifications, dimensions may differ in length.
R is a right hand spec. and L is a left hand spec.

■Dimensions [Kitagawa own controller]

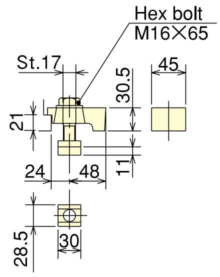
MRM250R(L)





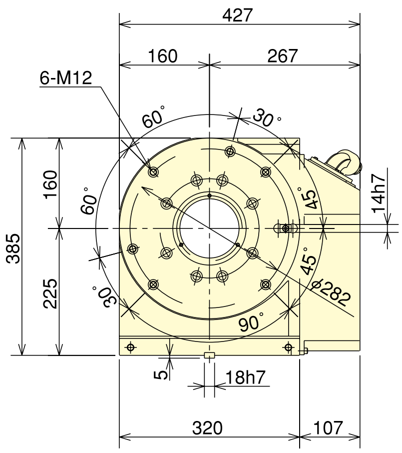


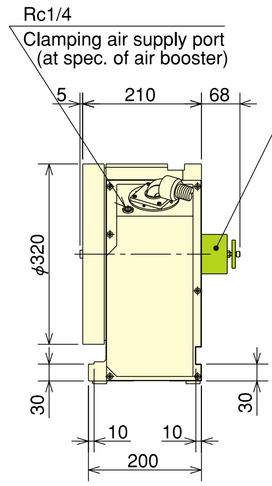
Thru-Hole Diameter

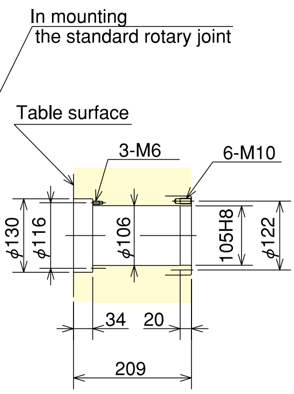


Clamping device

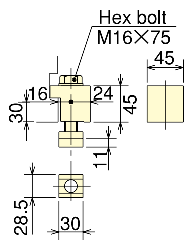
MRM320R(L)







Thru-Hole Diameter

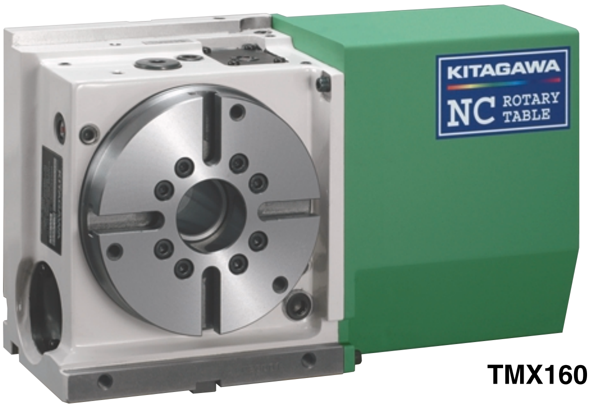


Clamping device

※R is a right hand spec. and L is a left hand spec.

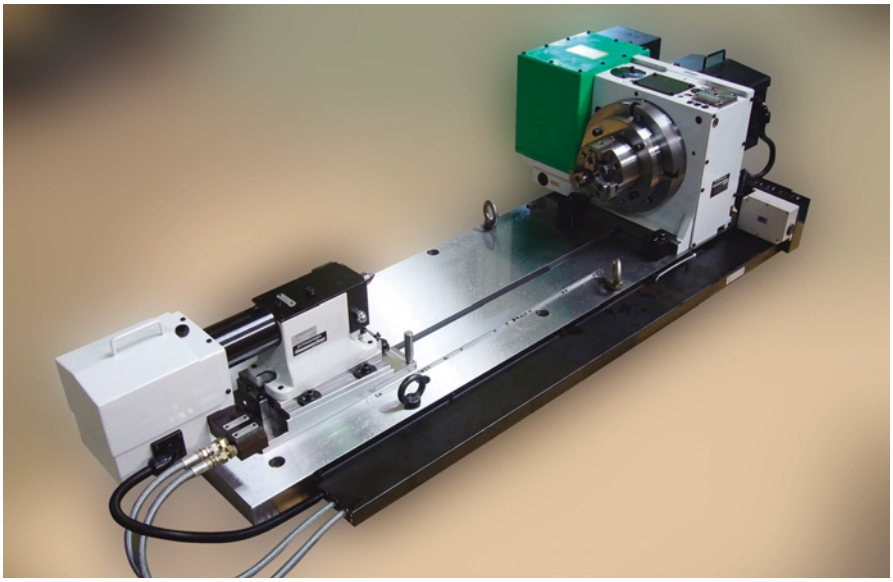
High performance range with high rigidity for heavy cutting (Green)

- ●High rigidity for heavy cutting
- ●High accuracy
- ●Integrated air booster provides high clamping torque (comparable to hydraulic) from a standard air supply
- ●Air booster or direct hydraulic clamping options available
- ●Rotary joint options available
- ●Can be used vertically and horizontally
- ●Rotary scale can be fitted to further increase accuracy

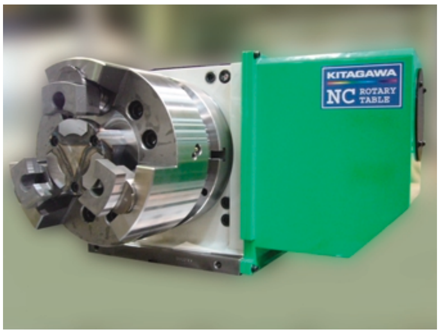


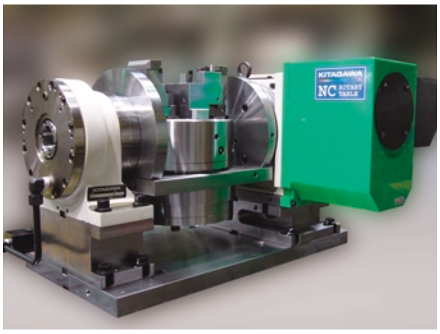
TMX160

Sample Application



▲Combine with tailstocks on p69 and 70 to suit machining of long work pieces.





▲Only Kitagawa can offer this combination of NC Rotary Table and chuck

4th axis specifications

TMX 160 B * * *

- **Type** (TMX): Right hand: TMX, Left hand: THX
- **Table Size** (160): TMX: 160・200・250, THX: 160・200
- **Clamping method** (B): B: Air-Hydraulic, H: Hydraulic
- **Motor type** (first *)
- **Design No.** (* *)

M signal specification

TMX 160 B 2 * *

- **Type** (TMX): Right hand: TMX, Left hand: THX
- **Table Size** (160): TMX: 160・200・250, THX: 160・200
- **Clamping method** (B): B: Air-Hydraulic, H: Hydraulic
- **Kitagawa own controller** (2): 2: MAC mini i, 4: MAC mini iH
- **Design No.** (* *)

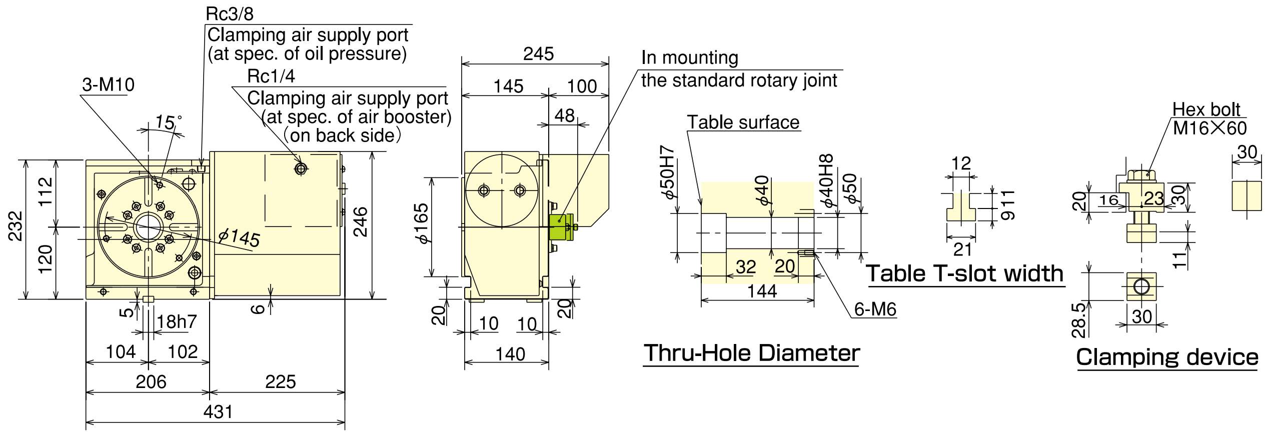
■Specifications

Model		TMX160	TMX200	TMX250
Right hand		○	○	○
Left hand		○	○	×
Table dia (mm)		φ165	φ200	φ250
Register diameter on Face Plate (mm)		φ50H7	φ75H7	φ105H7
Spindle through hole diameter (mm)		φ40	φ52	φ78
Centre Height (mm)		120	140	180
Clamping method		Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic
Clamping torque (N・m) (In pneumatic 0.5MPa/hydraulic 3.5MPa)		450	600	1100
Motor axis reduced inertia (kg・m²)		0.00012	0.00032	0.00056
Servomotor (for FANUC specification)		αiF 2/5000	αiF 4/4000	αiF 4/4000
Gear ratio (Decel. Ratio in M signal)		1/72	1/90	1/90(1/120)
Max. spindle speed	FANUC specification (for min^{-1}/motor3000min^{-1})	41.6	33.3	33.3
	M signal specification (for min^{-1}/motor3000min^{-1})	41.6	33.3	25
Allowable work inertia (kg・m²)		0.51	1.00	1.95
Indexing accuracy (sec)		20	20	20
Repeatability (sec)		4	4	4
Mass of product (kg)		56	60	101
Manual Tailstock (as an option・P69 reference)		TS160RN	TS200RN	TS250RN
Tail Spindle (as an option・P73 reference)		TSR121A	TSR142A	TSR180A
Rotary Joint (as an option・P77 reference)		RJ40H16D01 Hydraulic/Pneumatic4-port	RJ40H20D03 Hydraulic/Pneumatic4-port	RJ70H25D05 Hydraulic/Pneumatic4-port
Allowable Load	Horizontal (kg)	160	200	250
	Vertical (kg)	80	100	125
Allowable load	F (kN)	10	17	21
	F×L (N・m)	600	1100	1600
	F×L (N・m)	450	600	1100
Allowable cutting torque	T (N・m)	240	310	730

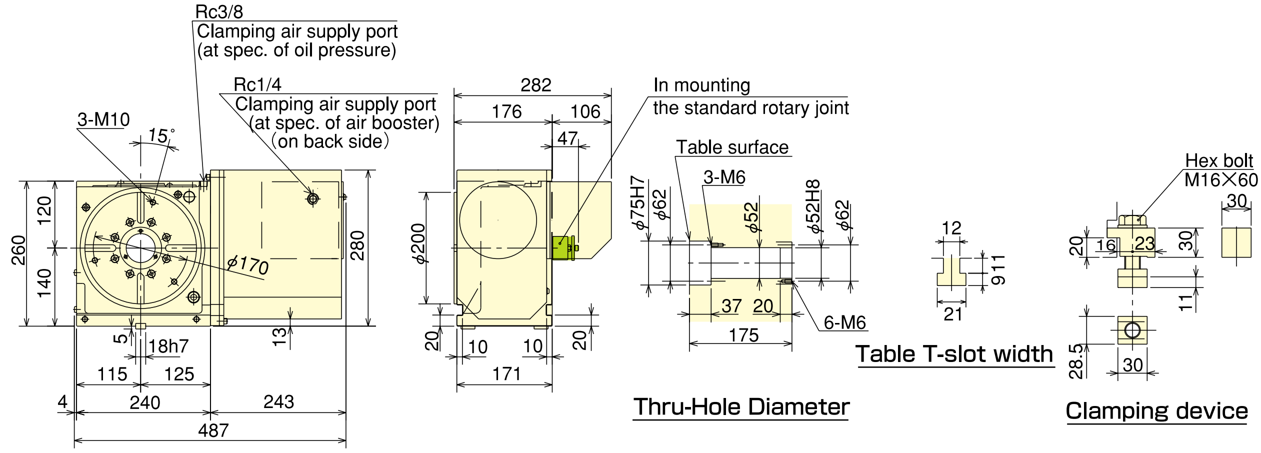
Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of air + hyd. clamp specification, the solenoid valve for table clamp is incorporated. 3. Solenoid valve is not incorporated in case of hydraulic clamp spec. Consequently, customer shall prepare it. 4. Neither cable nor hose is fitted between NC rotary table and machine tool... 5. In the port side on a table surface jig side of a rotary joint, TMX200 or 250 is fixed to the rotary table side, and TMX160 to jig side. 6. Because a mounting pitch varies with the machines, refer to the pitch of the table spindle size drawing on P71. 7. Each product mass is determined by a Kitagawa M signal spec.

■Dimensions【4th axis specifications】

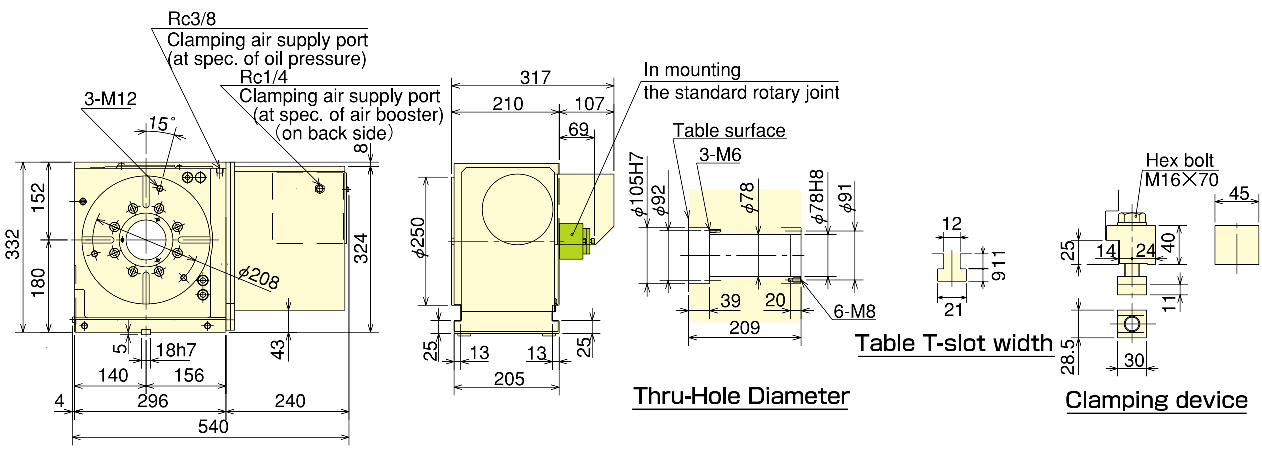
TMX160(THX)



TMX200(THX)



TMX250



※The above outline dimensions are shown with FANUC motor specifications.
In case of specifications with other makers, the dimensions may differ in length.
TMX is a right hand spec. and THX is a left hand spec.

■Dimensions [Kitagawa own controller]

TMX160 (THX)

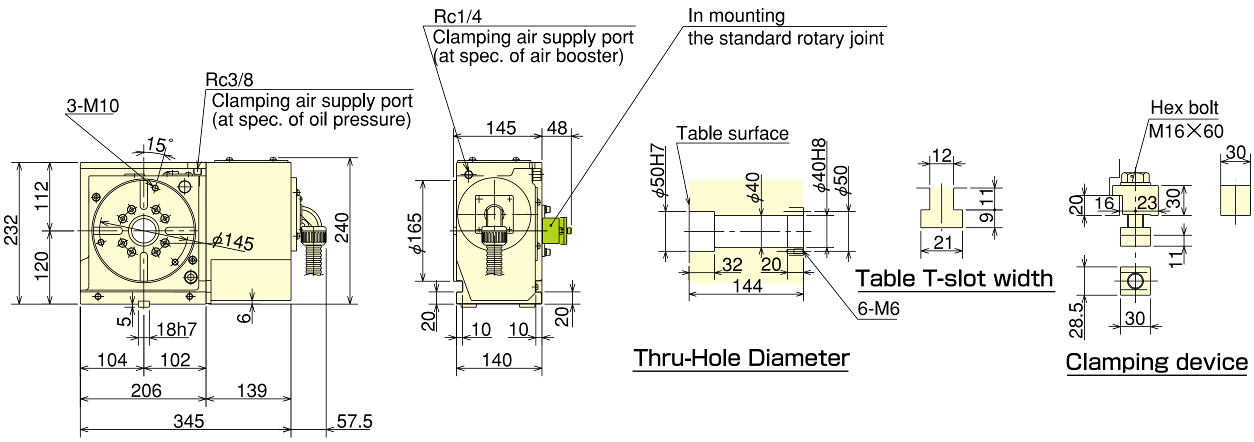


Table T-slot width

Thru-Hole Diameter

Clamping device

TMX200 (THX)

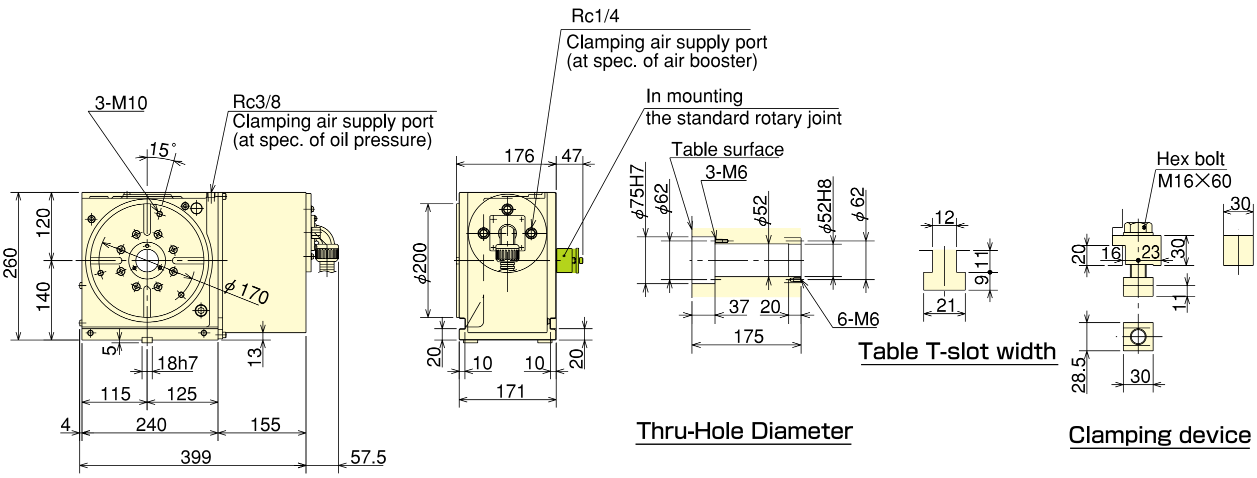


Table T-slot width

Thru-Hole Diameter

Clamping device

TMX250

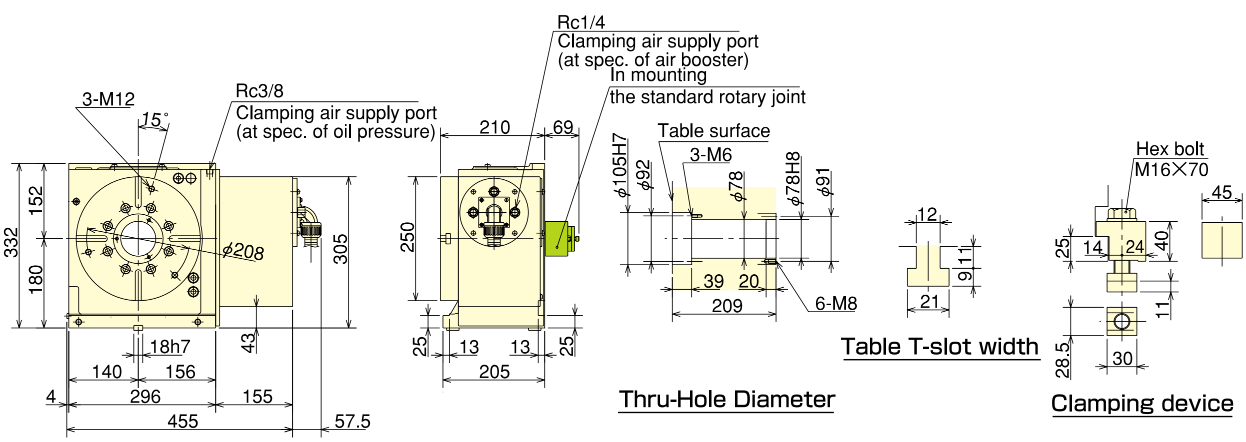


Table T-slot width

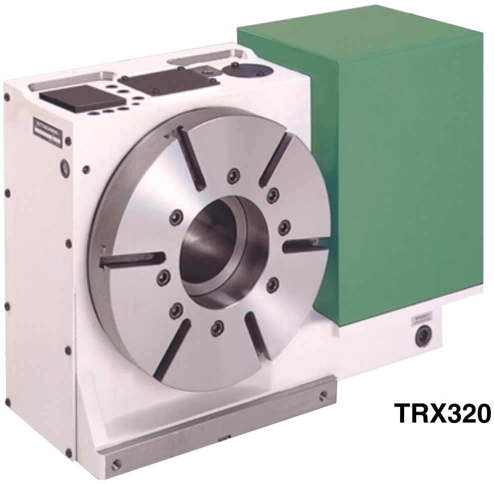
Thru-Hole Diameter

Clamping device

※TMX is a right hand spec. and THX is a left hand spec.

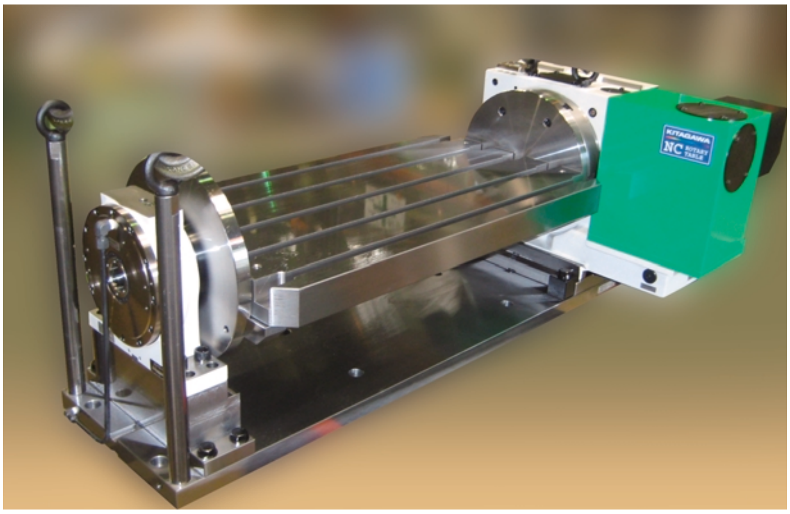
High performance range for machining large work pieces

- ●High rigidity for heavy cutting
- ●Hydraulic clamping method
- ●High accuracy
- ●Rotary joint options available
- ●Vertically and horizontally installed type
- ●Large thru-hole
- ●Vertical mounted motor
- ●Rotary scale can be fitted to further increase accuracy

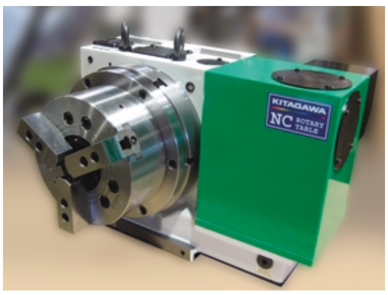


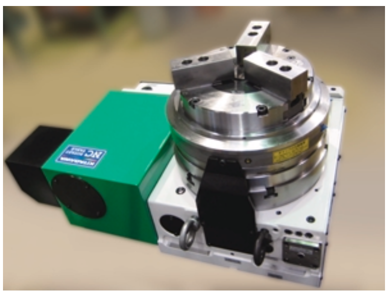
TRX320

Sample Application



▲Only Kitagawa can offer this combination of NC Rotary Table and chuck





▲Can be used vertically and horizontally. Left and right hand versions available to suit machining area.

4th axis specifications

TRX 320 H ＊ ＊ ＊

- Type: Right hand: TRX / Left hand: TLX
- Table Size: TRX: 320 / TLX: 250・320
- Clamping method: B: Air-Hydraulic / H: Hydraulic
- Motor type
- Design No.

TR 400 H 2 ＊ ＊ ＊

- Type: Right hand: TR / Left hand: TL
- Table Size: TR: 400・500・630 / TL: 400
- Clamping method: B: Air-Hydraulic / H: Hydraulic
- Gear Ratio: 2: 1/180
- Motor type
- Design No.

M signal specification

TRX 320 B 2 ＊ ＊

- Type: Right hand: TRX / Left hand: TLX
- Table Size: TRX: 320 / TLX: 250・320
- Clamping method: B: Air-Hydraulic / H: Hydraulic
- Kitagawa own controller: 2: MAC mini i / 4: MAC mini iH
- Design No.

TR M 400 H 7 ＊ ＊

- Type
- Kitagawa own controller
- Table Size: TR: 400・500・630 / TL: 400
- Clamping method: B: Air-Hydraulic / H: Hydraulic
- Kitagawa own controller: 7: MAC mini iHP
- Design No.

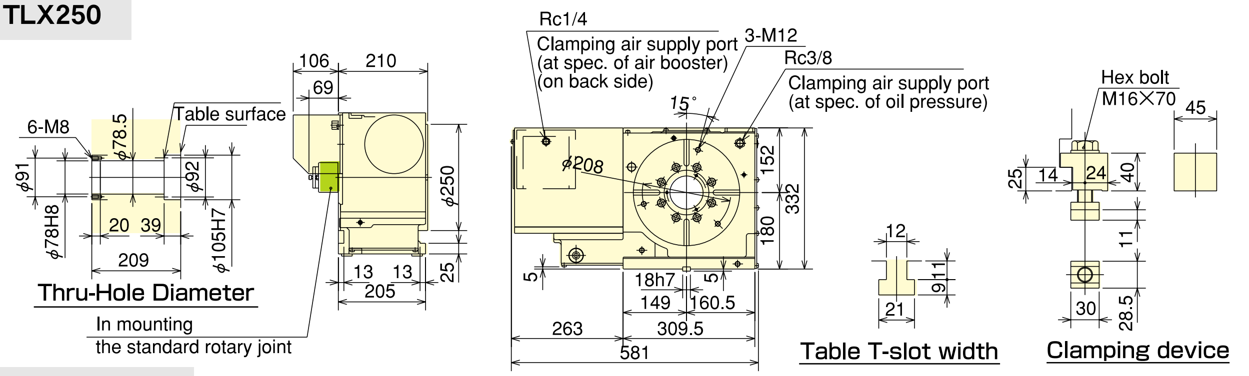
■Specifications

Model		TLX250	TRX320	TR400	TR500	TR630
Right hand		×	○	○	○	○
Left hand		○	○	○	×	×
Table dia (mm)		φ250	φ320	φ400	φ500	φ630
Register diameter on Face Plate (mm)		φ105H7	φ135H7	φ180H7	φ200H7	φ280H7
Spindle through hole diameter (mm)		φ78	φ110	φ150	φ170	φ250
Centre Height (mm)		180	225	255	310	400
Clamping method		Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic	Hydraulic	Hydraulic	Hydraulic
Clamping torque (N·m) (Pneumatic 0.5MPa / Hydraulic 3.5MPa)		1100	2600	2500	3200	4000
Motor axis reduced inertia (kg·m²)		0.00073	0.00085	0.0028	0.0028	0.0064
Servomotor (for FANUC specification)		αiF 4/4000	αiF 8/3000	αiF 12/3000	αiF 12/3000	αiF 22/3000
Gear ratio (Decel. Ratio in M signal)		1/90(1/120)	1/120(1/180)	1/180	1/180	1/180
Max. spindle speed	FANUC specification (min^{-1})	33.3 (3000min^{-1})	25 (3000min^{-1})	11.1 (2000min^{-1})	11.1 (2000min^{-1})	11.1 (2000min^{-1})
	M signal specification (min^{-1})	25 (3000min^{-1})	16.6 (3000min^{-1})			
Allowable work inertia (kg·m²)		1.95	4.48	10.00	18.73	49.62
Indexing accuracy (sec)		20	20	20	20	20
Repeatability (sec)		4	4	4	4	4
Mass of product (kg)		142	196	350	550	900
Manual Tailstock (as an option・P69 reference)		TS250RN	TS320RN	TS400RN	TS500RN	TS630RN
Tail Spindle (as an option・P73 reference)		TSR180A	TSR180A-45	Order production	Order production	Order production
Rotary Joint (as an option・P77 reference)		RJ70H25D05 Hydraulic/Pneumatic6-port	RJ70H32K02 Hydraulic/Pneumatic6-port	Order production	Order production	Order production
Allowable Load	Horizontal (kg)	250	350	500	600	1000
	Vertical (kg)	125	180	250	300	400
Allowable load	F (kN)	21	26	32	50	70
	F×L (N·m)	1600	2500	5000	8000	10000
	F×L (N·m)	1100	2600	2500	3200	4000
Allowable cutting torque	T (N·m)	730	1000	1700	2600	5000

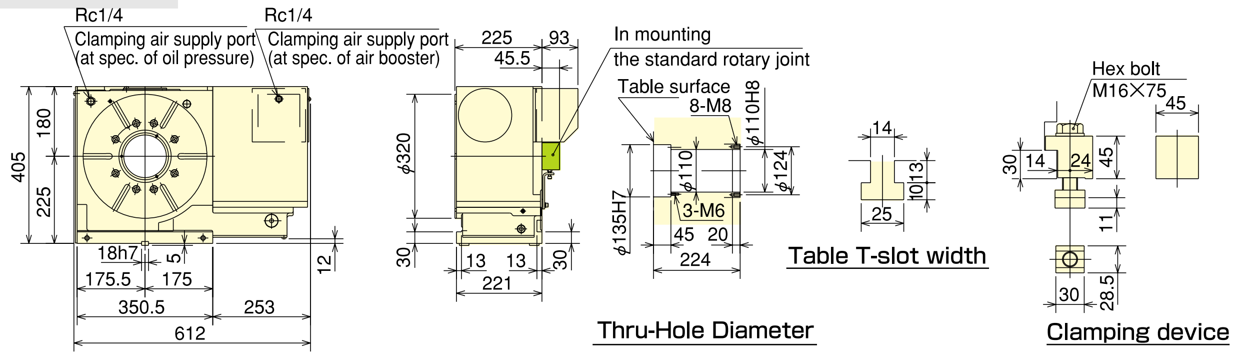
Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of air + hyd. clamp specification, the solenoid valve for table clamp is incorporated. 3. Solenoid valve is not incorporated in case of hydraulic clamp method. Consequently, customer shall prepare it. 4. Neither cable nor hose is fitted between NC rotary table and machine tool... 5. In the port part on the table surface jig side of a rotary joint, TRX320 is fixed to the rotary table side. 6. Because a mounting pitch varies with the machines, refer to the pitch of the table spindle size drawing on P71. 7. Contact to Kitagawa about rotary joint and tail spindle of 400-size or more. 8. Each product mass is determined by a Kitagawa M signal spec.

■Dimensions [4th axis specifications]

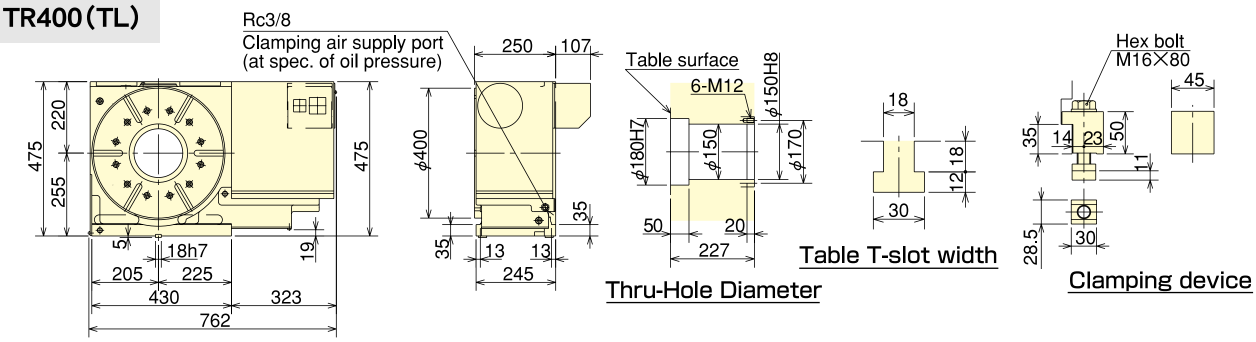
TLX250



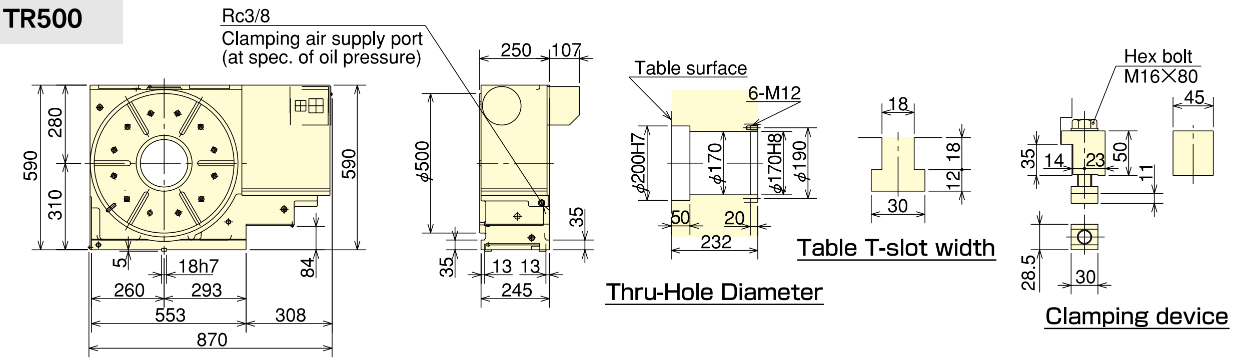
TRX320(TLX)



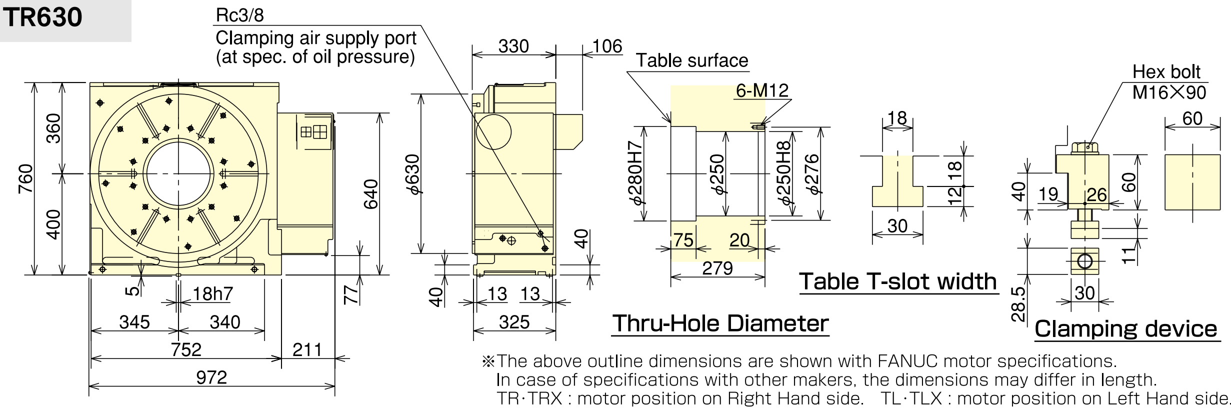
TR400(TL)



TR500



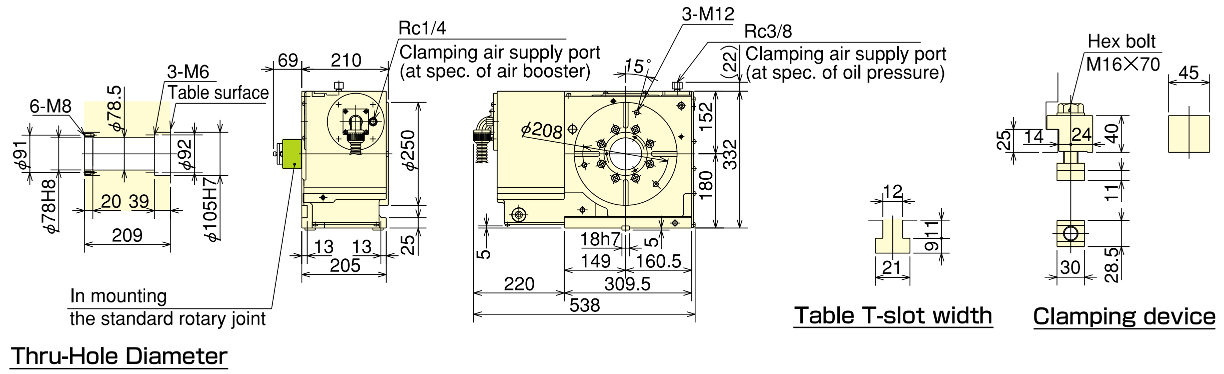
TR630



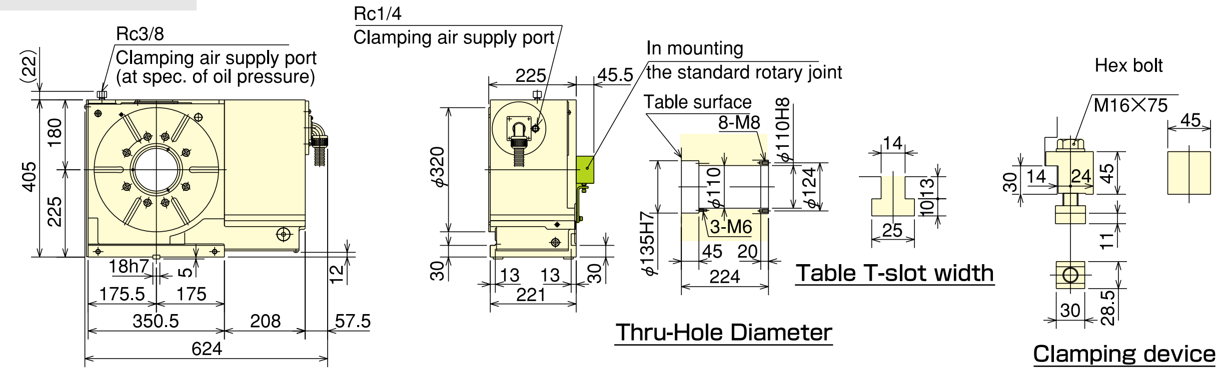
※The above outline dimensions are shown with FANUC motor specifications.
In case of specifications with other makers, the dimensions may differ in length.
TR・TRX : motor position on Right Hand side.　TL・TLX : motor position on Left Hand side.

■Dimensions [Kitagawa own controller]

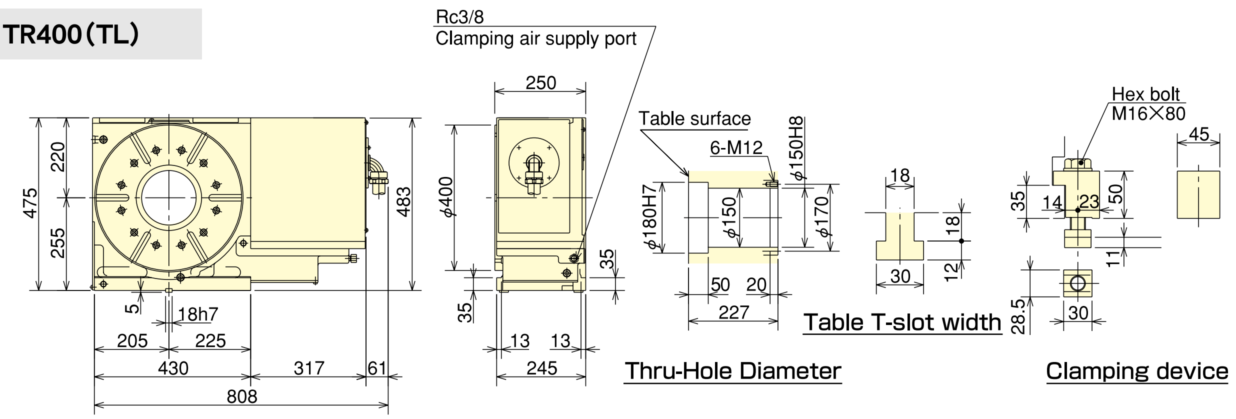
TLX250



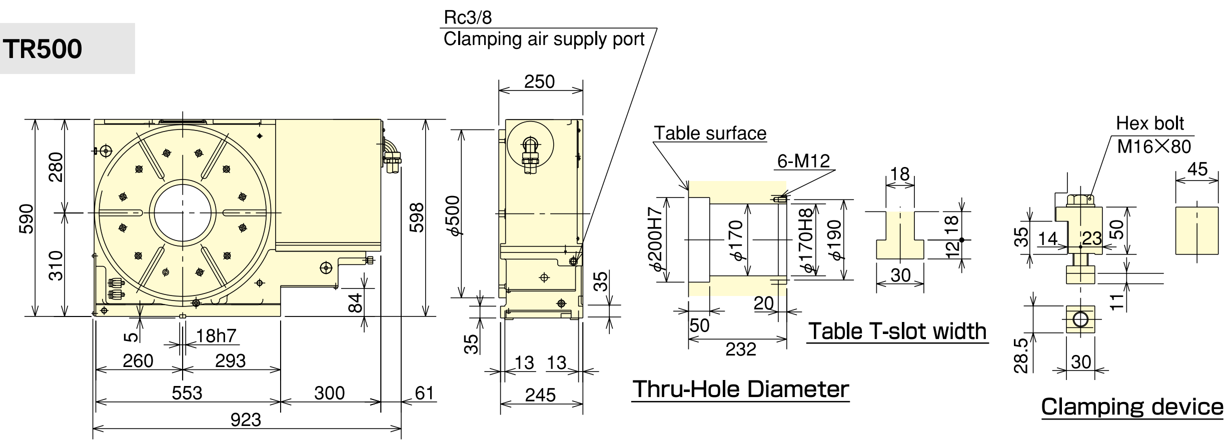
TRX320(TLX)



TR400(TL)



TR500



※TR · TRX : motor position on Right Hand side.　TL · TLX : motor position on Left Hand side.
※Contact to Kitagawa on TR630 with MAC mini i Series. Kitagawa about M signal spec. of 630-size.

TR

High Performance NC Rotary Table - Back side mounted motor

TBX series

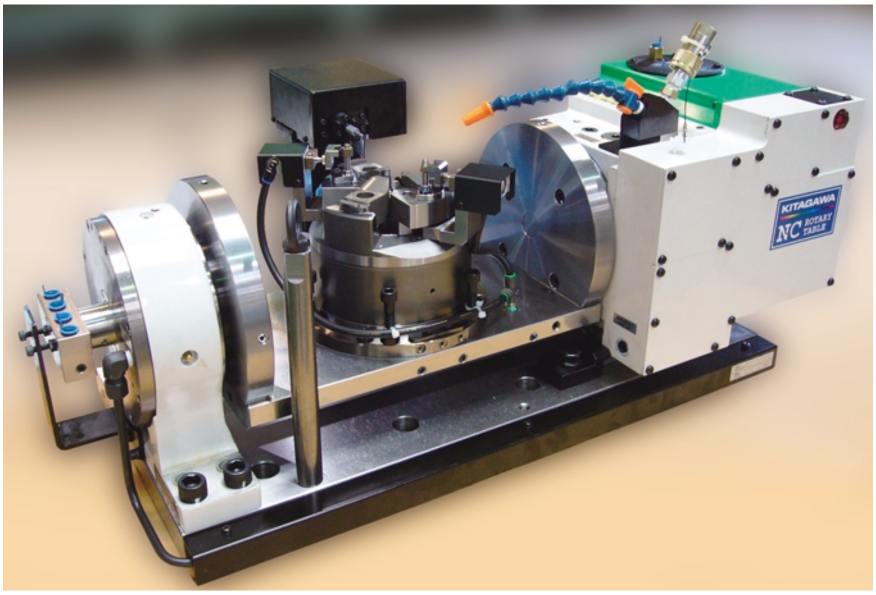
TBX160・TBX200
TBX250・TBX320

High performance range with back mounted motor to reduce interference with machining area

- ●High rigidity for heavy cutting
- ●High accuracy
- ●Space saving
- ●Integrated air booster provides high clamping torque (comparable to hydraulic) from a standard air supply
- ●Air booster or direct hydraulic clamping options available

TBX320

Sample Application



▲Space saving design reduces footprint size.

4th axis specifications

TBX 160 B * * *

- Type: TBX
- Table Size: 160・200・250・320
- Clamping method: B: Air-Hydraulic, H: Hydraulic
- Motor type
- Design No.

M signal specification

TBX 160 B 2 * *

- Type: TBX
- Table Size: 160・200・250 320
- Clamping method: B: Air-Hydraulic, H: Hydraulic
- Kitagawa own controller: 2: MAC mini i, 4: MAC mini iH
- Design No.

