

# Rotary Table/Rack & Pinion Style

## Series MSQ

### Size: 10, 20, 30, 50, 70, 100, 200

#### How to Order

**High Precision Type** MSQ A **10** A - M9BW [ ] [ ]

**Basic Type** MSQ B **10** A - M9BW [ ] [ ]

**Size**

10
20
30
50

**Size**

10
20
30
50
70
100
200

**Thread type**

End port type	Size
Nil	M 5
Nil	Rc 1/8
-XF	G 1/8
-XN	NPT 1/8

\* Side ports are all M5.

**Number of auto switches**

Nil	2 pcs.
S	1 pc.
n	n pcs.

**Auto switch type**

Nil	Without auto switch (built-in magnet)
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\* Refer to the table below for auto switch types.

**A** With adjustment bolt  
**R** With internal shock absorber

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

#### Applicable Auto Switch/Refer to pages 761 to 809 for detailed auto switch specification.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)				Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (Nil)	1 (M)	3 (L)	5 (Z)				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC
	3-wire (PNP)			12 V		M9PV		M9P	●	●	●	○	○			
	2-wire					M9BV		M9B	●	●	●	○	○	—		
	Diagnostic indication (2-color display)			3-wire (NPN)	24 V	5 V, 12 V		M9NWW	M9NW	●	●	●	○	○	IC circuit	
				3-wire (PNP)		M9PWW		M9PW	●	●	●	○	○	—		
				2-wire		M9BWW		M9BW	●	●	●	○	○			
	Water resistant (2-color indication)			3-wire (NPN)	24 V	5 V, 12 V		M9NAV**	M9NA**	○	○	●	○	○	IC circuit	
				3-wire (PNP)		M9PAV**		M9PA**	○	○	●	○	○	—		
				2-wire		M9BAV**		M9BA**	○	○	●	○	○			
Reed switch		—	Grommet	Yes		3-wire (NPN equiv.)	—	5 V	—	A96V	A96	●	—	●	—	—
	2-wire				24 V	12 V	100 V	A93V	A93	●	—	●	—	—	—	—
				100 V or less			A90V	A90	●	—	●	—	—	—	IC circuit	

\*\* Although it is possible to mount water resistant type auto switches, note that the rotary actuator itself is not of water resistant construction.

\* Lead wire length symbols: 0.5 m ..... Nil (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWZ

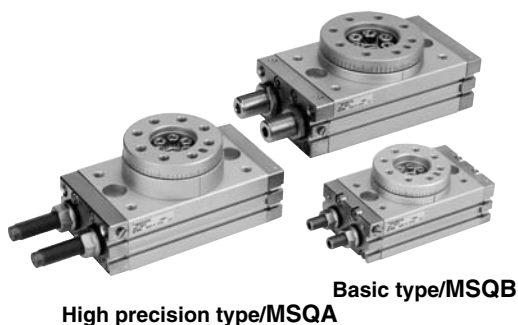
\* Auto switches marked with a "○" are produced upon receipt of orders.

\* Auto switches are shipped together, (but not assembled).

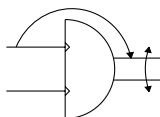


Refer to pages 796 and 797 for the details of solid state auto switch with pre-wired connector.

D-□



JIS symbol



## Specifications

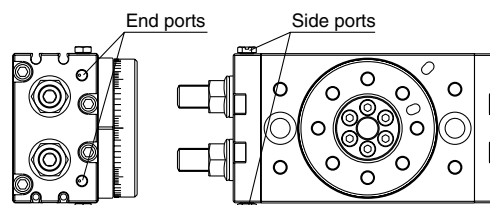
Size		10	20	30	50	70	100	200
Fluid		Air (non-lube)						
Maximum operating pressure	With adjustment bolt	1 MPa						
	With internal shock absorber	0.6 MPa <sup>Note 1)</sup>						
Minimum operating pressure	Basic type	0.1 MPa						
	High precision type	0.2 MPa	0.1 MPa			—		
Ambient and fluid temperature		0 to 60°C (with no freezing)						
Cushion	With adjustment bolt	Rubber bumper						
	With internal shock absorber	Shock absorber						
	Shock absorber model	RBA0805-X692	RBA1006-X692	RBA1411-X692	RBA2015-X821	RBA2725-X821		
Angle adjustment range		0 to 190° <sup>Note 2)</sup>						
Maximum rotation		190°						
Cylinder bore size		ø15	ø18	ø21	ø25	ø28	ø32	ø40
Port size	End ports	M5 x 0.8		Rc 1/8, G 1/8, NPT 1/8				
	Side ports	M5 x 0.8						

Note 1) The maximum operating pressure of the actuator is restricted by the maximum allowable thrust of the shock absorber.

