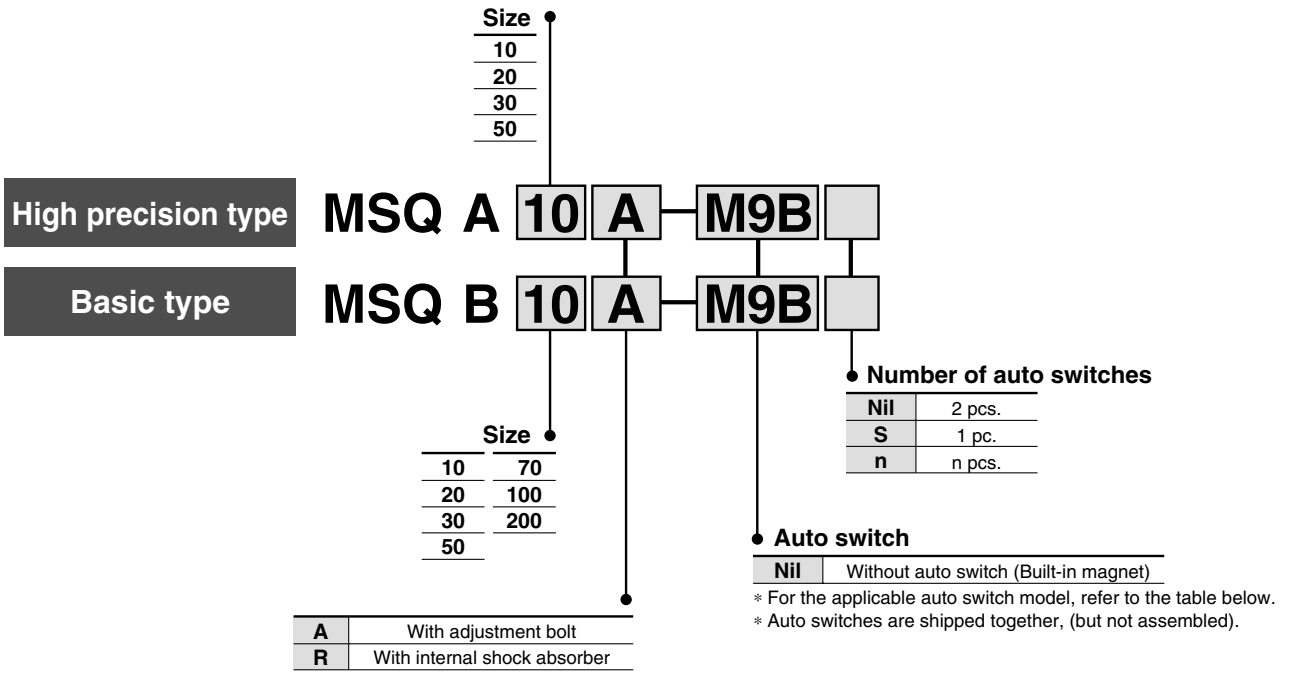
Rotary Table: Basic Type/High Precision Type
Rack & Pinion Style
Series MSQ
Size: 10, 20, 30, 50, 70, 100, 200

How to Order



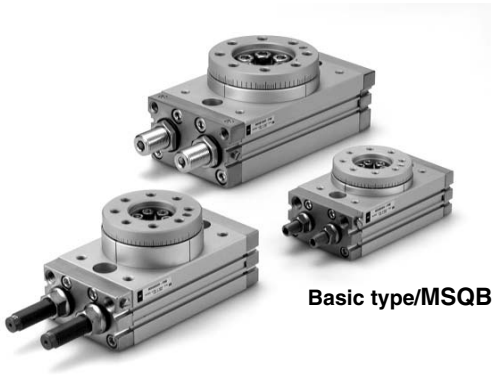
Applicable Auto Switch/Refer to page 11-11-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)	Applicable load	
Reed switch	—	Grommet	No	2-wire	24 V	5 V, 12 V	100 V or less	**A90V**	**A90**	●	●	—	IC circuit	Relay, PLC
			Yes	3-wire (NPN equiv.)	—	5 V	—	**A96V**	**A96**	●	●	—		—
				2-wire	24 V	12 V	100 V	**A93V**	**A93**	●	●	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**M9NV**	**M9N**	●	●	○	IC circuit	Relay, PLC
				3-wire (PNP)				**M9PV**	**M9P**	●	●	○		
				2-wire		12 V		**M9BV**	**M9B**	●	●	○	—	
	Diagnostic indication (2-color display)			3-wire (NPN)		5 V, 12 V		**F9NWV**	**F9NW**	●	●	○	IC circuit	
				3-wire (PNP)				**F9PWV**	**F9PW**	●	●	○		
				2-wire		12 V		**F9BWV**	**F9BW**	●	●	○	—	
	Improved water resistance (2-color display)							—	**F9BA**∗∗	—	●	○		