■Specifications

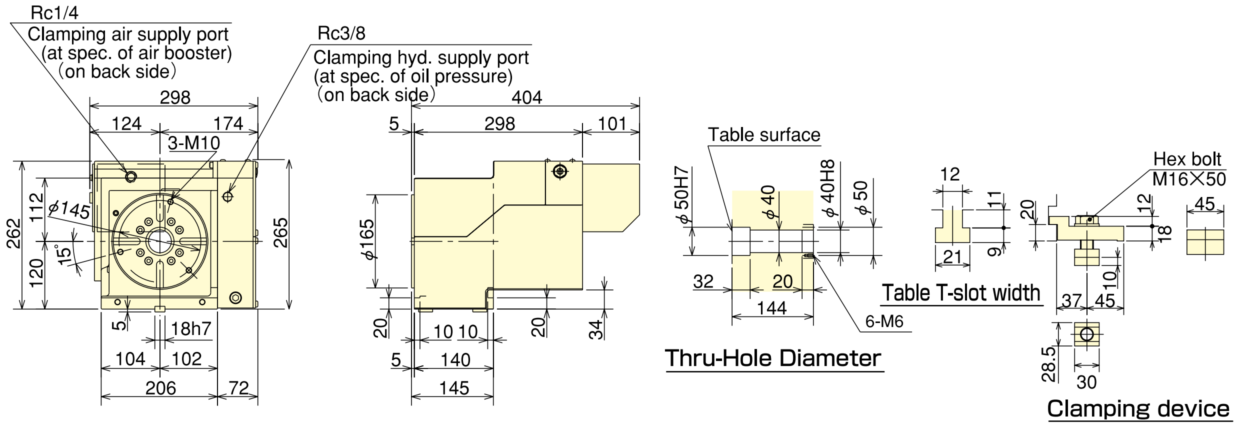
Model		TBX160	TBX200	TBX250	TBX320
Table dia (mm)		φ165	φ200	φ250	φ320
Register diameter on Face Plate (mm)		φ50H7	φ75H7	φ105H7	φ135H7
Spindle through hole diameter (mm)		φ40	φ52	φ78	φ110
Centre Height (mm)		120	140	180	225
Clamping method		Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic
Clamping torque (N・m) (In Pneumatic 0.5MPa / Hydraulic 3.5MPa)		450	600	1100	2600
Motor axis reduced inertia (kg・m²)		0.00032	0.00087	0.00112	0.00147
Servomotor (for FANUC specification)		αiF 2/5000	αiF 4/4000	αiF 4/4000	αiF 8/3000
Gear ratio (Decel. Ratio in M signal)		1／72	1／90	1／90(1／120)	1／120(1／180)
Max. spindle speed	FANUC specification (for min^{-1}／motor $3000min^{-1}$)	41.6	33.3	33.3	25
	M signal specification (for min^{-1}／motor $3000min^{-1}$)	41.6	33.3	25	16.6
Allowable work inertia (kg・m²)		0.26	0.50	0.98	2.24
Indexing accuracy (sec)		20	20	20	20
Repeatability (sec)		4	4	4	4
Mass of product (kg)		66	74	135	220
Manual Tailstock (as an option・p69 reference)		TS160RN	TS200RN	TS250RN	TS320RN
Tail Spindle (as an option・p73 reference)		TSR121A	TSR142A	TSR180A	TSR180A-45
Allowable load	Horizontal (kg)	—	—	—	—
	Vertical (kg)	80	100	125	180
Allowable load	F (kN)	10	17	21	26
	F×L (N・m)	600	1100	1600	2500
	F×L (N・m)	450	600	1100	2600
Allowable cutting torque	T (N・m)	240	310	730	1000

Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of air + hyd. clamp specification, the solenoid valve for table clamp is incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. Solenoid valve is not incorporated in case of hydraulic clamp method. Consequently, customer shall prepare it. 5. Because a mounting pitch varies with the machines, refer to the pitch of the table spindle size drawing on P71. 6. Each product mass is determined by a Kitagawa M signal spec.

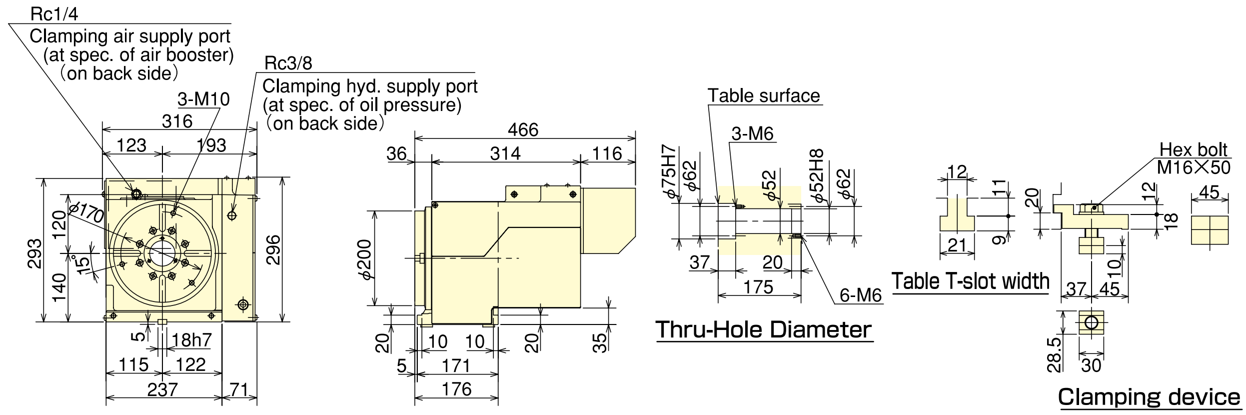
TBX

■Dimensions【4th axis specifications】

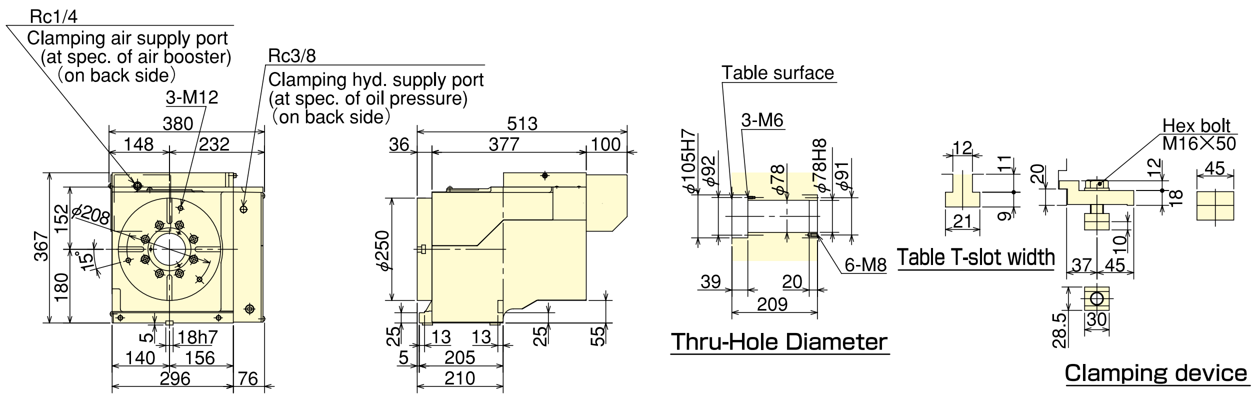
TBX160



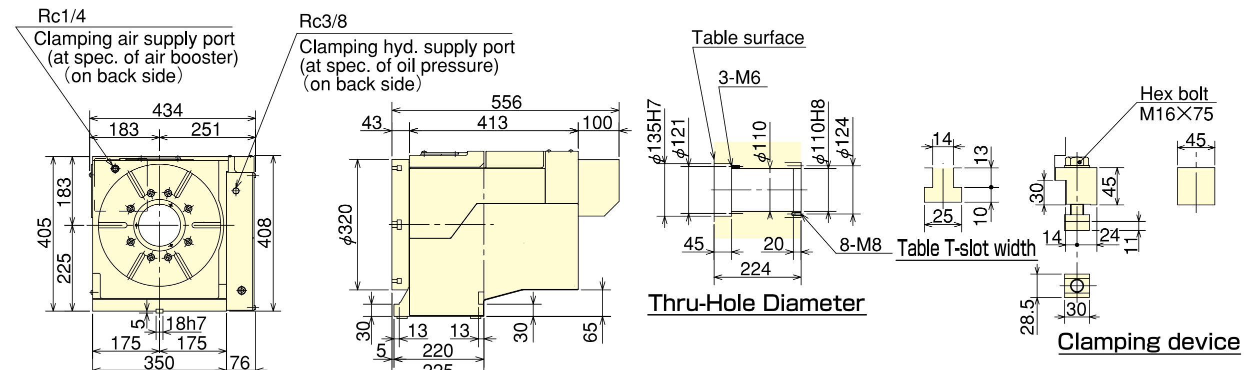
TBX200



TBX250



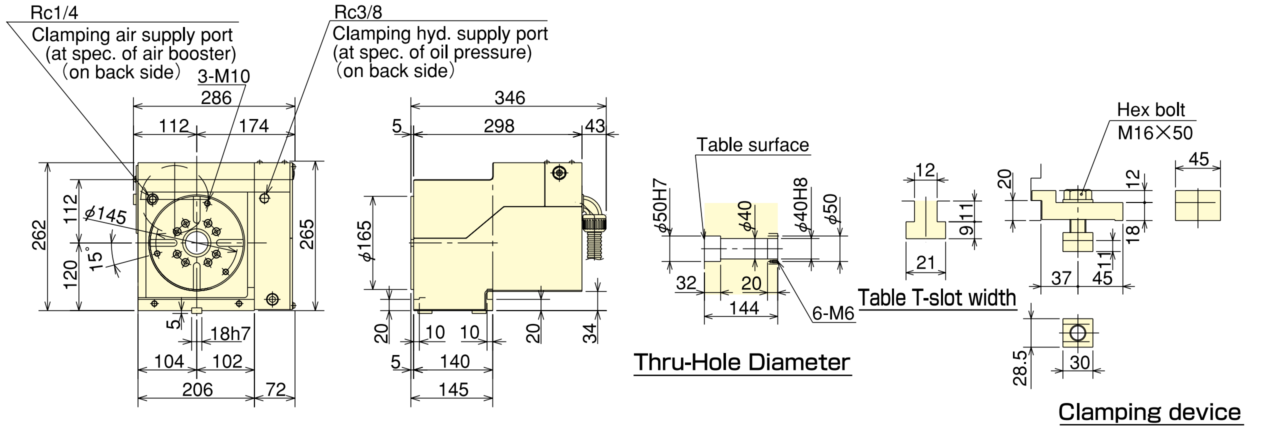
TBX320



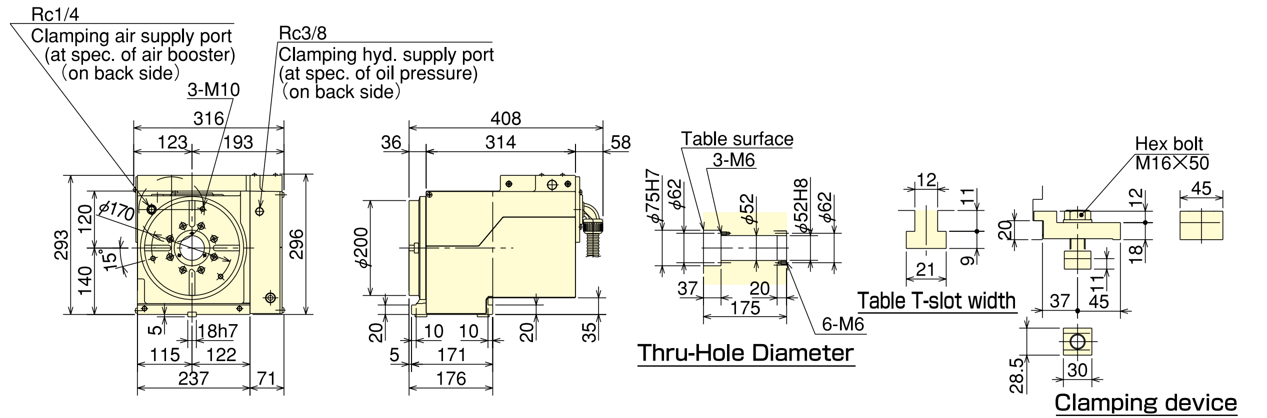
※The above outline dimensions are shown with FANUC motor specifications.
In case of specifications with other makers, the dimensions may differ in length.

■Dimensions [Kitagawa own controller]

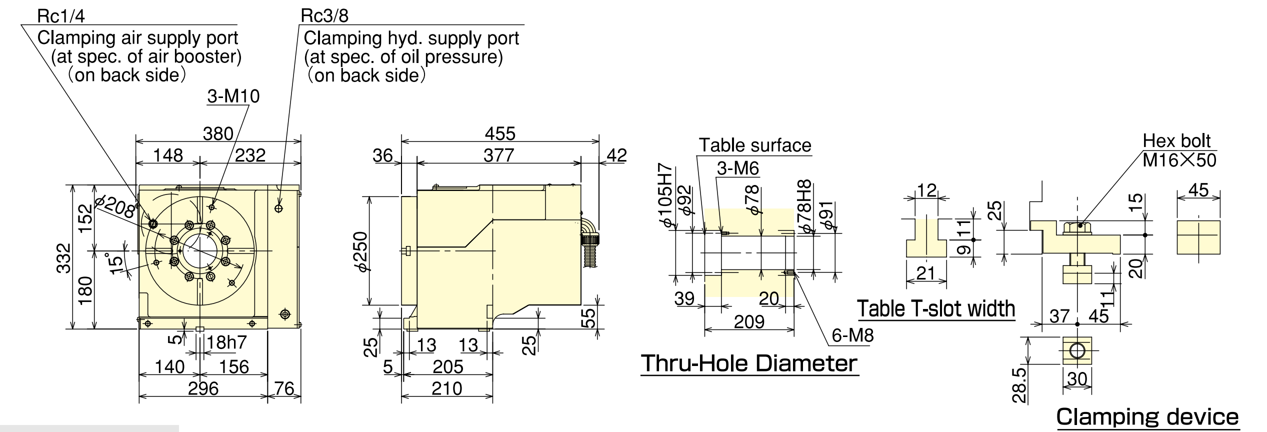
TBX160



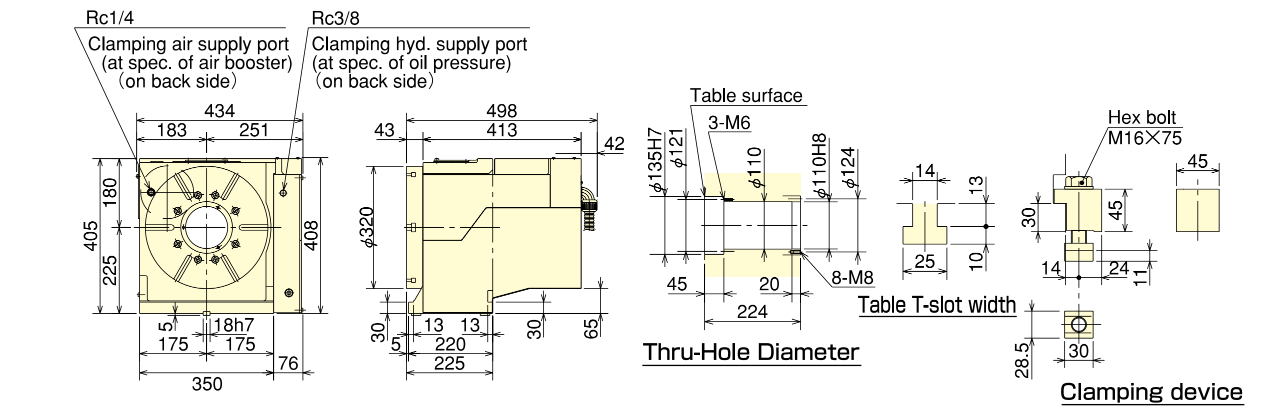
TBX200



TBX250



TBX320



TBX

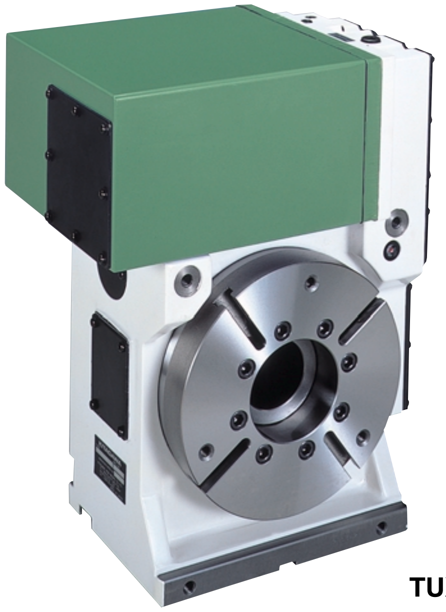
High Performance NC Rotary Table – Top-motor –

TU series

TUX200・TUX250・TUX320
TU400・TU500

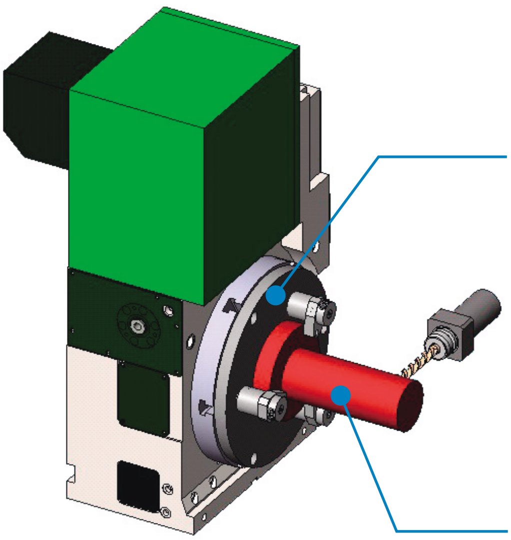
High performance range suitable for 5th axis machining on horizontal machining centres

- High rigidity for heavy cutting
- High accuracy
- Top mounted motor position allows optimal machining area for vertical 5 axis machining
- Integrated air booster provides high clamping torque (comparable to hydraulic) from a standard air supply
- Rotary Joint built in as option



TUX200

Machining time shortened by high rigidity



●High rigidity

Original Kitagawa cross roller bearing provides high rigidity and allows for high cutting speeds.

●Large through hole

Suitable for machining long work pieces.

4th axis specifications

TUX 200 B * * *

- Type: TUX
- Table Size: 200・250・320
- B: Clamping method
  - B：Air-Hydraulic/Hydraulic
  - H：Hydraulic
- *: Motor type
- * *: Design No.

TU 400 H 4 * * *

- Type: TU
- Table Size: 400・500
- H: Clamping method
  - B：External Air-Hydraulic Booster
  - H：Hydraulic
- 4: Gear Ratio
  - 2：1/180
  - 3：1/120
  - 4：1/90
- *: Motor type
- * *: Design No.

M signal specification

TUX 200 B 2 * *

- Type: TUX
- Table Size: 200・250・320
- B: Clamping method
  - B：Air-Hydraulic/Hydraulic
  - H：Hydraulic
- 2: Kitagawa own controller
  - 2：MAC mini i
  - 4：MAC mini iH
- * *: Design No.

■Specifications

Model		TUX200	TUX250	TUX320	TU400	TU500
Table dia (mm)		φ200	φ250	φ320	φ400	φ500
Register diameter on Face Plate (mm)		φ75H7	φ105H7	φ135H7	φ180H7	φ210H7
Spindle through hole diameter (mm)		φ52	φ78	φ110	φ154	φ182
Centre Height (mm)		140	180	225	255	310
Clamping method		Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic	Air-Hydraulic/Hydraulic	Hydraulic	Hydraulic
Clamping torque (N・m) (In pneumatic 0.5MPa / Hydraulic 3.5MPa)		600	1100	2600	2500	3200
Motor axis reduced inertia (kg・m²)		0.00055	0.00068	0.00085	0.00293	0.00320
Servomotor (for FANUC specification)		αiF 4/4000	αiF 4/4000	αiF 8/3000	αiF 12/3000	αiF 12/3000
Gear ratio (Decel. Ratio in M signal)		1/90	1/90(1/120)	1/120(1/180)	1/90	1/120
Max. spindle speed	FANUC specification (for min^{-1}/motor $3000min^{-1}$)	33.3	33.3	25	22.2	16.6
	M signal specification (for min^{-1}/motor $3000min^{-1}$)	33.3	25	16.6	–	–
Allowable work inertia (kg・m²)		0.50	0.98	2.24	5.00	9.38
Indexing accuracy (sec)		20	20	20	20	20
Repeatability (sec)		4	4	4	4	4
Mass of product (kg)		80	142	200	350	550
Manual Tailstock (Option・P69 reference)		TS200RN	TS250RN	TS320RN	TS400RN	TS500RN
Tail Spindle (Option・P73 reference)		TSR142A	TS180A	TSR180A-45	Order production	Order production
Rotary Joint (Option・P77 reference)		RJ40H20V02 Hydraulic/Pneumatic4-port	RJ70H25V01 Hydraulic/Pneumatic6-port	RJ70H32V01 Hydraulic/Pneumatic6-port	Order production	Order production
Allowable Load	Horizontal (kg)	–	–	–	–	–
	Vertical (kg)	100	125	180	250	300
Allowable load	F (kN)	17	21	26	32	50
	F×L (N・m)	1100	1600	2500	5000	8000
	F×L (N・m) (Note 5)	600	1100	2600	2500	3200
Allowable cutting torque	T (N・m)	310	730	1000	1700	2600

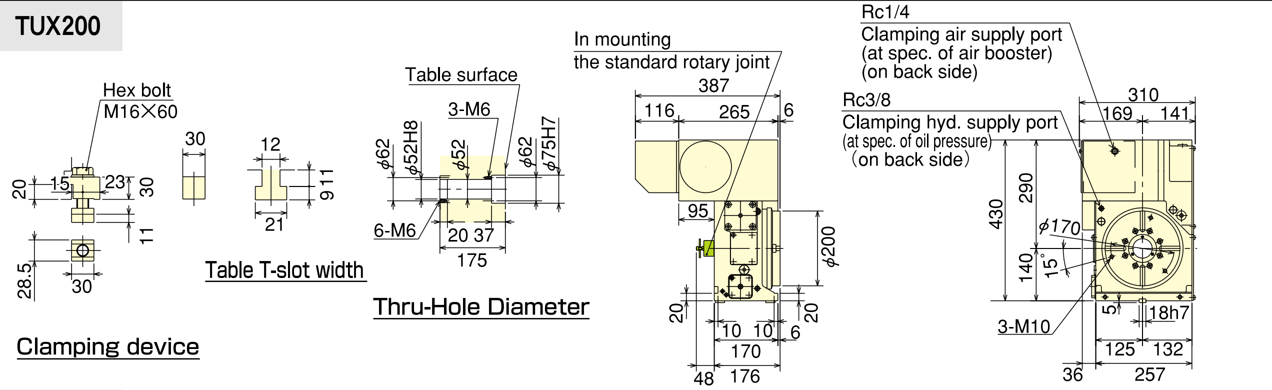
Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of air pressure clamp specification, the solenoid valve for table clamp is incorporated. 3. Solenoid valve(s) is (are) not incorporated in case of hydraulic clamp method. Consequently, customer shall prepare it. 4. Neither cable nor hose is fitted between NC rotary table and machine tool... 5. In the port part on the table surface jig side of a rotary joint, each TUX200, 250 or 320 is fixed to the rotary table side. 6. Because a mounting pitch varies with the machines, refer to the pitch of the table spindle size drawing on P71. 7. Contact to Kitagawa about rotary joint and tail spindle of 400-size or more. 8. Each product mass is determined by a Kitagawa M signal spec.

NC ROTARY TABLE

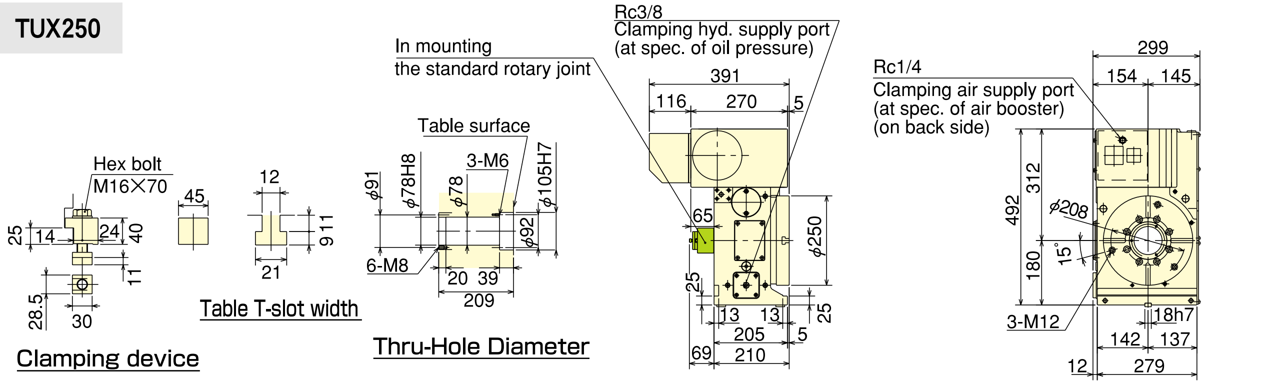
TU series TUX200・TUX250・TUX320・TU400・TU500

■Dimensions［4th axis specifications］

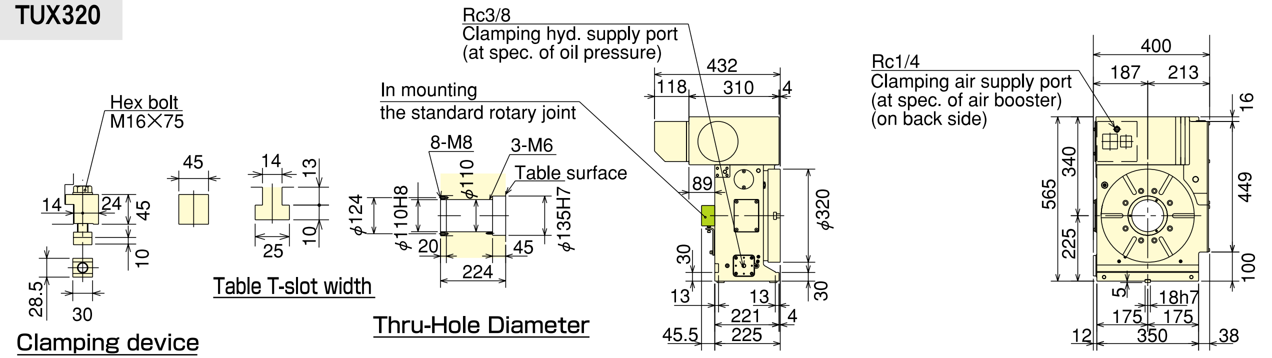
TUX200



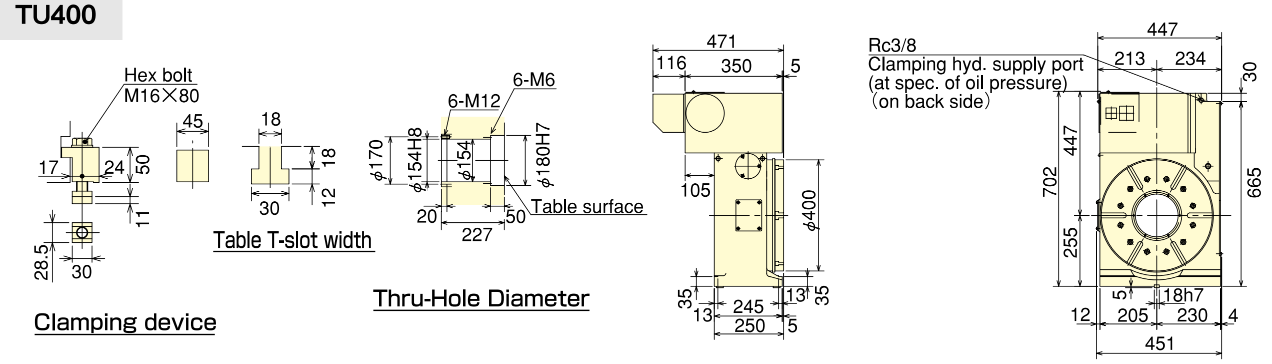
TUX250



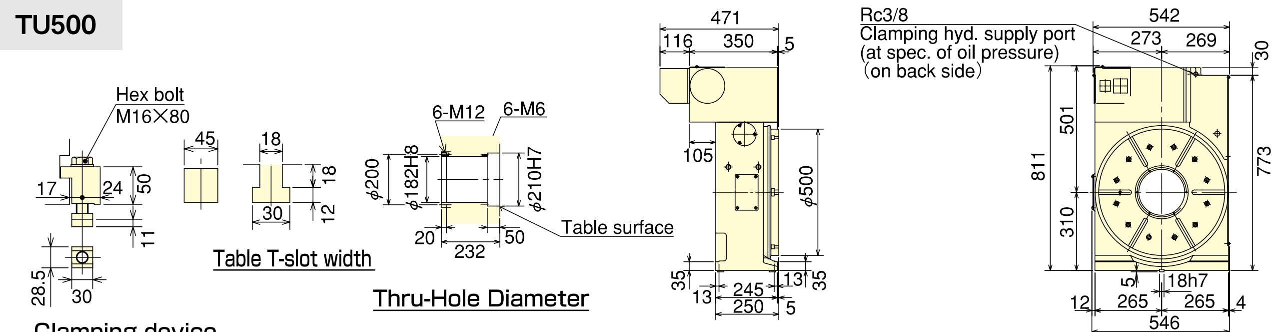
TUX320



TU400



TU500

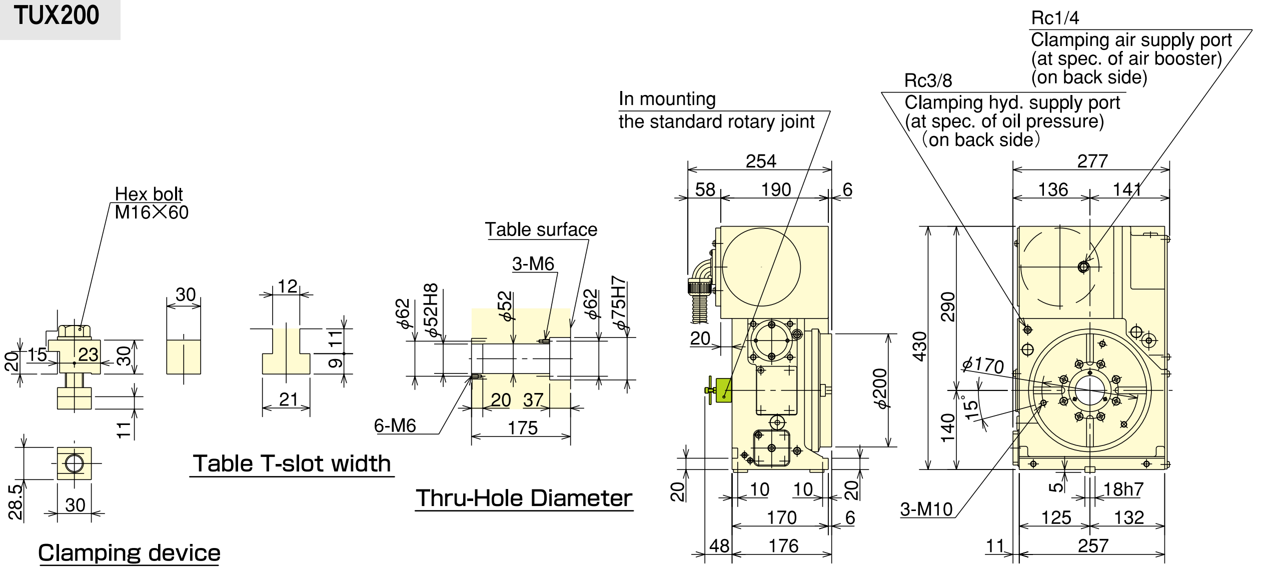


※The above outline dimensions are shown with FANUC motor specifications.
In case of specifications with other makers, the dimensions may differ in length.

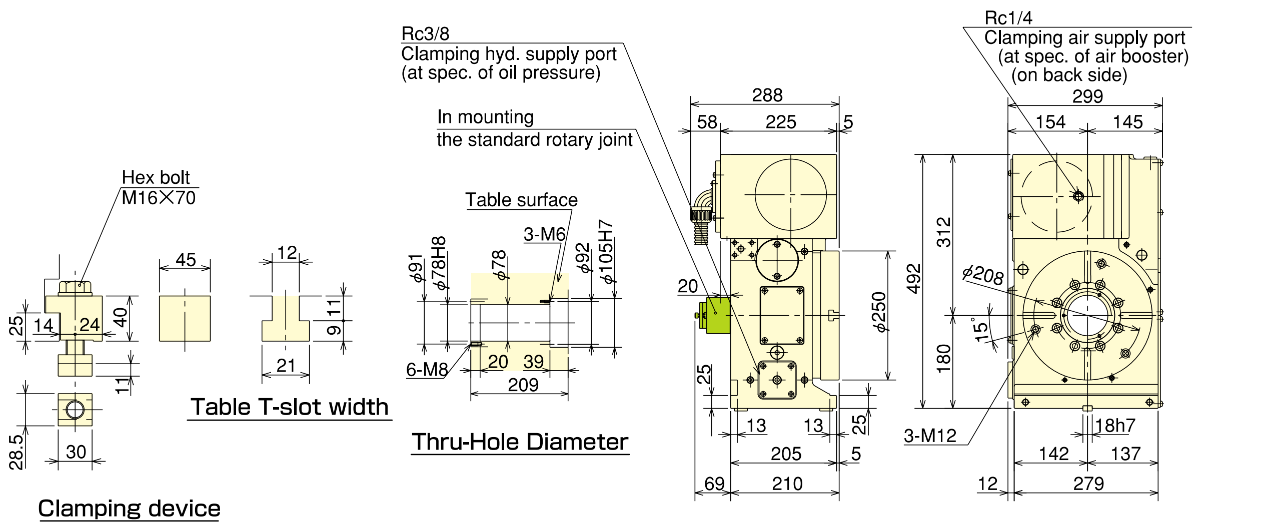
TU

■Dimensions [Kitagawa own controller]

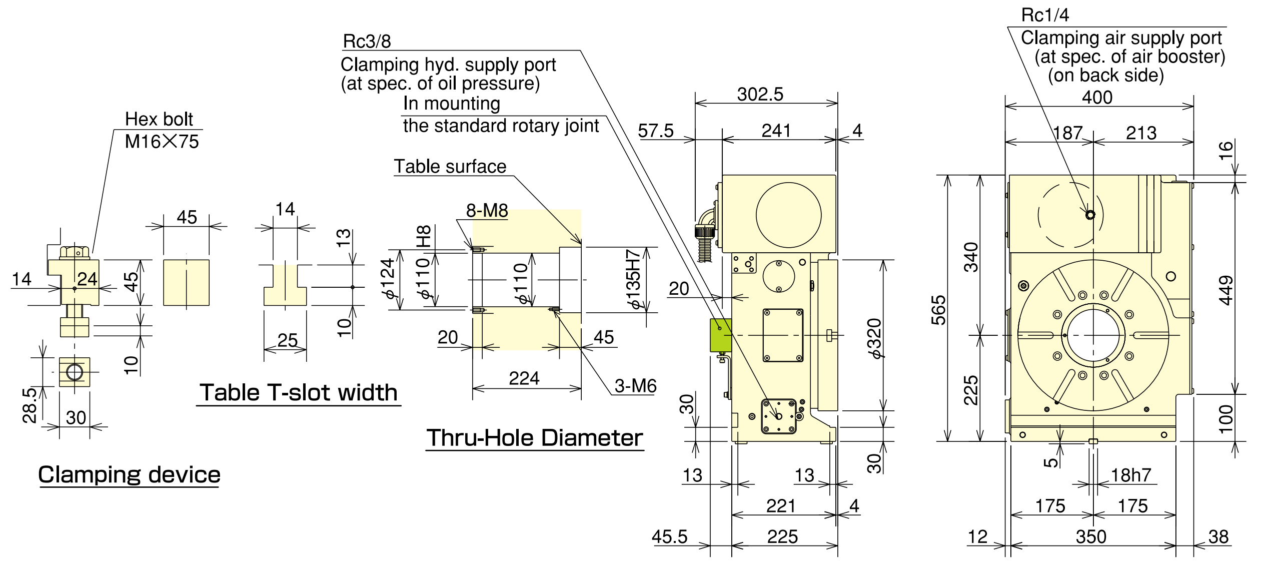
TUX200



TUX250



TUX320



TU

Multiple Spindle NC Rotary Table
TM series

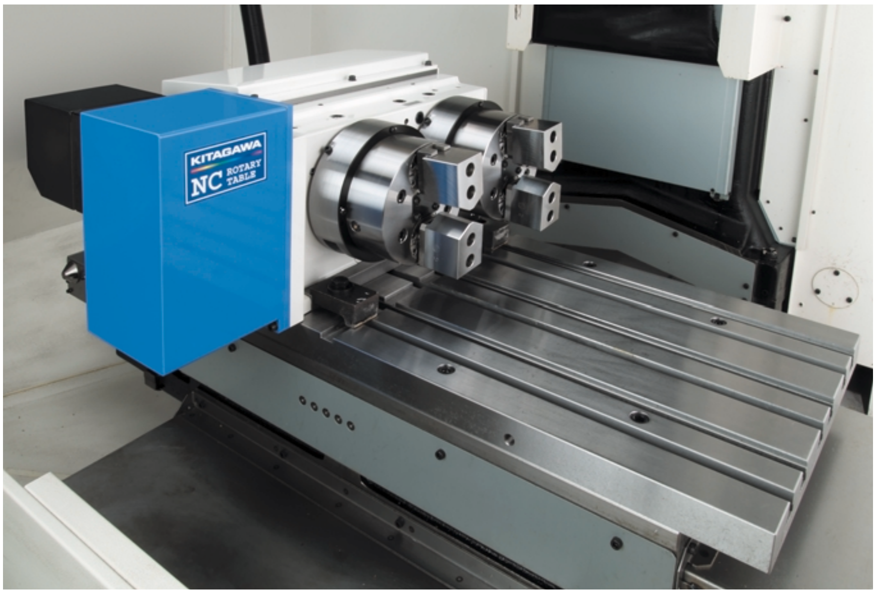
TM2100・TM3100・TM2160・TM3160
TH2100・TH3100・TH2160・TH3160

Multi spindle range for multiple work piece machining
Reduces set up time and increases productivity

- ●Mono-block body & compact design
- ●Ideal for tapping machines with high speed rotation
- ●Working time reduced
- ●Multi spindle for simultaneous work piece machining

TMM3100

Sample Application



▲Work holding device combining NC Rotary Table and Chuck.

4th axis specifications

※Table Size 100 can be used for only pneumatic type.

TM 2 160 H ＊＊＊

- **Type** — TM: Right hand / TH: Left hand
- Number of tables — 2・3
- **Table Size** — 100・160
- **Clamping method** — A: Pneumatic / B: External Air-Hydraulic Booster / H: Hydraulic
- **Motor type**
- **Design No.**

M signal specification

※Table Size 100 can be used for only pneumatic type.

TM M 2 160 H 2 ＊

- **Type** — TM: Right hand / TH: Left hand
- **Kitagawa own controller**
- Number of tables — 2・3
- **Table Size** — 100・160
- **Clamping method** — A: Pneumatic / B: External Air-Hydraulic Booster / H: Hydraulic
- Kitagawa own controller — 2: MAC mini i / 4: MAC mini iH
- **Design No.**

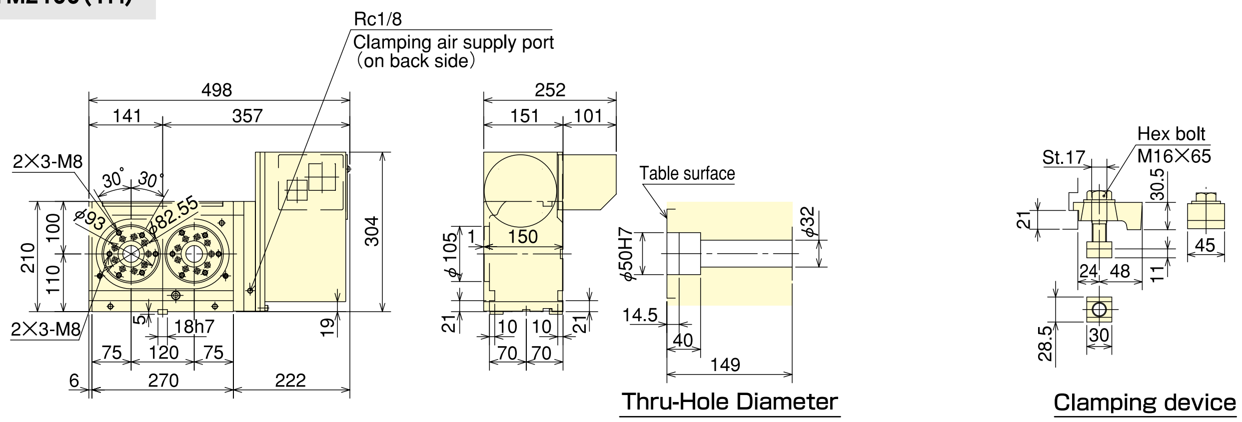
■Specification

Model		TM2100	TM3100	TM2160	TM3160
Right hand		○	○	○	○
Left hand		○	○	○	○
Table dia (mm)		φ105	φ105	φ165	φ165
Register diameter on Face Plate (mm)		φ50H7	φ50H7	φ50H7	φ50H7
Spindle through hole diameter (mm)		φ32	φ32	φ40	φ40
Centre Height (mm)		110	110	140	140
Clamping method		Pneumatic	Pneumatic	Pneumatic/Hydraulic	Pneumatic/Hydraulic
Clamping torque (N・m) (In pneumatic 0.5MPa/hydraulic 3.5MPa)		117	117	176 / 400	176 / 400
Motor axis reduced inertia (kg・m²)		0.000353	0.000475	0.000145	0.000188
Servomotor (for FANUC specification)		αiF 4/4000	αiF 4/4000	αiF 4/4000	αiF 4/4000
Gear ratio (Decel. Ratio in M signal)		1/36	1/36 (1/60)	1/90	1/90 (1/120)
Max. spindle speed	FANUC specification (for min^{-1})	83.3 (for 3000min^{-1})	69.4 (for 2500min^{-1})	33.3 (for 3000min^{-1})	33.3 (for 3000min^{-1})
	M signal specification (min^{-1})	83.3 (for 3000min^{-1})	50 (for 3000min^{-1})	33.3 (for 3000min^{-1})	16.6 (for 2000min^{-1})
Allowable work inertia (kg・m²)		0.054	0.054	0.51	0.51
Indexing accuracy (sec)		60	60	30	30
Repeatability (sec)		5	5	4	4
Mass of product (kg)		85	100	100	150
Manual Tailstock (Option・P70 reference)		TS2100RN	TS3100RN	TS2160RN	TS3160RN
Allowable Load	Horizontal (kg)	60	60	160	160
	Vertical (kg)	30	30	80	80
Allowable load	F (kN)	6	6	10	10
	F×L (N・m)	200	200	600	600
	F×L (N・m)	120	120	176 (400)	176 (400)
Allowable cutting torque	T (N・m)	180	180	300	300

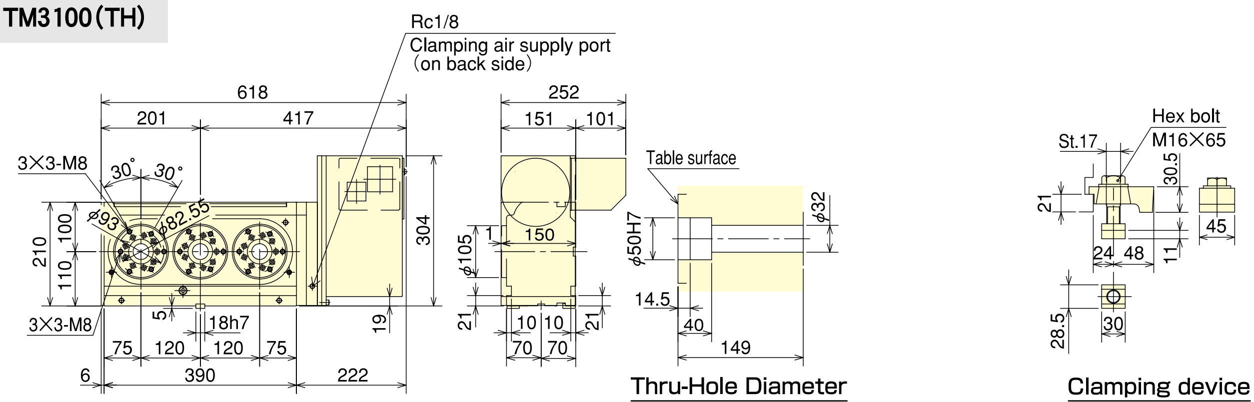
Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of air/air-hydraulic clamp specifications, the solenoid valve(s) for table clamp is (are) incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. Solenoid valve is not incorporated in case of hydraulic clamp method. Consequently, customer shall prepare it. 5. Each product mass is determined by a Kitagawa M signal spec. 6. Contact to Kitagawa about rotary joint and tail spindle.