Note 2) Be careful if the rotation angle of a type with internal shock absorber is set below the value in the table below, the piston stroke will be smaller than the shock absorber's effective stroke, resulting in decreased energy absorption ability.

Size	10	20	30	50	70	100	200
Minimum rotation angle that will not allow decrease of energy absorption ability	52°	43°	40°	60°	71°	62°	82°

The service life of the shock absorber may be different from the rotary table body depending on the operating conditions. Refer to Specific Product Precautions for the suitable replacement period.



## Allowable Kinetic Energy and Rotation Time Adjustment Range

Size	Allowable kinetic energy (J) <sup>Note 1)</sup>		Rotation time adjustment range for stable operation (s/90°)	
	With adjustment bolt	With internal shock absorber	With adjustment bolt	With <sup>Note 2)</sup> internal shock absorber
10	0.007	0.039	0.2 to 1.0	0.2 to 0.7
20	0.025	0.116		
30	0.048	0.116		
50	0.081	0.294	0.2 to 1.5	0.2 to 1.0
70	0.240	1.100		
100	0.320	1.600	0.2 to 2.0	
200	0.560	2.900	0.2 to 2.5	

Note 1) If operated where the kinetic energy exceeds the allowable value, this may cause damage to the internal parts and result in product failure. Please pay special attention to the kinetic energy levels when designing and during operation to avoid exceeding the allowable limit.

Note 2) When the rotation time of the type with an internal absorber is set longer than the time shown in the table above, energy absorption of the shock absorber greatly decreases.

## Mass

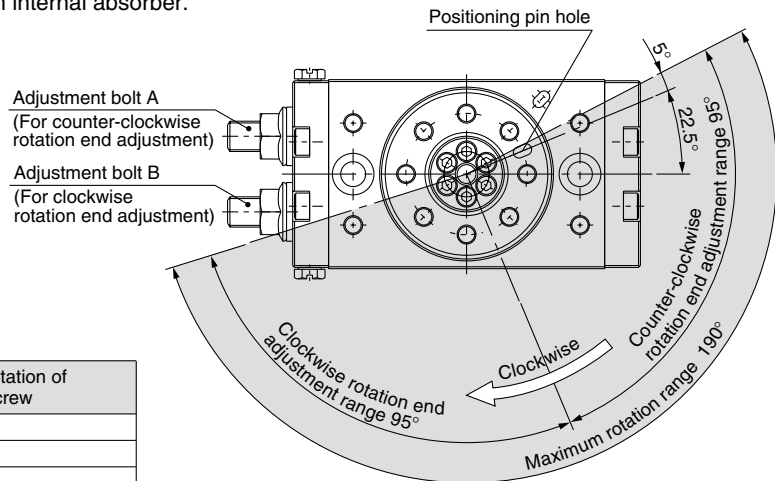
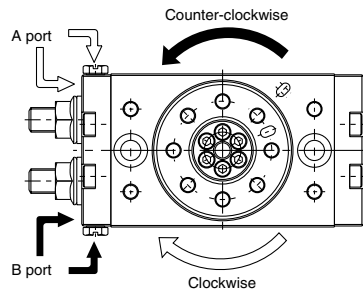
(g)

Size		10	20	30	50	70	100	200
Basic type	With adjustment bolt	530	990	1290	2080	2880	4090	7580
	With internal shock absorber	540	990	1290	2100	2890	4100	7650
High precision type	With adjustment bolt	560	1090	1410	2240	—		
	With internal shock absorber	570	1090	1410	2260			

Note) Values above do not include auto switch mass.

## Rotation Direction and Rotation Angle

- The rotary table turns in the clockwise direction where the A port is pressurized, and in the counter-clockwise direction when the B port is pressurized.
- By adjusting the adjustment bolt, the rotation end can be set within the ranges shown in the drawing.
- The rotation angle can also be set on a type with internal absorber.