∗∗ Though it is possible to mount water resistant auto switch, the rotary table itself is not water resistance type.
∗ Lead wire length symbols: 0.5 m ·····Nil (Example) M9N
3 m ····· L (Example) M9NL
5 m ····· Z (Example) M9NZ
∗ Solid state switches marked "○" are produced upon receipt of order.

Made to Order → Please contact SMC.

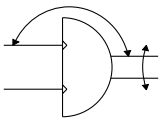
- –50 Without indicator light
- –61 Flexible lead wire
- Pre-wire connector



Basic type/MSQB

High precision type/MSQA

JIS Symbol



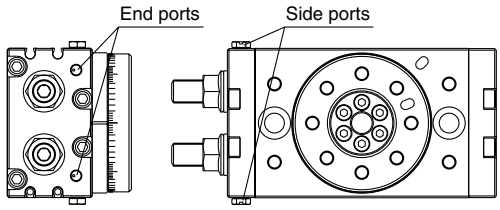
Specifications

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 Note 1)						
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° Note 2)						
Maximum rotation			190°						
Cylinder bore size			ø15	ø18	ø21	ø25	ø28	ø32	ø40
Port size	End ports		M5 x 0.8		Rc 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°



Allowable Kinetic Energy and Rotation Time Adjustment Range

Size	Allowable kinetic energy (mJ)		Rotation time adjustment range for stable operation (s/90°)	
	With adjustment bolt	With internal shock absorber	With adjustment bolt	With Note1) internal shock absorber
10	7	39	0.2 to 1.0	0.2 to 0.7
20	25	116		
30	48	116		
50	81	294		
70	240	1100	0.2 to 1.5	0.2 to 1.0
100	320	1600	0.2 to 2.0	
200	560	2900	0.2 to 2.5	

Note 1) Be careful if a type with internal absorber is used below the minimum speed, the energy absorption ability will decrease drastically.

Weight

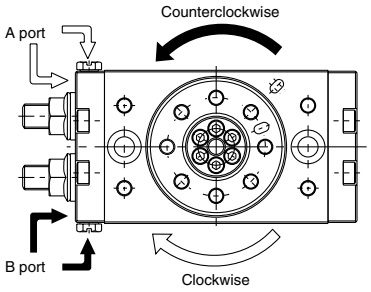
(g)

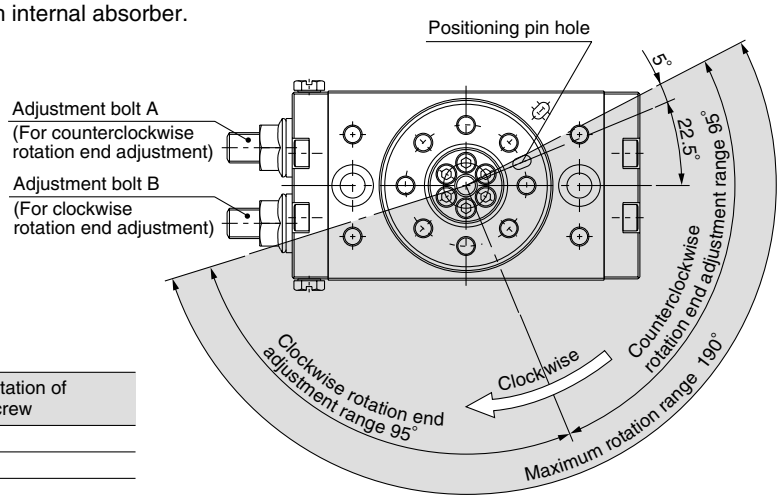
Size		10	20	30	50	70	100	200
Basic type	With adjustment bolt	530	990	1290	2080	2880	4090	7580
	With internal shock absorber	540	990	1290	2100	2890	4100	7650
High precision type	With adjustment bolt	560	1090	1410	2240	–		
	With internal shock absorber	570	1090	1410	2260			