■Dimensions【4th axis specifications】

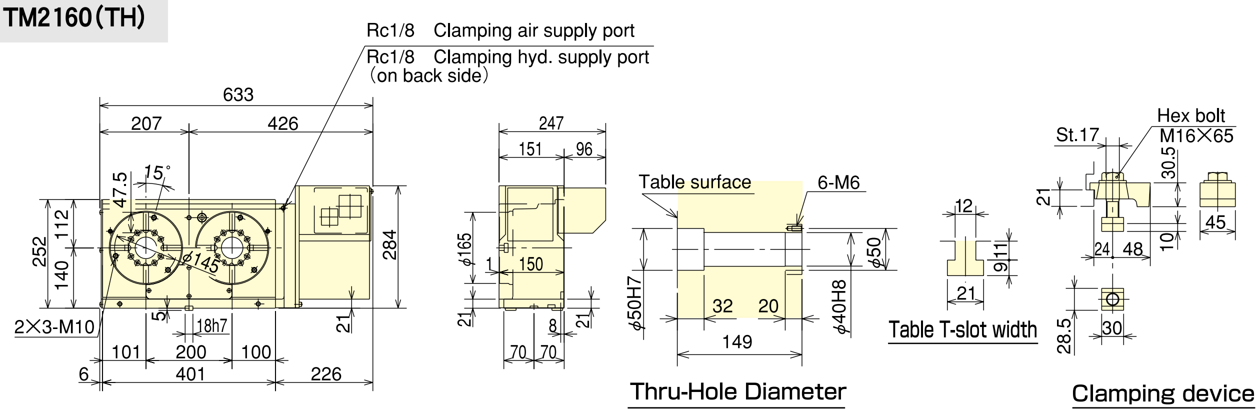
TM2100(TH)



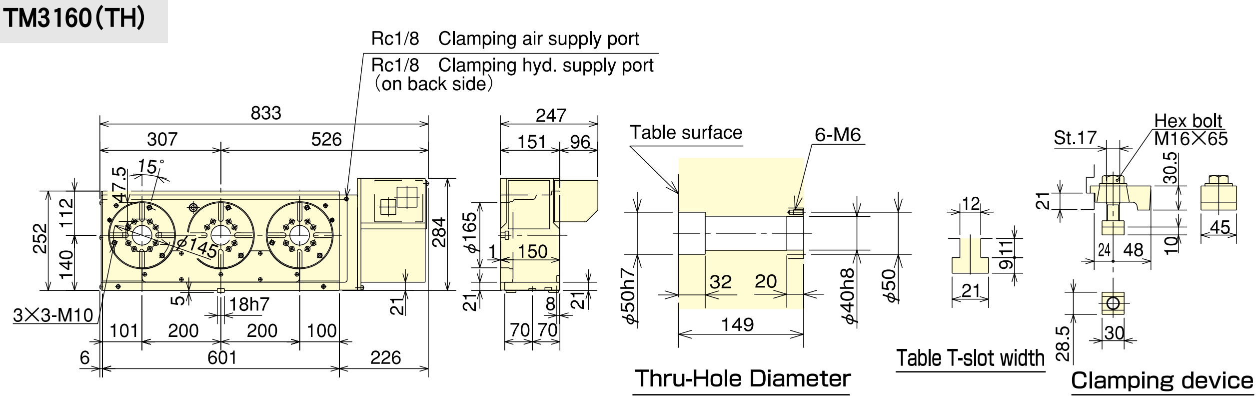
TM3100(TH)



TM2160(TH)



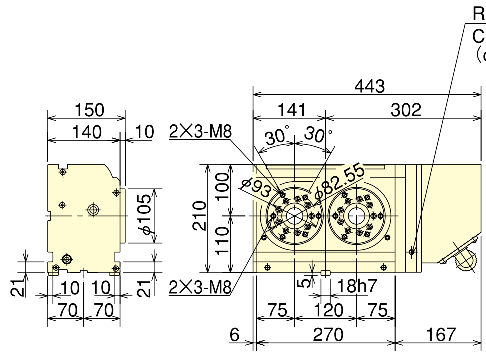
TM3160(TH)

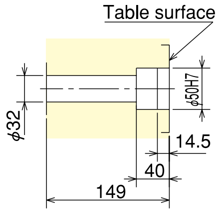


※The above outline dimensions are shown with FANUC motor specifications.
In case of specifications with other makers, the dimensions may differ in length.
TM is used at a right hand and TH is used at a left hand.

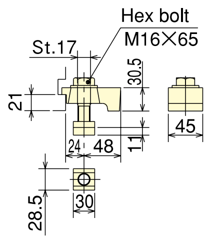
■Dimensions [Kitagawa own controller]

TMM2100(THM)



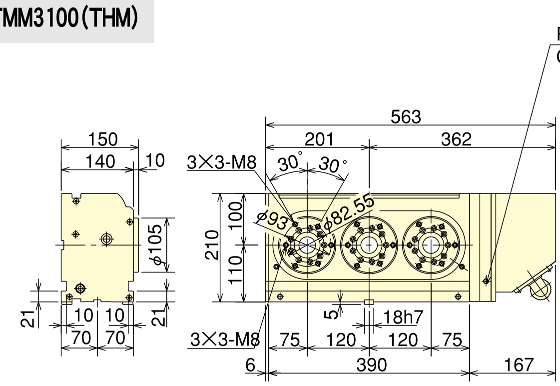


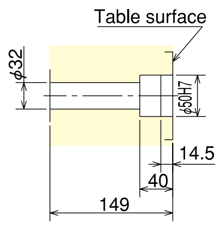
Thru-Hole Diameter



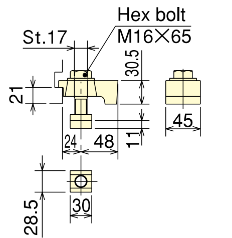
Clamping device

TMM3100(THM)



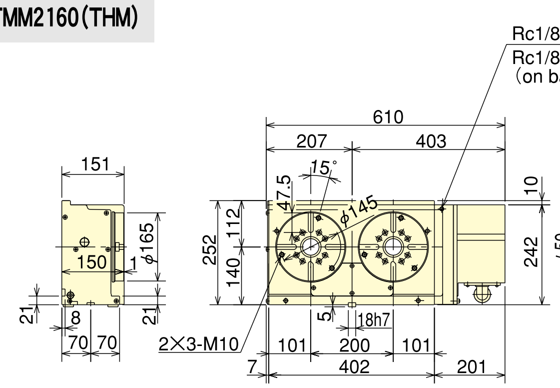


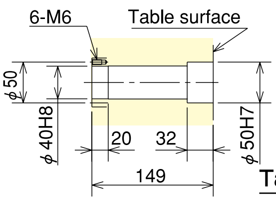
Thru-Hole Diameter



Clamping device

TMM2160(THM)





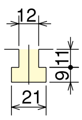
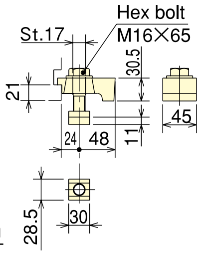


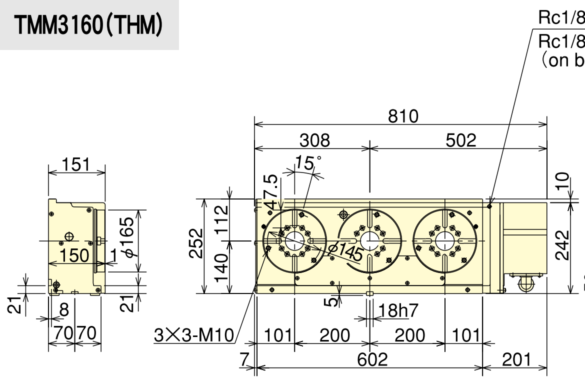
Table T-slot width

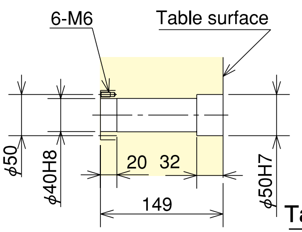
Thru-Hole Diameter



Clamping device

TMM3160(THM)





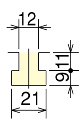
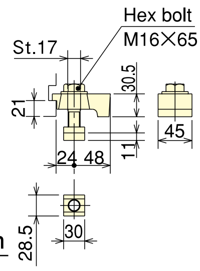


Table T-slot width

Thru-Hole Diameter



Clamping device

※TM is used at a right hand and TH is used at a left hand.

TM

NC ROTARY TABLE

Compact Type Tilting NC Rotary Table
TT101・TT120 series

TT101
TT(S)120

※TTS is Straight tilting table

Compact tilting range to suit 5 axis machining on small work pieces

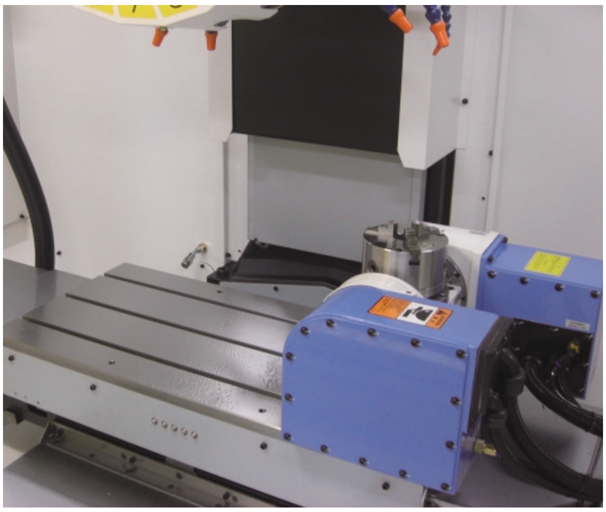
- ●Minimum size in its class
- ●Light weight
- ●High rigidity
- ●High speed rotation
- ●Rotary Joint built in as option
- ●Cylinder mountable
- ●Pneumatic clamping specification
- ●Ideal design for compact machining centres

※In specification with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting twin axis products overseas.

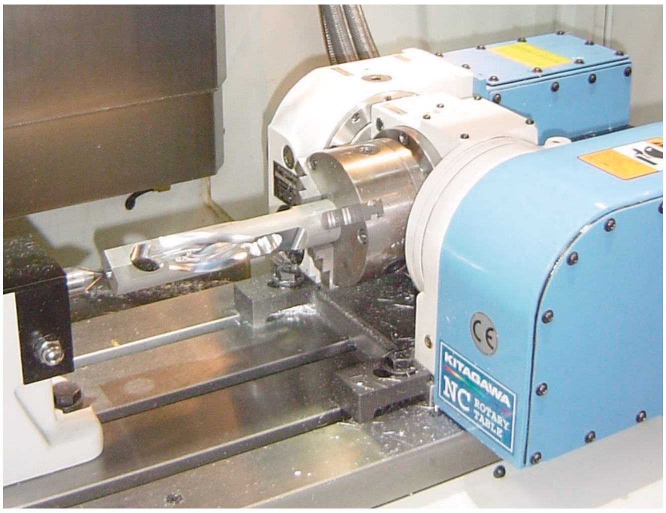
TT101

TT

Sample Application



▲Only Kitagawa can offer this combination of NC Rotary Table and chuck



▲Combine with tailstocks on p69 and 70 to suit machining of long work pieces.

4th axis specifications

TT 101 A * * * *

- **TT** — **Type**: TT: STD type; TTS: Tilting straight type (only 120 size)
- **101** — **Table Size**: 101・120
- **A** — **Clamping method**: Only Pneumatic
- ***** — **Rotary axis motor type**
- ***** — **Tilting motor type**
- *** *** — **Design No.**

M signal specification

TT M 101 A 5 * *

- **TT** — **Type**: TT: STD type; TTS: Tilting straight type (only 120 size)
- **M** — **Kitagawa own controller**
- **101** — **Table Size**: 101・120
- **A** — **Clamping method**: Only Pneumatic
- **5** — **Kitagawa own controller**: 5: MAC mini iH2; 6: MAC mini iHT (Only TT101)
- *** *** — **Design No.**

■Specifications

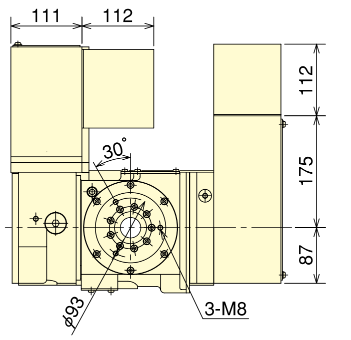
Model			TT101	TT120／TTS120
Tilting angle			−20°～+120°	−20°～+110°
Table dia (mm)			ϕ110	ϕ125
Register diameter on Face Plate (mm)			ϕ50H7	ϕ60H7
Spindle through hole diameter (mm)			ϕ32	ϕ32
Centre Height (mm)			140	150
Clamping method			Pneumatic	Pneumatic
Clamping torque (N･m)			180	120
(In pneumatic 0.5MPa)			300	200
Motor axis reduced inertia (kg･m²)			0.000082	0.000072
			0.000081	0.000034
Servomotor (for FANUC specification)			Rotating axis αiF 1/5000 Tilting axis αiF 2/5000	αiF 2/5000
Gear ratio		Rotating axis	1／72	1／90
		Tilting axis	1／120	1／180
Max. spindle speed	for FANUC specification	Rotating axis (for min^{-1}/motor3000min^{-1})	41.6	33.3
		Tilting axis (for min^{-1}/motor3000min^{-1})	25	16.6
	M signal specification	Rotating axis (for min^{-1}/motor3000min^{-1})	41.6	33.3
		Tilting axis (for min^{-1}/motor3000min^{-1})	25	16.6
Allowable work inertia (kg･m²)			0.05	0.06
Indexing accuracy (sec)		Rotating axis	30	30
		Tilting axis	60	60
Repeatability (sec)			4	4
Mass of product (kg)			65	100 / 105
Allowable Load		at horizontal (kg)	35	35
		at tilted (kg)	20	20
Allowable load		F (kN)	4	4
		F×L (N･m)	300	200
		F×L (N･m)	180	120
Allowable cutting torque		T (N･m)	160	190
Moment of tilting weight capacity		W×L (kgf・m)	7	10

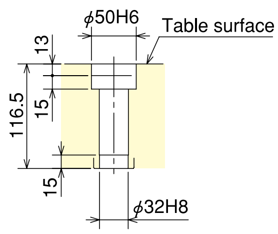
Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. The solenoid valve for the table clamp is incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. Each product mass is determined by a Kitagawa M signal spec. 5. Contact to Kitagawa about rotary joint.

TT

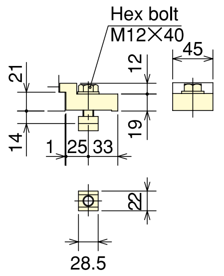
■Dimensions【4th axis specifications】

TT101

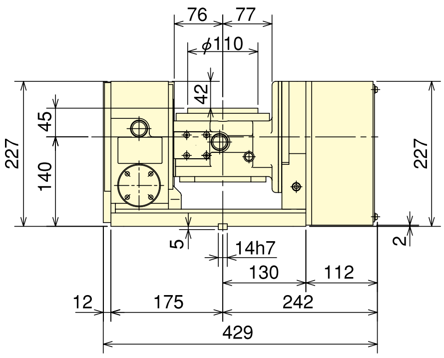


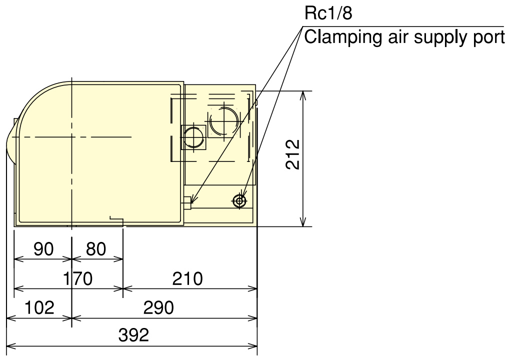


Thru-Hole Diameter

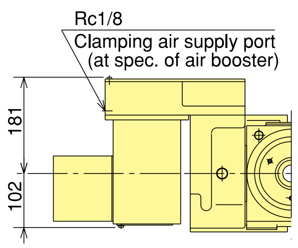


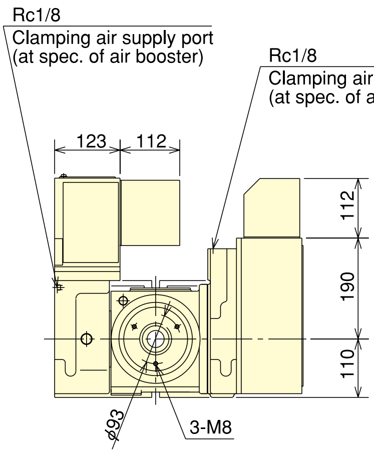
Clamping device

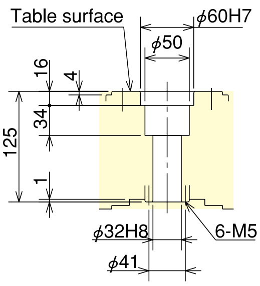




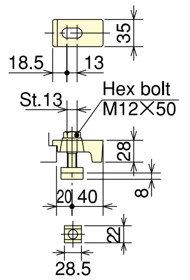
TT(S)120



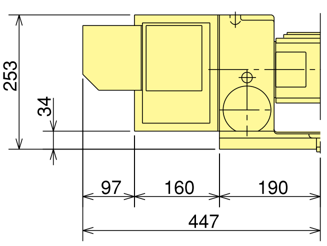




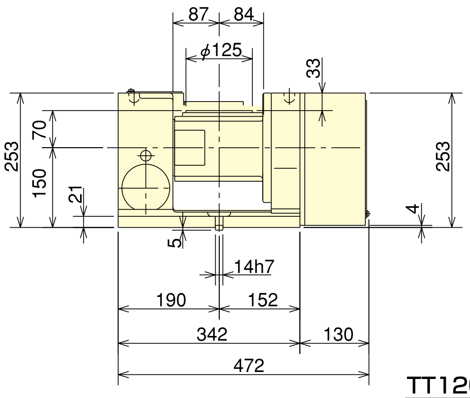
Thru-Hole Diameter

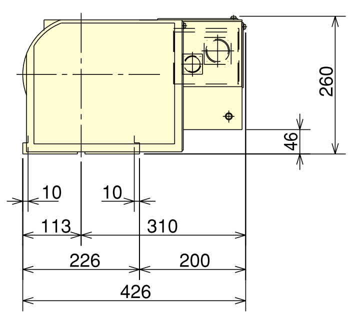


Clamping device



TTS120



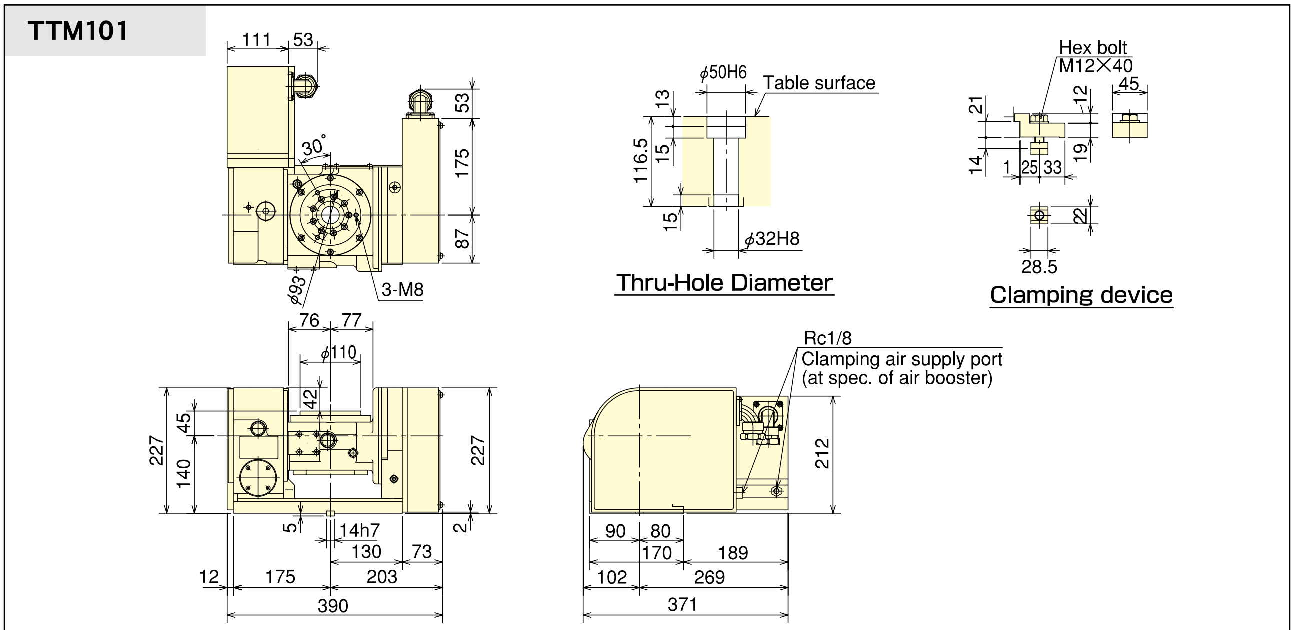


TT120

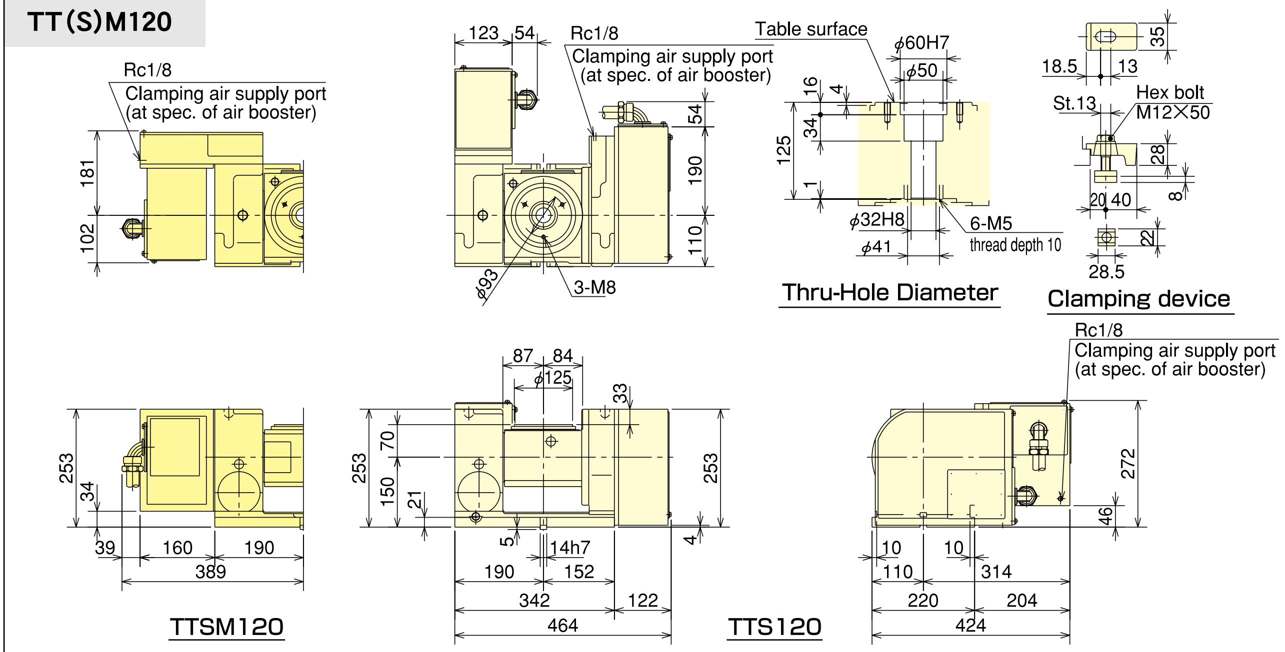
※The above dimensions are the same as FANUC spec.
In case of other maker motor specifications, dimensions may differ in length.

■Dimensions [Kitagawa own controller]

TTM101

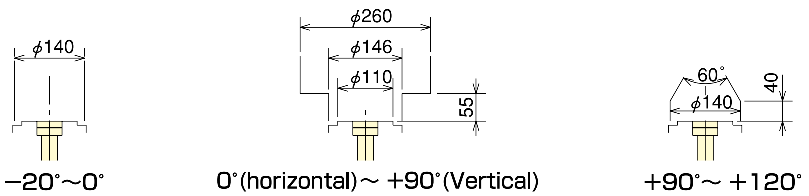


TT(S)M120

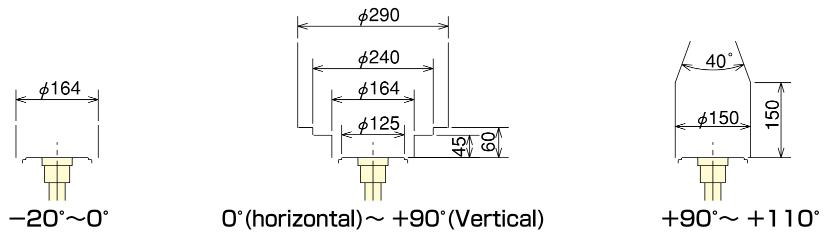


DATA Tilting NC table • Work loadable area

TT101



TT(S)120



TT

NC ROTARY TABLE

Low centre line tilting NC Rotary Table
TT140

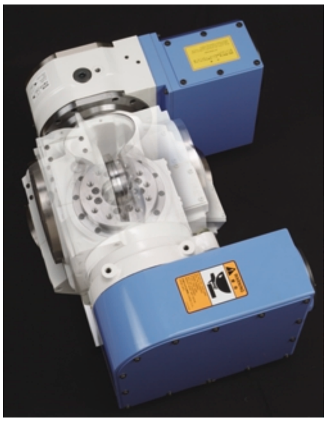
Tilting type to suit 5 axis machining with decreased input on the Z axis

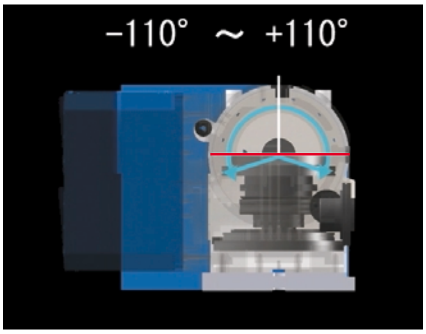
- ●Wide machining area and tilting axis index 220° (±110°)
- ●Compact and high speed
  Ideal for use on small machining centres
- ●Highest clamping torque in its class
- ●Built in rotary joint (option) allows simple and secure jig piping
- ●Table surface on tilt axis centre line
- ●Pneumatic clamping mechanism

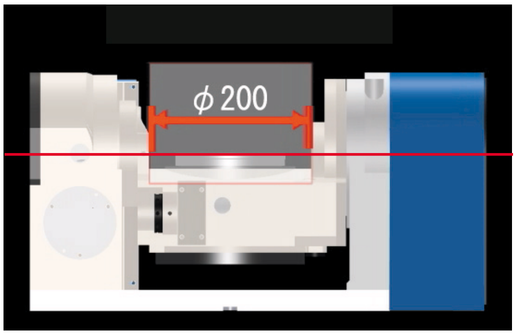
※In specification with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting twin axis products overseas.

TT140

Wide Machining Area



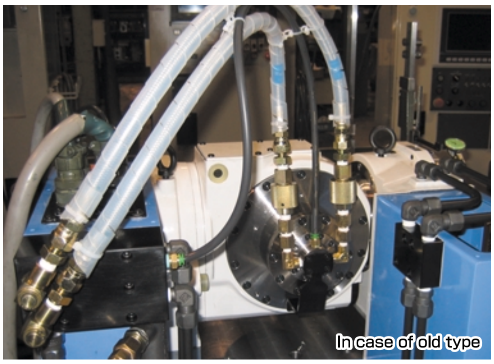




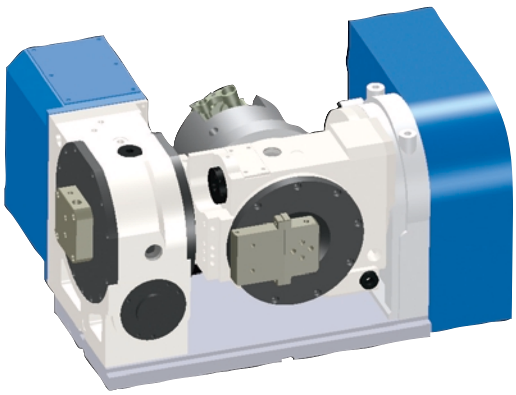
●Tilting axis index 220°

●Max. dia. ϕ200mm of loadable work

Complete built-in rotary joint (option)



Simplified Pipework



●Installation of optional rotary joint

TT

4th axis specifications

TT 140 A ＊ R ＊＊

- **Type**: TT
- **Table Size**: 140
- **Clamping method**: A — Only Pneumatic
- **Motor type**: ＊
- **Option spec.**: R — R:Rotary joint, －:Non- option
- **Design No.**: ＊＊

M signal specification

TT 140 A ＊ R ＊＊

- **Type**: TT
- **Table Size**: 140
- **Clamping method**: A — Only Pneumatic
- **Kitagawa own controller**: ＊ — (5:MAC mini iH2)
- **Option spec.**: R — R:Rotary joint, －:Non- option
- **Design No.**: ＊＊

■Specifications

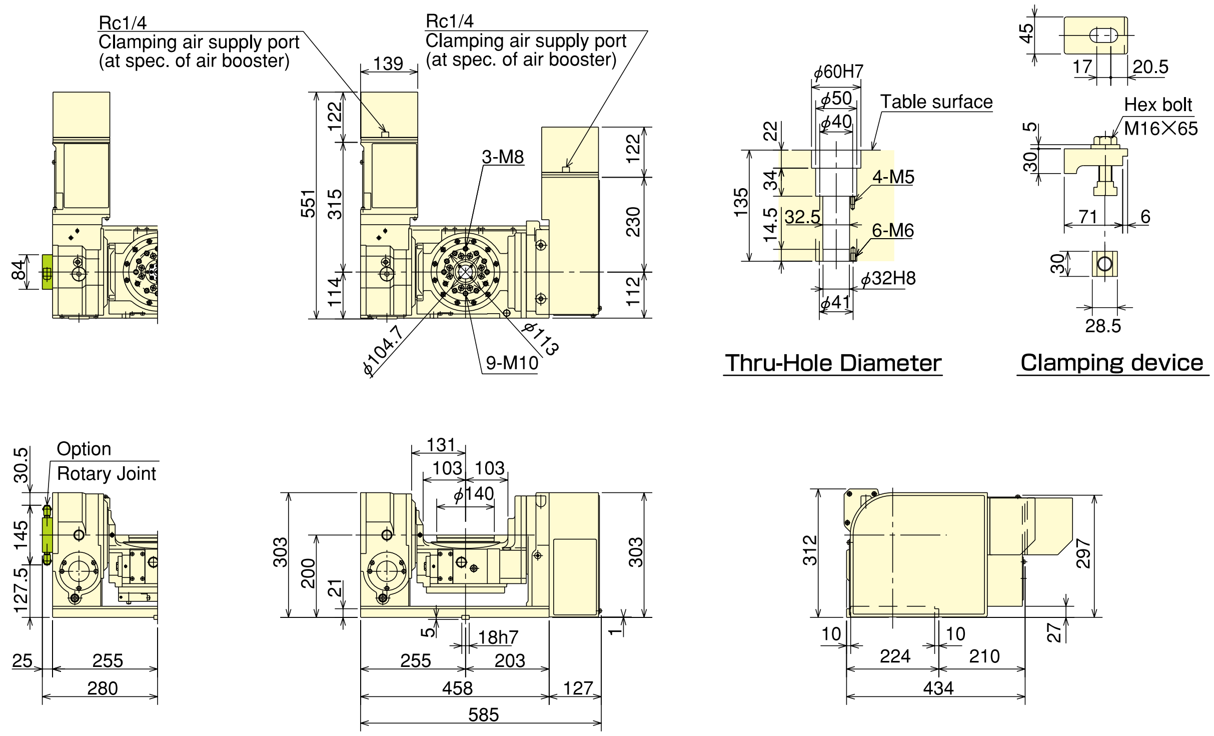
Model			TT140
Tilting angle			－110°～＋110°
Table dia (mm)			ϕ140
Register diameter on Face Plate (mm)			ϕ60H7
Spindle through hole diameter (mm)			ϕ32
Centre Height (mm)			200
Clamping method			Pneumatic
Clamping torque (N･m) (In pneumatic 0.5MPa)		Rotating axis	280
		Tilting axis	500
Motor axis reduced inertia (kg･m²)		Rotating axis	0.000282
		Tilting axis	0.000194
Servomotor (for FANUC specification)			αiF 2/5000
Gear ratio		Rotating axis	1／72
		Tilting axis	1／180
Max. spindle speed	for FANUC specification	Rotating axis (for min^{-1}/Motor3000min^{-1})	41.6
		Tilting axis (for min^{-1}/Motor3000min^{-1})	16.6
	M signal specification	Rotating axis (for min^{-1}/Motor3000min^{-1})	41.6
		Tilting axis (for min^{-1}/Motor3000min^{-1})	16.6
Allowable work inertia (kg･m²)			0.12
Indexing accuracy (sec)		Rotating axis	30
		Tilting axis	60
Repeatability (sec)			4
Mass of product (kg)			150
Built-in rotary joint (as an option)			RJ32TT140 (Hydraulic／Pneumatic 4-port)
Allowable Load		at horizontal (kg)	50
		at tilted (kg)	30
Allowable load		F (kN)	4
		F×L (N･m)	280
		F×L (N･m)	500
Allowable cutting torque		T (N･m)	190
Moment of tilting weight capacity		W×L (kgf・m)	11

Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. The solenoid valve for the table clamp is incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. Each product mass is determined by a Kitagawa M signal spec.

TT140 series TT140

■Dimensions [4th axis specifications]

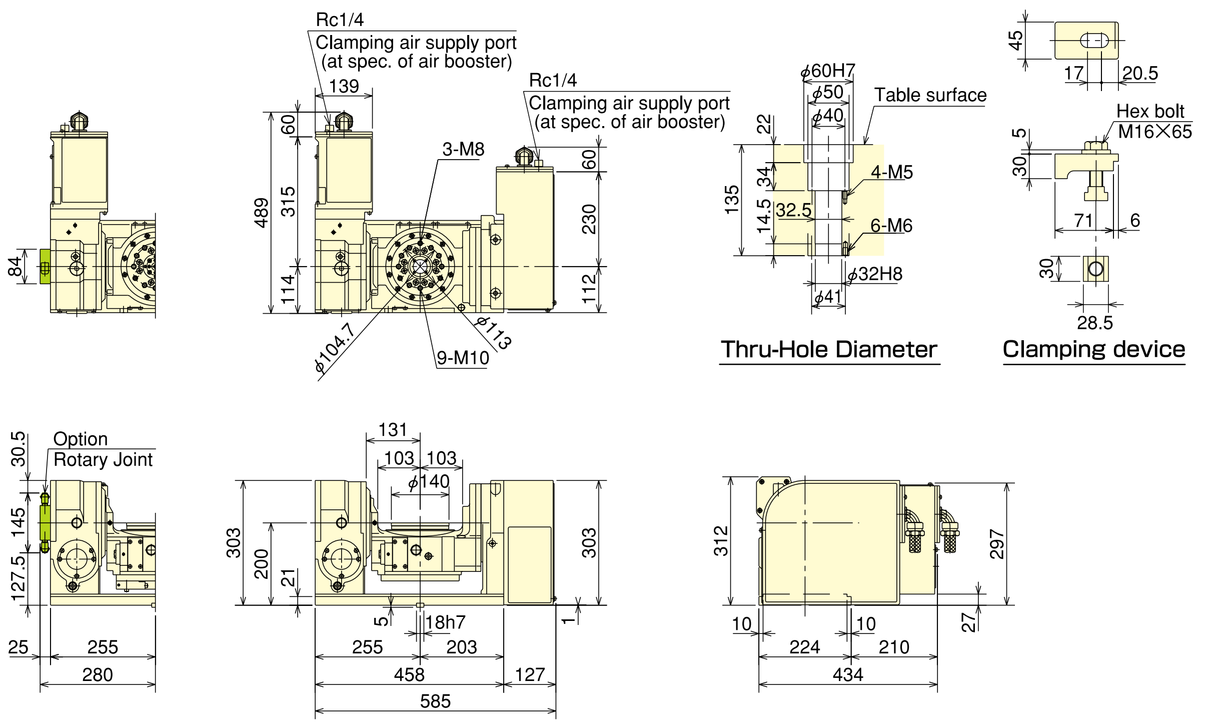
TT140



※The above outline dimensions are shown with FANUC motor specifications.

■Dimensions [Kitagawa own controller]

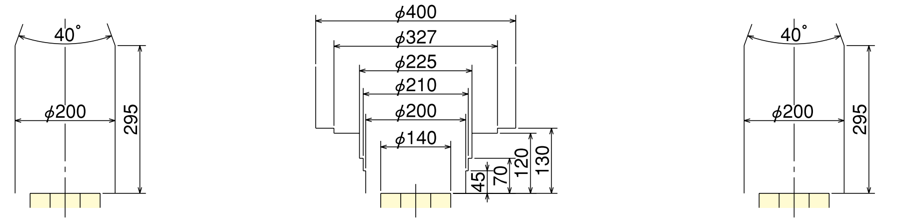
TT140



※The above outline dimensions are shown with FANUC motor specifications.

DATA Tilting NC table • Work loadable area

TT140



−110°~0°　　0°(horizontal)~ +90°(Vertical)　　+90°~ +110°

NC ROTARY TABLE

Tilting NC Rotary Table
TT182 series　TT182・TW182

※TW is the side motor type tilting table

High stability tilting table to suit 5 axis machining (Blue)

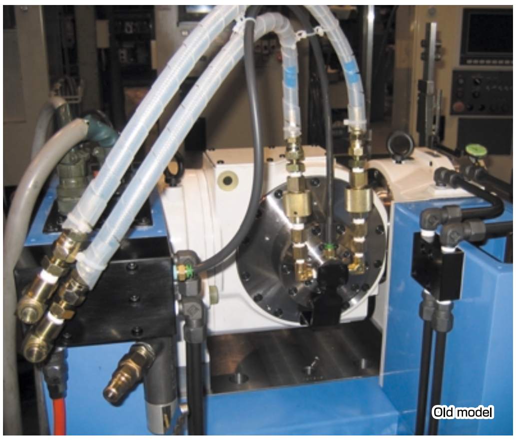
- ●Built in air hydraulic boosters deliver high clamping torque on both axes
- ●Compact design
- ●High speed
- ●High rigidity
- ●Built in rotary joint (option) allows simple and secure jig piping
- ●Air booster or direct hydraulic clamping options available

TT182

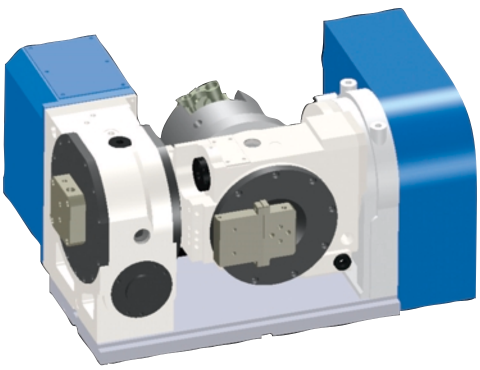
※In specification with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting twin axis products overseas.

TT

Complete built-in rotary joint (option)

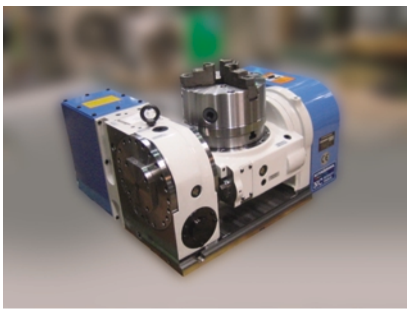


Simplified Pipework



Sample Application

◀Provided for high accuracy 5-axis machining.



◀Only Kitagawa can offer this combination of NC Rotary Table and chuck

●Installation of optional rotary joint

4th axis specifications

TT 182 B ✻ R ✻ ✻

- **Type**
  - TT: STD type
  - TW: Tilting straight type
- **Table size**: 182
- **Clamping method**
  - B: Air-Hydraulic
  - H: Hydraulic
- **Motor type**
- **Option spec.**
  - R: Rotary Joint
  - C: Outer cylinder
  - −: Non- option
- **Design No.**

M signal specification

TT 182 B ✻ R ✻ ✻

- **Type**
  - TT: STD type
  - TW: Tilting straight type
- **Table size**: 182
- **Clamping method**
  - B: Air-Hydraulic
  - H: Hydraulic
- **Kitagawa own controller** (5: MAC mini iH2)
- **Option spec.**
  - R: Rotary Joint
  - C: Outer cylinder
  - −: Non- option
- **Design No.**

■Specifications

Model			TT182／TW182
Tilting angle			−35° ～＋110°
Table dia (mm)			φ180
Register diameter on Face Plate (mm)			φ65H7
Spindle through hole diameter (mm)			φ40
Centre height at verticality (mm)			180
Clamping method			Air-Hydraulic/Hydraulic
Clamping torque (N･m) (In pneumatic 0.5MPa/hydraulic 3.5MPa)		Rotating axis	450
		Tilting axis	800
Motor axis reduced inertia (kg･m²)		Rotating axis	0.000242
		Tilting axis	0.000135
Servomotor (for FANUC specification)			αiF 2/5000
Gear ratio		Rotating axis	1／90
		Tilting axis	1／180
Max. spindle speed	for FANUC specification	Rotating axis (for min⁻¹/motor3000min⁻¹)	33.3
		Tilting axis (for min⁻¹/motor3000min⁻¹)	16.6
	M signal specification	Rotating axis (for min⁻¹/motor3000min⁻¹)	33.3
		Tilting axis (for min⁻¹/motor3000min⁻¹)	16.6
Allowable work inertia (kg･m²)			0.25
Indexing accuracy (sec)		Rotating axis	20
		Tilting axis	60
Repeatability (sec)			4
Mass of product TT/TW (kg)			155／170
Built-in rotary joint (option)			RJ40FTT182 Hyd./pneumatic 4-port＋Exclusive pneumatic 1 port of air
Pneumatic outer cylinder (option・P43, 44 reference)			NY1312T18B
Hydraulic outer cylinder (option・P43, 44 reference)			NY0912T18A
Allowable Load		at horizontal (kg)	60
		at tilted (kg)	40
Allowable load		F (kN)	5
		F×L (N･m)	800
		F×L (N･m)	450
Allowable cutting torque		T (N･m)	250
Moment of tilting weight capacity		W×L (kgf・m)	12

Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of air + hyd. clamp specification, the solenoid valve for table clamp is incorporated. 3. In a hyd. clamp spec., the solenoid valve is not incorporated. Consequently, customer shall prepare it. 4. Neither cable nor hose is fitted between NC rotary table and machine tool... 5. Each product mass is determined by a Kitagawa M signal spec.