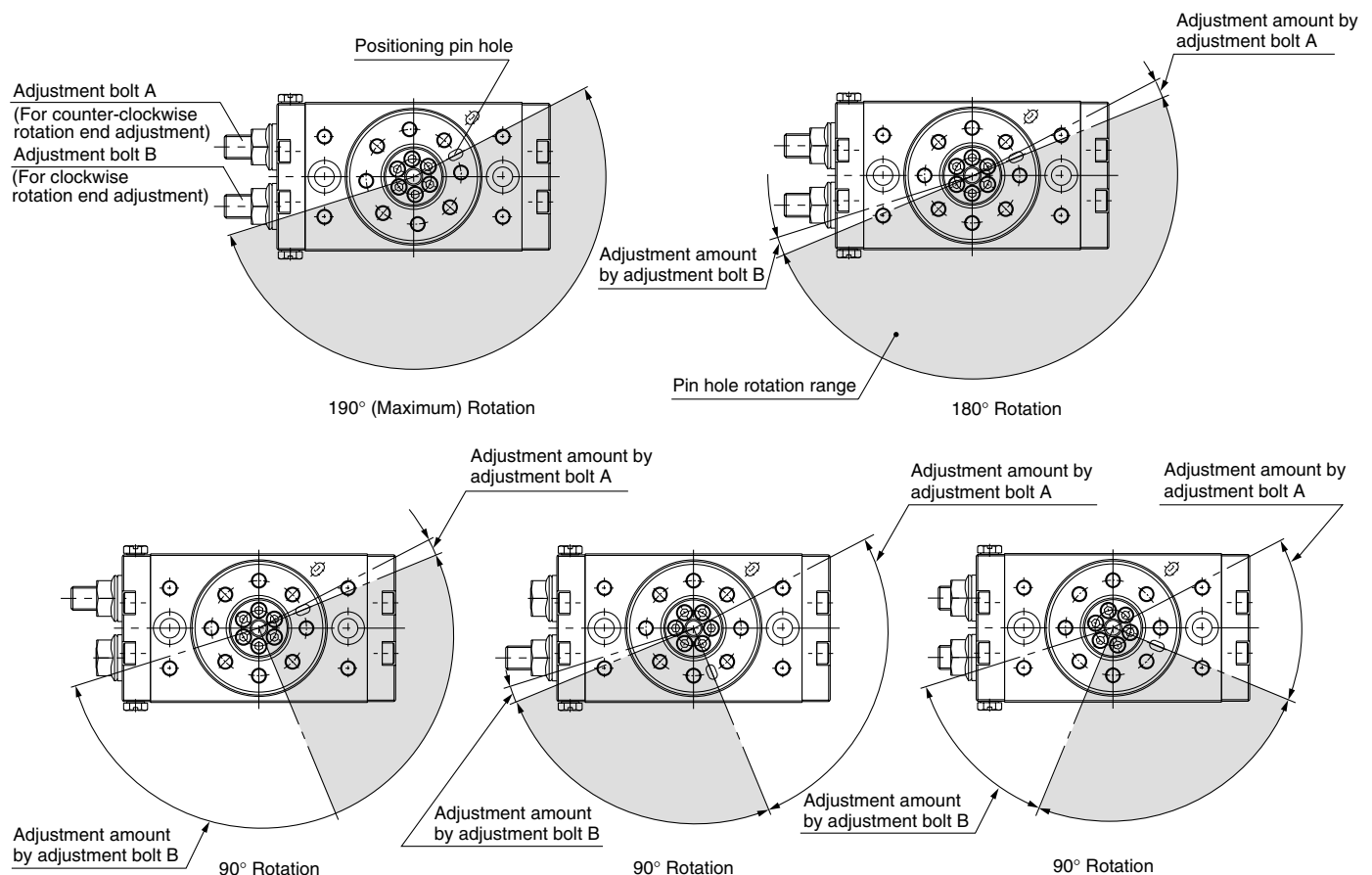
### With adjust bolt, internal shock absorber

Size	Adjustment angle per rotation of angle adjustment screw
10	10.2°
20	7.2°
30	6.5°
50	8.2°
70	7.0°
100	6.1°
200	4.9°

- Note) • The drawing shows the rotation range of the positioning pin hole.  
 • The pin hole position in the drawing shows the counter-clockwise rotation end when the adjustment bolts A and B are tightened equally and the rotation is adjusted 180°.

## Rotation Range Example

- Various rotation ranges are possible as shown in the drawings below using adjustment bolts A and B.  
 (The drawings also show the rotation ranges of the positioning pin hole.)
- The rotation angle can also be set on a type with inertial absorber.



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

D-□

# Series MSQ

## Clean Series

Prevents dispersion of the particles generated inside of the product into the clean room by sucking them out of the vacuum port on the body side.