Note) Values above do not include auto switch weights.

Rotation Direction and Rotation Angle

- The rotary table turns in the clockwise direction where the A port is pressurized, and in the counterclockwise 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 for the desired rotation angle.
- The rotation angle can also be set on a type with internal absorber.





With adjust bolt, internal shock absorber

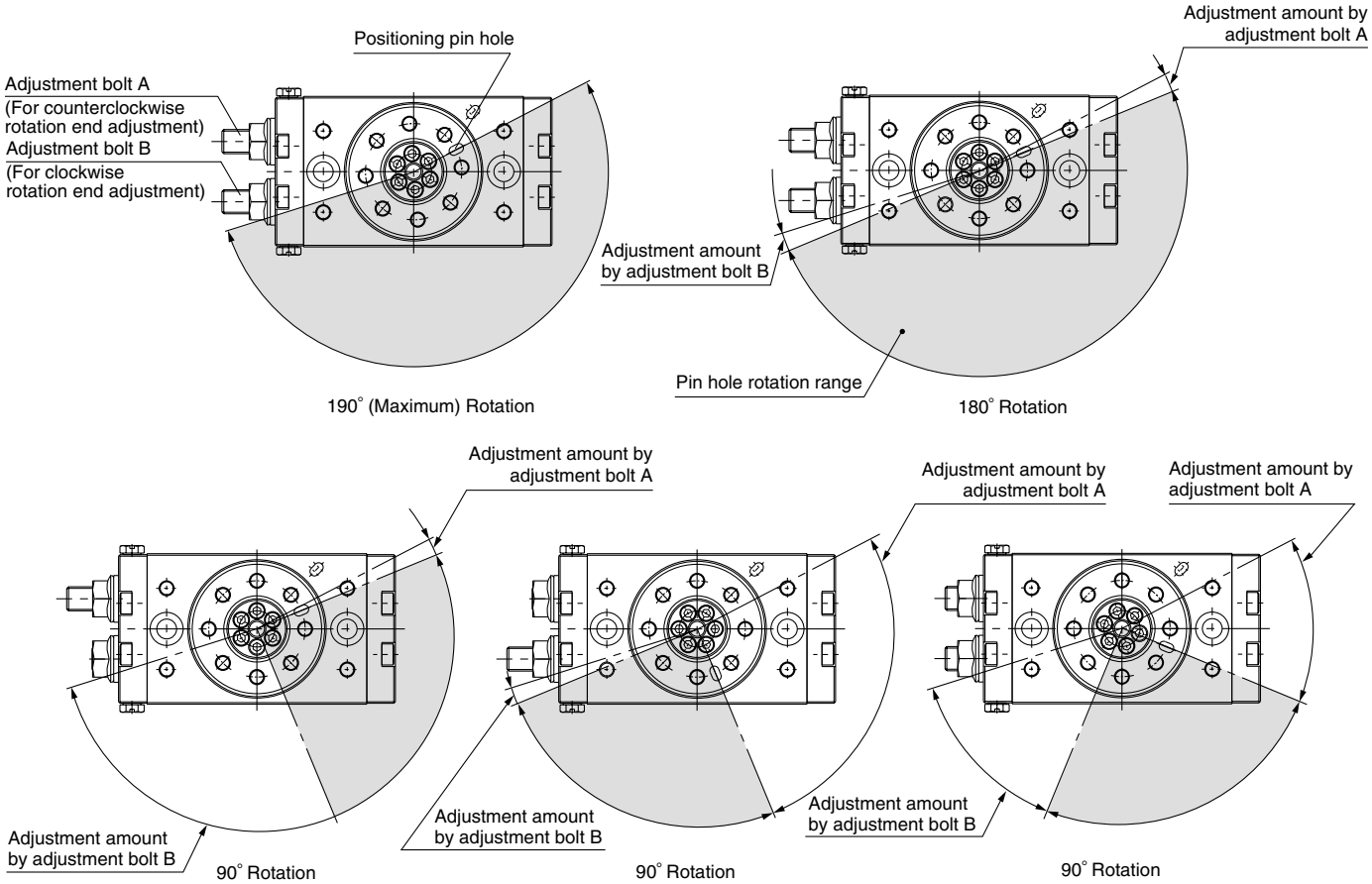
Size	Adjustment angle per rotation of angle adjustment screw
10	10.2°
20	7.2°
30	6.5°
50	8.2°
70	7.0°
100	6.1°
200	4.9°