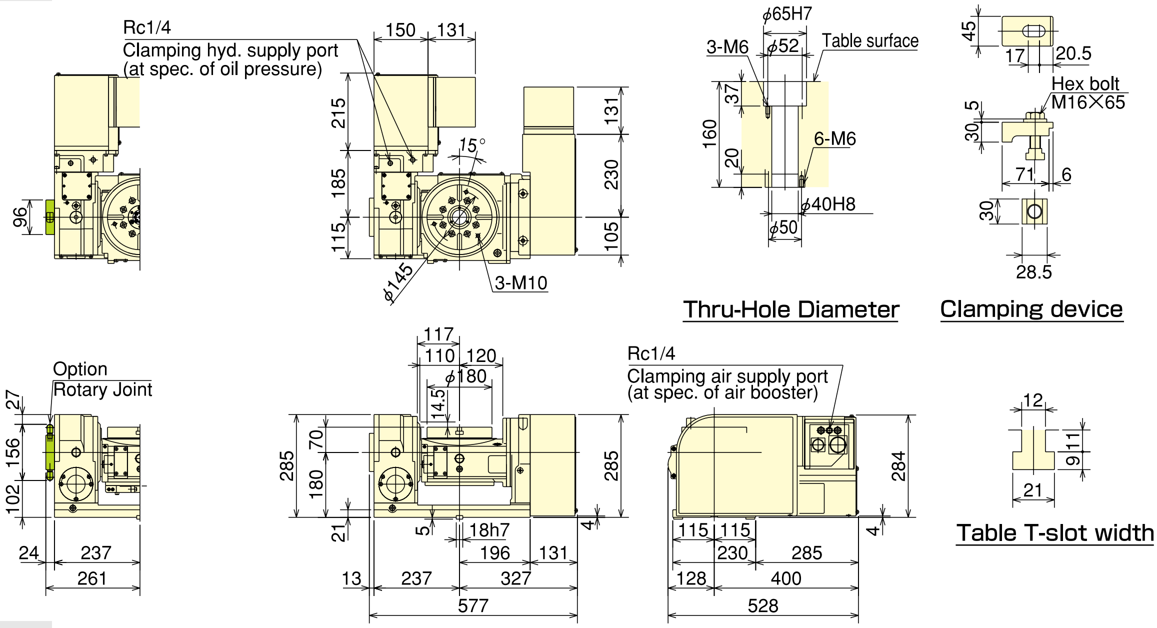
TT

NC ROTARY TABLE

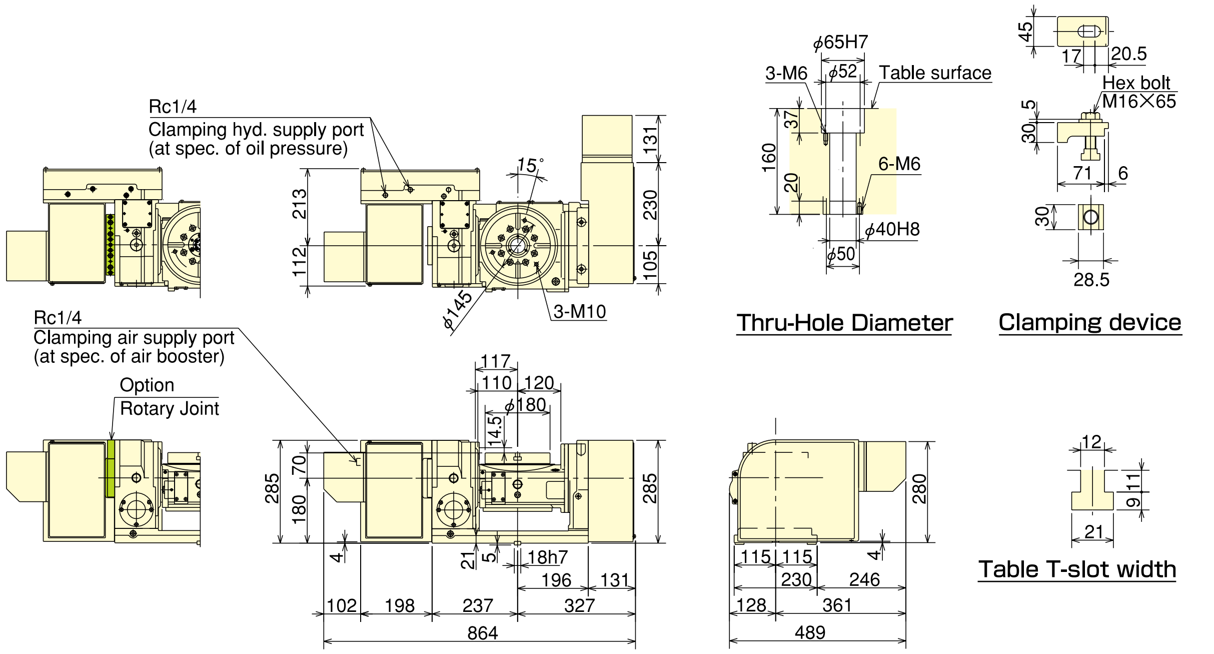
TT182 series TT182・TW182

■Dimensions【4th axis specifications】

TT182



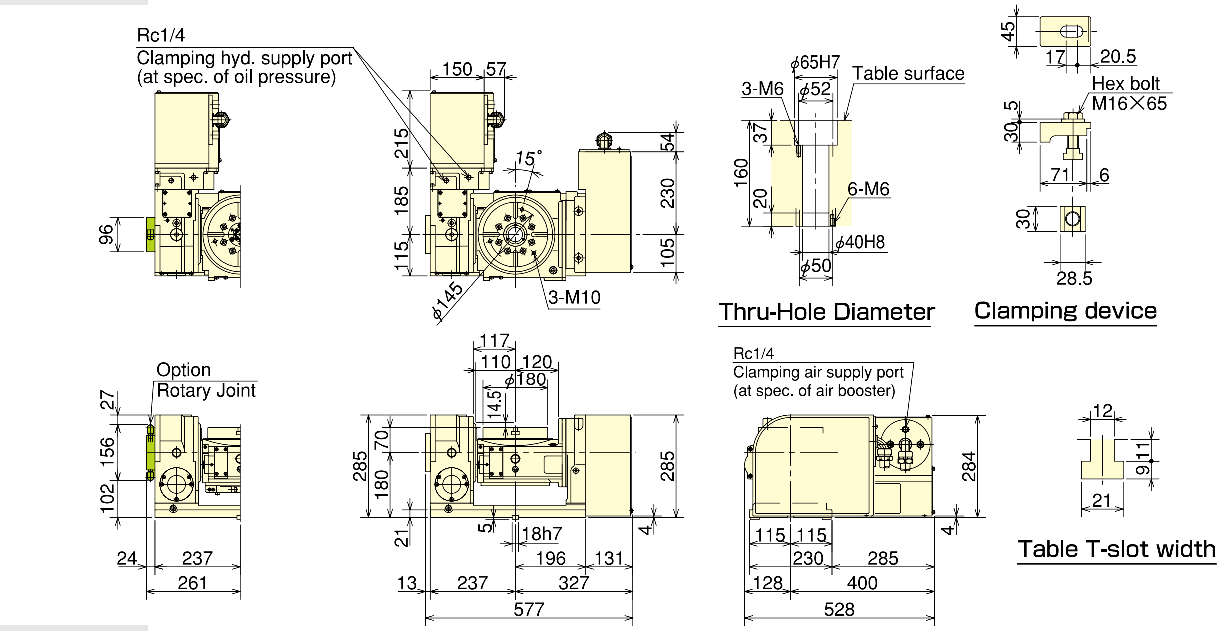
TW182



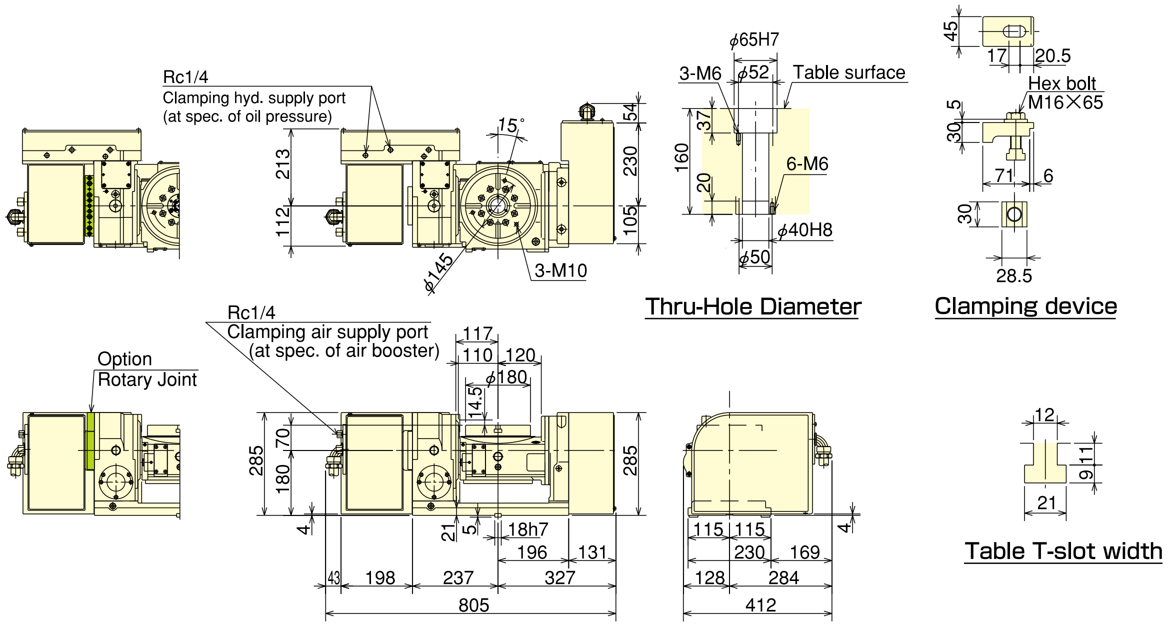
TT

■Dimensions [Kitagawa own controller]

TT182

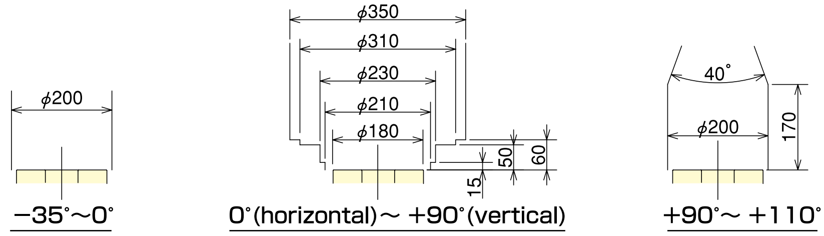


TW182



DATA Tilting NC table • Work loadable area

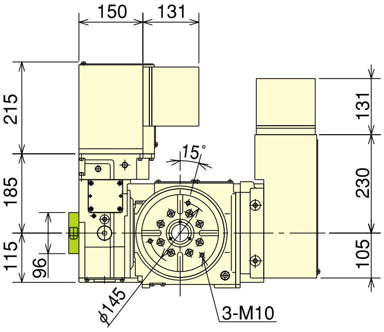
TT182/TW182

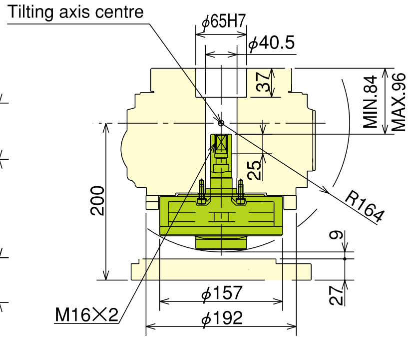


TT182 series TT182・TW182

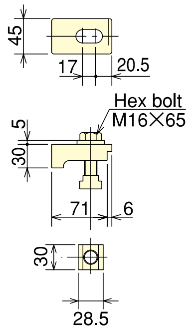
■Dimensions【4th axis specifications】

TT182 【Pneumatic outer cylinder spec.】

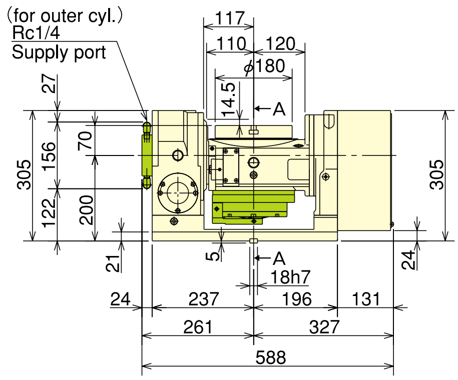


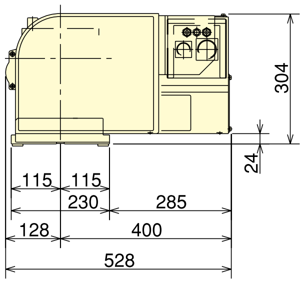


Cross section A-A



Clamping device





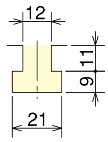
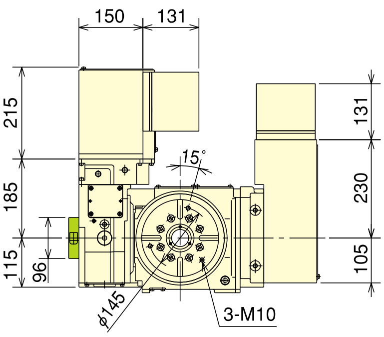


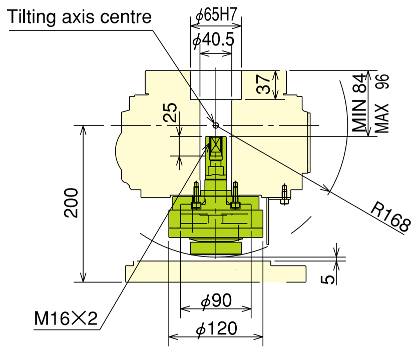
Table T-slot width

■Pneumatic outer cylinder spec.

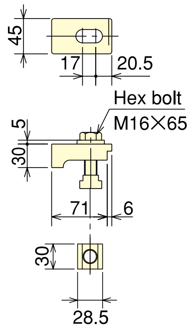
Cylinder	Number of ports	Inner dia. of cyl. (mm)	Piston stroke (mm)	Piston thrust (kN) Air pressure 0.5MPa Push	Piston thrust (kN) Air pressure 0.5MPa Pull	Piston thrust (kN) Air pressure 1.0MPa Push	Piston thrust (kN) Air pressure 1.0MPa Pull	Max. allowable air pressure (MPa)	Mass (kg)
NY1312T18B	Air: 3-port	135	12	4.9	4.7	9.8	9.4	1.0	9.0

TT182 【Hydraulic outer cylinder spec.】

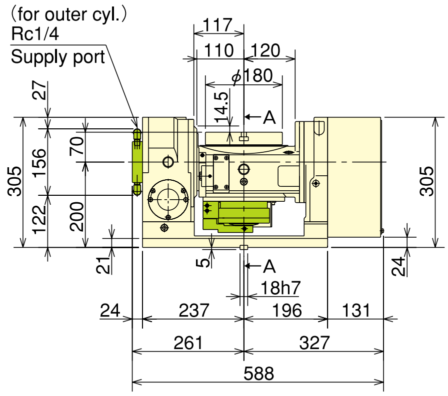


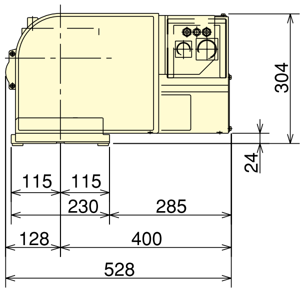


Cross section A-A



Clamping device





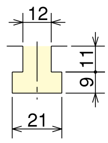


Table T-slot width

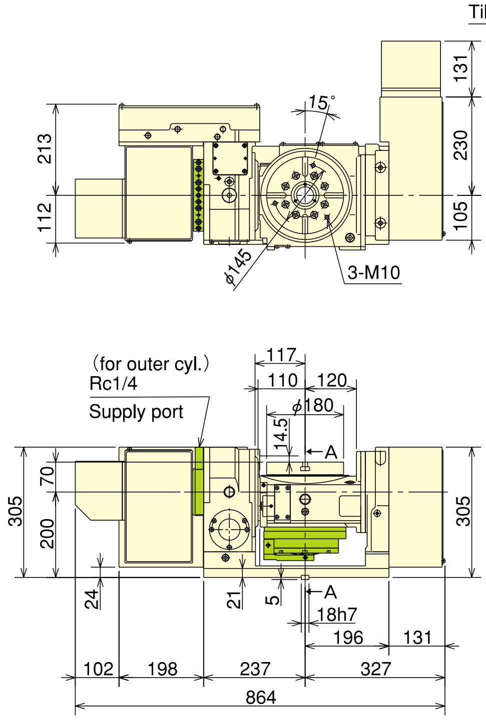
■Hydraulic outer cylinder spec.

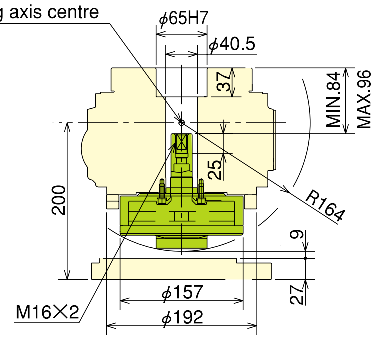
Cylinder	Number of ports	Inner dia. of cyl. (mm)	Piston stroke (mm)	Piston thrust (kN) Hydraulic pressure 3.5MPa Push	Piston thrust (kN) Hydraulic pressure 3.5MPa Pull	Max. allowable hyd. pressure (MPa)	Mass (kg)
NY0912T18A	Hyd.: 2-port+Air: 1-port	90	12	18.2	17.1	3.5	7.7

※1.The above outline dimensions are shown with FANUC motor specifications.
2. In outer cylinder mounting spec., centre height varies to 200 from 180.

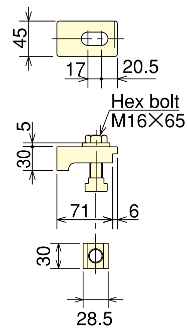
■Dimensions【4th axis specifications】

TW182 【Pneumatic outer cylinder spec.】

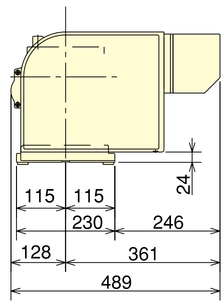




Cross section A-A



Clamping device



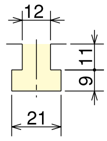
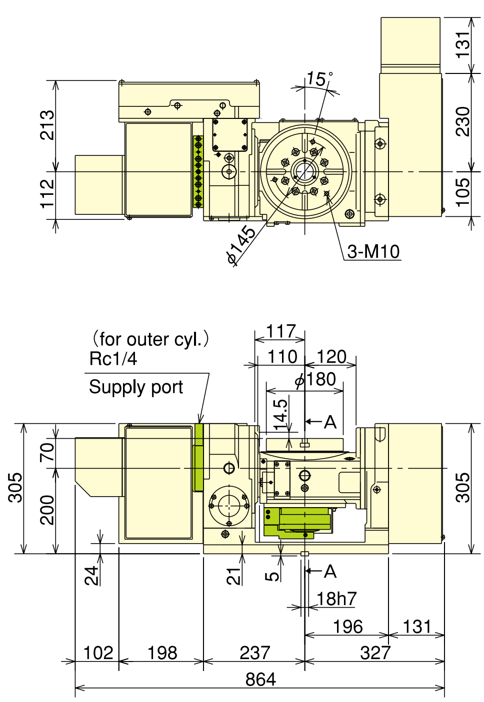
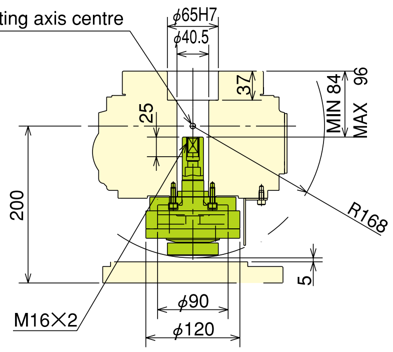


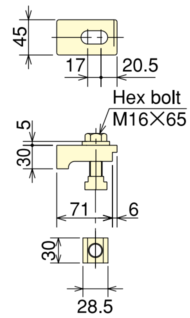
Table T-slot width

TW182 【Hydraulic outer cylinder spec.】

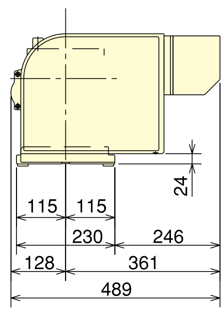




Cross section A-A



Clamping device



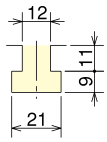


Table T-slot width

※1.The above outline dimensions are shown with FANUC motor specifications.
2. In outer cylinder mounting spec., centre height varies to 200 from 180.

NC ROTARY TABLE

Tilting NC Rotary Table
TT251・TT321 series

TT(S)251
TT(S)321

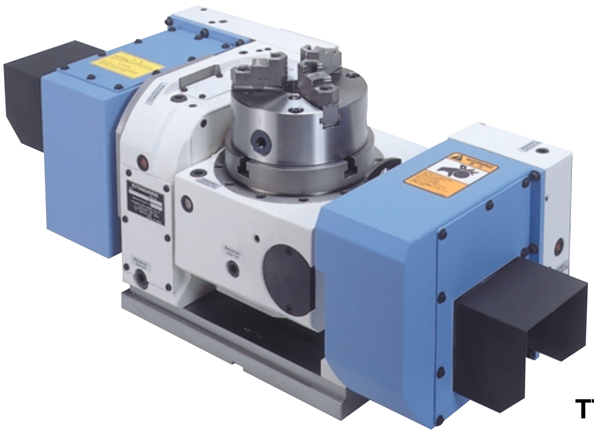
※TTS is the side motor type tilting table

High rigidity tilting tables to suit 5 axis machining on large work pieces with heavy cutting

- ●Minimum size in its class
- ●High rigidity for heavy cutting
- ●High accuracy
- ●Rotary Joint built in as option
- ●Cylinder mountable
- ●Hydraulic clamping method
- ●Integrated air booster provides high clamping torque (comparable to hydraulic) from a standard air supply

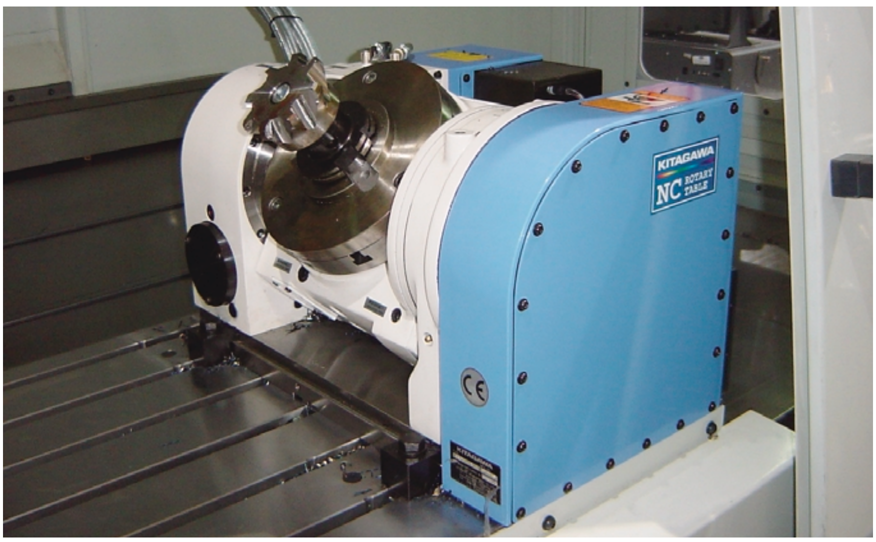
※In specification with the foreign trade control ordinance, permission of the ministry of economy, trade and industry is required when exporting twin axis products overseas.

TT251



TTS

Sample Application



▲Allows the complex machining of large work pieces.

TT

4th axis specifications

TT 251 B * * * *

- **Type** — TT: STD type; TTS: Tilting straight type
- **Table Size** — 251・321
- **Clamping method** — B: Air-Hydraulic; H: Hydraulic
- **Rotary axis motor type**
- **Tilting axis motor type**
- **Design No.**

M signal specification

TT M 251 B 5 * *

- **Type** — TT: STD type; TTS: Tilting straight type
- **Kitagawa own controller**
- **Table Size** — 251・321
- **Clamping method** — B: Air-Hydraulic; H: Hydraulic
- **Kitagawa own controller** (5: MAC mini iH2)
- **Design No.**

■Specifications

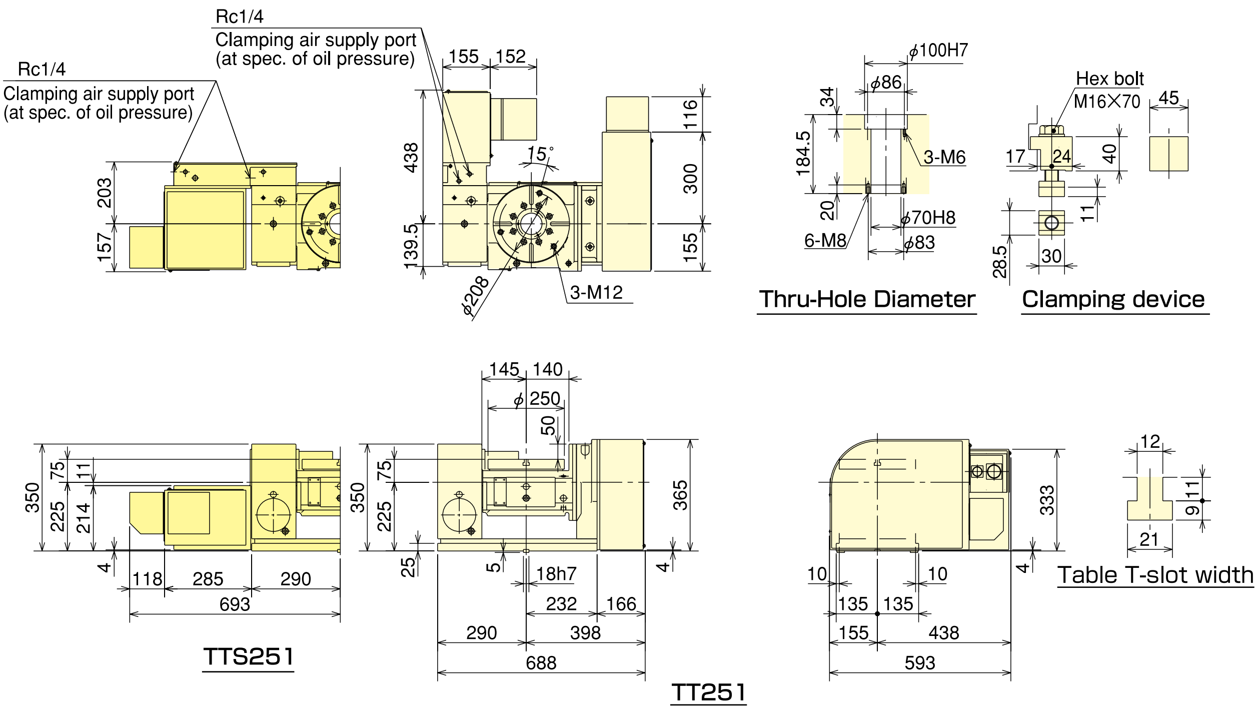
Model			TT251／TTS251	TT321／TTS321
Tilting angle			−35°～＋110°	−35°～＋110°
Table dia (mm)			φ250	φ320
Register diameter on Face Plate (mm)			φ100H7	φ135H7
Spindle through hole diameter (mm)			φ70	φ110
Centre Height (mm)			225	255
Clamping method			Hydraulic	Hydraulic
Clamping torque (N・m) (Hydraulic 3.5MPa)		Rotating axis	900	2600
		Tilting axis	1200	2600
Motor axis reduced inertia (kg・m^2)		Rotating axis	0.00073	0.00083
		Tilting axis	0.00054	0.00046
Servomotor (for FANUC specification)			αiF 4/4000	αiF 8/3000
Gear ratio	for FANUC specification	Rotating axis	1／90	1／120
		Tilting axis	1／180	1／360
	M signal specification	Rotating axis	1／180	1／360
		Tilting axis	1／240	1／360
Max. spindle speed	for FANUC specification	Rotating axis (for min^{-1}/motor3000min^{-1})	33.3	25
		Tilting axis (for min^{-1}/motor3000min^{-1})	16.6	8.3
	M signal specification	Rotating axis (for min^{-1}/motor3000min^{-1})	25.0	8.3
		Tilting axis (for min^{-1}/motor3000min^{-1})	16.6	8.3
Allowable work inertia (kg・m^2)			0.78	1.92
Indexing accuracy (sec)		Rotating axis	20	20
		Tilting axis	45	45
Repeatability (sec)			4	4
Mass of product TT/TTS (kg)			260 / 270	350 / 360
Allowable Load		at horizontal (kg)	100	150
		at tilted (kg)	60	100
Allowable load		F (kN)	12	16
		F×L (N・m)	1200	2600
		F×L (N・m)	900	2600
Allowable cutting torque		T (N・m)	600	1000
Moment of tilting weight capacity		W×L (kgf・m)	26	75

Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. In case of hydraulic clamp specification, the solenoid valve for the table clamp not incorporated. Consequently, customer shall prepare it. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. Each product mass is determined by a Kitagawa M signal spec.

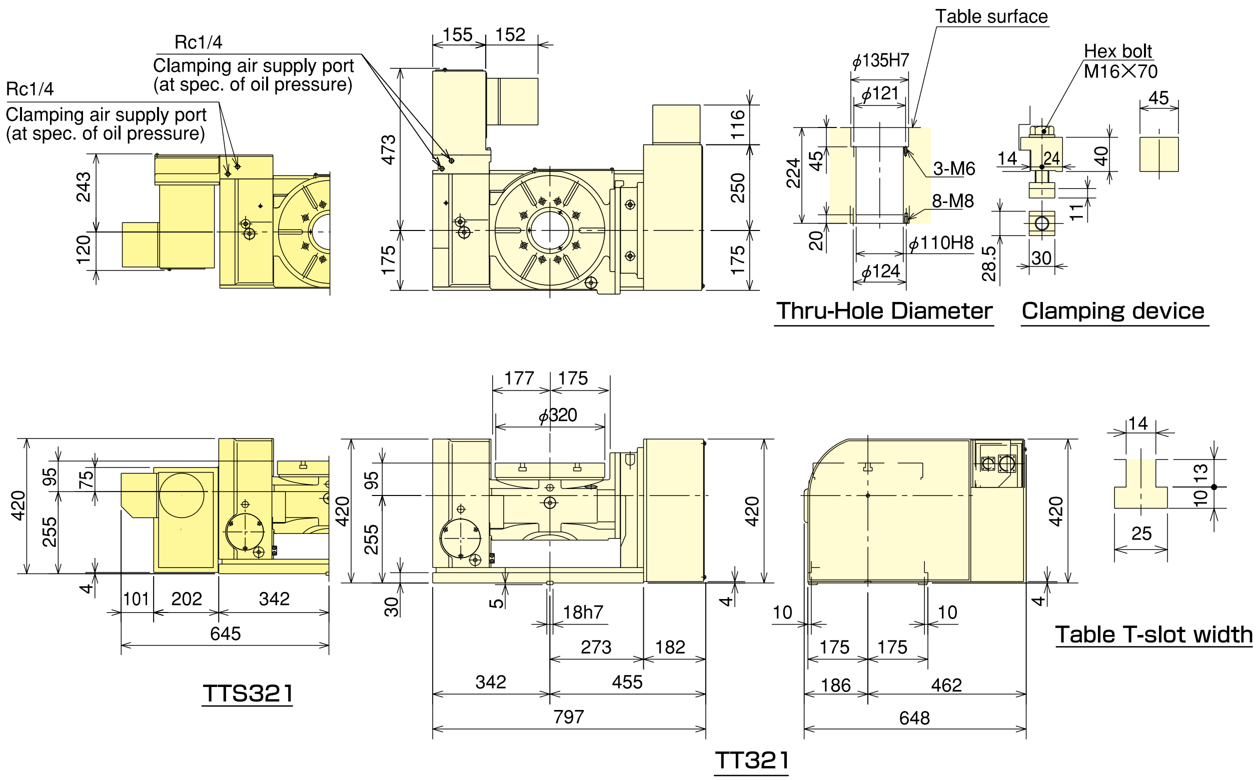
NC ROTARY TABLE TT251/TT321 series TT(S)251・TT(S)321

■Dimensions【4th axis specifications】

TT(S)251



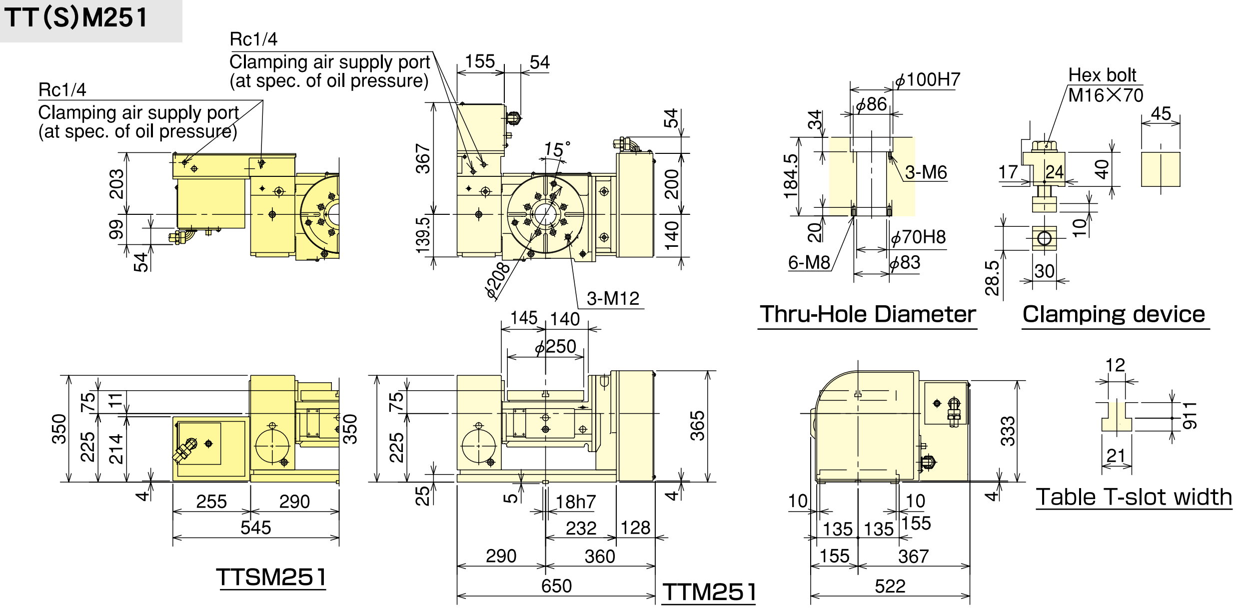
TT(S)321



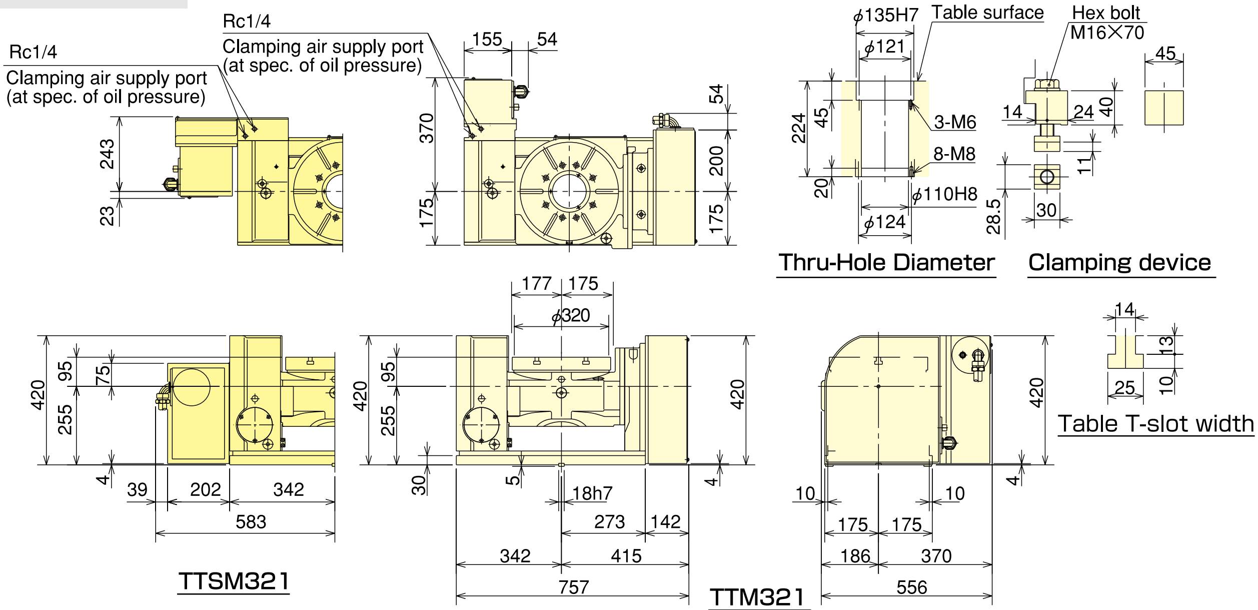
※The above outline dimensions are shown with FANUC motor specifications.

■Dimensions [Kitagawa own controller]

TT(S)M251

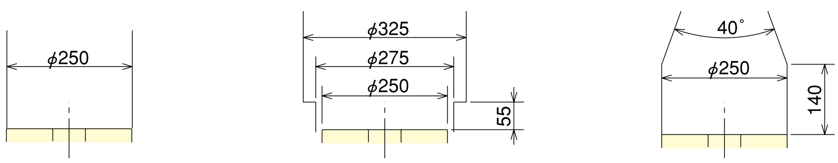


TT(S)M321



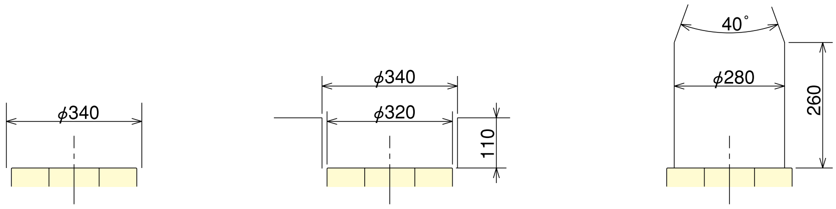
DATA Tilting NC table • Work loadable area

TT(S)251



−35°～0°　　0°(horizontal)～ +90°(Vertical)　　+90°～ +110°

TT(S)321



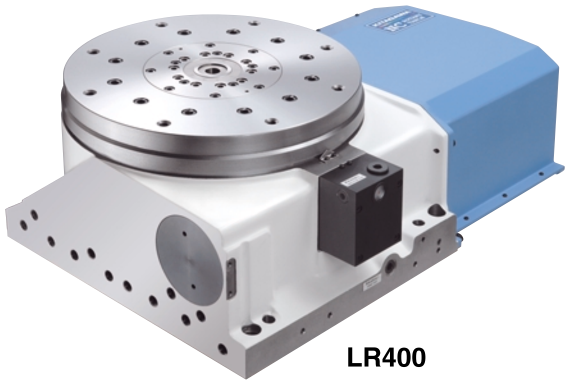
−35°～0°　　0°(horizontal)～ +90°(Vertical)　　+90°～ +110°

NC ROTARY TABLE

Horizontal NC Rotary Table LR series LR320・LR400・LR500

Special purpose machine axis range for high durability and safe operation

- ●Large diameter worm shaft and worm gear
- ●Large module
- ●Special purpose, high durability for integration with machining centre
- ●Built-in rotary joint



LR400

■Specifications

Model		LR320	LR400	LR500
Table dia (mm)		φ320	φ400	φ500
Table height (mm)		250	260	270
Clamping method		Hydraulic	Hydraulic	Hydraulic
Clamping torque (N･m) (In hydraulic 3.5MPa)		2100	3500	3500
Motor axis reduced inertia (kg･m²)		0.0031	0.0061	0.0033
Servomotor (for FANUC specification)		αiF 12/3000	αiF 22/3000	αiF 22/3000
Gear ratio		1／45	1／45	1／90
Max. spindle speed (for min⁻¹／motor 2000min⁻¹)		44.4	44.4	22.2
Allowable work inertia (kg･m²)		7.2	11.9	33.6
Indexing accuracy (sec)		20	20	20
Repeatability (sec)		4	4	4
Mass of product (kg)		200	330	490
Number of ports of built-in rotary joint		Hydlaulic/Pneumatic 9-port + Coolant/Pneumatic 1-port	Hydlaulic/Pneumatic 10-port + Coolant/Pneumatic 1-port	Hydlaulic/Pneumatic 10-port + Coolant/Pneumatic 1-port
Allowable load	Horizontal (kg)	450	650	650
Allowable load	F (kN)	30.4	39.2	39.2
	F×L (N･m)	2500	5000	5000
	F×L (N･m)	2100	3500	3500
Allowable cutting torque	T (N･m)	1225	1922	1922

Note) 1. The solenoid valve for table clamp is not incorporated. Customer to prepare it.
2. Pressure switch for clamp/unclamp checking is not incorporated. Consequently, customer shall prepare it and mount it to the hydraulic circuit for clamp near the solenoid valve.
3. Zero Return confirmation system is not fitted on LR series in order to suit Servo motors with Absolute encoder as standard specification. Thus Zero Return confirmation system is required in using Servo motors with Incremental encoder, please contact.
4. Neither Cable nor Hose is fitted between NC Rotary Table and Machine.
5. Mass of product is the same as the additional axis of FANUC.
6. Contact to Kitagawa about rotary joint.
7. The cylinder for clamp is the reciprocating type.

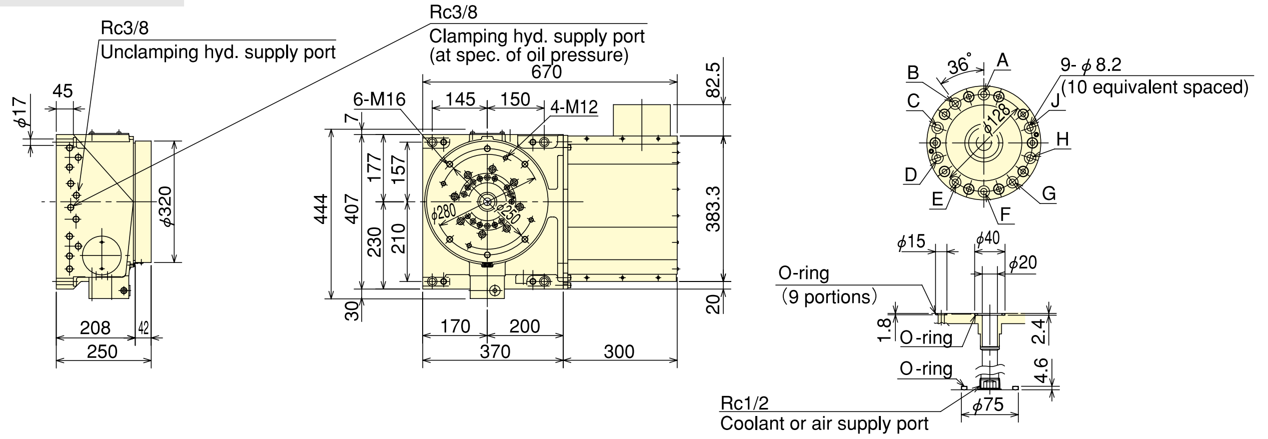
LR

LR 320 H 8 * * *

- LR — Type
- 320 — Table Size: 320・400・500
- H — Clamping method: Only Hydlaulic
- 8 — Gear ratio 8：1/45 4：1/90
- * — Motor type
- * * — Design No.

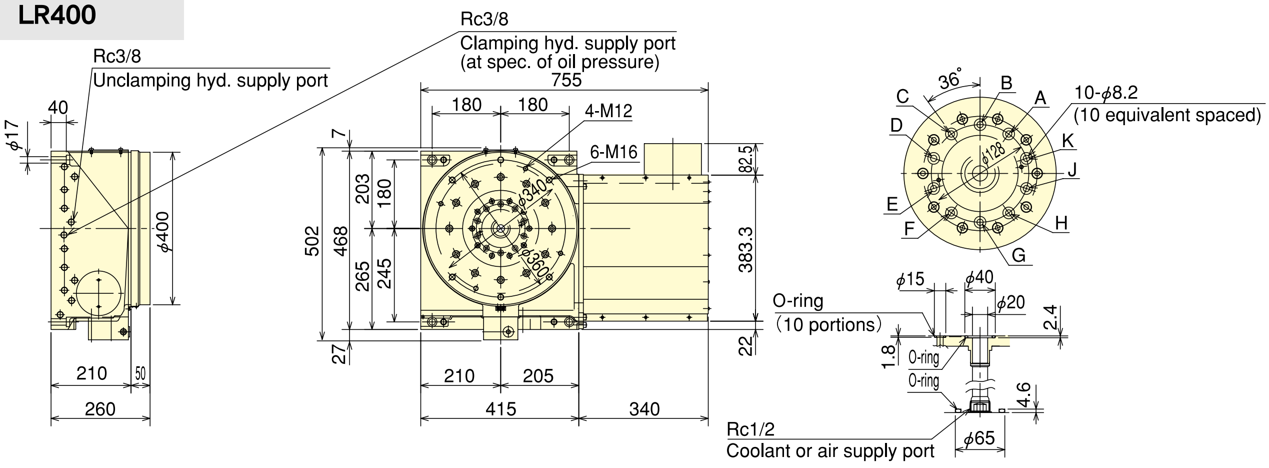
■Dimensions [4th axis specifications]

LR320



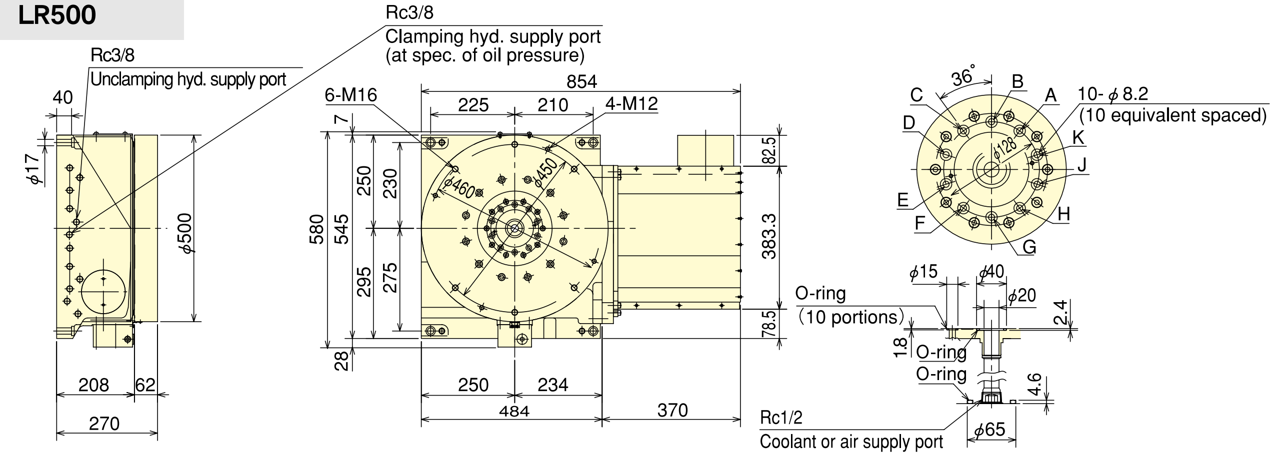
Detailed table hole

LR400



Detailed table hole

LR500



Detailed table hole

※The above outline dimensions are shown with FANUC motor specifications.
In case of specifications with other makers, the dimensions may differ in length.

LR

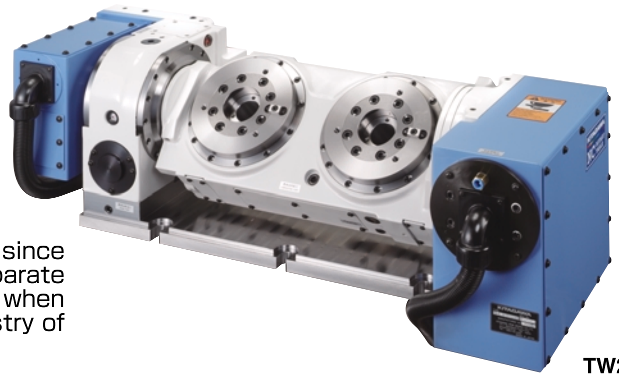
NC ROTARY TABLE

Two-axis Tilting NC Rotary Table TW2180

High performance twin spindle tilting table

- ●Mountable to a compact M/C
- ●Smallest width in its class 999mm
- ●Built in rotary joint (option) allows simple and secure jig piping
- ●High clamping torque

※In the specifcations of both two additional axes, since this product is applied to (8) of item 6 of a separate list No.1 of the Foreign Trade Control Ordinance, when exporting it overseas, the permission of the Ministry of Economy, Trade and Industry is required.