### How to Order

**11-MSQB10A-A90S**

- Clean series Vacuum type**
- Auto switch type**
- Number of auto switches**
- Thread type**
- Size**
- End port type**
- With adjustment bolt**
- Shock absorber**

End port type	Size
Nil	M 5
Nil	Rc 1/8
-XF	G 1/8
-XN	NPT 1/8

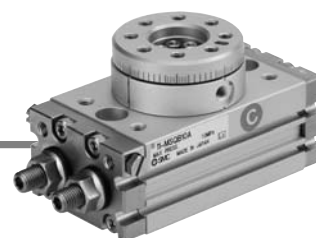
\* Side ports are all M5.

### Specifications

Particle generation grade	Suction flow rate (example)
Grade 1 <small>Note 1)</small>	1 ℓ/min (ANR)

11-MSQA is identical to the high precision type and 11-MSQB is identical to the basic type.

Note) Please refer to "Pneumatic Clean Series" catalog for further details.

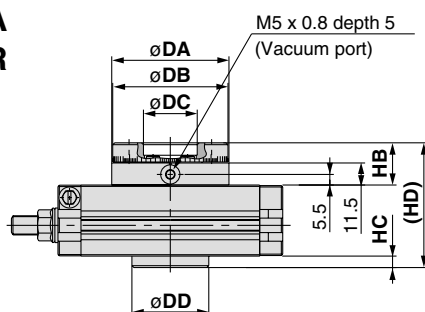


## Dimensions

Clean series products do not have a hollow axis.

### Basic type

11-MSQB□A  
11-MSQB□R

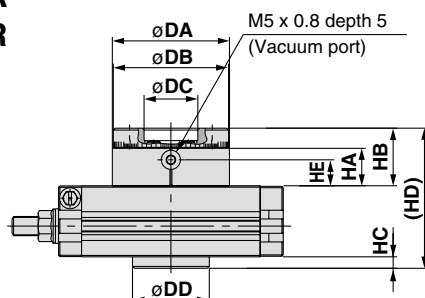


Size	DA(h9)	DB(h9)	DC(H9)	DD(h9)	HB	HC	HD
10	46	45	20	35	20	5	59
20	61	60	28	40	22	6	65
30	67	65	32	48	22	6	68
50	77	75	35	54	24	7	77

Dimensions other than above are identical to the basic type.