Note) • The drawing shows the rotation range of the positioning pin hole.
• The pin hole position in the drawing shows the counterclockwise 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
MRQ
D-
20-

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 – MSQ B 10 A – A90 S

- **11**: Clean Series Vacuum type
- **B**:

A	High precision type
B	Basic type

- **10**: Size

Size
10
20
30
50

- **A**:

A	With adjustment bolt
R	Shock absorber

- **A90**: Auto switch
- **S**: Number of auto switches

Specifications and Allowable Load

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

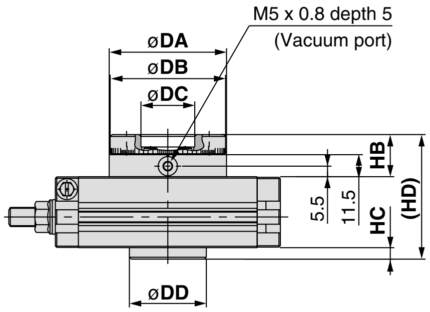
11-MSQA is identical to the high precision type and 11-MSQB is identical to the basic type.

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

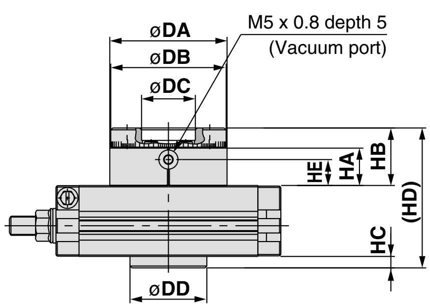


(mm)

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

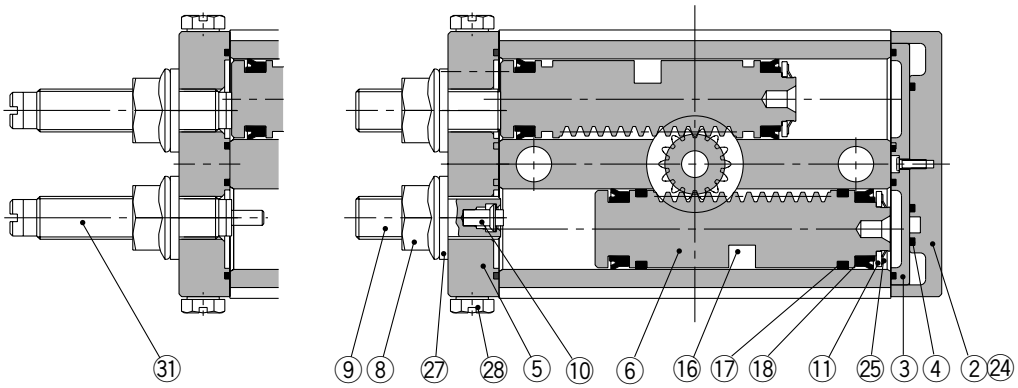


(mm)