TW2180

■Specifications

Model			TW2180
Tilting angle			-110° ～ +110°
Table dia (mm)			ϕ180
Register diameter on Face Plate (mm)			ϕ65H7
Spindle through hole diameter (mm)			ϕ40
Distance between axes (mm)			250
Centre height at right angle on table face (mm)			200
Clamping method		Rotating axis	Pneumatic
		Tilting axis	Air-Hydraulic
Clamping torque (N·m) (In pneumatic 0.5MPa)		Rotating axis	400
		Tilting axis	800
Motor axis reduced inertia (kg·m²)		Rotating axis	0.000383
		Tilting axis	0.00035
Servomotor (for FANUC specification)			αiF 2/5000
Gear ratio		Rotating axis	1/90
		Tilting axis	1/180
Max. spindle speed	FANUC specification	Rotating axis (for min-1/motor 3000min-1)	33.3
		Tilting axis (for min-1/motor 3000min-1)	16.6
	M signal specification	Rotating axis (for min-1/motor 3000min-1)	33.3
		Tilting axis (for min-1/motor 3000min-1)	16.6
Allowable work inertia (kg·m²)			0.12
Indexing accuracy (sec)		Rotating axis	30
		Tilting axis	60
Repeatability (sec)			4
Mass of product (kg)			247
Built-in rotary joint (as an option)			RJ40TW2180 Rotation per axis Hydraulic per axis/Pneumatic 2-port + Exclusive Pneumatic 3-port
Allowable Load		at horizontal (kg)	Rotation per axis 30
		at tilted (kg)	Rotation per axis 30
Allowable load		F (kN)	Rotation per axis 5
		F×L (N·m)	Rotation per axis 800
		F×L (N·m)	Rotation per axis 400
Allowable cutting torque		T (N·m)	Rotation per axis 250
Moment of tilting weight capacity		W×L (kgf · m)	6

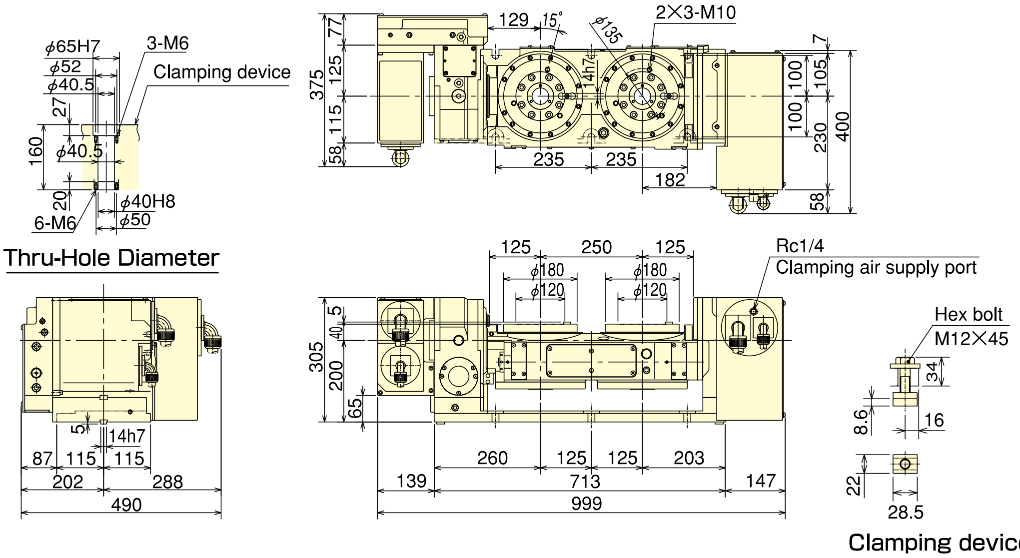
Note) 1. The switch for pressure checking is incorporated to all series except TC/DM of NC tables. 2. Solenoid valve(s) is (are) incorporated. 3. Neither cable nor hose is fitted between NC rotary table and machine tool... 4. Each product mass is determined by a Kitagawa M signal spec. 5. Simultaneous machining of 2-axis is impossible. 6. In case of additional axis spec., the position and type of supply port may be changed. Contact to Kitagawa on it separately.

TW 2 180 B R F *

- **Type**: TW
- **Number of tables**: 2
- **Table Size**: 180
- **Clamping method**: B : Rotating axis Air-Hydraulic / Tilting axis Only Pneumatic
- **Option spec.** R : Rotary Joint / – : Non- option
- **Motor type (Double axes; same maker) Controller type** (5 : MAC mini iH2)
- **Design No.**: *

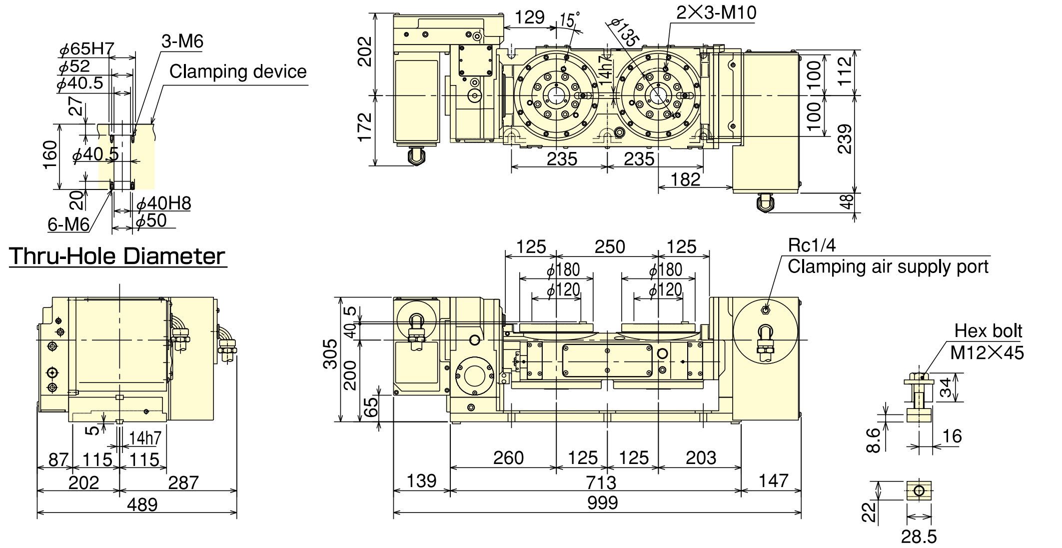
■Dimensions

TW2180 【4th axis specifications】



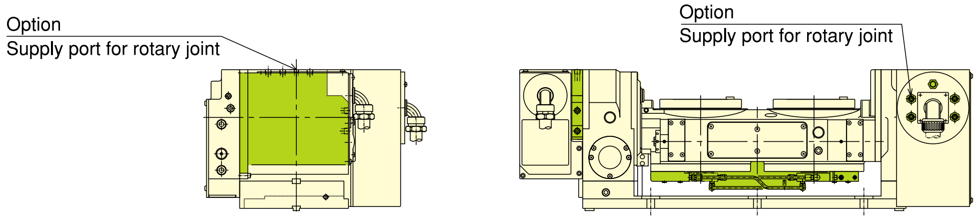
※The above dimensions are the same as FANUC dimensions. In case of motor specifications of other makers, dimensions may differ in length.
Confer with Kitagawa about clamp devices.

With Kitagawa own controller



Clamping device

With Kitagawa own controller



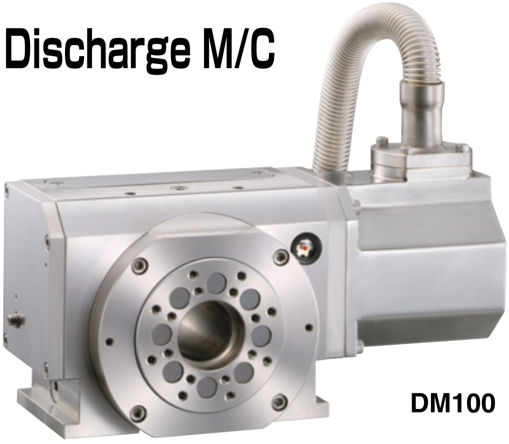
NC ROTARY TABLE

Exclusive NC Rotary Table for Wire Cutting Electric Discharge Machinery

DM100

Exclusive table for Wire Cutting Electric Discharge M/C
Reliable Performance for use in water

- ●Light weight・Compact
- ●Stainless Steel construction and special seals prevent rust and ensure waterproofing
- ●Large through hole for long work pieces
- ●High accuracy and function
- ●Maintenance free accomplished by built-in current collector
- ●Special purpose vertical use



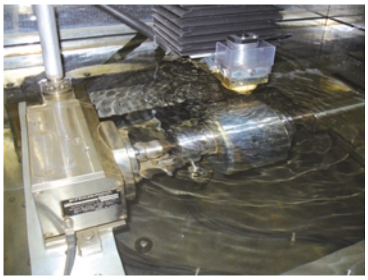
DM100

■Specifications

Model		DM100
Table dia (mm)		ϕ100
Register diameter on Face Plate (mm)		ϕ45H7
Spindle through hole diameter (mm)		ϕ40
Centre Height (mm)		65
Motor axis reduced inertia ($kg\cdot m^2$)		0.000054
Servomotor (for FANUC specification)		βM 0.5/4000 ／ βiS 0.5/6000
Gear ratio		1／120
Max. spindle speed	for FANUC specification (for min^{-1}／motor $360min^{-1}$)	3.0
	M signal specification (for min^{-1}／motor $360min^{-1}$)	3.0
Min. spindle speed	for FANUC specification (for min^{-1}／motor $0.33min^{-1}$)	0.00275
	M signal specification (for min^{-1}／motor $3.6min^{-1}$)	0.03
Allowable work inertia ($kg\cdot m^2$)		0.025
Indexing accuracy (sec)		30
Repeatability (sec)		5
Mass of product (kg)		20
Manual Tailstock (as an option)		DM100RN01
Allowable Load	Vertical (kg)	20
Erosion current (A)		20
Protection grade		IP68 (submerged 0.5m) However, piping opening part is excluded.

(Note)
- ・There is no clamp method. The described fully-closed spec. Is with Fanuc absolute α iCZ sensor A860-2164-T411.
- ・Please contact Kitagawa if Heidenhain direct codes are required.
- ・Product mass is determined by Kitagawa own controller spec.

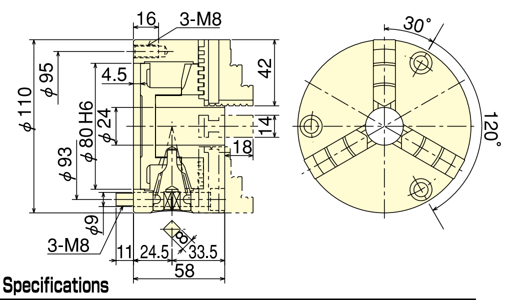
Sample Application



▲Rust and waterproof for safe use in water.

Scroll chuck SC-4D dimensions.

※Special surface treatment prevents rust.



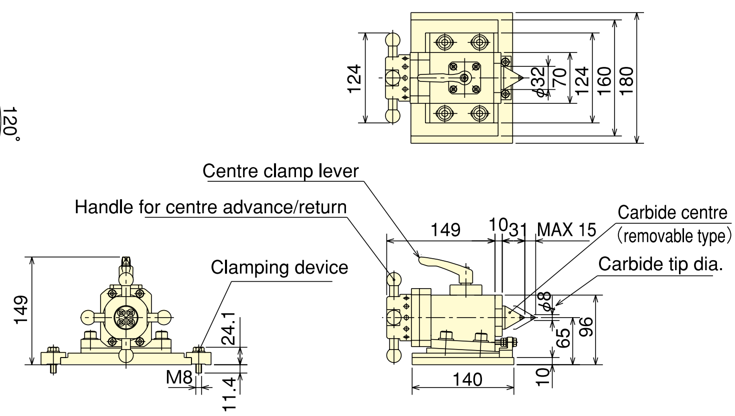
■ Specifications

Max. allowable handle torque (N・m)	Max. static gripping force (kN)	Max. allowable speed (min^{-1})
44.1	12	100

Mass (kg)	Moment of inertia ($kg\cdot m^2$)	Gripping diameter(mm)	
		Outside gripping	Inside gripping
3.1	0.004	ϕ3～ϕ95	ϕ29～ϕ84

Manual tailstock DM100RN01 dimensions.

※Rust proof and waterproof. Long work pieces can be supported securely.



Product mass	11kg

DM

4th axis specifications

DM 100 R ＊ ＊＊

- DM — Type
- 100 — Table Size: 100
- R — Right hand
- ＊ — Motor type
- ＊＊ — Design No.

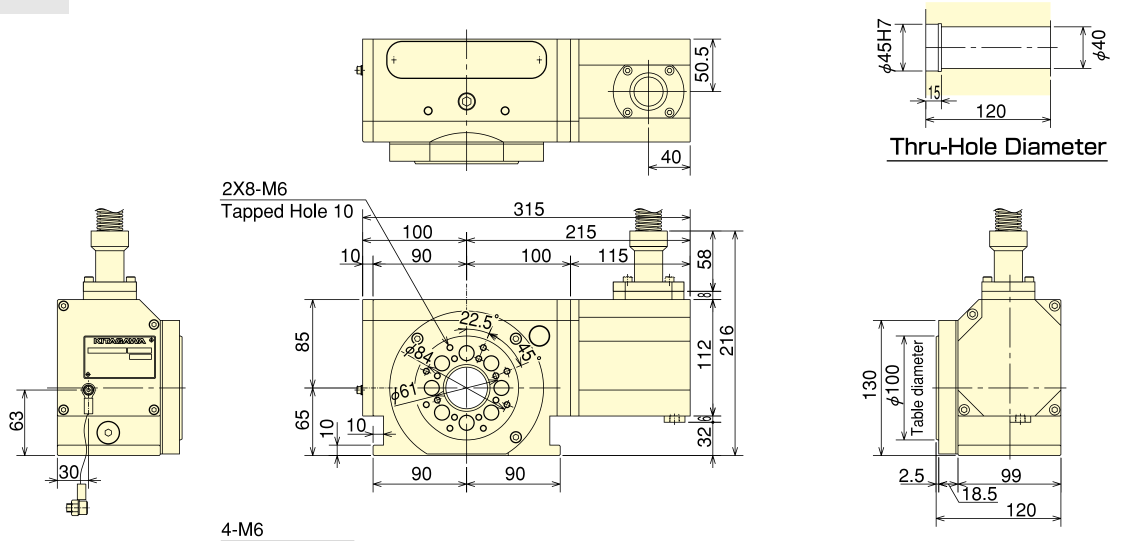
M signal specification

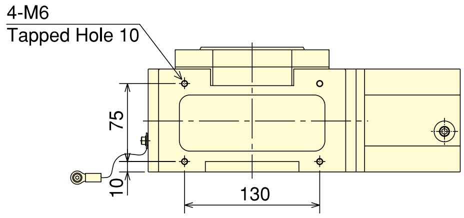
DM M 100 R 8 ＊＊

- DM — Type
- M — Kitagawa own controller
- 100 — Table Size: 100
- R — Right hand
- 8 — Kitagawa own controller (8：MAC mini iDM)
- ＊＊ — Design No.

■Dimensions

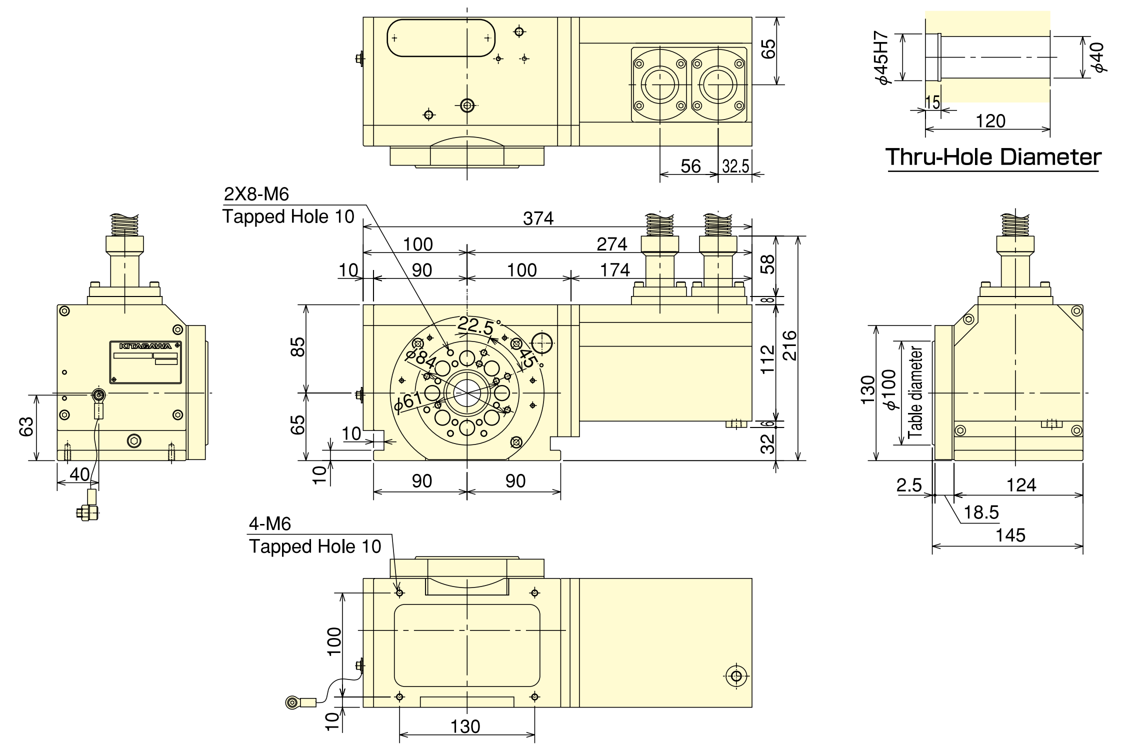
DM100 【Additional axis spec.】【Kitagawa own controller】





※The above dimensions are the same as Kitagawa own controller and FANUC specifications.
In case of other maker motor specifications, dimensions may differ in length.

DM100 【4th axis Fully-closed encoder spec.】



High Speed NC Rotary Table RSM100

NC ROTARY TABLE

High Speed Table for Machining Small Work Pieces

- ●With exclusive controller
- ●Simple design
- ●Light weight/compact
- ●Max. speed 83.3min^{-1}

RSM100

■With controller MAC mini iF

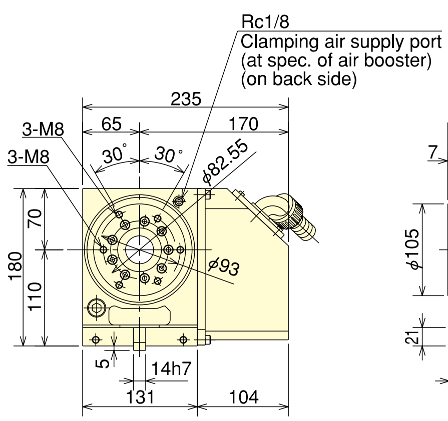
Model	RSM100
Right hand	○
Left hand	○
Table dia (mm)	ϕ 105
Register diameter on Face Plate (mm)	ϕ 50H7
Spindle through hole diameter (mm)	ϕ 32
Centre Height (mm)	110
Clamping method	Pneumatic
Clamping torque (N·m) (In pneumatic 0.5MPa)	80
Gear ratio	1/36
Max. spindle speed (for min^{-1}／motor 3000min^{-1})	83.3
Allowable work inertia (kg·m²)	0.054
Indexing accuracy (sec)	50
Repeatability (sec)	10
Mass of product (kg)	23
Manual Tailstock (as an option・P69 reference)	RS100RN

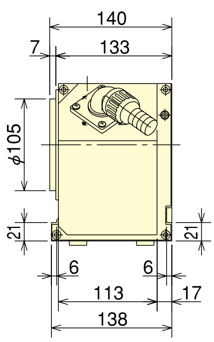
Model		RSM100
Allowable Load	Horizontal (kg)	60
	Vertical (kg)	30
Allowable load	F (kN)	6
	F×L (N·m)	200
	F×L (N·m)	82
Allowable cutting torque	T (N·m)	40

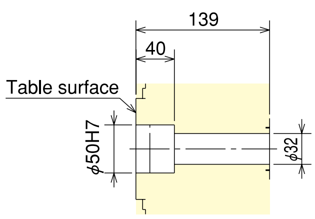
※RSM100 : With MAC mini i(H)F
Note) This model is for only M signal spec., and it is not provided for 4th axis specification.

■Dimensions

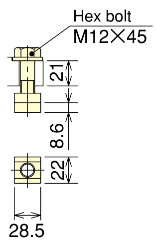
RSM100R(L) 【Kitagawa own controller】







Thru-Hole Diameter



Clamping device

※The notation "R" means right handed ; "L" means left handed model.

RSM

NC ROTARY TABLE

Rotary Table TC100

5C Collet Manual specification

TCM100

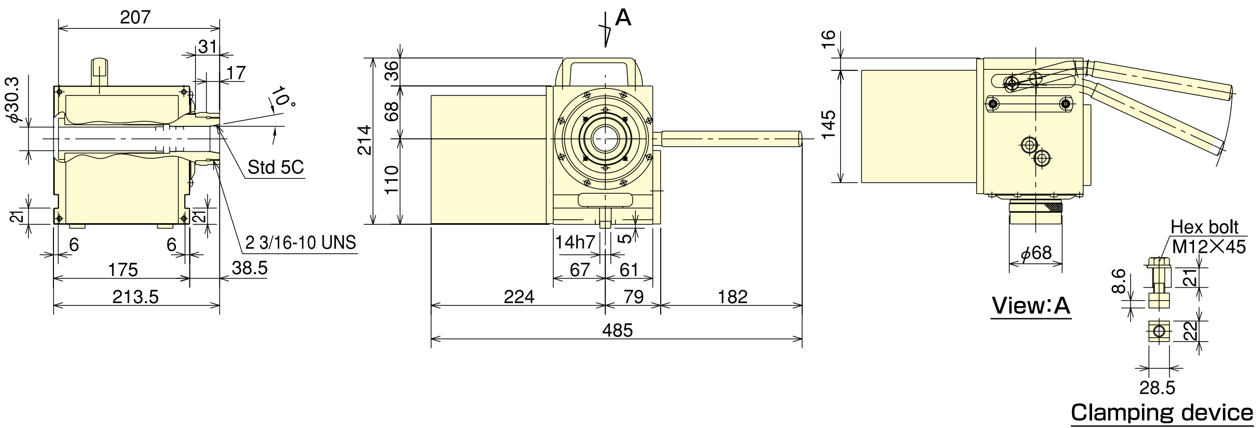
■TC100 Specifications

Model	Spindle	Centre height (mm)	Spindle hole (mm)	Collet Thrust force (kN)	Guide block width (mm)	Gear Ratio	Allowable Load(kg)	
							Vertical	Horizontal
TC100	5C Collet chuck adaptation	110	ϕ30.3	4.8	14h7	1/36	30	60

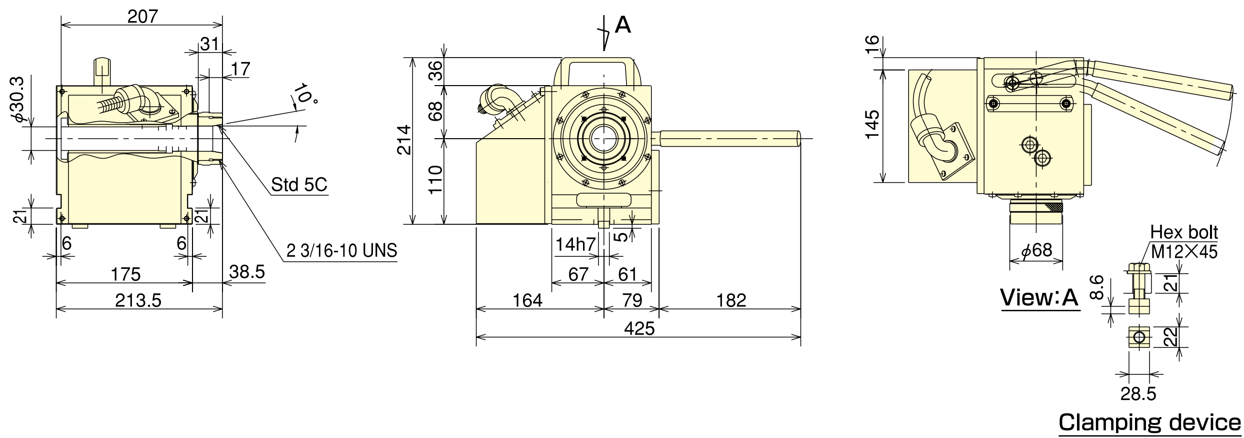
Model	Allowable work inertia (kg・m²)	Max. spindle speed (min⁻¹)	Indexing accuracy (sec)	Repeatability (sec)	Mass of product (kg)
TC100	0.054	83.3	45	5	24

■Dimensions

TC100 【4th axis specifications】



TCM100 【Kitagawa own controller specification】



※Max. table rotation is subject to 3000 min⁻¹ of a motor.

TC

NC ROTARY TABLE

Kitagawa own controller MAC mini i series

MAC mini i･MAC mini iH
MAC mini iH2

Easy operation, Full functionality

【 All Types 】

●Absolute Encoders are adopted to all types.
Absolute encoders of 17 bits are used on all MAC mini controllers.
This means it is not necessary to return to the zero position after each power on. The machine zero position can also be optionally set at any angle. If the cable from the rotary table is disconnected from the controller the zero position still remains.

●LCD can display various data.
The LCD screen is used to display various data. Programs can be displayed by each block. Parameter settings and alarm messages are displayed clearly with descriptions making setup, programming and error finding simple.

●Max. 90 channels capacity.
Standard 16 channels can be expanded to 90 by setting the number of blocks per channel.

●1000 blocks per channel.
Each program created in one channel can contain 1000 blocks.

●Manual pulse generator.
Manual pulse generators can be fitted as an option.

●Extend reset function can be installed.

【 MAC mini iH Type: CE Compliant. 】

●Pendant type features manual operation.
All features, programming editing, diagnostics etc can be operated from the product.

●ENABLE switch function
The pendant is equipped with an ENABLE switch as standard for safe operation in manual mode and automatic mode.

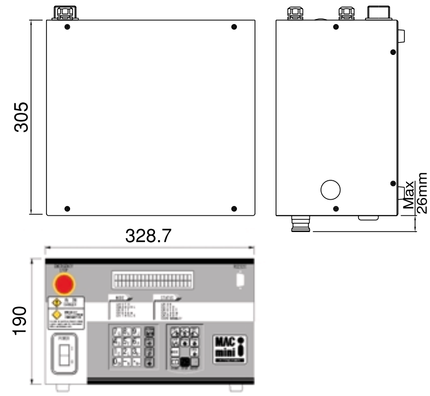
●External channel number output.
The channel number that is selected can be outputted to external equipment, this allows the selected channel number to be checked on the machine side.

●Controller corresponding to 2 axes （MAC mini iH2 / iHT）
2 axis controller. One controller can control 2 axis. One common M signal can also correspond to 2 axis.

●Many outputs of function signals.
Output of auto signals, output of manual signals etc.

MAC mini i / iF / iDM

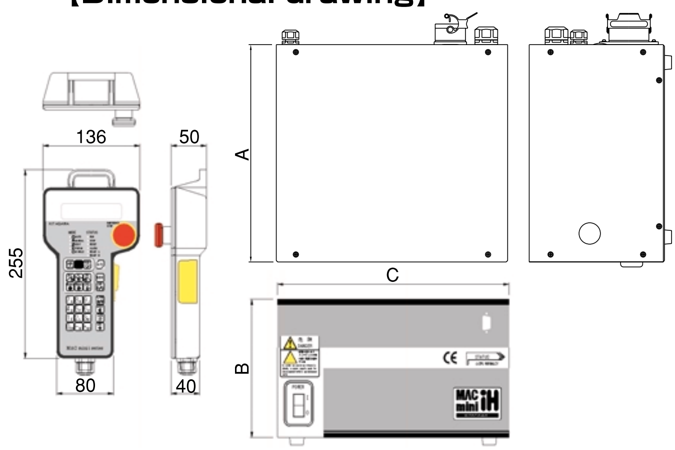
[Dimensional drawing]



MAC mini iH / iHF / iHP

Conforms to EN standard and corresponds to EMC command.

[Dimensional drawing]



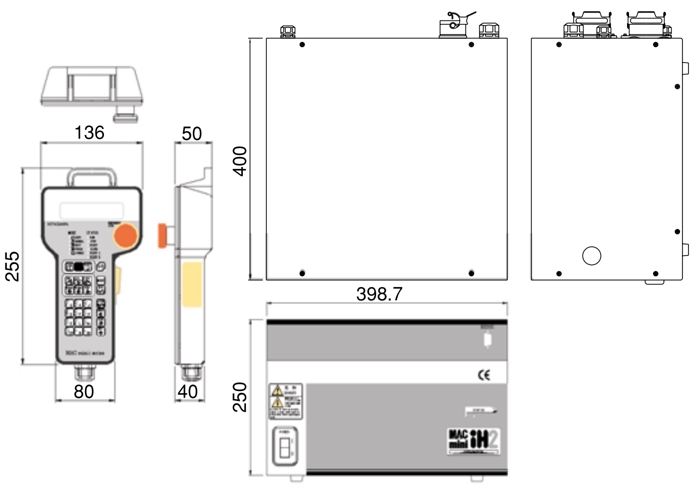
■Dimensions

	A	B	C
iH / iHF	305	190	328.7
iHP	400	250	398.7

MAC mini iH2 / iHT

Two-axis controller conformed to EN standard and corresponded to EMC command.

[Dimensional drawing]

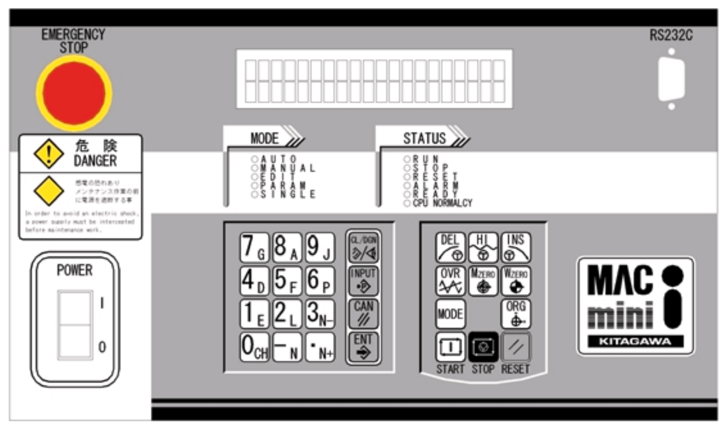


MAC mini i Type PANEL FUNCTIONS

EMG STOP button LCD (20 characters x 2 lines) RS232C Connector

MODE Display LED

STATUS Display LED



Power SW EDIT Keys (Programs/parameters) Operation keys

■ Power SW
Turns ON/OFF controller power.

■ EMG STOP button
Stops the table during operation in an emergency.

■ LCD
Displays current position, program, parameter and alarm data.

【 Current position display example 】

```
BG// @  012-345
M///           VO,Q
```

【 Program display example 】

```
BG// .@.F8/@07/-///
M/// E/    C    I
```

【 Parameter display example 】

```
@900/           0
OQL  HMOTS  OTQLHRRHNM
```

【 Alarm display example 】

```
;@=Dqq-//0
DLDQFDMBX  RSNO
```

【 Diagnosis screen display example 】

```
@  /00///  BK@LO
                D@,H
```

■ RS232C Connector
Uses this connector when data communication or remote control is performed.

■ MODE Display LED
AUTO : Auto operation mode
Executes block by block as often as a start signal is inputted.
MANUAL : Manual operation mode
Rotates the table manually.
EDIT : Program EDIT mode
Inputs and edits programs.
PARAM : Parameter mode
Sets and checks parameters.
SINGLE : Manual operation
Operates the controller independently.

■ STATUS Display LED
RUN : During RUN
Lamp lights during program run.
STOP : During STOP
Lamp lights when program is not run. When the program is held, the lamp lights together with "RUN".
RESET : During RESET
Lamp lights just after power ON, after program reset and JOG start.
ALARM : During alarm occurrence
Lamp lights during alarm. The lamp flashes while alarms occur redundantly.
READY : Operation ready
Lamp lights when the controller can be operated automatically.

■ EDIT Keys
Used when program INPUT/EDIT, parameter setting and selection of diagnosis screen are performed.

■ Operation keys
- Selects operation mode.
- Feeds at JOG in CW direction.
- Feeds at JOG in CCW direction.
- Feeds at high JOG speed when pressing this button together with or .
- Rotates to MZRN position.
- Rotates to WZRN position.
- Starts the program.
- Stops the program.
- Resets the program or alarm.
- Sets WZRN position.
- Sets the override of feedrate.

MAC mini iH Type PENDANT FUNCTIONS

■ **EMG STOP button**
Stops the table during operation in an emergency.

■ **ENABLE switches**
Be sure to press ENABLE switches for safety operation and to prevent malfunction in auto operation start before an automatic operation is started by manual operation or pendant operation.

■ **LCD**
Displays current position, program, parameter and alarm data.

【 Current position display example 】

```
BG// @  012-345
M///          VO,Q
```

【 Program display example 】

```
BG// .@.F8/@07/-///
M/// E/    C    I
```

【 Parameter display example 】

```
@900/           0
OQL  HMOTS  OTQLHRRHNM
```

【 Alarm display example 】

```
;@=Dqq-//0
DLDQFDMBX  RSNO
```

【 Diagnosis screen display example 】

```
@ /00/// BK@LO
               D@,H
```

■ **EDIT Keys**
Used when program INPUT/EDIT, parameter setting and selection of diagnosis screen are performed.

■ **MODE Display LED**

AUTO : Auto operation mode
Executes block by block as often as a start signal is inputted.
MANUAL : Manual operation mode
Rotates the table manually.
EDIT : Program EDIT mode
Inputs and edits programs.
PARAM : Parameter mode
Sets and checks parameters.
SINGLE : Manual operation
Operates the controller independently.

■ **STATUS Display LED**

RUN : During RUN
Lamp lights during program run.
STOP : During STOP
Lamp lights when program is not run. When the program is held, the lamp lights together with "RUN".
RESET : During RESET
Lamp lights just after power ON, after program reset and JOG start.
ALARM : During alarm occurrence
Lamp lights during alarm. The lamp flashes while alarms occur redundantly.
READY A : A-axis operation ready
Lamp lights when A-axis can be operated automatically.
READY B : B-axis operation ready
Lamp lights when B-axis can be operated automatically.
When MAC mini iH2/iHT are used, B-axis is used.

■ **Operation keys**

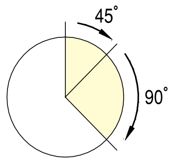
- LNCD Selects operation mode.
- HMR Feeds at JOG in CW direction.
- CDK Feeds at JOG in CCW direction.
- GH Feeds at high JOG speed when pressing this button together with HMR or CDK .
- LYDQN Rotates to MZRN position.
- VYDQN Rotates to WZRN position.
- Starts the program.
- Stops the program.
- Resets the program or alarm.
- NQF Sets WZRN position.
- NUQ Sets the override of feedrate.

■ **Axis change keys**

A/B When MAC mini iH2/iHT are manually operated and programs/parameters are edited, A-axis is changed with B-axis and vise versa.

PROGRAM EXAMPLES

■ ANGLE INDEX

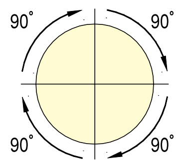


N000 A 45.000 F0
(A 45.000: Index angle; F0: Rapid traverse)

N001 A 90.000 J0
(J0: Jump destination)

Rotates 45°at rapid traverse and returns to N000 after rotating 90°.

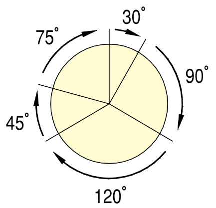
■ EQUIPARTITION



N000 A360.000 F0 D4 J0
(A360.000: Partition angle; D4: Divided partition)

Rotates with circle of 360°divided into 4-partition (every 90) at rapid traverse and returns to N000 after operating 4 times.

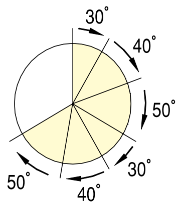
■ UNEQUAL PARTITION



N000 A 30.000 F0
N001 A 90.000
N002 A120.000
N003 A 45.000
N004 A 75.000 F500 J0
(F500: Feedrate)

Rotate 45°at rapid traverse, 90°, 120°, 45°and 75°at feedrate 5.00min^{-1} before returning to N000.

■ REPETITION



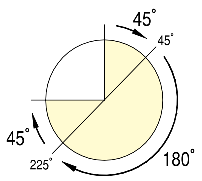
N000 G27 P10 E12 L2
(G27: Repeating command; P10: Repeating start block; E12: Repeating end block; L2: Repeating times)

N010 A 30.000
N011 A 40.000
N012 A 50.000

Command that repeats content of N010~N012

Rotate 30°, 40° and 50°.

■ ABSOLUTE / INCREMENTAL



N000 G90 A 45.000 F0
(G90: ABS command; A 45.000: Index position)

N001 A225.000
(Index position)

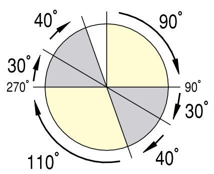
N002 G91 A 45.000
(G91: INC command; A 45.000: Index angle)

Rotates 45°at rapid traverse under absolute mode.

Rotates 225°.

Rotates 45°under incremental mode.

■ SUBPROGRAM



N000 A 90.000 F0 J10
(J10: Subprogram jump destination)

N001 G90 A270.000 J10
(J10: Subprogram jump destination)

N002 J0
N010 G91 A 30.000
N011 A40.000 J-1
(J-1: Return command)

Rotates 90°at rapid traverse and jumps to N010.
Rotates 270°under absolute command and jumps to N010.

Returns to N000.

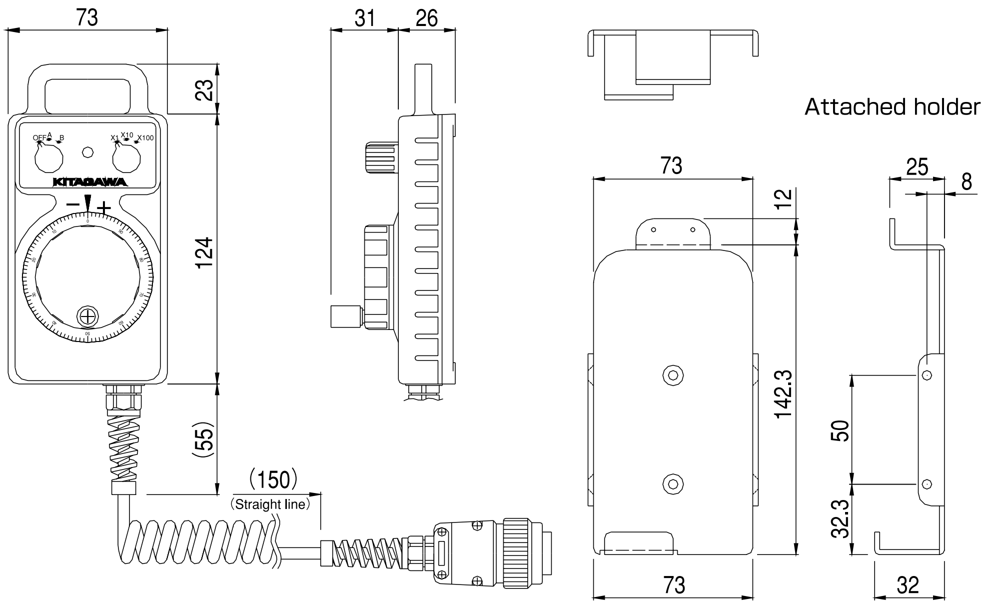
Rotates 30°under incremental command, rotates 40°and returns to original subprogram jump command point.

MAC mini i Series　OPTION

■ Manual Pulse Generator

【HC11DAKC11】

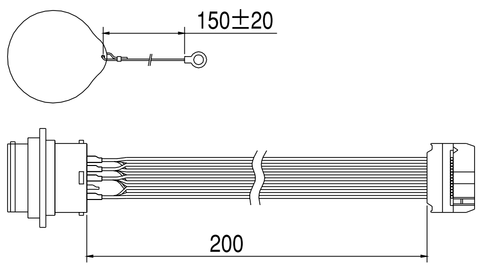
This pulse generator can operate the table at 0.1˚,0.01˚and 0.001˚, and it adjusts jigs easily. One pulse generator can operate MAC mini iH2/iHT by changing the shaft.



■ Manual Pulse Generator Junction cable

To use the manual pulse generator, this junction cable (for inside panel) is required.
For HC1-IC, dust caps and mounting screws (4 pieces) are attached.

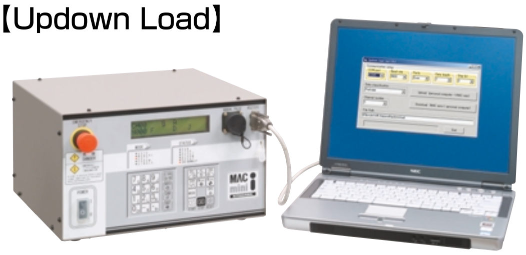
【HC1-IC】



■ Dedicated software for data communication

This software can input and output the data for "Program", "Parameter" and "WZRN POS." that stores them in the controller.
This software is for Windows and it corresponds to WindowsXP, NT4.0 and 2000.
For RS232C cable, please consult our Sales Section.

【Updown Load】

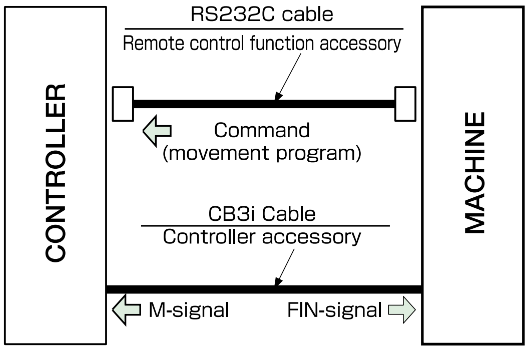


MAC mini i Series　OPTION

■ Remote Control Function

Remote Control Mode

The rotary table is controlled by programming the table movement into the machine's NC program. There is no programming required on the controller.
The movement of the rotary table is controlled by the program on the machine.



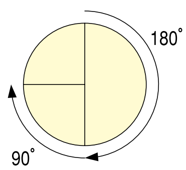
NC maker and Required function

NC maker	Required Function (※1)	NC unit type
FANUC	Custom macro B (External output command)	After FS0 series After FS11 series
Mitsubishi Electric Corporation	User macro（External output command）	After MELDAS300 series
Okuma	User task Ⅱ READ/WRITE･GET/PUT functions	After OSP5000
Yamazaki Mazak Corporation	External output command	Fusion 640M MATRIX ※2

※1 Since the required function may be the option of NC unit, please check that the required function exists to each maker.
※2 RS232C extension is required.

Examples of Machine Programs

● Program: FANUC (external output command)



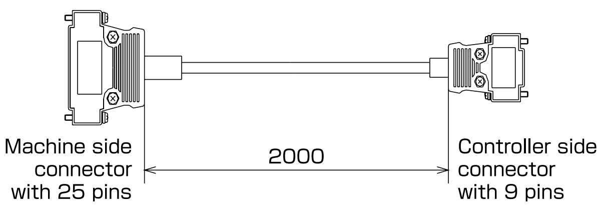
POPEN;	Open RS232C port.
DPRNT [//G91A180.000F30.00/];	Transmit movement command to controller.
PCLOS;	Close RS232C port.
M100;	Start positioning.
・・・・・・・・	Process by movement program on the machine
POPEN;	Open RS232C port.
DPRNT [//G91A90.000F0.00/];	Transmit movement command to controller.
PCLOS;	Close RS232C port.
M100;	Start positioning.

Remote Control Function Accessory

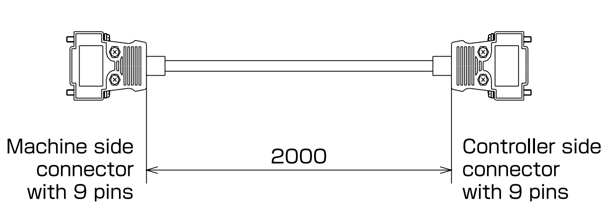
● RS232C cable for remote controlling

RS232C cable to connect between the machine and the controller.
Select the cable with appropriate connector type to match RS232C port on the machine.