### High precision type

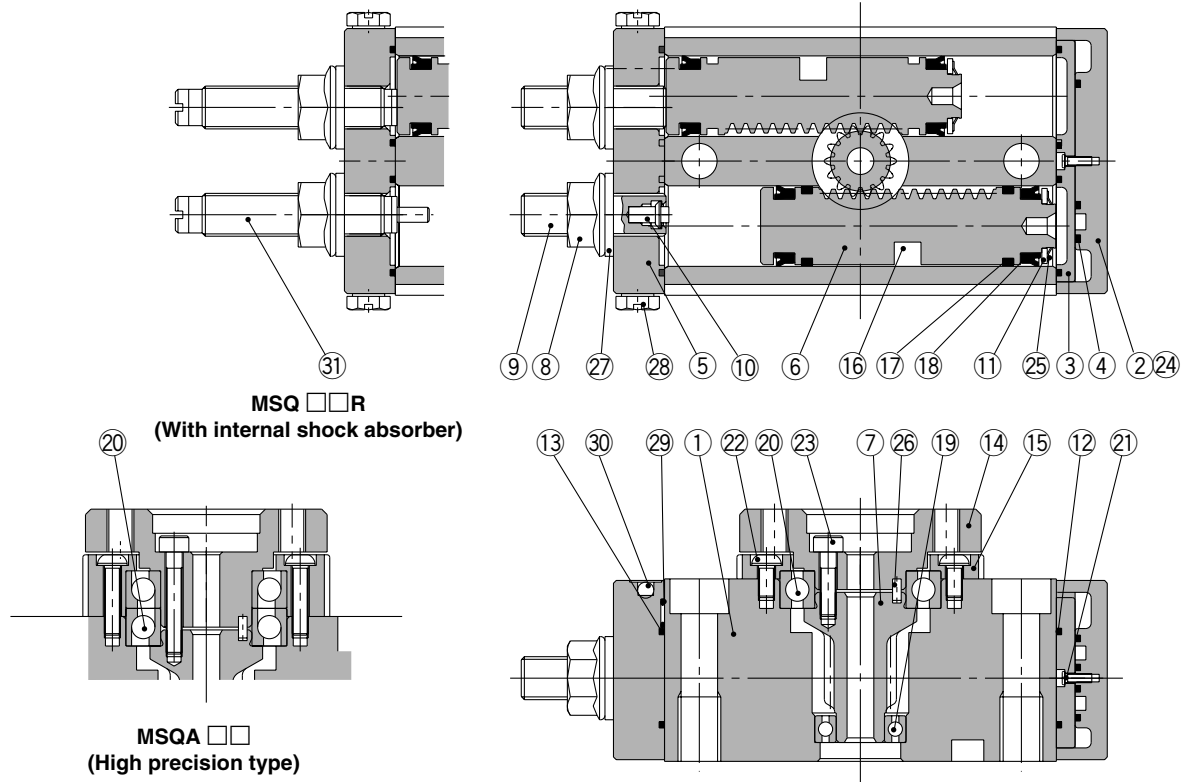
11-MSQA□A  
11-MSQA□R



Size	DA(h8)	DB(h8)	DC(H8)	DD(h8)	HA	HB	HC	HD	HE
10	46	45	20	35	15.5	24	5	63	9.5
20	61	60	28	40	19.5	30	6	73	13.5
30	67	65	32	48	19.5	30	6	76	13.5
50	77	75	35	54	21.5	34	7	87	15.5

Dimensions other than above are identical to the high precision type.

## Construction



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MSZ

CRQ2X  
MSQX

MRQ

## Parts list

No.	Description	Material	Note
1	Body	Aluminium alloy	Anodized
2	Cover	Aluminium alloy	Nickel plated
3	Plate	Aluminium alloy	Chromated
4	Seal	NBR	
5	End cover	Aluminium alloy	Nickel plated
6	Piston	Stainless steel	
7	Pinion	Chrome molybdenum steel	
8	Hexagon nut with flange	Steel wire	Nickel plated
	Hexagon nut		Nickel plated
9	Adjustment bolt	Chrome molybdenum steel	Nickel plated
10	Cushion pad	Rubber material	
11	Seal retainer	Aluminium alloy	Chromated
12	Gasket	NBR	
13	Gasket	NBR	
14	Table	Aluminium alloy	Anodized
15	Bearing retainer	Aluminium alloy	Anodized
16	Magnet	—	Chromated
17	Wear ring	Resin	
18	Piston seal	NBR	

No.	Description	Material	Note
19	Deep groove ball bearing	Bearing steel	
	Needle bearing		
20	Deep groove ball bearing	Bearing steel	
	Angular contact ball bearing		
21	Round head philips screw No.0	Steel wire	Chromated
	Round head philips screw	Stainless steel	
22	Low head cap screw	Stainless steel	
	Hexagon socket head set bolt	Chrome molybdenum steel	Nickel plated
23	Hexagon socket head set bolt	Stainless steel	
24	Hexagon socket head set bolt	Stainless steel	
	Hexagon socket head set bolt	Carbon steel	Nickel plated
25	Type CS retaining ring	Spring steel	
26	Parallel pin	Carbon steel	
	Parallel key		
27	Seal washer	NBR	
28	Plug	Brass	
29	O-ring	NBR	
30	Steel balls	Stainless steel	
31	Shock absorber	—	

## Replacement parts

Description	Size																							
	10				20				30				50				70				100			
Seal kit	P523010-5				P523020-5				P523030-5				P523040-5				P391050-5				P391060-5			
Parts included in seal kit	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.	No.	Description	Qty.
	4	Seal	1	4	Seal	1	4	Seal	1	4	Seal	1	4	Seal	1	4	Seal	1	4	Seal	1	4	Seal	1
	12	Gasket	1	12	Gasket	1	12	Gasket	1	12	Gasket	1	12	Gasket	1	12	Gasket	4	12	Gasket	4	12	Gasket	4
	13	Gasket	1	13	Gasket	1	13	Gasket	1	13	Gasket	1	13	Gasket	1	17	Wear ring	4	17	Wear ring	4	17	Wear ring	4
	17	Wear ring	4	17	Wear ring	4	17	Wear ring	4	17	Wear ring	4	17	Wear ring	4	18	Piston seal	4	18	Piston seal	4	18	Piston seal	4
	18	Piston seal	4	18	Piston seal	4	18	Piston seal	4	18	Piston seal	4	18	Piston seal	4	27	Seal washer	2	27	Seal washer	2	27	Seal washer	2
	27	Seal washer	2	27	Seal washer	2	27	Seal washer	2	27	Seal washer	2	27	Seal washer	2	29	O-ring	4	29	O-ring	4	29	O-ring	4

A grease pack (10 g) is included. When only a grease pack is needed, order with the following part number.

Grease pack part no: GR-S-010 (10g)