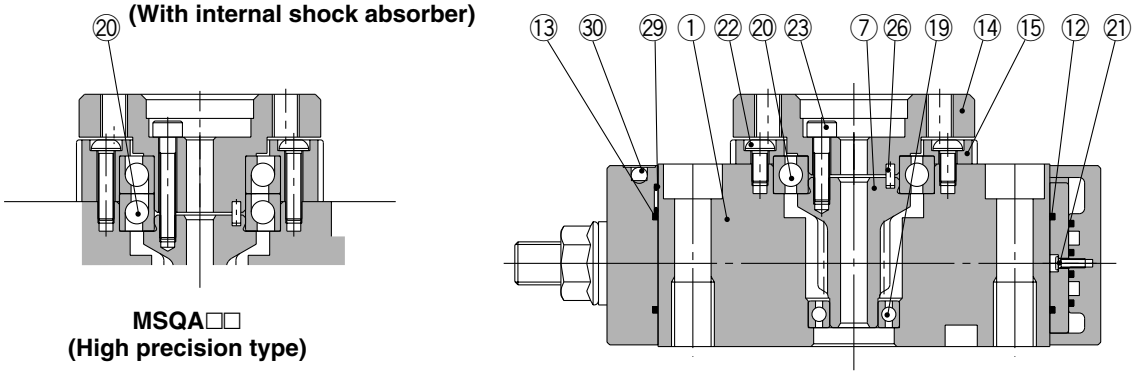
Size	DA(h8)	DB(h8)	DC(H8)	DD(h8)	HA	HB	HC	HD	HE
10	46	45	20	35	15.5	24	5	63	9.5
20	61	60	28	40	19.5	30	6	73	13.5
30	67	65	32	48	19.5	30	6	76	13.5
50	77	75	35	54	21.5	34	7	87	15.5

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

Construction



MSQ□□R
(With internal shock absorber)



MSQA□□
(High precision type)

Component Parts

No.	Description		Material
①	**Body**		Aluminium alloy
②	**Cover**		Aluminium alloy
③	**Plate**		Aluminium alloy
④	**Seal**		NBR
⑤	**End cover**		Aluminium alloy
⑥	**Piston**		Stainless steel
⑦	**Pinion**		Chrome molybdenum steel
⑧	**Hexagon nut with flange**	**Size: 10 to 50**	Steel wire
	Hexagon nut	**Size: 70 to 200**	
⑨	**Adjustment bolt**		Chrome molybdenum steel
⑩	**Cushion pad**		Rubber material
⑪	**Seal retainer**		Aluminium alloy
⑫	**Gasket**		NBR
⑬	**Gasket**		NBR
⑭	**Table**		Aluminium alloy
⑮	**Bearing retainer**		Aluminium alloy
⑯	**Magnet**		Magnetic material
⑰	**Wear ring**		Resin
⑱	**Piston seal**		NBR