【RSCB0925】(Standard)



【RSCB0909】(Made to order)



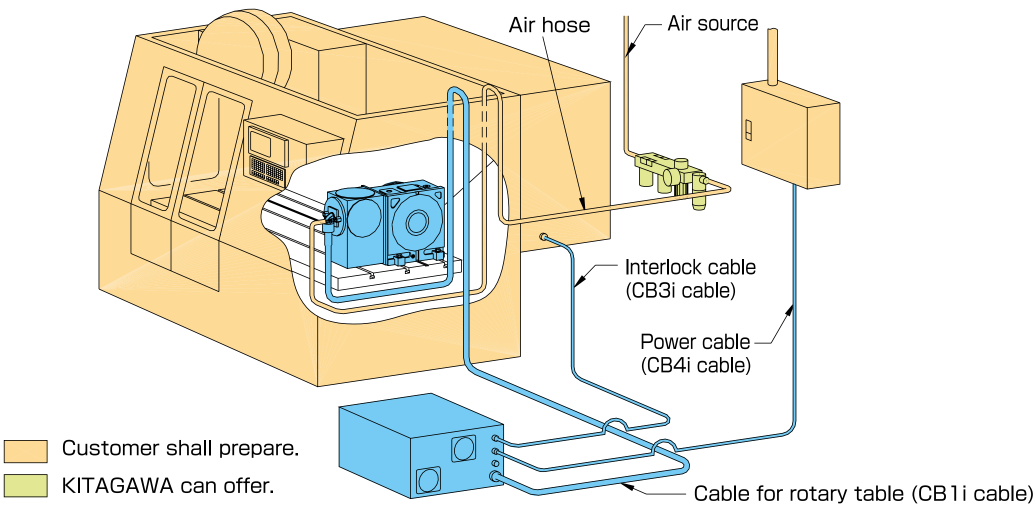
MAC mini i Series Specification

Item \ MAC mini	Standard specification			CE specification				
	i	iDM	iF	iH	iHF	iHP	iH2	iHT
Controlled axes	1 axis			1 axis			2 axes	
Servomotor spec.	AC servo motor with absolute detector							
Servomotor capacity	750W	200W	400W	750W	400W	2KW	750W+750W	400W+750W
Setting unit	0.001°							
Max. setting angle	999-rotation +360° and 999.999°							
Equal partition	2～999 partition (dividable to sector form)							
Program capacity	2000-block (500-block x 1CH + 100-block x 15CH: Standard)							
	■ Optional channel set function is usable at max. 90-CH, max. 1000-block (1CH).							
Command method	Absolute / incremental methods (selectable at G90 / G91)							
Zero position return	MZRN and WZRN			MZRN and WZRN (commandable by external input.)				
Manual feed	Rapid traverse, slow speed feed, step feed							
Emergency stop	Emergency stop button or forced servo stop by external interlock input + master stop							
	■ When an emergency stop button is pushed, the data is outputted(EMOUT) to the external equipment.							
Halt	Halt of rotary table by key input or external SP input							
Feedrate override	Settable to 1～200% (Can be notched to 1～100%.)							
Preparatory function	DWELL, LEAD CUTTING, BUFFER FUNCTION, CLAMP PRESENCE, DEVIATION CHECK FUNCTION, INTERLOCK START, CONTINUOUS START, MZRN, WZRN, REPEATING FUNCTION, LOOP JUMP FUNCTION, ABSOLUTE/INCREMENTAL, FIN SIGNAL CONTROL COMMAND							
Jump function	Jumps to subprogram.							
Uni-directional approach	Even if rotary direction is changed, positioning from uni-direction is available.							
Software limit function	Software limit can be set from machine zero position to prevent interference with the machine by mounting jigs or workpiece.							
Over travel stop function	The hard limit mode can control the rotary range of rotary table.							
	Inputted point : 1 point			Inputted point : 2 points				
Pitch error compensation	Pitch error can be compensated per 15°. (Min. set unit : 0.001°)							
Backlash compensation	The backlash compensation of rotary table can be set. (Min. set unit : 0.001°)							
Alarm function	When error is detected, alarm No. and alarm message are automatically displayed.							
Self-diagnosis function	Machine coordinate, work coordinate (command value, encoder value), remained movement, I/O signal state, position deviation, current %, encoder electric angle							
Input power	Single-phase AC200/230V±10% 50/60Hz (Only iHP : 3 phases, AC200/230V±10% 50/60Hz)							
Apparent power	1.0KVA		0.6KVA	1.0KVA	0.6KVA	4.3KVA	2.0KVA	1.6KVA
Weight	7.5kg			14kg		27kg	24kg	
Environment	Working temperature : 0～45℃ Storage temperature (transportation temp.) : -10℃～60℃ Humidity: 85%RH or less (dew condensation, freezing not to be found.) Vibration proof: 0.5G or less Shock resistant: 1G or less							
				Ambient atmosphere : to pollution level 2				
Display	LCD 20 characters x 2 lines							
Attached cables	・Rotary table～controller Polyamide flexible cable ・・ 5m ・Power cable ・・・・・・・・・・・・ 5m ・External interlock cable ・・ 5m			・Rotary table～controller Polyamide flexible cable with metal blade ・・ 5m ・Power cable ・・・・・・・・・・・・ 5m ・External interlock cable ・・ 5m			・Rotary table～controller Two polyamide flexible cables with metal blade・5m ・Power cable ・・・・・・・・・・・・ 5m ・External interlock cable ・・ 5m	
External input signal	START, STOP External EMG STOP, external channel selection			START, STOP, RESET External EMG STOP, external channel selection external ZRN, AUTO/MANU mode change			START, STOP, RESET External EMG STOP, external channel selection external ZRN (A-axis / B-axis) AUTO / MANU mode change	
External output signal	Block completed, 360° comp., optional completed signal, MZRN completed, EMG STOP output signal, alarm output signal (A-contact, B-contact)			Block completed, 360° comp., optional completed signal, MZRN completed, EMG STOP output signal, alarm output signal (A-contact, B-contact), channel No. output			【Common output】 Block completed, EMG STOP output signal, channel No. output, alarm output signal (A-contact, B-contact), 【A/B each axis output】 360° comp., optional completed signal, MZRN completed	
RS232C Interface	External equipment can input and output programs, parameters, etc. Interface is also used for the remote control function.							

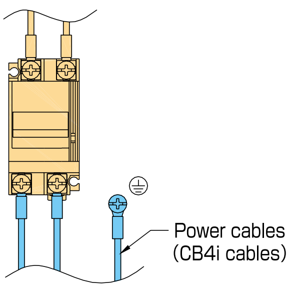
Note) Minimum federate is at $0.03min^{-1}$.

NC ROTARY TABLE MAC mini i Series MAC mini i･MAC mini iH･MAC mini iH2

Connection



■ Power Supply



Supply power to controller.
Customer shall prepare exclusive circuit breaker.
Specifications of circuit breaker are as follows:

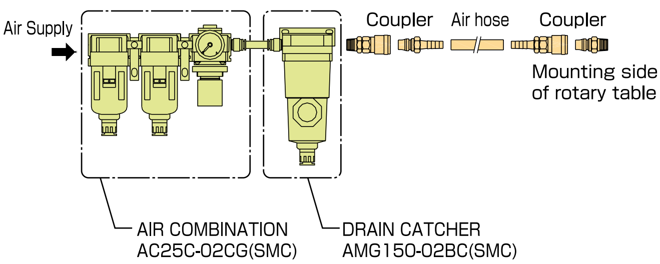
Type	Capacity
MAC mini iF / iHF / iDM	5A
MAC mini i / iH	10A
MAC mini iH2 / iHT	15A
MAC mini iHP	30A

Connect an earth wire of Class D (Class No. 3).
Moreover, when the earth leakage breaker is used, it is recommended to use the breaker for which sensitivity current is 100mA or more, an operation time is 0.1 second or more, or a high frequency measure is taken in order to prevent the motor from the malfunction caused by a motor's high frequency.

■ Connection for external interlock

When the rotary table is interlocked with the external equipment, it is controlled with M signals from the external equipment.
The external equipment must be equipped with the connection (terminal board) for M-signal OUTPUT, M-signal completed INPUT, etc., by machine maker.

■ Air Supply

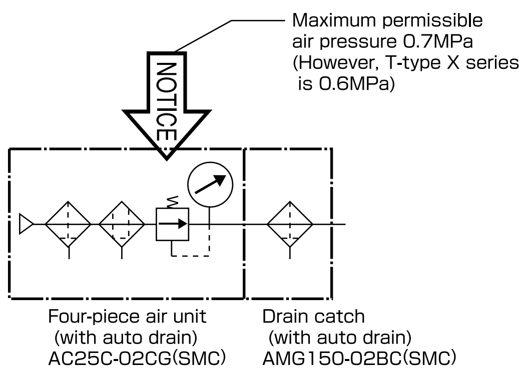


The rotary table is clamped by air.
Therefore, please prepare the following components.

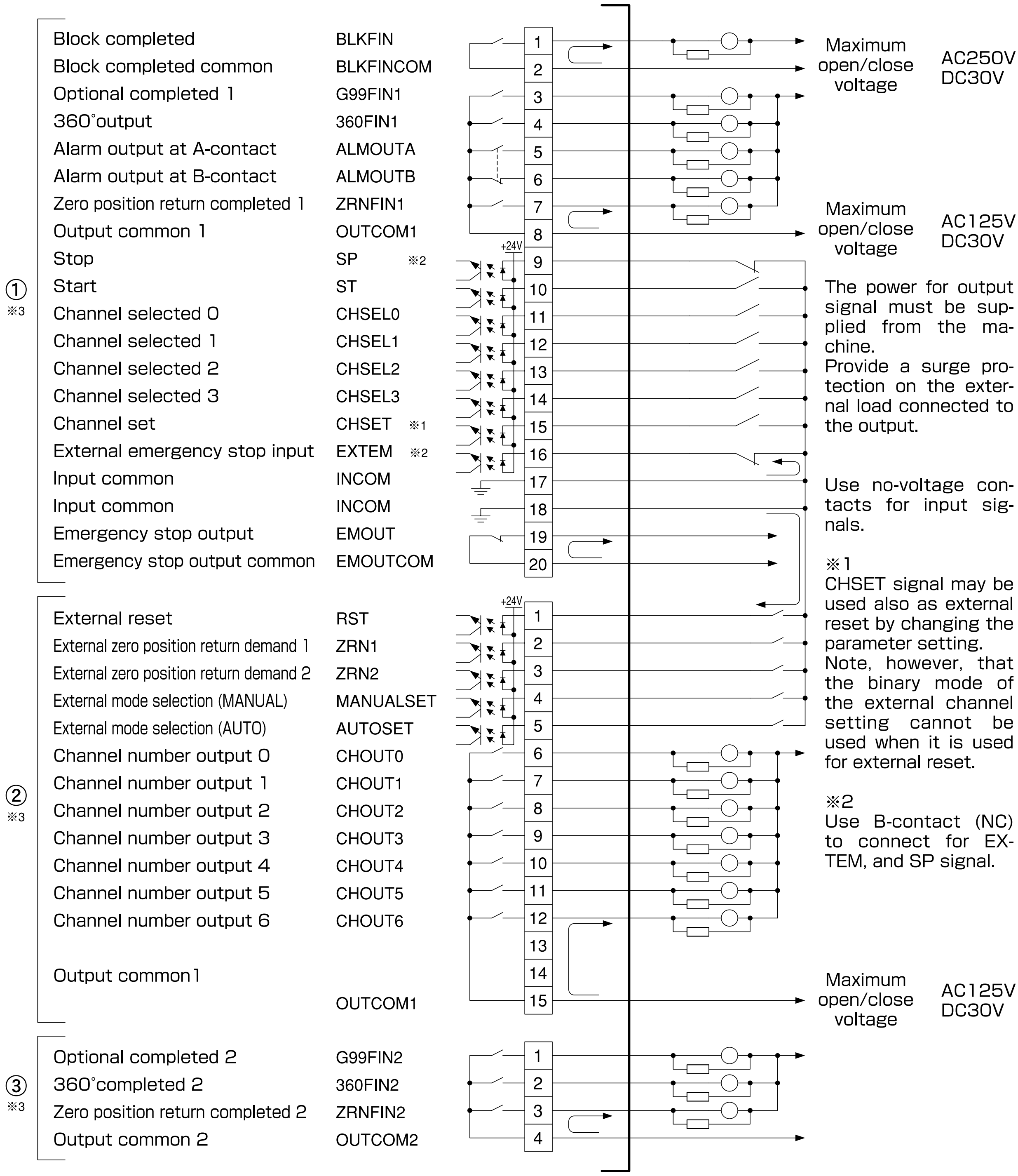
- Air combination
- Drain unit
- Air hoses or air tubes (incombustibility)
- Couplers for connection

※Air-Unit should have the specification with Auto drain port

■ Air Diagram



Mutual Connection Diagram



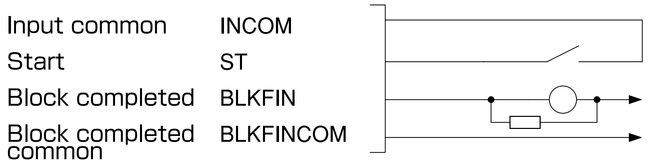
※3
MAC mini i series may have different I/O signals depending on the machine types.

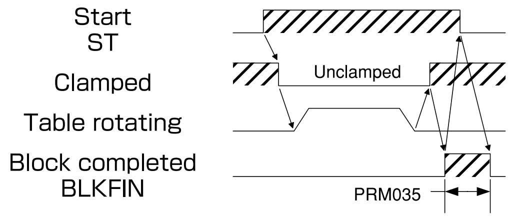
	I/O Signal Configurations ①	②	③
MAC mini i / iF / iDM	○	—	—
MAC mini iH / iHF / iHP	○	○	—
MAC mini iHT / iH2	○	○	○

Extension not available for configurations marked with "—".

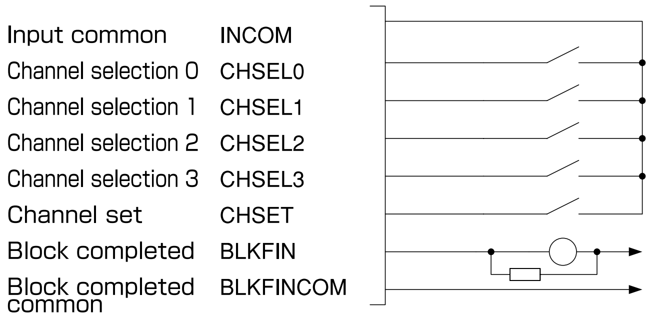
Machine Connection Diagram

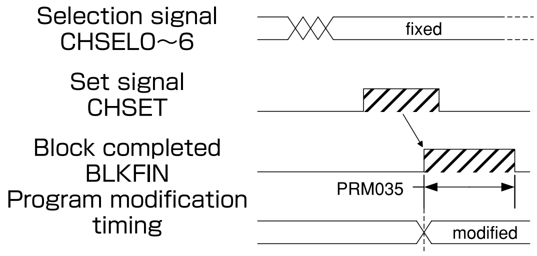
■ M-Signal Interlock





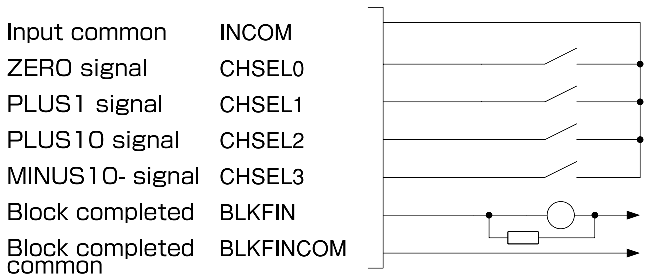
■ External Program Selection:Binary Mode

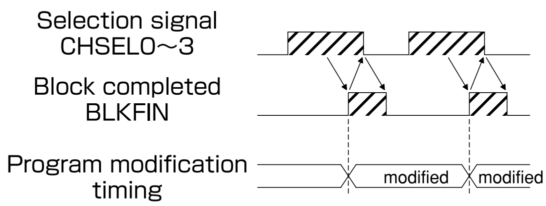




※The channels available on binary mode are CH00 through CH15.

■ External Program Selection:M-signal Mode



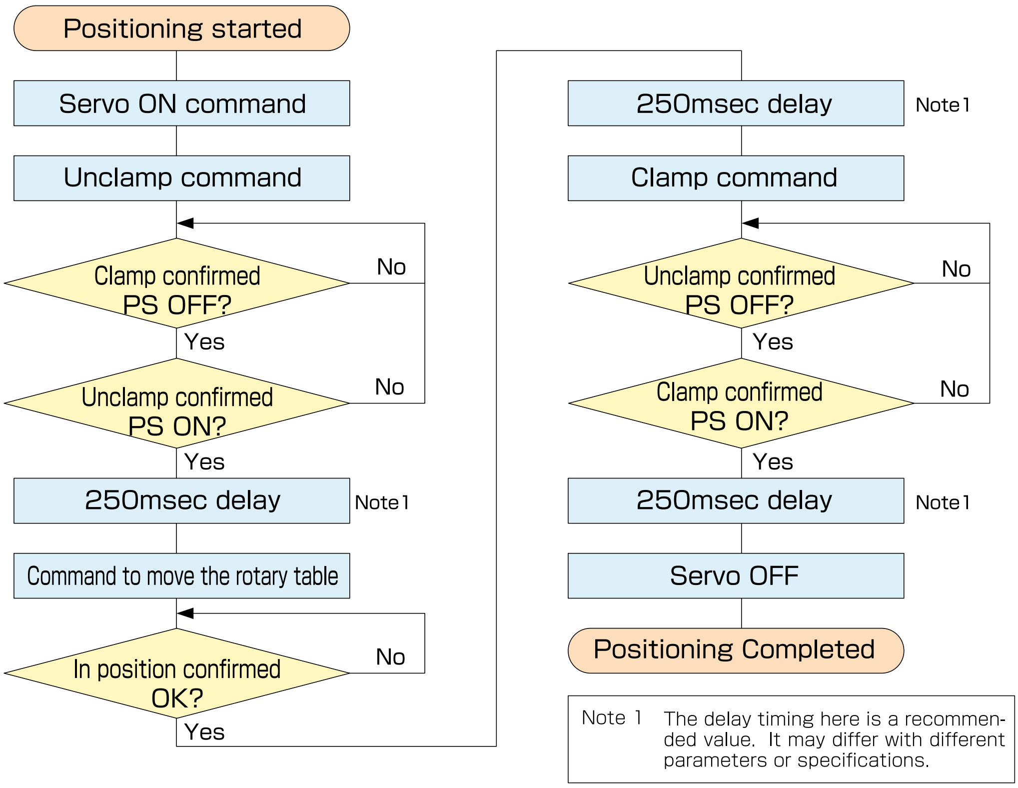


※The channels available on M-signal mode are CH00 through CH89.
For CH16 and later, extension channel setting is required.

■ Control Flow-Chart

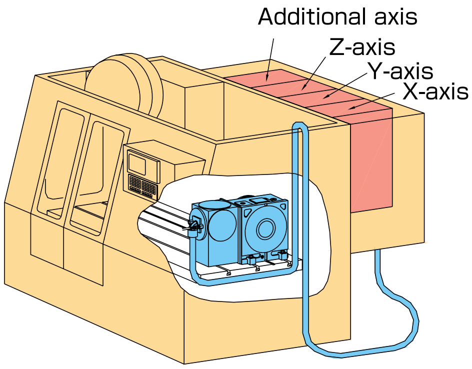
It is in principle recommended for Kitagawa's NC rotary table control to turn the servo OFF while clamping.

Semi-／Full-Closed Loop



■ Methods for Controlling NC Rotary Table

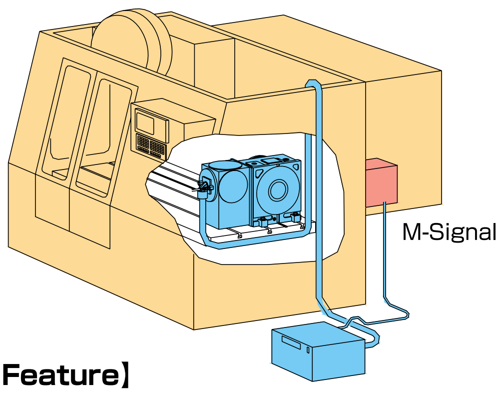
Additional-Axis Method



【Feature】

◆NC Rotary Table is controlled as the NC Axis of the machine.
◆Interpolation machining is possible with X- , Y- and Z-axis of the machine.
◆Program can be controlled on the machine.

M-Signal Method



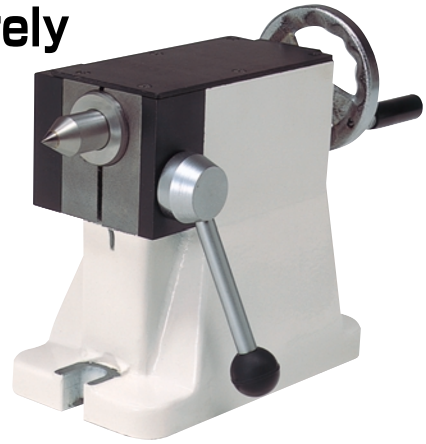
【Feature】

◆NC Rotary Table is controlled by a separate controller, and not as the NC Axis of the machine.
◆NC Rotary Table can be fitted with machine with no compatibility for an additional axis, as long as M-signal is available.
◆NC Rotary Table can easily be transferred to another machine.

Tailstock Manual

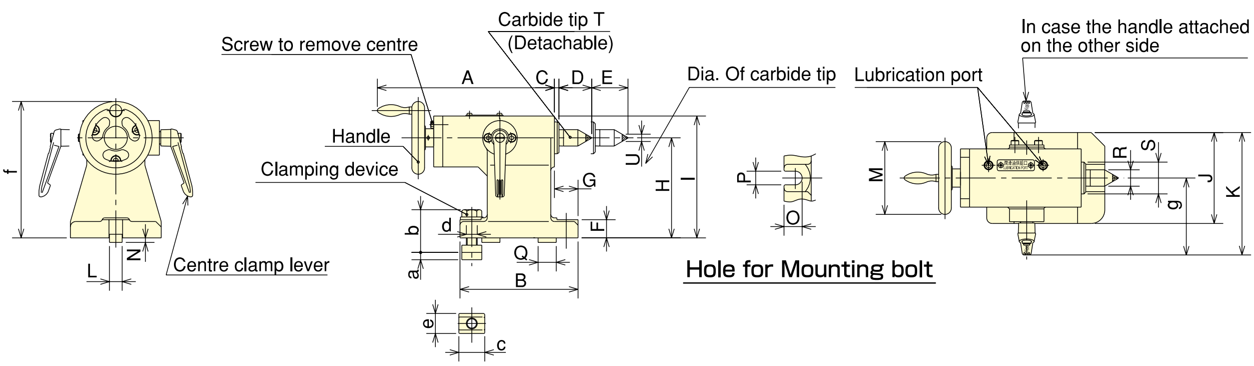
Supports long work pieces securely

- Clamp handle can be installed on left or right side
- Notch type hard wheel

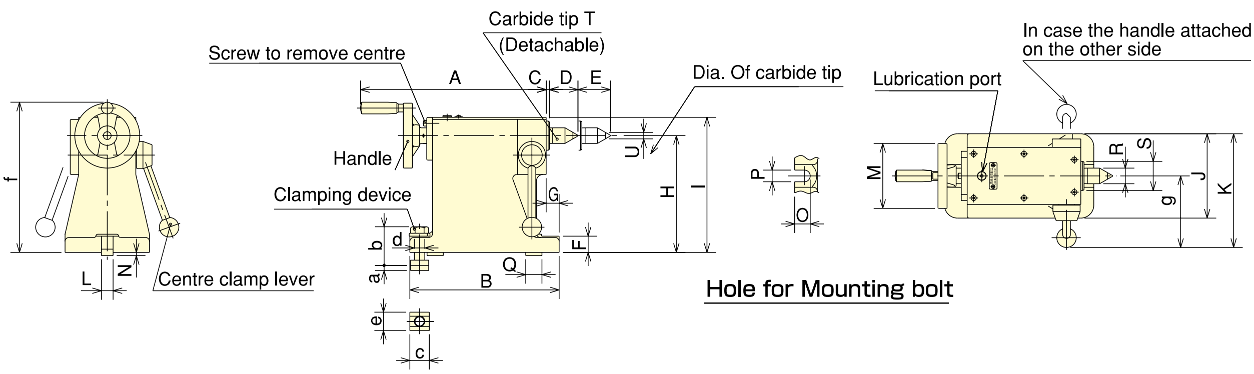


Dimensions

RS100/MR120/MR160 Dimensions



MR/TS Dimensions



Dimensions

Model \ Dimensions	A	B	C	D	E Max.	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	a	b	c	d	e	f	g	Mass of product(kg)
RS100RN	195	130	5	36	40	20	26	110	134	100	135	14h 7	80	5	20	15	20	ϕ18	ϕ35	MT-2	ϕ8	8.6	47	28.5	M12	22	150	85	8
MR120RN	185	130	5	36	30	20	26	120	144	100	135	14h7	80	5	20	15	20	ϕ18	ϕ35	MT-2	ϕ8	8.6	47	28.5	M12	22	160	85	9
MR160RN	185	140	5	36	30	25	31	140	164	120	145	18h7	80	5	24.5	19	25	ϕ18	ϕ35	MT-2	ϕ8	11	58	30	M16	28.5	180	85	10
TS160RN	286	220	5	44	50	20	15	120	149.5	110	160	18h7	100	5	22	19	25	ϕ24.1	ϕ45	MT-3	ϕ10	11	54.5	30	M16	28.5	170	105	12
MR200RN TS200RN	286	230	5	44	50	25	20	140	169.5	120	163	18h7	100	5	24.5	19	25	ϕ24.1	ϕ45	MT-3	ϕ10	11	59.5	30	M16	28.5	190	103	16
MR250RN TS250RN	286	230	5	44	50	25	20	180	209.5	130	176	18h7	100	5	24.5	19	25	ϕ24.1	ϕ45	MT-3	ϕ10	11	59.5	30	M16	28.5	230	111	20
MR320RN TS320RN	286	230	5	44	50	25	20	225	254.5	150	186	18h7	100	5	24.5	19	25	ϕ24.1	ϕ45	MT-3	ϕ10	11	59.5	30	M16	28.5	275	111	24
TS400RN	414	320	3	52.4	70	35	17	255	305	210	261	18h7	140	5	28.5	19	25	ϕ31.6	ϕ65	MT-4	ϕ14	11	69.5	30	M16	28.5	325	156	67
TS500RN	414	320	3	52.4	70	35	17	310	360	210	261	18h7	140	5	28.5	19	25	ϕ31.6	ϕ65	MT-4	ϕ14	11	69.5	30	M16	28.5	380	156	80
TS630RN	461	330	5	70	80	40	15	400	450	260	317	18h7	160	5	32.5	19	25	ϕ44.7	ϕ80	MT-5	ϕ18	11	77.5	30	M20	28.5	480	187	100

NC ROTARY TABLE

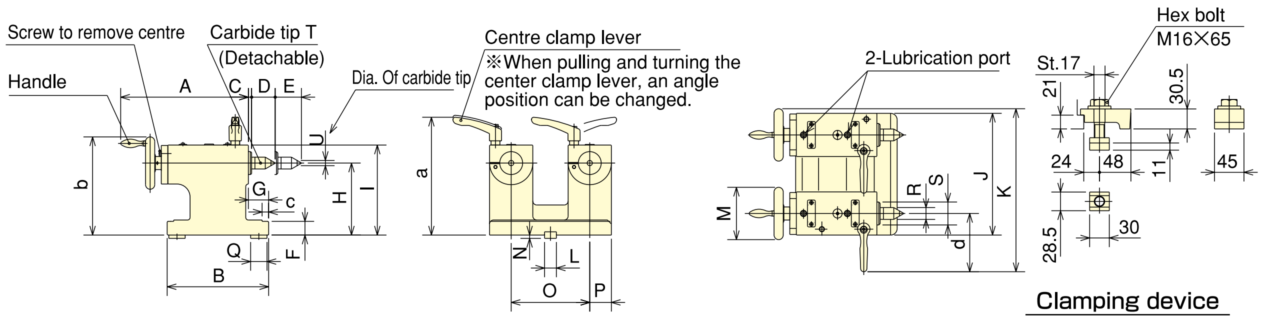
Tailstock Manual (Multi spindles)

Supports long work pieces securely

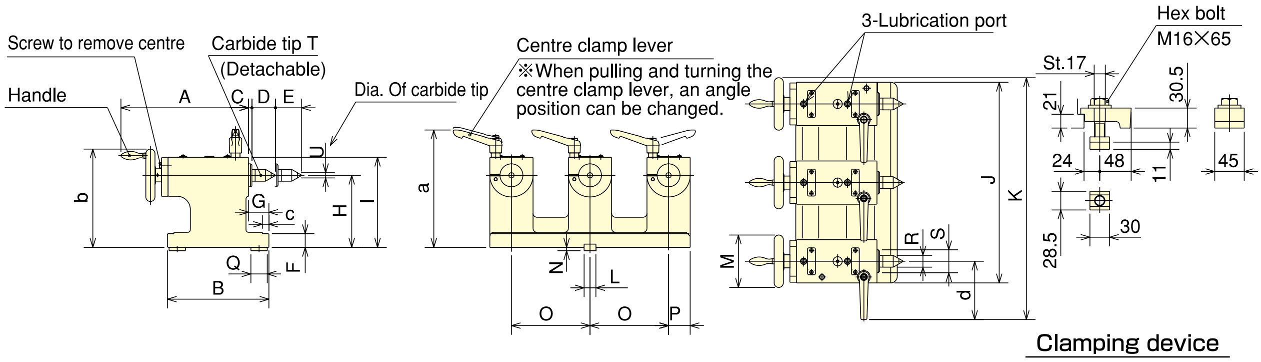
●Clamp handle can be installed on left or right side
●Notch type hard wheel

■Dimensions

TS2100/TS2160 Dimensions



TS3100/TS3160 Dimensions



■ Multi Spindles Dimensions

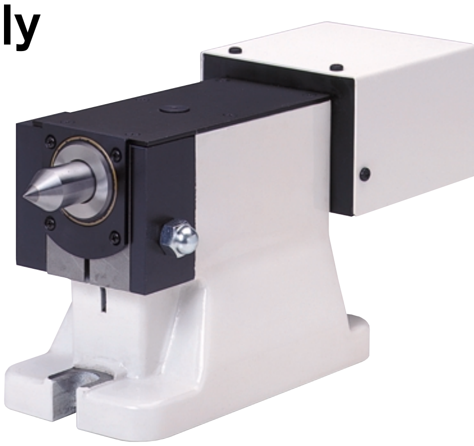
Model \ Dimensions	A	B	C	D	E Max.	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	a	b	c	d	Mass of product(kg)
TS2100RN	195	155	5	36	40	21	31	110	138	186	249	18h7	80	5	120	33	25	ϕ18	ϕ35	MT-2	ϕ8	180	150	10	89	17
TS2160RN	195	155	5	36	40	21	31	140	168	266	329	18h7	80	5	200	33	25	ϕ18	ϕ35	MT-2	ϕ8	210	180	10	89	20
TS3100RN	195	155	5	36	40	21	31	110	138	306	369	18h7	80	5	120	33	25	ϕ18	ϕ35	MT-2	ϕ8	180	150	10	89	32
TS3160RN	195	155	5	36	40	21	31	140	168	466	529	18h7	80	5	200	33	25	ϕ18	ϕ35	MT-2	ϕ8	210	180	10	89	39

Tailstock

Pneumatic/Hydraulic
Parts correcponding to order received

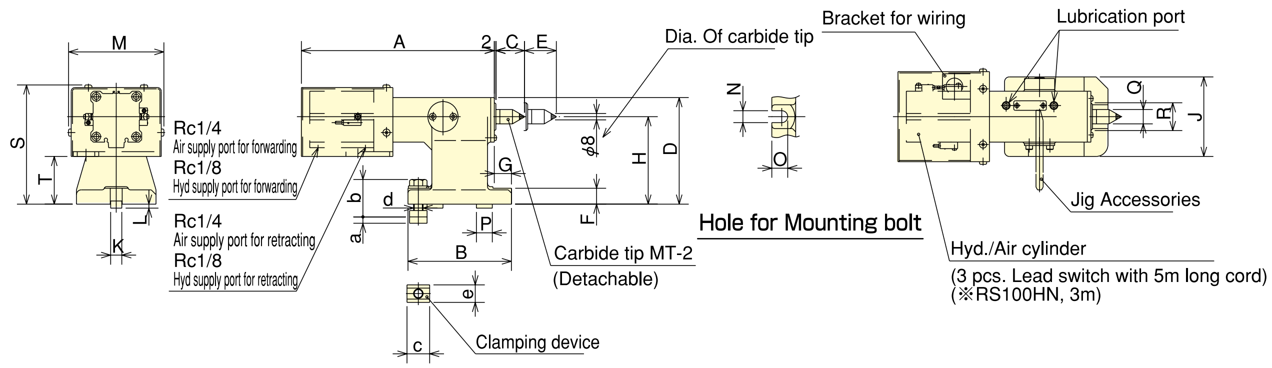
Supporting a Long Work Securely

- ●Stroke confirmation on cylinder
- ●Removable carbide centre
- ●Easily exchangeable quil-type centre
- ●Equipped with a proximity switch for position confirmation

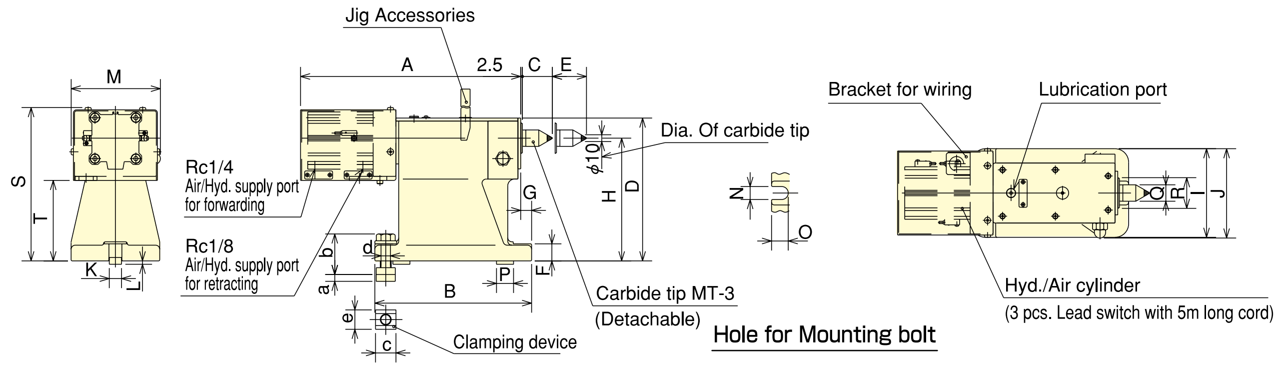


■Dimensions

RS100/MR120/MR160 Dimensions



MR/TS Dimensions



■Dimensions

Model \ Dimensions	A	B	C	D	E Max.	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	a	b	c	d	e	Center thrust [Pneu.] (kN)	Center thrust [Hyd.] (kN)	Mass of product(kg)
RS100A(H)N	256	130	36	134	40	20	21.5	110	-	100	14h7	5	120	15	20	20	ϕ18	ϕ35	150	60	8.6	47	28.5	M12	22	0.98(100)		10
MR120A(H)N	236	130	36	144	30	20	21.5	120	-	100	14h7	5	120	15	20	20	ϕ18	ϕ35	160	70	8.6	47	28.5	M12	22	0.98(100)		11
MR160A(H)N	236	140	36	164	30	25	26.5	140	-	120	18h7	5	120	19	24.5	25	ϕ18	ϕ35	180	90	11	58	30	M16	28.5	0.98(100)	1.71(174)	12
TS160A(H)N	323	220	44	149.5	50	20	11	120	110	123	18h7	5	130	19	22.5	25	ϕ24.1	ϕ45	165	58	11	54.5	30	M16	28.5	1.55(158)	2.8 (286)	16
TS200A(H)N	323	230	44	169.5	50	25	16	140	120	126	18h7	5	130	19	24.5	25	ϕ24.1	ϕ45	185	78	11	59.5	30	M16	28.5	1.55(158)	2.8 (286)	20
MR250A(H)N TS250A(H)N	323	230	44	209.5	50	25	16	180	130	131	18h7	5	130	19	24.5	25	ϕ24.1	ϕ45	225	118	11	59.5	30	M16	28.5	1.55(158)	2.8 (286)	24
MR320A(H)N TS320A(H)N	323	230	44	254.5	50	25	16	225	150	-	18h7	5	130	19	24.5	25	ϕ24.1	ϕ45	270	163	11	59.5	30	M16	28.5	1.55(158)	2.8 (286)	28

※The centre thrust force values shown are at 0.5 MPa (5kgf/cm^2) for pneumatic force, or 3.5 MPa (35kgf/cm^2) for hydraulic force.

NC ROTARY TABLE

Tailstock

Pneumatic/Hydraulic (Multi spindles)
Parts correcponding to order received

Parts correcponding to order received

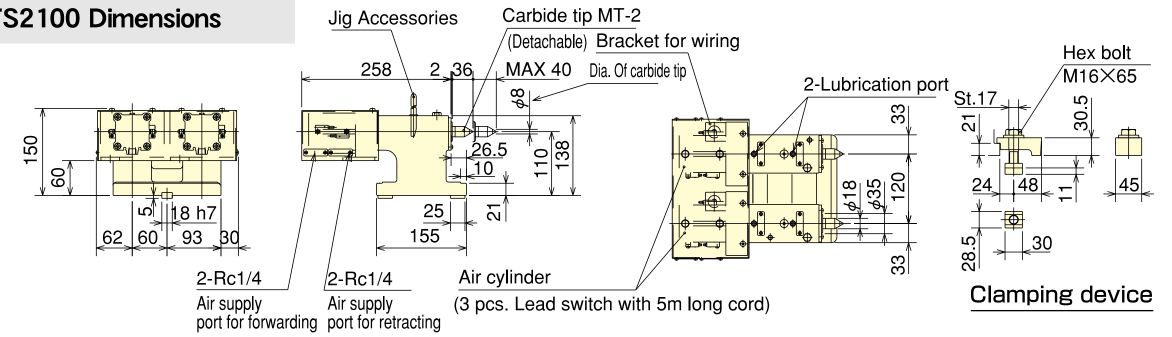
TS

Supporting a Long Work Securely

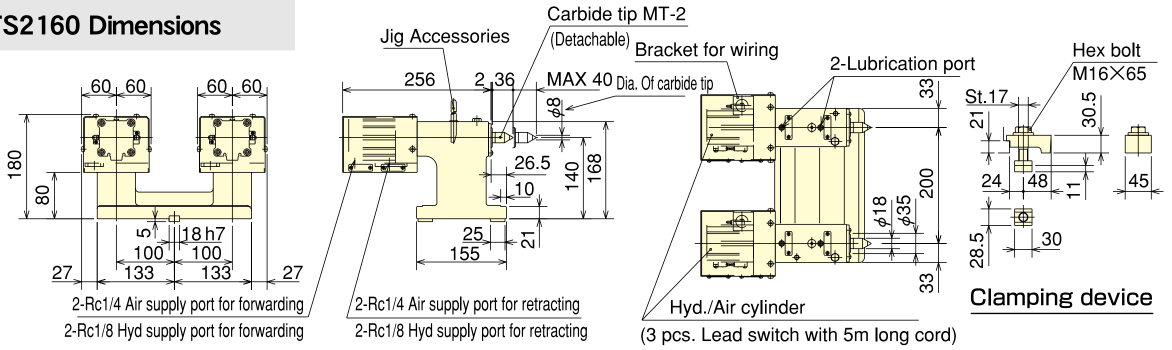
- ●Stroke confirmation on cylinder
- ●Removable carbide centre
- ●Easily exchangeable quil-type centre
- ●Equipped with a proximity switch for position confirmation

■Dimensions

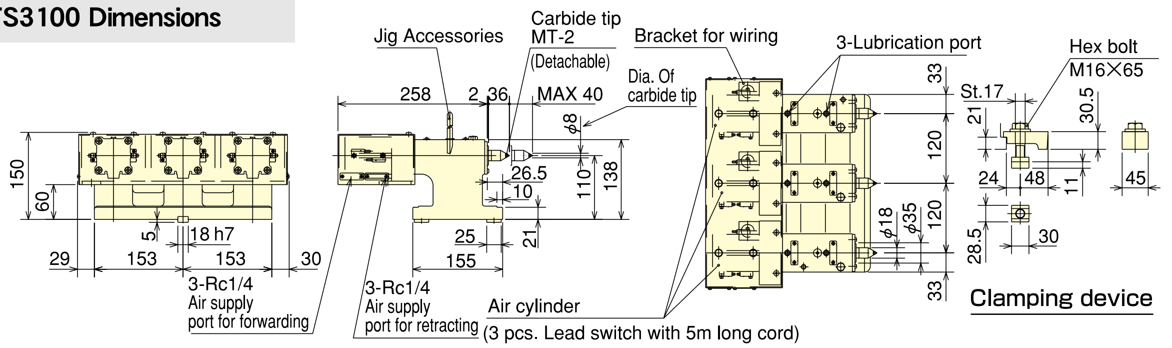
TS2100 Dimensions



TS2160 Dimensions



TS3100 Dimensions



■ Multi Spindles Dimensions

Model / Dimensions	Centre trust [Pneu] (kN)	Centre trust [Hyd.] (kN)	Mass product (kg)
TS2100AN	0.98	-	22
TS2160A(H)N	0.98	1.71	25
TS2100AN	0.98	-	32

NC ROTARY TABLE

Tail Spindle TSR SERIES

TSR121A・TSR142A・TSR180A(H)
TSR110Z-01・TSR120Z-01
TSR140Z-01・TSR180Z-01

TSR

Support for index machining of large work and trunnion assemblies

- ●Clamping mechanism spec
  (Heavy duty tailstock with Disk clamping)
- ●Non clamping mechanism spec
- ●Suitable for supporting many types of jig

TSR180A

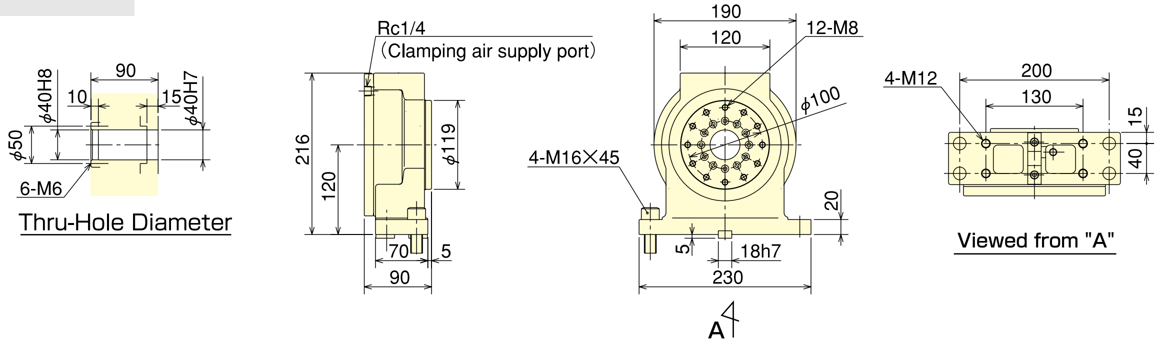
■Specifications [clamping mechanism specification]

Model	Centre height (mm)	Spindle hole (mm)	Clamping torque N・m Air pressure 0.5MPa	Clamping torque N・m Hyd.pressure 3.5MPa	Mass of product (Kg)
TSR121A	120	ϕ40	310	—	18
TSR142A	140	ϕ40	450	—	21
TSR180A(H)	180	ϕ70	125	900	53

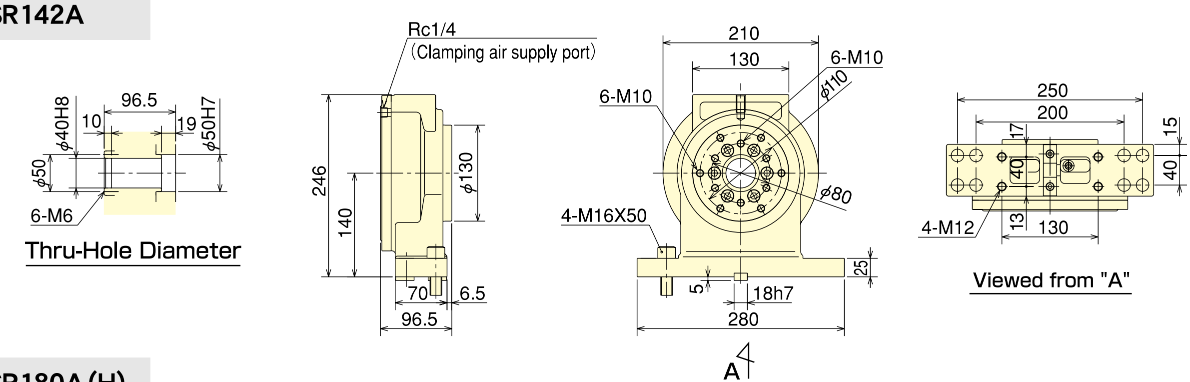
Note) Neither Pressure Switch, clamp and unclamp, not Solenoid Valve are attached.