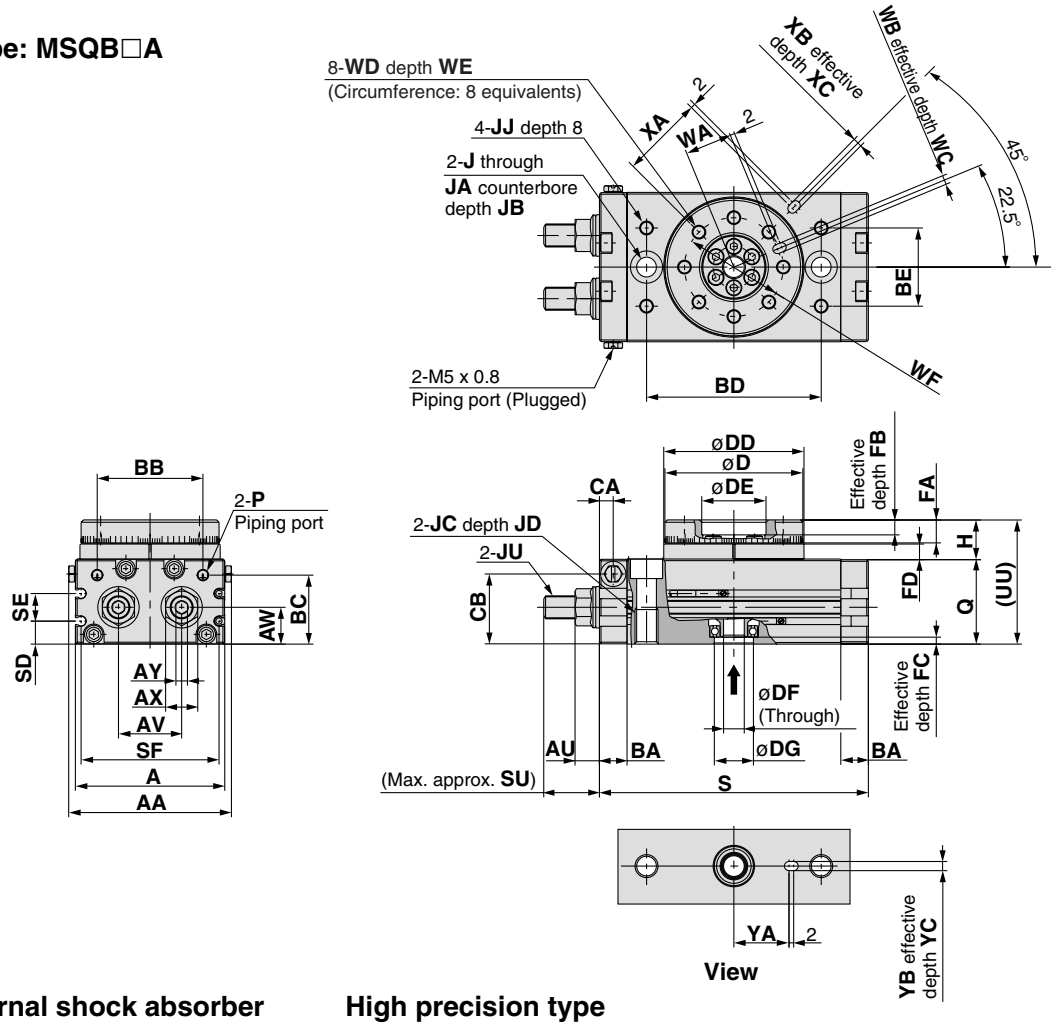
No.	Description		Material
⑲	**Deep groove ball bearing**	**Size: 10 to 50**	Bearing steel
	Needle bearing	**Size: 70 to 200**	
⑳	**Deep groove ball bearing**	**Basic type**	Bearing steel
	Angular contact ball bearing	**High precision type**	
㉑	**Round head philips screw No.0**		Steel wire
㉒	**Round head philips screw**	**Size: 10**	Stainless steel
	Low head cap screw	**Size: 20 to 50**	Chrome molybdenum steel
	Hexagon socket head set bolt	**Size: 70 to 200**	
㉓	**Hexagon socket head set bolt**		Stainless steel
㉔	**Hexagon socket head set bolt**	**Size: 10 to 50**	Stainless steel
		Size: 70 to 200	Carbon steel
㉕	**CS type snap ring**		Spring steel
㉖	**Parallel pin**	**Size: 10 to 50**	Carbon steel
	Parallel key	**Size: 70 to 200**	
㉗	**Seal washer**		NBR
㉘	**Plug**		Brass
㉙	**O-ring**	**Size: 70 to 200 only**	NBR
㉚	**Steel balls**	**Size: 70 to 200 only**	Stainless steel
㉛	**Shock absorber**		—

Replacement Parts

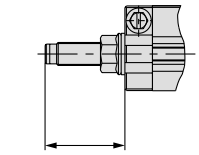
Description	Kit no.							Note
	10	**20**	**30**	**50**	**70**	**100**	**200**	
Seal kit	P523010-5	P523020-5	P523030-5	P523040-5	P391050-5	P391060-5	P391070-5	A set of above numbers ④, ⑫, ⑬, ⑰, ⑱ and ㉗