■Dimensions [clamping mechanism specification]

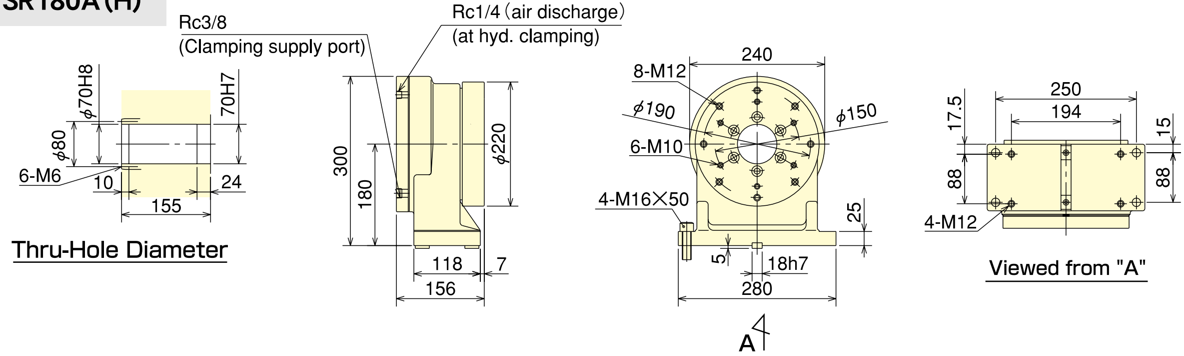
TSR121A



TSR142A



TSR180A(H)

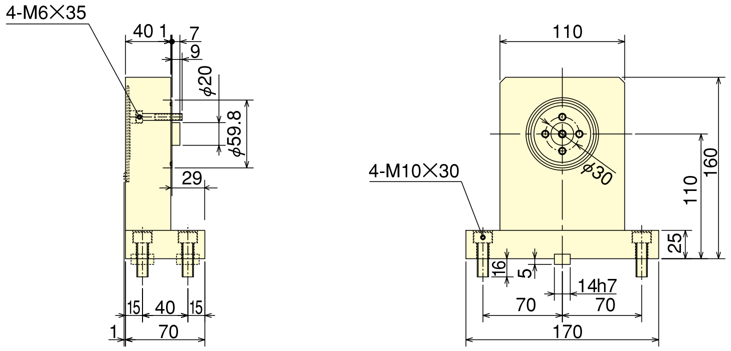


■Specifications [no clamping mechanism specification]

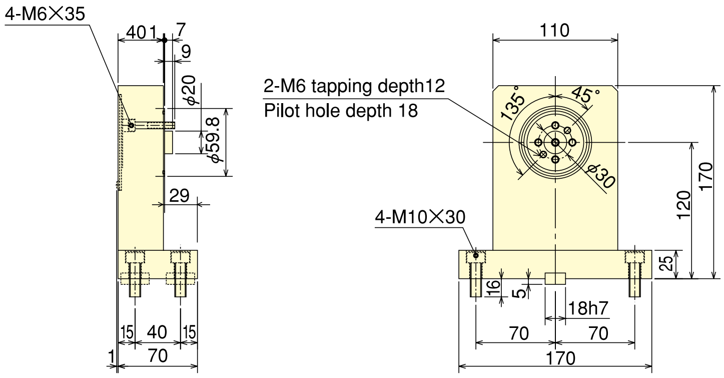
Model	Centre height (mm)	Mass of product (Kg)
TSR110Z-01	110	7.0
TSR120Z-01	120	7.3
TSR140Z-01	140	8.0
TSR180Z-01	180	9.4

■Dimensions [no clamping mechanism specification]

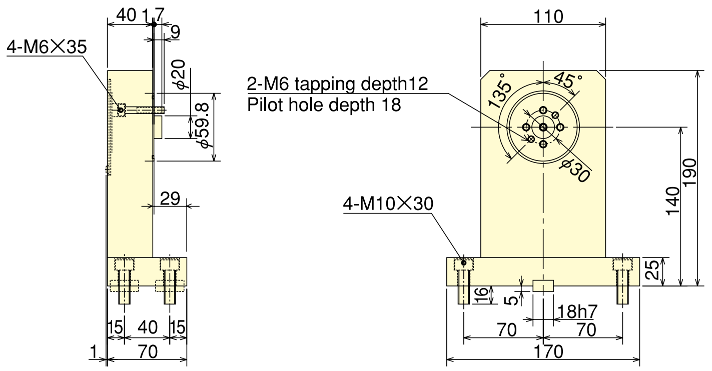
TSR110Z-01



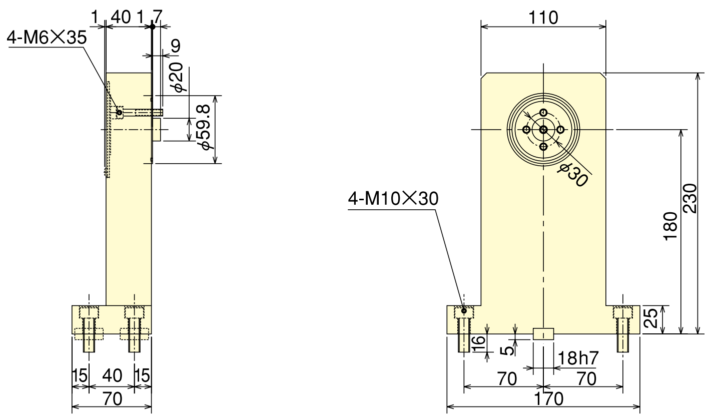
TSR120Z-01



TSR140Z-01



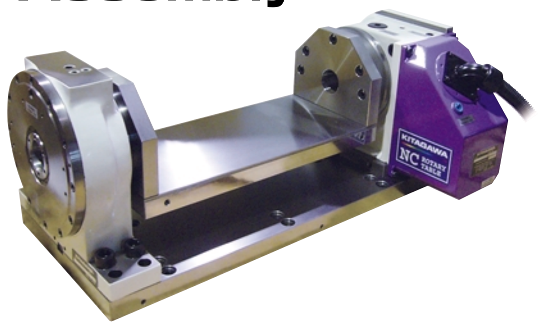
TSR180Z-01



Trunnion assembly
TJ series TJ16M38E・TJ16M38C

Quick delivery; NC Rotary Table, Tail Spindle and Trunnion Assembly

- Allows greater flexibility to meet specific customer requirements
  Simultaneous machining of multiple work pieces
- Multifaceted machining possible: Excellent rigidity

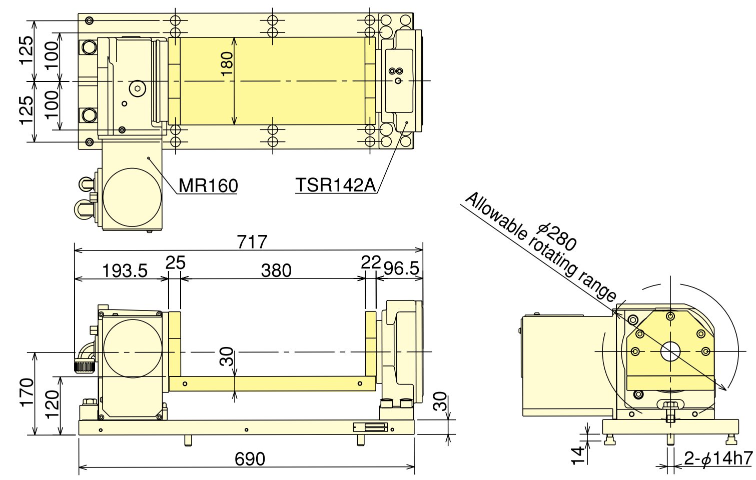


■ Specifications

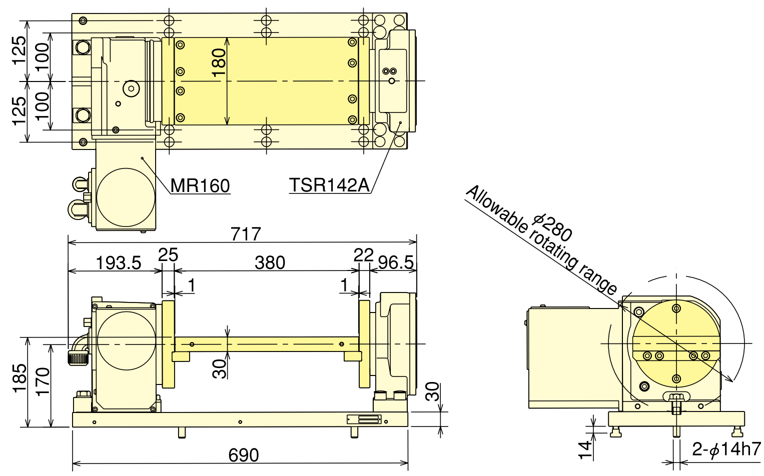
	Item / Model		TJ16M38E	TJ16M38C
1	Plate length	(mm)	380	380
2	Plate width	(mm)	180	180
3	Plate height above the datum plane	(mm)	120	185
4	Allowable rotating radius	(mm)	ϕ280	ϕ280
5	Allowable load	(kg)	80	40 on one side (80 in total)
6	Mass of product	(kg)	133	135

■ Dimensions

TJ16M38E／Offset Type

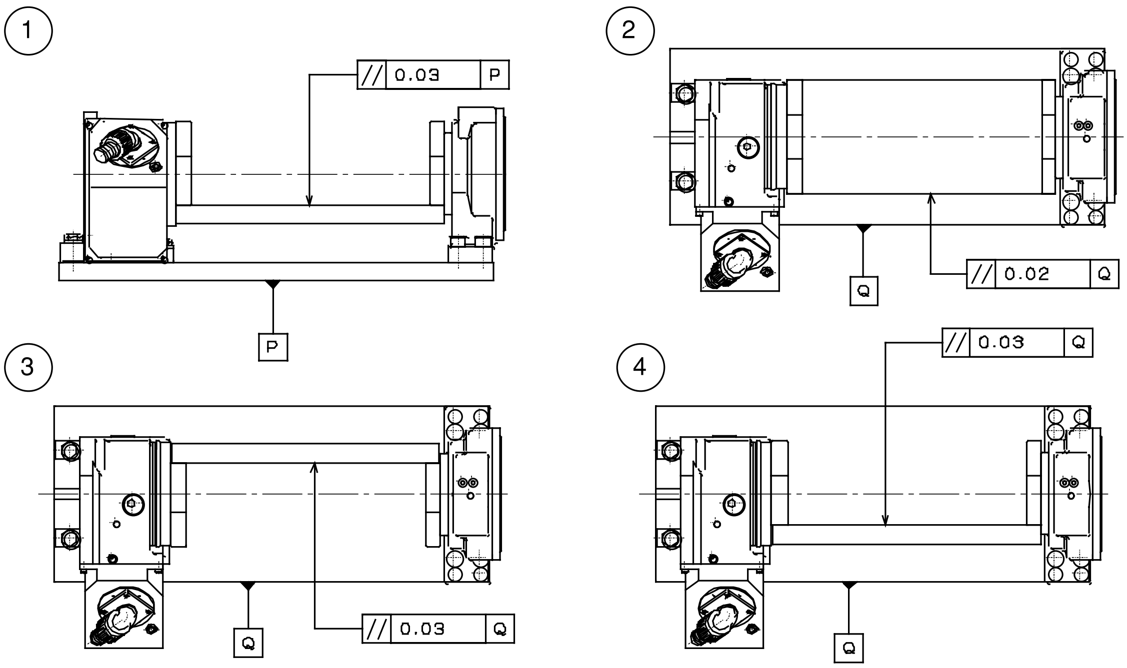


TJ16M38C／Centre Type

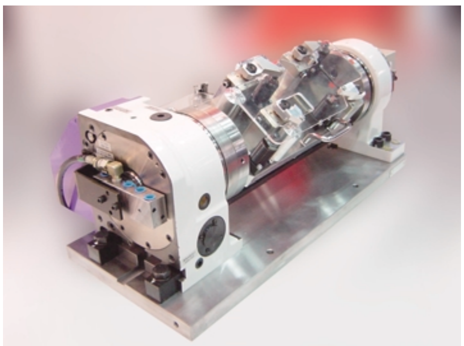


■ DATA accuracy specification

	Inspection Item	Allowance
1	Plate upper face parallelism to the mounting datum plane P	0.03 mm
2	Plate upper face parallelism to the mounting datum plane Q	0.02 mm
3	Plate upper face parallelism to the plate datum plane Q (at 90°rotation)	0.03 mm
4	Plate upper face parallelism to the plate datum plane Q (at 270°rotation)	0.03 mm



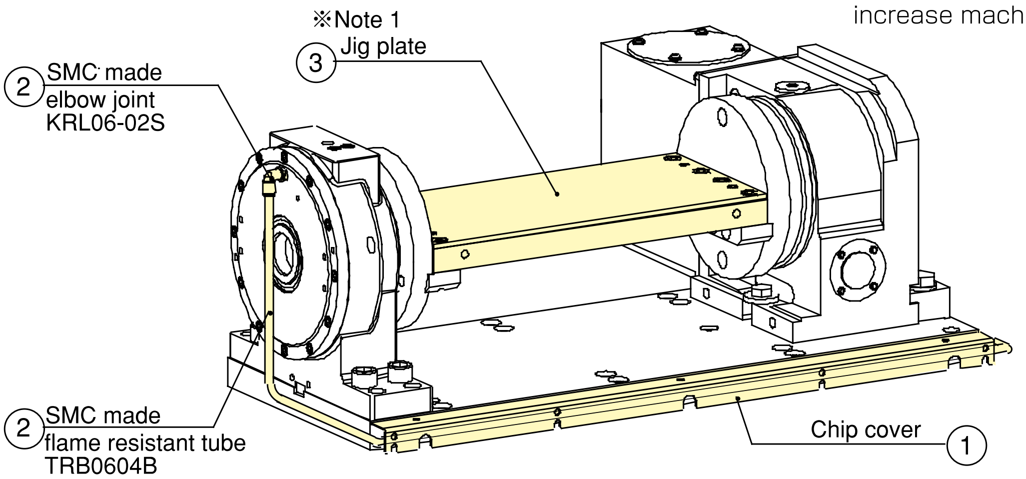
Sample Application



▲Trunnion Assembly can be made to customers specific requirements to increase machining flexibility.

■TJ Options

Following optional parts are available.
① Chip cover
② Flame resistant tube (with elbow joint)
③ Jig plate



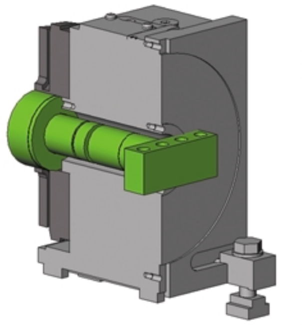
Note) 1.Accuracy adjustment must be done by the user after fitting any additional jig plate.
2.Consult for any special parts or additional processing beside options.

Rotary Joint
RJ

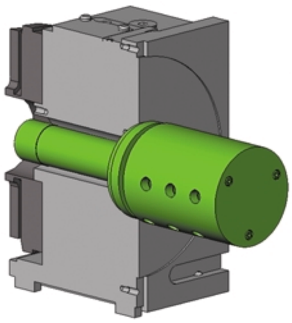
●Built in rotary joint reduces supply block projection
●External rotary joint allows many ports
●Provides air or hydraulic pressure from the rear of the table to a fixture

■Applicable machine type and the specifications

Model	Size	Maximum number of ports		Rated input pressure (MPa)	
		Built-in type	External type	Hydraulic	Air-Hydraulic
MR	120	3	4	7	0.7
	160	4(+1)	6		
	200	4(+1)	6		
	250	6	8		
	320	6	8		
TMX	160	4(+1)	6		
	200	4(+1)	6		
	250	6	8		
TUX	200	4(+1)	6		
	250	6	8		
	320	6	8		
TRX	320	6	10		
TSR	121	4(+1)	6		
	142	4(+1)	6		
	180	6	8		



Built-in rotary joint



External rotary joint

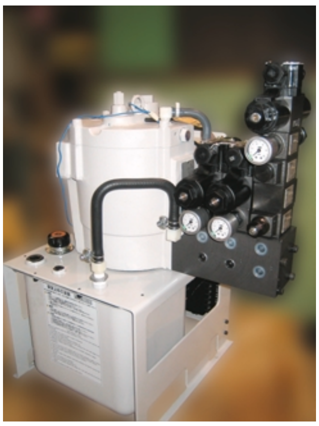
(+1)port is exclusive for pneumatic pressure.
Note) Not fitted for RSM100, TC, DM, or TBX160.
For tables of TBX 200 size or more and 400 size or more, confer with Kitagawa separately.

■Hydraulic pump unit

〔specifications〕
・Service pressure:3.4MPa($35kgf/cm^2$)
・Adjustable pressure range:1.5~6.9MPa($15\sim70kgf/cm^2$)
・Power source:AC3ϕ　200/220V　50/60Hz

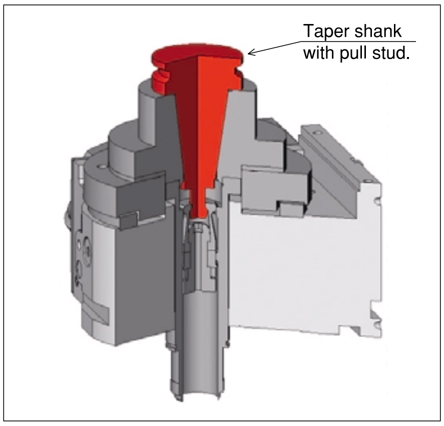
HUP 0 7 3 - D ＊＊

Type
Number of blocks
Tank capacity
07:7ℓ
10:10ℓ
Solenoid voltage
D:DC
A:AC
Serial number



■Pull-stud type

Pull studs can be used to position and fix jigs or work pieces easily.

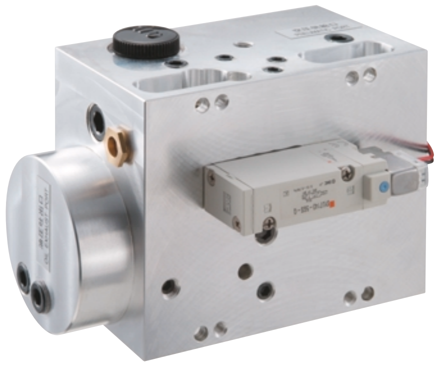


NC ROTARY TABLE

Air Hydraulic Booster

AB series AB10T･AB25T･AB50T

●External mounted Air-Hydraulic Booster
●A unit changing air pressure to hydraulic pressure
●High clamping force is produced using a standard air supply



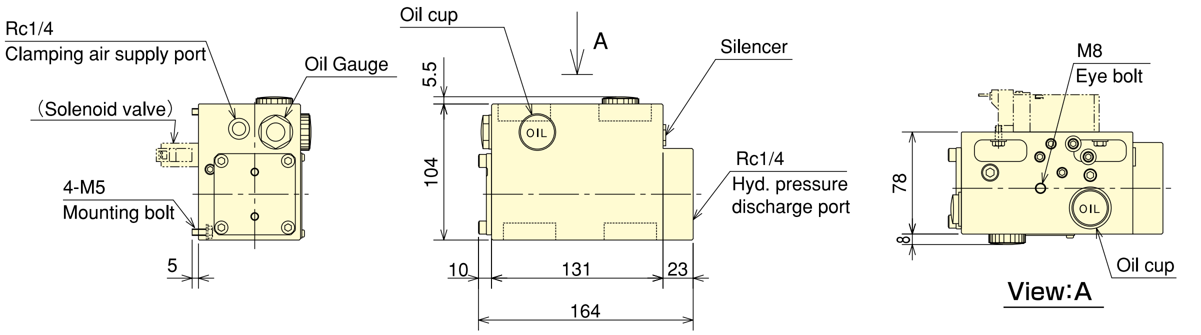
■ Specifications

Model \ specifications	Air pressure MPa	Multiplication ratio	Hydraulic pressure (theoretically boosted) MPa	Recommended oil	Mass of product	Applicable unit	
AB10T	0.4～0.5	1:7.5	3～3.75	Turbin oil ♯32	Approx. 3 kg	―	
AB25T		1:8	3.2～4.0		Approx. 5 kg	TT	251、321
AB50T					Approx. 6 kg	TR/TU	400、500、630

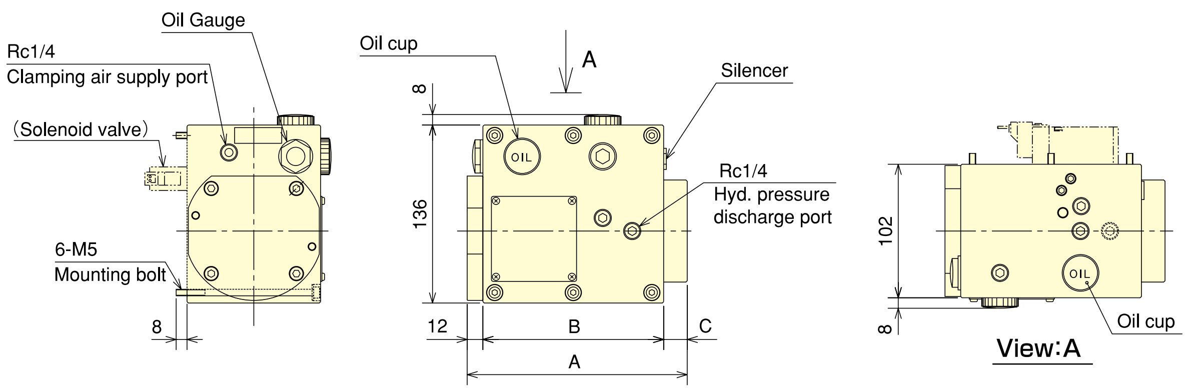
Note) Oil cap and oil gauge can be changed by mounting status of NC rotary table.

■ Dimensions

AB10T



AB25T/50T



※Solenoid is not included. Consult to arranged solenoid appropriate to each specification.

■ Dimensions

Model \ Dimensions	A	B	C
AB25T	168	138	18
AB50T	251	169	70

CHUCK

Scroll Chuck
SC・JN

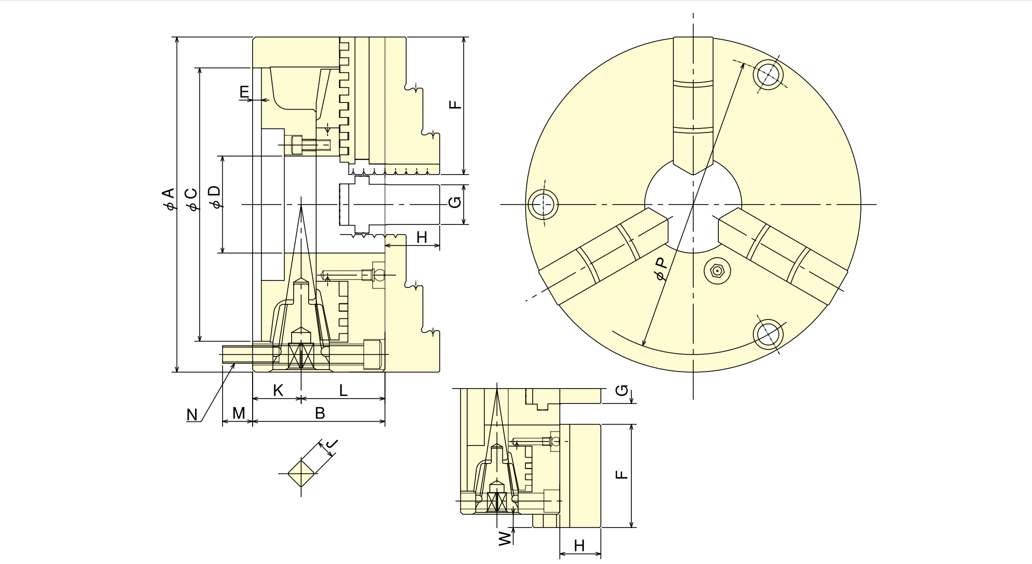
Only Kitagawa can offer a complete NC Rotary Table and workholding solution

●Integrated-gripper type

●Steel Body

Steel body is used for increased rigidity and improved durability allowing for high speed operation. (SC body of cast iron, JN body of steel)

■Dimensions



■Dimensions

Values in (parentheses) are with split jaws.

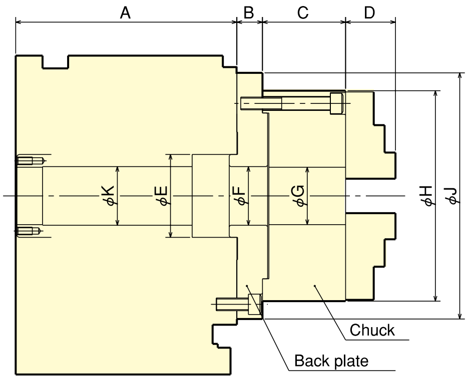
Model		A	B	C (H6)	D	E	F	G	H	J	K	L	M	N	P	W max.	W min.
SC-3-106		85	45	60	16	3.5	35	11	15	7	17	28	12	3-M 6	71	1.5	- 7
SC-4-105	SC-4F-112	110	58	80	24	4.5	42	14	18	8	24.5	33.5	11	3-M 8	93	2.5	-12
SC-5-107	SC-5F-113	130	60	100	32	4.5	50	16	20	8	22.5	37.5	13.6	3-M 8	113	3.5	-14.5
JN06-101	(JN06T102)	165	65	130	45	5	66	20.5	27 (39)	10	24	41	17	3-M10	145		
JN07-101	(JN07T102)	190	75	155	55	5	78	22.5	31 (42)	11	27.5	47.5	17	3-M10	170		
JN09-101	(JN09T102)	232	84	190	70	6	88	26.5	33 (50)	12	29.5	54.5	19	3-M12	208		
JN10-101	(JN10T102)	273	86	230	85	6	98	26.5	37 (54)	12	31.5	54.5	18.5	3-M12	248		
JN12-101	(JN12T102)	310	96	260	96	7	113	30.5	44 (56)	14	31.5	64.5	18.5	3-M12	282		
SC-14-103		355	110	300	100	7	132	35	52	15	38	72	27	6-M14	328		
SC-16-113		405	120	345	110	8	146	40	58	15	43.5	76.5	27	6-M14	375		

■Specifications

Model		Max.Gripping Force (kN)	Max. rotation (min⁻¹)	Net Weight with Soft top jaw (kg)	Moment of intertia (kg・m²)	Gripping range Outer dia.φ (mm)	Gripping range Inner dia.φ (mm)	Handle torque (N・m)
SC-3-106		9	2500	1.5	0.001	2～ 70	24～ 64	29.4
SC-4-105	SC-4F-112	12	2500	3.1	0.004	3～ 95	29～ 84	44.1
SC-5-107	SC-5F-113	15	2500	4.4	0.009	3～110	33～100	63.7
JN06-101	(JN06T102)	31	4000	8.4	0.030	3～160	48～150	88.3
JN07-101	(JN07T102)	31	3500	12.2	0.060	4～180	56～170	107.9
JN09-101	(JN09T102)	37	2900	21.2	0.160	5～220	62～210	147.0
JN10-101	(JN10T102)	46	2500	28	0.253	5～260	70～250	176.5
JN12-101	(JN12T102)	55	2200	41	0.588	10～300	86～290	206.0
SC-14-103		40.5	1500	54	0.950	25～315	107～290	225.6
SC-16-113		55	1500	74	1.275	25～360	113～340	245.0

Note) 1. One set each of inner and outer jaws are supplied as standard for SC and JN. Soft jaws may not be used.
2. One set each of inner, outer and soft jaws are supplied as standard for SC-F. This type is not available larger than 6 inches.
3. When using the soft jaws on SC-F, make sure to lower specification.
4. A gripping range may be limited by a NC rotary table mounted.

■Scroll chuck fitting dimensional drawing



■Scroll chuck fitting dimensions

The values inside (parentheses) are with split jaws.

Rotary Table Model	Chuck Model		A	B	C	D	E	F	G	H	J	K
RS100	SC-3-106		140	15	45	15	50	30	16	85	105	32
	SC-4-105		140	-	58	18	50	25	24	110	-	32
MR120	SC-4-105	SC-4F-112	136	17	58	18	50	26	24	110	135	32.5
	SC-5F-107	SC-5F-113	136	-	60	20	50	34	32	130	-	32.5
	JN06-101	(JN06T102)	136	14	65	27(39)	50	34	45	165	165	32.5
MR160	SC-5F-107	SC-5F-113	145	19	60	20	50	40	32	130	165	40.5
	JN06-101	(JN06T102)	145	-	65	27(39)	50	40	45	165	-	40.5
	JN07-101	(JN07T102)	145	20	75	31(42)	50	41	55	190	190	40.5
MR200	JN06-101	(JN06T102)	173	20	65	27(39)	65	46	45	165	193	46
	JN07-101	(JN07T102)	173	-	75	31(42)	65	56	55	190	-	46
MR250	JN06-101	(JN06T102)	180	21	65	27(39)	100	46	45	165	235	71
	JN07-101	(JN07T102)	180	21	75	31(42)	100	56	55	190	236	71
	JN09-101	(JN09T102)	180	-	84	33(50)	100	71	70	232	-	71
	JN10-101	(JN10T102)	180	20	86	37(54)	100	85	85	273	273	71
	JN12-101	(JN12T102)	180	21	96	44(56)	100	90	96	310	310	71
MR320	JN09-101	(JN09T102)	210	25	84	33(50)	130	120	70	232	320	106
	JN10-101	(JN10T102)	210	25	86	37(54)	130	85	85	273	320	106
	JN12-101	(JN12T102)	210	-	96	44(56)	130	98	96	310	-	106
TMX(THX,TBX)160	JN06-101	(JN06T102)	145	-	65	27(39)	50	40	45	165	-	40
	JN07-101	(JN07T102)	145	20	75	31(42)	50	41	55	190	190	40
TMX(THX,TBX,TUX)200	JN06-101	(JN06T102)	176	20	65	27(39)	75	52	45	165	193	52
	JN07-101	(JN07T102)	176	-	75	31(42)	75	66	55	190	-	52
	JN09-101	(JN09T102)	176	15	84	33(50)	75	65	70	232	230	52
TMX(TLX,TBX,TUX)250	JN06-101	(JN06T102)	210	21	65	27(39)	105	56	45	165	236	78
	JN07-101	(JN07T102)	210	21	75	31(42)	105	56	55	190	236	78
	JN09-101	(JN09T102)	210	-	84	33(50)	105	71	70	232	-	78
	JN10-101	(JN10T102)	210	20	86	37(54)	105	95	85	273	273	78
TRX(TLX,TBX,TUX)320	JN09-101	(JN09T102)	225	-	84	33(50)	135	110	70	232	-	110.5
	JN10-101	(JN10T102)	225	-	86	37(54)	135	98	85	273	-	110.5
	JN12-101	(JN12T102)	225	-	96	44(56)	135	98	96	310	320	110.5
	SC-14-103	SC-14	225	25	110	52	135	100	100	355	355	110.5
TR(TU)400	JN10-101	(JN10T102)	250	23	86	37(54)	180	86	85	273	314	150
	JN12-101	(JN12T102)	250	-	96	44(56)	180	98	96	310	-	150
	SC-14-103	SC-14	250	-	110	52	180	100	100	355	-	150
TR(TU)500	JN12-101	(JN12T102)	250	20	96	44(56)	200	96	96	310	352	170.5
	SC-14-103	SC-14	250	-	110	52	200	150	100	355	-	170.5
TR630	JN12-101	(JN12T102)	330	27	96	44(56)	280	100	96	310	416	250
	SC-16-113	SC-16	330	36	120	58	280	260	110	405	422	250

CHUCK

WORK GRIPPER

Work Gripper
AS series

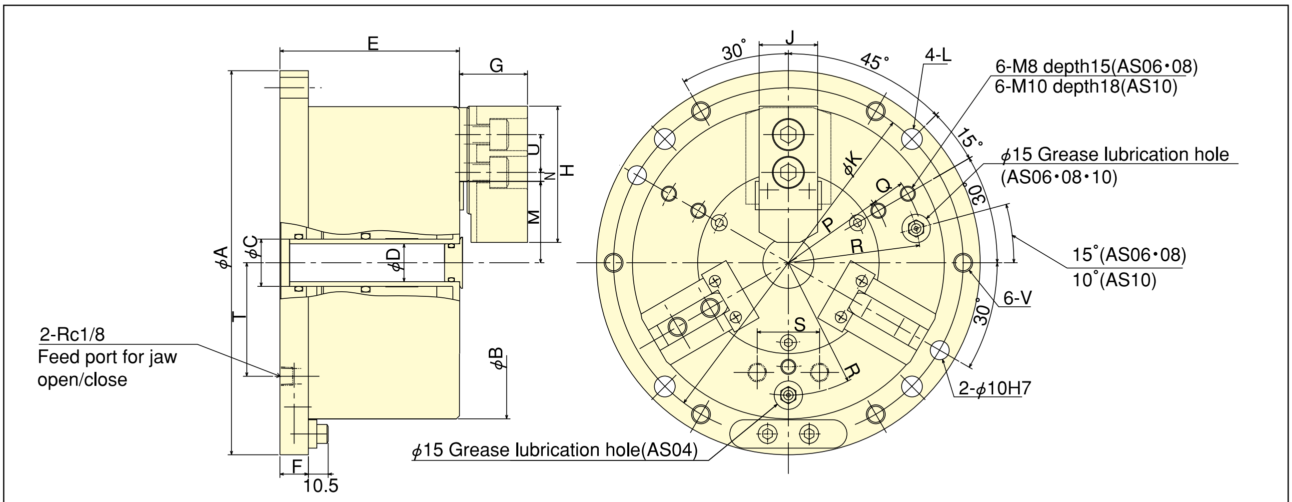
Only Kitagawa can offer a complete NC Rotary Table and workholding solution

- ●Compact and light weight design with integrated air cylinder
- ●Easy to connect direct air supply or through rotary joint
- ●Open centre allows for bar work or air blast
- ●Soft jaws are compatible with Kitagawa standard power chucks

■Specifications

Model \ Specifications	Jaw stroke (in dia.) (mm)	Gripping force [pneumatic 0.6MPa] (kN)	Net Weight (kg)	Max. pneumatic service pressure (MPa)	Applicable soft jaws	Gripping Dia (mm) max.	Gripping Dia (mm) min.	Moment of intertia (kg・m²)
AS04	5.2	7.5	7.3	0.7	SB04B1	110	10	0.014
AS06	5.2	21	16	0.7	SB06B1	165	23	0.078
AS08	6.3	33	27.7	0.7	SB08B1	210	30	0.180
AS10	6.3	48	42.5	0.7	SB10A1	254	50	0.315

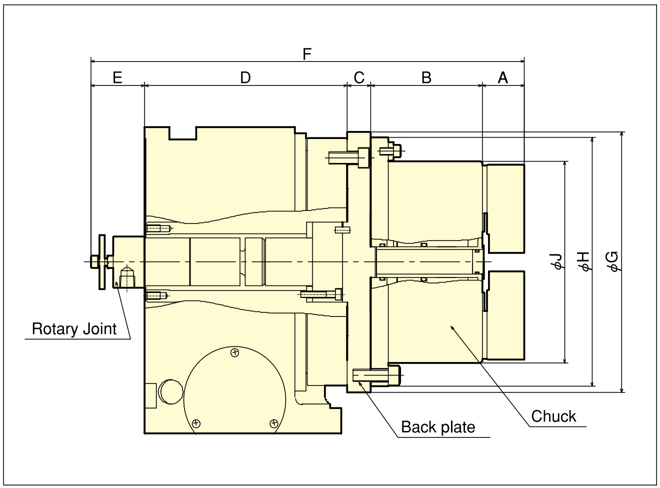
■Dimensions



■Dimensions

Model \ Dimensions	A	B	C	D	E	F	G	H	J	K	L	Mmax.	Mmin.	Nmax.	Nmin.	P	Q	R	S	T	U	V
AS04	148	110	20H7	-	90	15	27	55	23	130	9	25.5	22.9	9.75	6.75	-	-	43	33	34	14	M 8
AS06	203	165	25H7	20	95	15	36	72	31	185	11	44.5	41.9	9.25	4.75	55	18	70	33	60	20	M10
AS08	248	210	36H7	30	106	15	42	95	35	230	11	53	49.85	14.75	8.75	68	25	90	33	80	25	M10
AS10	300	254	50H7	43	110	16	46	110	40	280	13	66	62.85	16	8.5	85	30	110	33	95	30	M12

■Work gripper fitting dimensions drawing



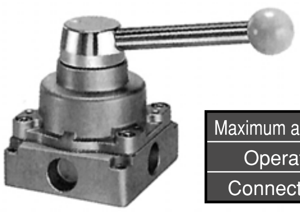
■Work gripper fitting dimensions

Rotary Table Model	Chuck Model	A	B	C	D	E	F	G	H	J
MR120	AS04	27	90	20	136	46	319	148	148	110
	AS06	36	95	20	136	46	333	203	200	165
MR160	AS04	27	90	20	145	47	329	165	148	110
	AS06	36	95	20	145	47	343	203	203	165
MR200	AS06	36	95	20	173	46	370	203	203	165
MR250	AS06	36	95	25	180	78.5	414.5	230	203	165
	AS08	42	106	25	180	78.5	431.5	250	248	210
MR320	AS10	46	110	25	210	69	460	320	300	254
TMX(THX)160	AS04	27	90	20	145	48	330	148	148	110
	AS06	36	95	20	145	48	344	203	203	165
TMX(THX,TUX)200	AS06	36	95	20	176	47	374	203	203	165
TMX(TLX,TUX)250	AS06	36	95	25	210	69	435	250	203	165
	AS08	42	106	25	210	69	452	250	248	210
TRX(TLX,TUX)320	AS10	46	110	25	220	45.5	446.5	300	300	254

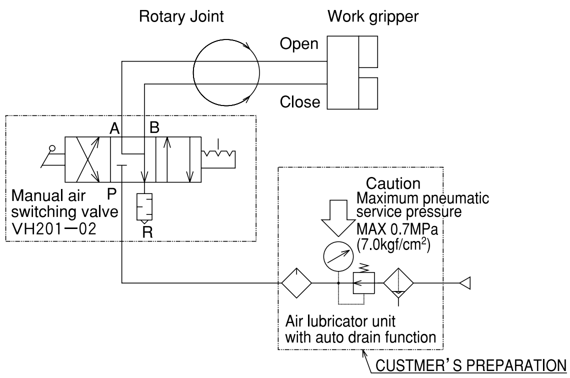
■Option

Manual air switching valve (made to order)

VH201-02



Maximum allowable pressure	1MPa
Operating degree	90°
Connecting bore size	Rc¼



CHUCK

Open Centre Power Chuck
B-200 series

Only Kitagawa can offer a complete NC Rotary Table and workholding solution

■Size Table

Model \ Size	A	B	C (H6)	D	E	F	G max.	G min.	H	J	K	L max.
B-204	110	59	85	70.6	3−M10	26	3.5	− 6.5	17.5	12	38	M32×1.5
B-205	135	60	110	82.6	3−M10	33	1	− 9	20	12	45	M40×1.5
B-206	169	81	140	104.8	6−M10	45	11	− 1	19	20	60	M55×2.0
B-208	210	91	170	133.4	6−M12	52	14.5	− 1.5	20.5	30	66	M60×2.0
B-210	254	100	220	171.4	6−M16	75	8.5	−10.5	25	45	94	M85×2.0

Model \ Size	M	N	P	Q max.	Q min.	R max.	R min.	S	T	U	V	W	X (3−)	Y
B-204	24	49.5	14	11.25	6.75	23	20.3	23	2	10	15.5	4	−	−
B-205	26	54	14	19.75	7.75	26.5	23.8	23	2	10	15	4	−	−
B-206	29	66	20	22.75	9.25	32	29.25	26	2	12	16	5	M6×10	116
B-208	39	95	25	29.75	14.75	38.7	35	35	2	14	20	5	M6×12	150
B-210	43	110	30	33.75	14.25	51	46.6	40	2	16	22	5	M8×15	190

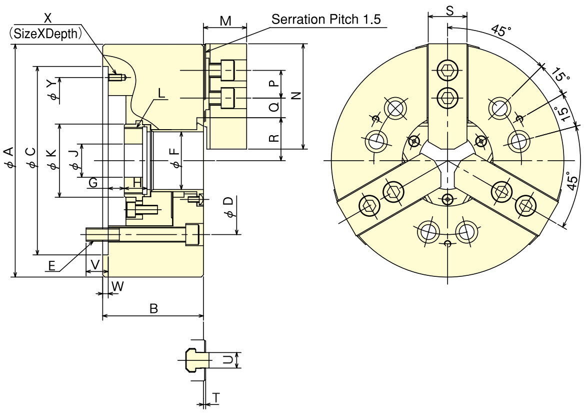
※Fitting of B-204 or 205 requires 120° pitch-3

■Specifications

Model \ Specifications	Thru-Hole (mm)	Gripping Dia (mm) Max.	Gripping Dia (mm) Min.	Jaw stroke (diameter) (mm)	Plunger Stroke (mm)	Max.Draw Bar Pull Force (kN)	Max.Gripping Force (kN)
B-204	26	110	7	5.4	10	14	28.5
B-205	33	135	12	5.4	10	17.5	36
B-206	45	169	16	5.5	12	22	57
B-208	52	210	13	7.4	16	34.8	86
B-210	75	254	31	8.8	19	43	111

Model \ Specifications	Net Weight with Soft top jaw (kg)	Moment of intertia (kg·m²)	Matching Hard top jaw	Matching Soft top jaw
B-204	4	0.007	HB04N1	SB04N1
B-205	6.7	0.018	HB04N1	SB05N1
B-206	11.9	0.058	HB06B1	SB06L1A
B-208	22.3	0.170	HB08A1	SB08B1
B-210	34.5	0.315	HB10A1	SB10B1

■Dimensions



ROTARY CYLINDER

Compact Closed Centre hydraulic rotary cylinder
M series

■Size Table

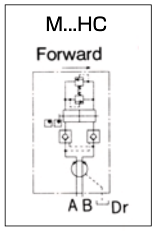
Model \ Size	A	B	C (h7)	D	E	F	G (H8)	H	J	K
M1120HC21N	110	20	145	128	42	30	22	M20×2.5	30	15
M1221HC21N	120	21	168	145	44	32	22	M20×2.5	30	15
M1330HC21N	130	30	168	150	51	36	26	M24×3.0	35	15

Model \ Size	L	M	N	P max.	P min.	Q max.	Q min.	R	S	T	U
M1120HC21N	135	125	14	60	40	72	52	26	159.2	M 8×1.25	14
M1221HC21N	138	128	14	60	39	75	54	27	182.2	M10×1.5	17
M1330HC21N	144	134	18	60	30	79	49	37	182.2	M10×1.5	17

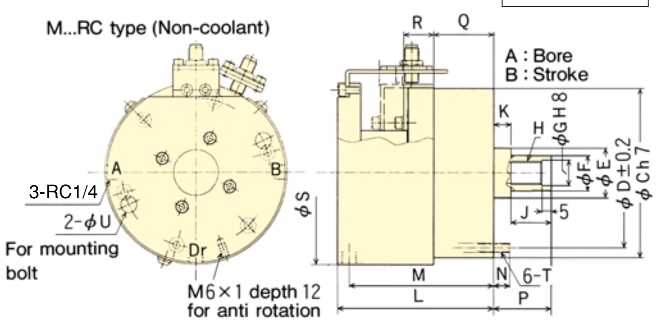
■Specifications

Model \ Specifications	Piston thrust force Pushing (in kN)	Piston thrust force Pulling (in kN)	Total leakage (ℓ/min)	Mass (kg)	Moment of intertia (kg·m²)
M1120HC21N	28	27	1.2	8.2	0.016
M1221HC21N	39	38	1.2	10.2	0.028
M1330HC21N	47	45	1.2	10.3	0.029

Note) 1. Piston thrust force : maximum hydraulic service pressure of 3.5MPa on M1120HC, 4.0MPa on M1221HC, and 4.0MPa on M1330HC.
2. Total leakage values shown are at hydraulic pressure of 3.0MPa and fluid temperature of 50℃.
3. Proximity switch : Model BES516-325-E3R (BALLUFF) DC12/24V 200mA PNP
4. When using on devices other than a NC table, be sure of the specifications described on Kitagawa's catalogues for chucks and cylinders.

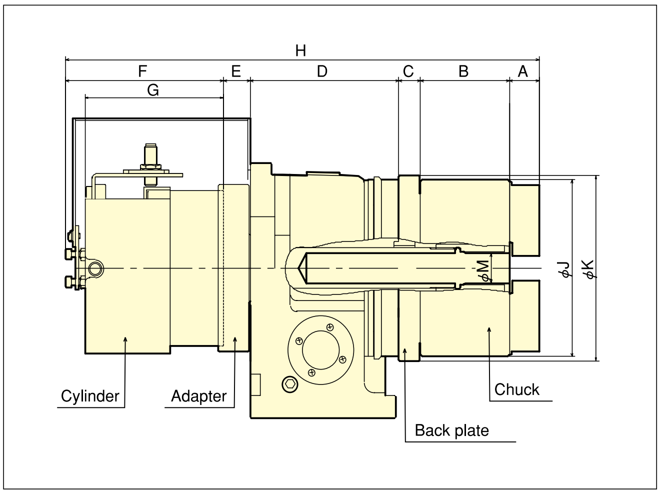


■Dimensions



CHUCK CYLINDER

■Fitting dimension drawing for power chuck B-200 series, cylinder M series



■Fitting dimensions for power chuck B-200 series, cylinder M series

Rotary Table Model	Chuck Model	Cylinder Model	A	B	C	D	E	F	G	H	J	K	M	Pressure(MPa)
MR160	B-205	M1120HC21N	26	62	21	145	27	148	135	433	135	165	33	2.27
	B-206	M1120HC21N	39	81	21	145	27	154	135	467	165	169	45	2.85
MR200	B-206	M1120HC21N	39	81	21	173	27	154	135	495	169	190	45	2.85
MR250	B-206	M1120HC21N	39	81	19	180	17	154	135	490	169	230	45	2.85
MR320	B-210	M1330HC21N	43	100	19	210	20	155	144	547	254	304	75	3.82
TMX (THX) 160	B-205	M1120HC21N	26	60	22	145	27	154	135	434	135	140	33	2.27
	B-206	M1120HC21N	39	81	16	145	27	154	135	462	140	169	45	2.85
TMX (THX,TUX) 200	B-206	M1120HC21N	39	81	22	176	26	159	135	503	169	169	45	2.85
	B-208	M1221HC21N	39	91	17	176	26	157	138	506	170	210	52	3.66
TMX (TLX,TUX) 250	B-206	M1120HC21N	39	81	22	210	17	159	135	528	169	183	45	2.85
	B-208	M1221HC21N	39	91	22	210	17	157	138	526	210	210	52	3.66
	B-210	M1330HC21N	43	100	22	210	21	151	144	504	254	308	75	3.82
TRX (TLX,TUX) 320	B-210	M1330HC21N	43	100	19	225	20	151	144	558	254	308	75	3.82

CHUCK

Closed Centre Power Chuck

N series

Only Kitagawa can offer a complete NC Rotary Table and workholding solution

■Size Table

Model \ Size	A	B	C (H6)	F	H	J	K	L	M	N max.	N min.	O max.
N-05	135	55	80	7	100	–	3-M8	14	19	30.4	27.2	11.25
N-06	165	74	140	5	104.8	21	6-M10	14	20	37.8	33.55	13.75
N-08	210	85	170	5	133.4	25	6-M12	20	25	46.3	41.9	22.25
N-10	254	89	220	5	171.4	34	6-M16	18	30	51.1	46.7	30.75
N-12	304	106	220	6	171.4	34	6-M16	18	30	61	55.75	48.75

Model \ Size	O min.	P max.	P min.	Q	R	S	T	U	V	W	X	Y	Z
N-05	6.75	9	−6	23	10	35	M12×1.75	3	28	29	62	–	–
N-06	7.75	101.5	81.5	31	12	36	M16×2.0	4	34	35	72	M6×10	116
N-08	11.75	127	106	35	14	36	M20×2.5	5	38	42	95	M6×12	150
N-10	11.25	158	133	40	16	36	M20×2.5	5	45	46	110	M8×15	190
N-12	12.75	163	133	50	18	36	M20×2.5	5	50	54	129	M8×15	190

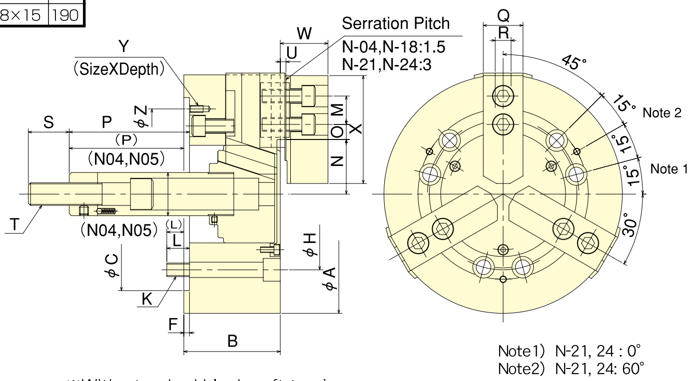
※Fitting of N-05 at 120°pitch-3

■Specifications

Model \ Specifications	Jaw stroke (diameter) (mm)	Plunger Stroke (mm)	Gripping Dia mm		Max.Draw Bar Pull Force (kN)	Max.Gripping Force (kN)
			max.	min.		
N-05	6.4	15	135	16	8.2	25.2
N-06	8.5	20	165	19	18	52.5
N-08	8.8	21	210	23	25	75
N-10	8.8	25	254	24	29	108
N-12	10.5	30	304	26	41	156

Model \ Specifications	Net Weight with Soft top jaw (kg)	Moment of intertia ($kg \cdot m^2$)	Matching Hard top jaw	Matching Soft top jaw
N-05	6.2	0.015	HB05C1	SB05B1
N-06	13	0.045	HB06B1	SB06B1
N-08	25	0.138	HB08A1	SB08B1
N-10	37	0.300	HB10A1	SB10B1
N-12	57.3	0.725	HB12B1	SB12A1

■Dimensions



※With standard blank soft top jaw.