Dimensions: Size 10, 20, 30, 50

Basic type: MSQB□A



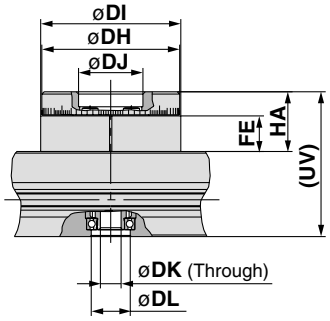
With internal shock absorber
MSQA□R
MSQB□R



(mm)

Size	FU
10	31.5
20	34.7
30	34.7
50	51.7

High precision type
MSQA□A: With adjustment bolt
MSQA□R: With internal shock absorber



(mm)

Size	DH	DI	DJ	DK	DL	FE	HA	UV
10	45h8	46h8	20H8	5	15H8	10	18.5	52.5
20	60h8	61h8	28H8	9	17H8	15.5	26	63
30	65h8	67h8	32H8	9	22H8	16.5	27	67
50	75h8	77h8	35H8	10	26H8	17.5	30	76

(mm)

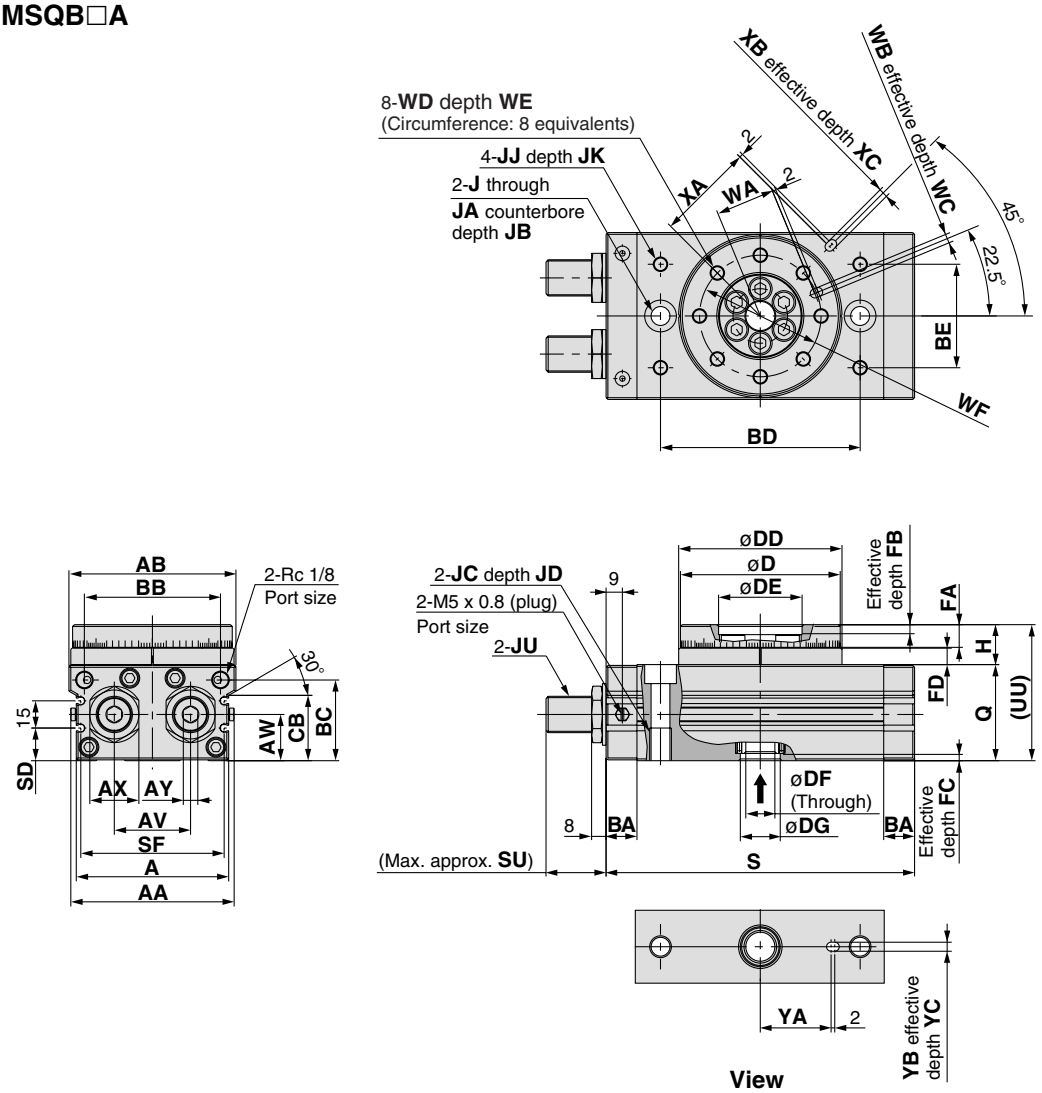
Size	AA	A	AU	AV	AW	AX	AY	BA	BB	BC	BD	BE	CA	CB	D	DD	DE	DF	DG	FA	FB	FC	FD	H	J	JA	JB
10	55.4	50	8.6	20	15.5	12	4	9.5	34.5	27.8	60	27	4.5	28.5	45h9	46h9	20H9	5	15H9	8	4	3	4.5	13	6.8	11	6.5
20	70.8	65	10.6	27.5	16	14	5	12	46	30	76	34	6	30.5	60h9	61h9	28H9	9	17H9	10	6	2.5	6.5	17	8.6	14	8.5
30	75.4	70	10.6	29	18.5	14	5	12	50	32	84	37	6.5	33.5	65h9	67h9	32H9	9	22H9	10	4.5	3	6.5	17	8.6	14	8.5
50	85.4	80	14	38	22	19	6	15.5	63	37.5	100	50	10	37.5	75h9	77h9	35H9	10	26H9	12	5	3	7.5	20	10.5	18	10.5