ROTARY CYLINDER

Compact Closed Centre hydraulic rotary cylinder

M series

■Size Table

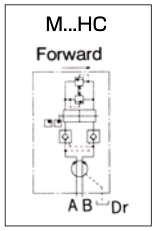
Model \ Size	A	B	C (h7)	D	E	F	G (H8)	H	J	K
M1120HC21N	110	20	145	128	42	30	22	M20×2.5	30	15
M1221HC21N	120	21	168	145	44	32	22	M20×2.5	30	15
M1330HC21N	130	30	168	150	51	36	26	M24×3.0	35	15

Model \ Size	L	M	N	P max.	P min.	Q max.	Q min.	R	S	T	U
M1120HC21N	135	125	14	60	40	72	52	26	159.2	M 8×1.25	14
M1221HC21N	138	128	14	60	39	75	54	27	182.2	M10×1.5	17
M1330HC21N	144	134	18	60	30	79	49	37	182.2	M10×1.5	17

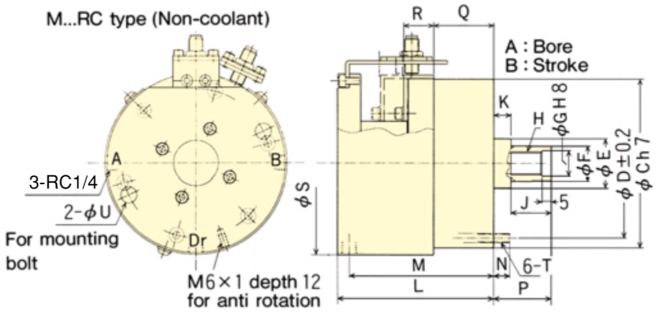
■Specifications

Model \ Specifications	Piston thrust force		Total leakage (ℓ/min)	Mass (kg)	Moment of intertia ($kg \cdot m^2$)
	Pushing (in kN)	Pulling (in kN)			
M1120HC21N	28	27	1.2	8.2	0.016
M1221HC21N	39	38	1.2	10.2	0.028
M1330HC21N	47	45	1.2	10.3	0.029

Note) 1. Piston thrust force : maximum hydraulic service pressure of 3.5MPa on M1120HC, 4.0MPa on M1221HC, and 4.0MPa on M1330HC.
2. Total leakage values shown are at hydraulic pressure of 3.0MPa and fluid temperature of 50℃.
3. Proximity switch : Model BES516-325-E3R (BALLUFF) DC12/24V 200mA PNP
4. When using on devices other than a NC table, be sure of the specifications described on Kitagawa's catalogues for chucks and cylinders.

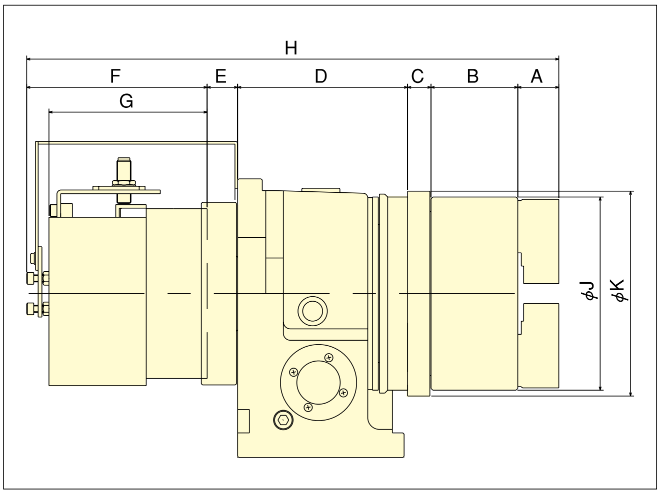


■Dimensions



CHUCK CYLINDER

■ N series power chuck, M series cylinder mounting dimensional drawing



■ N series power chuck, M series cylinder mounting dimensional list

Rotary Table Model	Chuck Model	Cylinder Model	A	B	C	D	E	F	G	H	J	K	Pressure(MPa)
MR160	N-05	M1120HC21N	29	55	21	145	27	154	135	431	135	165	1.05
	N-06	M1120HC21N	35	74	21	145	27	154	162	456	165	165	2.33
MR200	N-06	M1120HC21N	35	74	21	173	27	154	135	484	165	193	2.33
MR250	N-06	M1120HC21N	35	74	19	180	17	154	135	479	165	230	2.33
MR320	N-10	M1330HC21N	46	89	19	210	20	155	144	539	254	304	2.58
TMX (THX) 160	N-05	M1120HC21N	29	55	21	145	27	154	135	431	135	140	1.05
	N-06	M1120HC21N	35	74	16	145	27	154	135	451	140	165	2.33
TMX (THX,TUX) 200	N-06	M1120HC21N	35	74	22	176	26	159	135	492	165	165	2.33
	N-08	M1221HC21N	42	85	17	176	26	157	138	503	170	210	2.63
TMX (TLX,TUX) 250	N-06	M1120HC21N	35	74	22	210	17	159	135	517	165	183	2.33
	N-08	M1221HC21N	42	85	22	210	17	157	138	533	210	210	2.63
	N-10	M1330HC21N	46	89	22	210	21	151	144	539	254	254	2.58
TRX (TLX,TUX) 320	N-10	M1330HC21N	46	89	19	225	20	151	144	550	254	308	2.58
	N-12	M1330HC21N	54	106	25	211	34	151	144	581	304	304	3.64

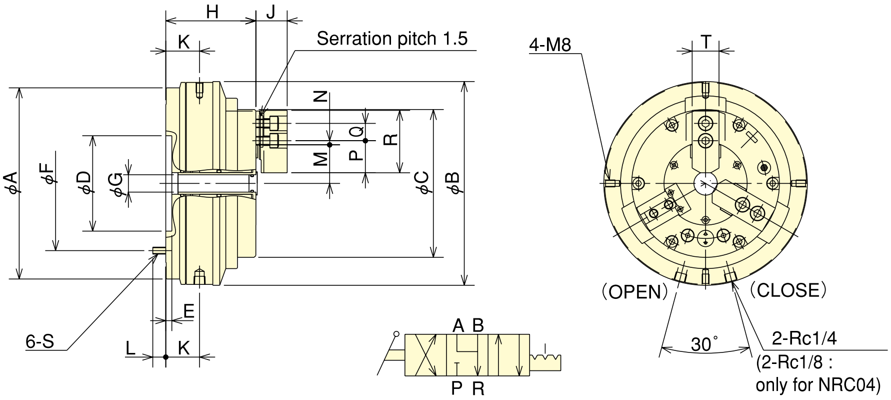
CHUCK

Rotary Chuck
NRC series

Only Kitagawa can offer a complete NC Rotary Table and workholding solution

●Exclusive air-operated chuck
●Integrated pneumatic cylinder
Can easily be fitted to TBX range of tables

■Dimensions



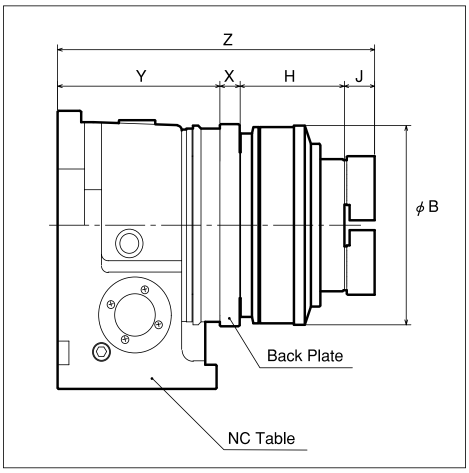
Note) Exhaust centre Solenoid Valve to be used.
See page 86.

■Dimensions

Model \ Dimensions	A	B	C	D(H7)	E	F	G	H	J	K	L	M max.	M min.	N max.	N min.	P	Q	R	S	T
NRC04	157	170	113	80	6	100	—	93	27	33	14	25.5	22.9	9.75	6.75	28	14	55	M6	23
NRC06	220.5	235	170.5	110	7	155	20	104	36	39	15	44.5	41.9	9.25	4.75	37	20	72	M8	31
NRC08	266	280	216	110	8	200	30	117	42	41.5	17	53	49.85	14.75	8.75	46	25	95	M8	35
NRC10	303	305	253	140	8	235	43	120	46	41.5	21	66	62.85	19	8.5	50	30	110	M10	40

■Specifications

Model \ Specifications	Plunger Stroke (mm)	Jaw stroke (in Dia.) (mm)	Gripping force per Jaw kN Air pressure at 0.6MPa	Max. air pressure (MPa)	Matching soft top jaw	Gripping Dia. (mm) Max.	Gripping Dia. (mm) Min.	Max. rotation (min^{-1})	Rotary torque (N･m)	Mass of Product (kg) (With Standard Soft Jaw)
NRC04	15	5.2	2.5	0.7	SB04B1	110	10	100	9.8	10
NRC06	15	5.2	7	0.7	SB06B1	165	23	72	9.8	22
NRC08	15	6.3	10.8	0.7	SB08B1	210	30	60	9.8	27.7
NRC10	15	6.3	16	0.7	SB10A1	254	50	53	9.8	42.5



■Rotary Chuck Fitting Dimensions

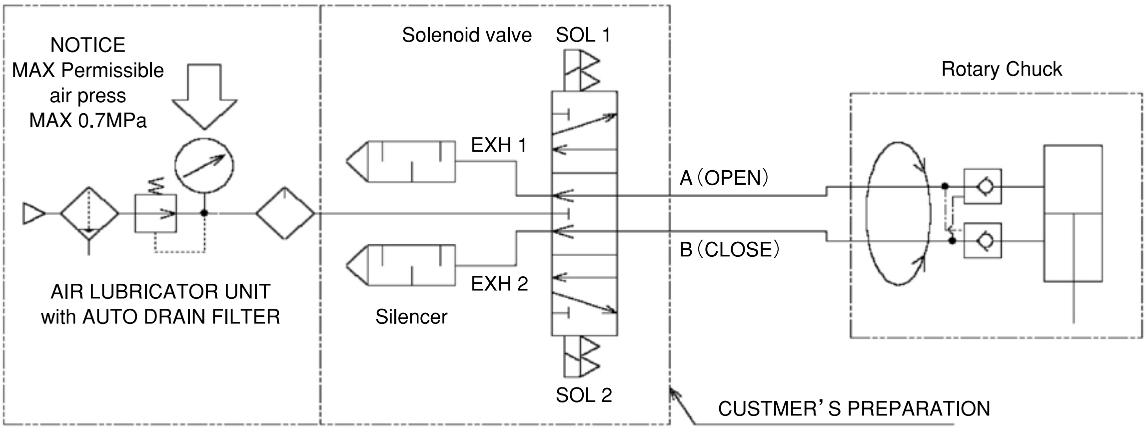
Rotary Table Model	Chuck model	B	H	J	X	Y	Z
RS100	NRC04	170	93	27	15	140	275
MR120	NRC04	170	93	27	18	136	274
MR160	NRC04	170	93	27	18	145	283
	NRC06	235	104	36	20	145	305 (Note1)
MR200	NRC04	170	93	27	18	173	311
	NRC06	235	104	36	20	173	333 (Note1)
MR250	NRC06	235	104	36	20	180	340
	NRC08	280	117	42	21	180	360 (Note1)
MR320	NRC10	315	120	46	22	210	398
TMX (THX,TBX) 160	NRC04	170	93	27	18	145	283
	NRC06	235	104	36	20	145	305
TMX (THX,TBX,TUX) 200	NRC04	170	93	27	20	176	486
	NRC06	235	104	36	20	176	336
TMX (TLX,TBX,TUX) 250	NRC06	235	104	36	20	210	370
	NRC08	280	117	42	21	210	390
TRX (TLX,TBX,TUX) 320	NRC10	305	120	46	22	225	413

Note) 1. The dimensions above are without stoppers. Consult for fitting positions of stoppers and others separately.
2. Since clamper may interfere with the chuck by a clamper position, confer with Kitagawa on it.
3. When installing the chuck at a horizontally-installed spec., contact to Kitagawa separately.

Piping and operation details for NRC chuck

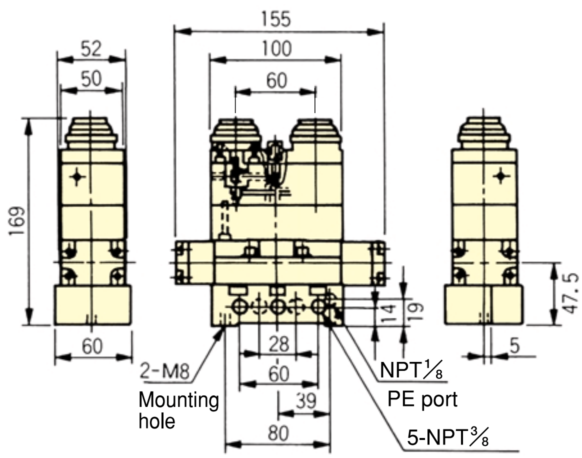
The specified solenoid must have 4 positions and 3 directions with a centre exhaust. After the solenoid valve has been switched and the chuck jaws opened or closed the solenoid valve must return to the centre, neutral position. Jaw movement occurs immediately after the solenoid is switched however, it will take a short amount of time before full gripping force is achieved. The amount of time required can be checked by fitting a pressure gauge to the chuck surface. For normal operation the pressure gauge can be removed and the required amount of time set as a dwell in the machine program. The solenoid valve must always be returned to the neutral position when the part has been gripped or removed. The NC Rotary Table should only be indexed when the solenoid valve is in the neutral position.

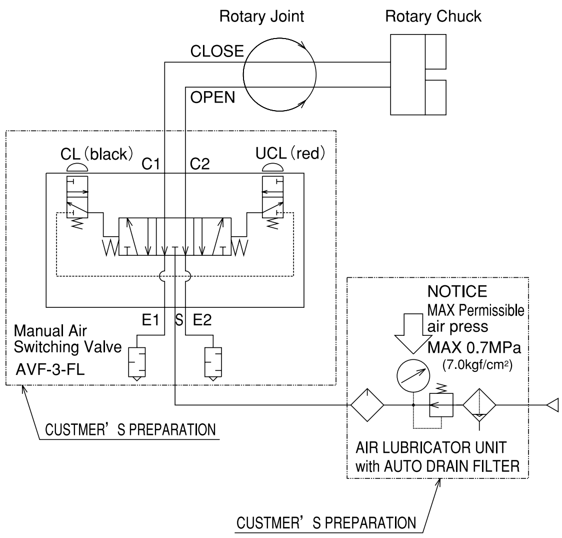
(NRC08 is installed on TMX250)



AIR DIAGRAM

■Manual air switching valve AVF-3-FL (made-to-order)





AIR DIAGRAM

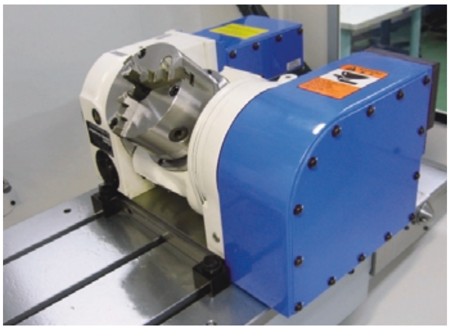
Light weight compact push button valve designed exclusively to simplify pipe layout for NRC chuck operation.

Service pressure	0～1MPa
Withstanding pressure	1.5MPa
Push button controlling force	4kg
Connecting bore size	NPT3/8

Note) An adopter plug is required to have Rc connecting bore.

CHUCK

Chuck Combinations



TT101 fitted with SC-4-105

■Recommended Combinations

The combinations above are only a fraction. See pages 79 through 88 for more. Consult for details of the chucks not listed here.

Chuck type / Model	Scroll chuck	Power chuck	Work gripper	Rotary chuck
RSM100	SC-4-105		AS04	NRC04
MR120	SC-5-107		AS04	NRC04
TM2100 TM3100	SC-4-105			
TT101 TT(S)120 TT140	SC-4-105		AS04	NRC04
TT182 TW182	JN06-101		AS04	NRC06
TMX160 MR160 TM2160 TM3160	JN06-101 JN06T102	N-06 B-206	AS06	NRC06
TBX160	JN06-101 JN06T102			NRC06
TBX200	JN07-101 JN07T102			NRC06
TMX200 MR200 TUX200	JN07-101 JN07T102	N-06 B-206	AS06	NRC06
MR250 TMX250 TUX250	JN09-101 JN09T102	N-10 B-210	AS08	NRC06 NRC08
TBX250	JN09-101 JN09T102			NRC06 NRC08
TT(S)251	JN09-101 JN09T102		AS08	NRC06 NRC08
MR320 TRX320 TU320	JN12-101 JN12T102	N-12	AS10	NRC10
TBX320	JN12-101 JN12T102			NRC10
TT(S)321	JN12-101 JN12T102		AS10	NRC10
TR400 TU400	SC-14-103	N-15		
TR500 TU500	SC-14-103	N-15		
TR630	SC-16-113	N-18		

Note) 1.Position the rotary table upright when mounting a power chuck.

NC ROTARY TABLE

Combinations of NC Rotary Table and Servomotor

Model \ Motor maker	FANUC AC	Mitsubishi AC	Yaskawa AC	Okuma AC	Sanyo AC	SIEMENS AC
TC100	αiF 1/5000 α1/3000	HA33NT	SGMPH-04A4A6S SGMAS-04A2A6S	BL-MC24J	P50B07030DXS00	1FK7032-5AK71 1FT6034-4AK71 1FK7034-5AK71 1FT6034-4AK71 1FK7040-5AF71 1FT6041-4AK71
TT101 Rotary Axis	αiF 1/5000 α1/3000	HA33NT	SGMAS-04A2A6S SGMPH-04A4A6S	BL-MC24J	Q2AA08050DXP00 P50B07030DXS00	1FK7032-5AK71 1FT6031-4AK71
TT101 Tilt Axis	αiF 2/5000 α2/3000	HA33NT	SGMAS-08A2A6S SGMAH-08A4A6S	BL-MC24J	Q2AA08075HXP00 P50B08050DXS00	1FK7034-5AK71 1FT6034-4AK71
TM2100 TM3100 TM2160 TM3160	αiF 4/4000 α3/3000	HF54T HC53T	SGMAH-08A4A6S SGMGH-05A2A3S SGMAS-08A2A6S	BL-MC25J	Q2AA08075HXP00 P50B08075HXS00	1KF7042-5AF71 1FT6061-6AF71
MR120	αiF 2/5000 α2/3000	HF75S HA33NT	SGMAH-08A4A6S SGMAS-08A2A6S	BL-MC24J	Q2AA08050DXP00 P50B08050DXS00	1FK7040-5AF71 1FT6041-4AF71
MR160	αiF 2/5000 α2/3000	HF75T HA33NT	SGMAH-08A4A6S SGMAS-08A2A6S	BL-MC24J	Q2AA08075HXP00 P50B08075HXS00	1FK7040-5AF71 1FT6041-4AF71
MR200	αiF 4/4000 α3/3000	HF54T HC53T	SGMAH-08A4A6S SGMGH-05A2A3S SGMAS-08A2A6S	BL-MC25J	Q2AA08075HXP00 P50B08075HXS00	1FK7042-5AF71 1FT6061-6AF71
MR250	αiF 4/4000 α3/3000	HF104T HC103T	SGMPH-15A4A6S SGMGH-09A2A3S	BL-MC25J	Q2AA08075HXP00 P50B08075HXS00	1FK7042-5AF71 1FT6061-6AF71
TMX160 TBX160	αiF 2/5000 α2/3000	HF75T HA33NT	SGMAH-08A4A6S SGMAS-08A2A6S	BL-MC24J	Q2AA08075HXP00 P50B08075DXS00	1FK7040-5AF71 1FT6041-4AF71
TT(S)120	αiF 2/5000 α2/3000	HA33NT	SGMAH-08A4A6S SGMAH-08A2A6S	BL-MC24J	Q2AA08075HXP00 P50B08075DXS00	1FK7040-5AF71 1FT6041-4AF71
TT140	αiF 2/5000 α2/3000	HA33NT	SGMAH-08A4A6S SGMAH-08A2A6S	BL-MC24J	Q2AA08075HXP00 P50B08075DXS00	1FK7040-5AF71 1FT6041-4AF71
TT182	αiF 2/5000 α2/3000	HF75T HA33NT	SGMAH-08A4A6S SGMAH-08A2A6S	BL-MC24J	Q2AA08075HXP00 P50B08075DXS00	1FK7040-5AF71 1FT6041-4AF71
TW182	αiF 2/5000 α2/3000	HF75T HA33NT	SGMAH-08A4A6S SGMAH-08A2A6S	BL-MC24J	Q2AA08075HXP00 P50B08075DXS00	1FK7040-5AF71 1FT6041-4AF71
TMX200 TBX200 TUX200	αiF 4/4000 α3/3000	HF54T HC53T	SGMAH-08A4A6S SGMGH-05A2A3S SGMAS-08A2A6S	BL-MC25J	Q2AA08075HXP00 P50B08075HXS00	1FK7042-5AF71 1FT6061-6AF71
TMX250 TBX250 TUX250 TT(S)251	αiF 4/4000 α6/3000	HF104T HC103T	SGMPH-15A4A6S SGMGH-09A2A3S	BL-MC50J	–	1FK7060-5AF71 1FT6062-6AF71
MR320 TRX320 TBX320 TUX320 TT(S)321	αiF 8/3000 α6/3000	HF104T HC103T	SGMPH-15A4A6S SGMGH-09A2A3S	BL-MC50J	–	1FK7063-5AF71 1FT6062-6AF71
LR320	αiF 12/3000 α12/2000	HF204S HC202S	SGMGH-20A2A2S	BL-MC150J	–	1FK7083-5AF71 1FT6082-8AC71
TR400 TR500	αiF 12/3000 α12/2000	HF204S HC202S	SGMGH-20A2A2S	BL-MC100J	–	1FK7083-5AF71 1FT6082-8AC71
LR400 LR500 TR630	αiF 22/3000 α22/2000	HF354S HC352S	SGMGH-20A2A2S	BL-MC200J	–	1FT6086-8AF71
DM100	βM 0.5/4000 βiS 0.5/6000	HC-KFS23K-S9	SGMAS-02A2A6S	–	–	–
TW2180	αiF 2/5000 αiS 4/5000	HA33NC-TS	SGMAS-08A2A6S SGMAH-08A4A6S	BL-MC24J	Q2AA08075HXP00 P50B08075DXS00	1FK7040-5AF71 1FT6041-4AF71

Note) 1. The maximum motor rotation is 2375 min^{-1} on BL-MCJ with MR250.

2. Some motor types have difference in specifications such as the maximum rotation and the outline dimensions.

3. For the NC rotary tables listed on green-shaded columns, standard fitting is with a servomotor with a straight shaft (without a keyway).

4. Please confer with our company about the motor which is not indicated in the above combination table.

DATA

High-Precision Table with Scale

High indexing accuracy by mounting rotary scale at additional axis spec.

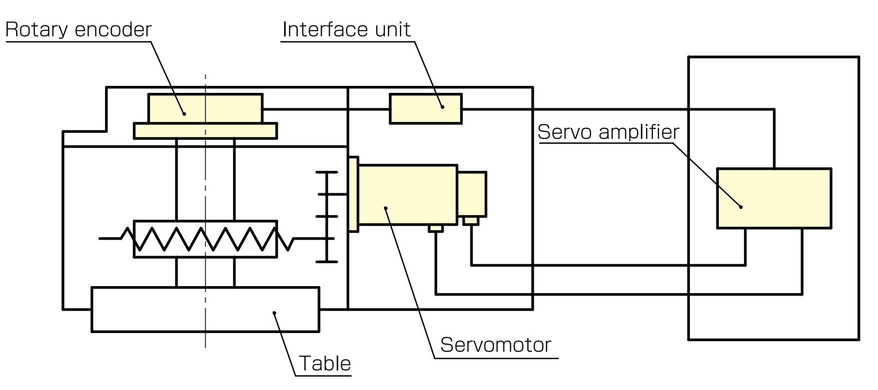
Full closed loop control becomes possible by mounting a commercial rotary scale to the NC rotary table. Highly precise indexing becomes possible by detecting the rotary angle of the table directly.

■**Fitted（○）/Not Fitted（×）**

NC table model		Rotary encoder (Heidenhain)	MP scale (MHI)
MR120、160、200、250、320		×	×
TMX160、200、250		○	○
THX160、200		○	○
TBX160、200、250、320		×	×
TUX200、250、320　TU400、500		○	○
TLX250、320		○	○
TRX320		○	○
TR400、500、630		○	○
TT101、120	Rotary shaft	○	×
	Tilting shaft	○	○
TT140、182、251、321	Rotary shaft	○	○
	Tilting shaft	○	○
TTS120	Rotary shaft	○	×
	Tilting shaft	×	×
TW182	Rotary shaft	○	○
	Tilting shaft	×	×
TTS251、321	Rotary shaft	○	○
	Tilting shaft	×	×
TW2180	Rotary shaft	×	×
	Tilting shaft	×	×

Note) 1．Inquire for accuracy details.
2．Fitting a rotary scale may affect dimensions and specifications. Please consult for the details.
3．Not fitted for ones with Kitagawa controller MAC mini i series.

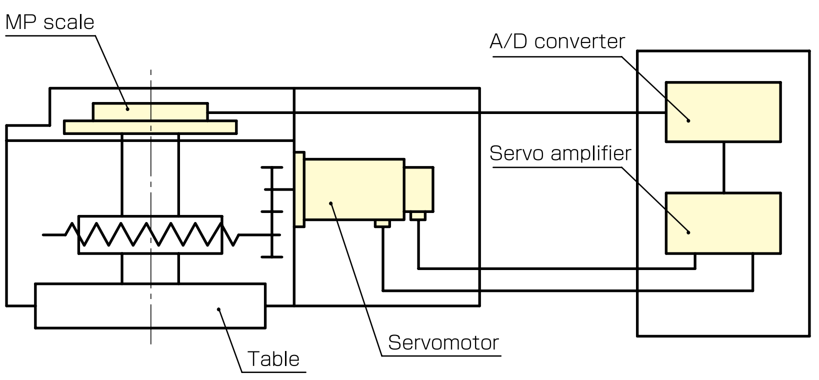
■Table configuration with Heidenhain rotary encoder



Rotary encoder	RON785	RON886	RCN727F	RCN827F
Interface unit	IBV102	IBV102	—	—
Recommended measuring pitch	0.0001°	0.00005°	0.0001°	0.0001°
Position value	—	—	27bit ABS	27bit ABS

Note) 1 . RCN727F and RCN827F are compatible to FANUC serial interface. Consult for compatibilities with other NC devices.
2 . The above recommended measuring pitches are of Heidenhain catalogue values.
3 . Consult for fitting other than the above mentioned Rotary encoder.

■Table configuration with MHI MP scale



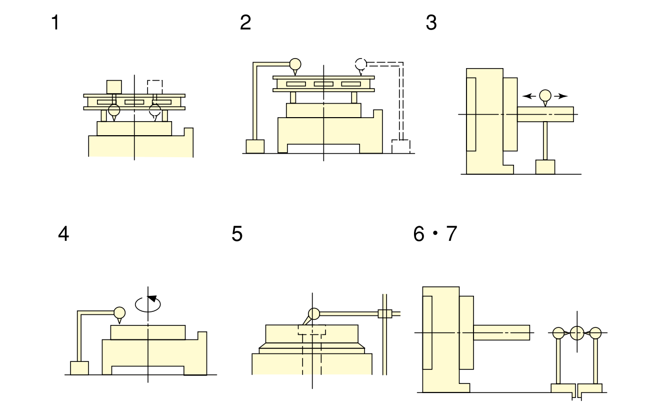
MP scale	MPI 736B	MPI 1272B
Recommended resolution	0.0001°	0.00005°
A/D converter	ADB-20J10	

Note) 1 . Using the A/D converter ADB-20J60 allows accommodation for serial interface.
2 . The above recommended resolutions are of MHI catalogue values.
3 . A pre-amplifier is required for MPR series.
4 . Consult when using non-standard preamplifier for MPR series.
5 . Consult for fitting other than the above mentioned MP scales.

Accuracy specification・Performance lists

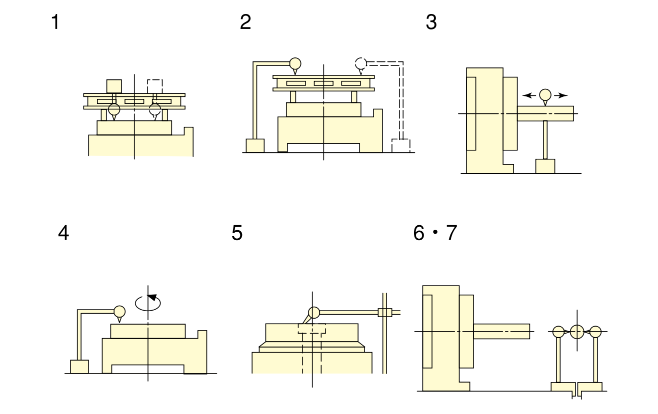
■MR series (Unit:mm)

No.	Inspection Item	Allowance
1	Straightness of table top face	0.020 at full length
2	Parallelism of upper face of table and mounting face of horizontal unit	0.020 at 150
3	Parallelism of rotary centre of table and mounting face of vertical unit	0.020 at 150
4	Run out of upper face during table rotation	0.020
5	Deflection of spindle centre hole	0.010
6	Parallelism of rotation centre of table and base guide block centre	0.020 at 150
7	Offset (deviation) of rotation centre of table and base guide block centre	0.020



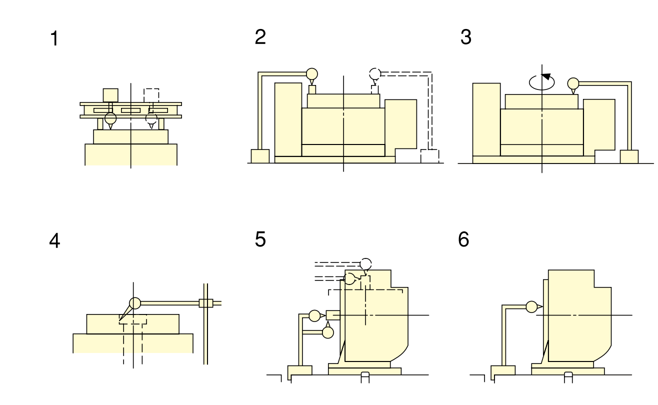
■T・LR series (Unit:mm)

No.	Inspection Item	Allowance
1	Straightness of table top face	0.010 at 300
2	Parallelism of upper face of table and mounting face of horizontal unit	0.020 at 300
3	Parallelism of rotary centre of table and mounting face of vertical unit	0.020 at 300
4	Run out of upper face during table rotation	0.010
5	Deflection of spindle centre hole	0.010
6	Parallelism of rotation centre of table and base guide block centre	0.020 at 300
7	Offset (deviation) of rotation centre of table and base guide block centre	0.020



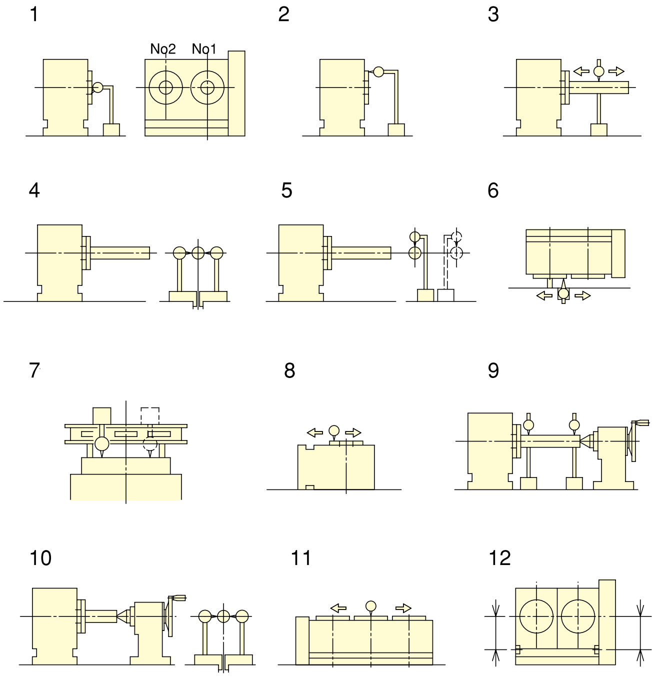
■TT series (Unit:mm)

No.	Inspection Item	Allowance
1	Straightness of table top face	0.010 at full length
2	Parallelism in tilt axis direction of upper face of table and lower face of base	0.020 at full length
3	Run out of upper face during table rotation	0.015
4	Deflection of spindle centre hole	0.010
5	Parallelism of tilt axis centre line and lower face of base	0.020 at full length
6	Parallelism between table top face and guide block	0.020 at full length



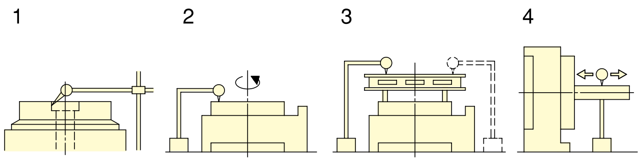
■Multiple spindle TM series (Unit:mm)

No.	Inspection Item	Allowance
1	Deflection of spindle centre hole	0.010
2	Run out of upper face during table rotation	0.010
3	Parallelism of table top face and base bottom face	0.020 at 150
4	Parallelism between spindle centre line and guide block centre line	0.020 at 150
5	Mutual difference of centre height	0.020
6	Mutual difference of average height of incoming and outgoing table	0.030
7	Straightness of table top face	0.010
8	Parallelism of table top face and base bottom face	0.010
9	Difference of height sizes for spindle center line and spindle centre line	0.030
10	Parallelism between spindle·tailstock centre line and guide block centre line	0.020 at 150
11	Mutual difference of average height from base bottom face to table top face	0.020
12	Mutual difference of centre hole position for base bottom face guide block	0.020



■RSM100 (Unit:mm)

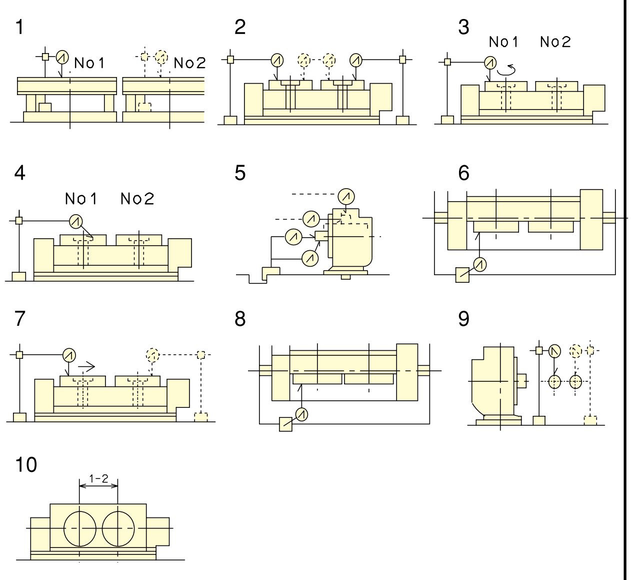
No.	Inspection Item	Allowance
1	Deflection of spindle centre hole	0.010
2	Run out of upper face during table rotation	0.020
3	Parallelism of table top face and base bottom face	0.020 at 150
4	Parallelism of spindle centre line and vertical mounting face	0.020 at 150



Accuracy specification·Performance lists

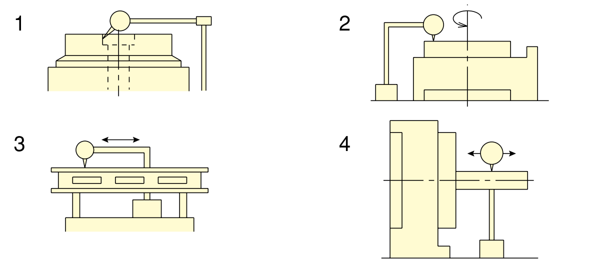
■TW2180 (Unit:mm)

No.	Inspection Item	Allowance
1	Straightness of table top face	0.010 at full length
2	Parallelism in tilt axis direction of upper face of table and lower face of base	0.020 at full length
3	Run out of upper face during table rotation	0.015
4	Deflection of spindle centre hole	0.010
5	Parallelism of tilt axis centre line and lower face of base	0.020 at full length
6	Parallelism of rotation centre of table and base guide block centre	0.020 at full length
7	Mutual difference of average height from base bottom to table top face	0.02
8	Mutual difference of average height of incoming and outgoing table	0.02
9	Mutual difference of centre height	0.02
10	Spindle centre distance	0.020 at 250



■DM100 (Unit:mm)

No.	Inspection Item	Allowance
1	Deflection of spindle centre hole	0.010 at full length
2	Run out of upper face during table rotation	0.005
3	Parallelism between table top face and base bottom face	0.01 at 150
4	Parallelism of spindle centre line and vertical mounting face	0.01 at 150



Glossary

Explanation of terms used to describe Kitagawa products.

Vertical • horizontal

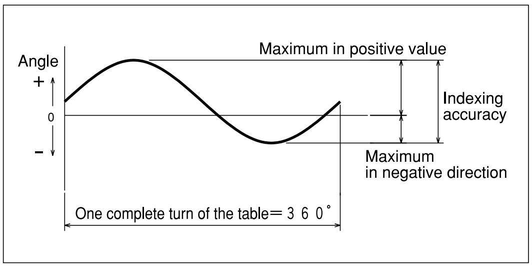
A vertical NC table is installed with the table surface perpendicular to the table surface of the machine tool, where as a horizontal one is installed flat with the NC table surface parallel to the machine tool table.

Right handed • Left handed

Facing to the table surface of the NC table installed upright, if the motor case is seen on the right hand side, it is “right-handed;” and if on the left hand side, it is “left-handed.”

Indexing accuracy

The angle of difference between the 0 position after one complete 360° turn of the table. Indexing accuracy is a sum of the max and min values.



Repeatability

The maximum difference between several measurements after indexing in clockwise direction from the datum point 0° .

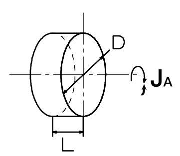
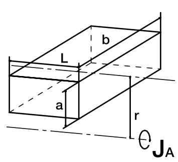
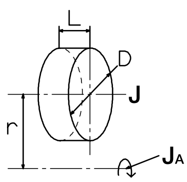
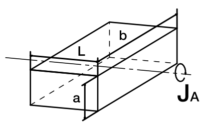
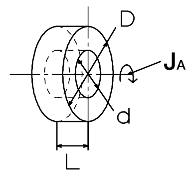
Clamp torque

Maximum allowable rotationable force that can be applied to the outside diameter of the rotary table face plate when in the clamped condition.

Allowable load

It is the maximum mass allowed on the table surface where the work is assumed to be a cylindrical castiron body of a diameter equal to the table surface.

Formulas to determine moment of inertia

	D :Major diameter of the round-bar [m] L :Length of the round-bar [m] ρ :Density [kg/m³] M:Mass of the round-bar [kg] J_A :Moment of inertia [kgm²]	$M=\frac{\pi D^2}{4}\times L\rho g$ $J_A=\frac{MD^2}{8}$		a : Side length [m] b : Side length [m] L : Side length [m] ρ : Density [kg/m³] r : Turning radius [m] J_A : Moment of inertia [kgm²]	$M=abL\rho g$ $J_A=\frac{1}{12}M\left(a^2+b^2+12r^2\right)$
	D :Major diameter of the round-bar [m] L :Length of the round-bar [m] r : Turning radius [m] ρ : Density [kg/m³] M:Mass of the round-bar J_A :Moment of inertia of the round-bar at the centre A [kgm²] J : Moment of inertia [kgm²]	$M=\frac{\pi D^2}{4}\times L\rho g$ $J=\frac{MD^2}{8}$ $J_A=J+M\cdot r^2$		a : Side length [m] b : Side length [m] L : Side length [m] ρ : Density [kg/m³] J_A : Moment of inertia [kgm²]	$M=abL\rho g$ $J_A=\frac{1}{12}M\left(a^2+b^2\right)$
	D :Outer diameter of the cylinder [m] d : Bore diameter of the cylinder [m] L :Length of the round-bar [m] ρ : Density [kg/m³] M:Mass of the cylinder [kg] J_A:Moment of inertia [kgm²]	$M=\left(\frac{\pi D^2}{4}\times L\rho g\right)-\left(\frac{\pi d^2}{4}\times L\rho g\right)$ $J_A=\frac{1}{8}M\left(D^2+d^2\right)$	Densities of various materials Dynamic velocity (ρ)	Iron 7.85×10^3kg/m³ Cast iron 7.35×10^3kg/m³ Aluminum 2.7×10^3kg/m³ Copper 8.94×10^3kg/m³ Brass 8.5×10^3kg/m³	Gravitational acceleration (g)

NC ROTARY TABLE

Glossary

Allowable load (axial load, circumferential load, moment load)

Load allowable onto the table surface; categorized by the following:
(Axial load): load exerted perpendicularly onto the table surface.
(Circumferential load): load exerted onto the outer edge of the table surface in the parallel direction; agrees with the clamping torque.
(Moment load): Load exerted onto the table surface in parallel direction.

Allowable cutting torque

Load allowed during lead cutting with the NC table turning; it is the load-resistant torque of the worm wheel when the table is rotating at a speed of 1 min^{-1}.

Work inertia

Load exerted in the circumferential direction; degrees with the clamping torque.

Allowable work inertia

The maximum work inertia allowed on the NC table.

Triple disk brake system

Pneumatic mechanism used to generate high clamping torque equivalent to that of hydraulic clamping. Three disk plates cause frictions on four surfaces.

Air hydro booster

Amplifies pneumatic pressure to produce equivalent hydraulic pressure when built in a NC table it generates a clamping torque equivalent to that by direct hydraulic clamping.

Air purge

Air injected into the motor case to prevent condensation, and thus to protect electric devices.

Relief valve

Discharges pressure build up inside the rotary table body as a result of deteriorated seals, thus avoiding damage to the break and motor.

Trunnion jig plate (cradle)

Plate assembly to connect NC table and tail spindle thus allowing greater variety of work pieces to be machined.

Cautions

Warranty and indemnity

Products are warranted for one year after delivery. Use only genuine Kitagawa parts, including consumables. Kitagawa Iron Works assumes no responsibilities for any defects or accidents caused by non genuine parts or operation of products outside the recommended operating conditions. The warranties become invalid when any part other than Kitagawa's genuine part was used.

When planning to export or to take the product out of Japan

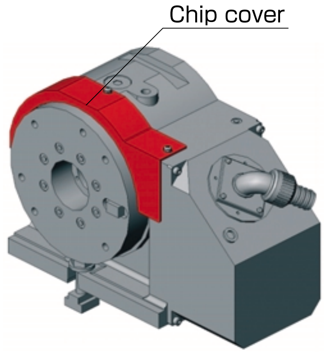
The products listed on this catalogue are subject to controls under "Export Trade Control Ordinance" and "Foreign Exchange Ordinance" by "Foreign Exchange and Foreign Trade Law." Consult in advance for any requirement of an approval by the Minister of Economy, Trade and Industry for export.

Using with grinding machine

Use with grinding machine can damage the face plate seals and is not warranted.

Chip cover optional

Chip covers are available to protect face plate seals in situations where chips directly hit the seal, or are easily trapped in a jig.



Air supply

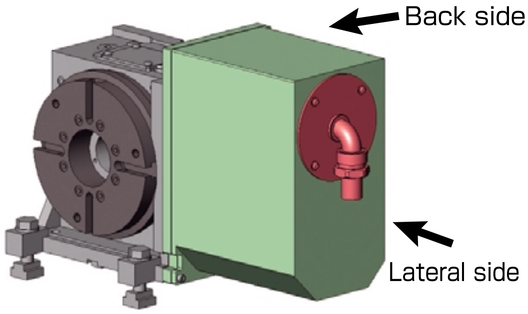
In some environments, condensation may occur inside the motor case. Our rotary tables are equipped with air purge to prevent electrical defects and corrosion caused by such condensation. The air supplied to the rotary table for air purge must be clean air of P65 or of the specification on the air circuit diagram. Where moisture may be contained in the supplied air, provide a dryer to remove the moisture. Any defect or accident caused by using air not complying with specifications will not be warranted.

NC control while using a table clamp

Refer to the control flow chart on page 68.

Direction of cable outlet

Standard cable outlet is provided on the back or the lateral side of the motor case. Consult for having cable outlet on any other position.



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