(mm)

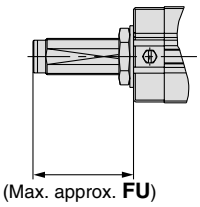
Size	JC	JD	JJ	JU	P	Q	S	SD	SE	SF	SU	UU	WA	WB	WC	WD	WE	WF	XA	XB	XC	YA	YB	YC
10	M8 x 1.25	12	M5 x 0.8	M8 x 1	M5 x 0.8	34	92	9	13	45	17.7	47	15	3H9	3.5	M5 x 0.8	8	32	27	3H9	3.5	19	3H9	3.5
20	M10 x 1.5	15	M6 x 1	M10 x 1	M5 x 0.8	37	117	10	12	60	25	54	20.5	4H9	4.5	M6 x 1	10	43	36	4H9	4.5	24	4H9	4.5
30	M10 x 1.5	15	M6 x 1	M10 x 1	Rc 1/8	40	127	11.5	14	65	25	57	23	4H9	4.5	M6 x 1	10	48	39	4H9	4.5	28	4H9	4.5
50	M12 x 1.75	18	M8 x 1.25	M14 x 1.5	Rc 1/8	46	152	14.5	15	75	31.4	66	26.5	5H9	5.5	M8 x 1.25	12	55	45	5H9	5.5	33	5H9	5.5

Dimensions: Size 70, 100, 200

Basic type: MSQB□A



With shock absorber
MSQB□R



(mm)

Size	FU
70	55.4
100	55.5
200	74.7

(mm)

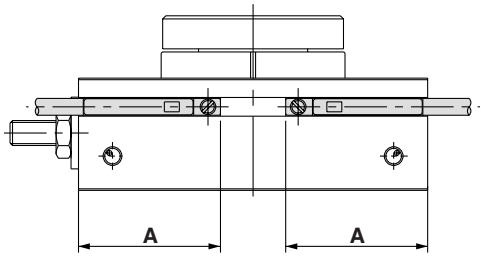
Size	AA	AB	A	AV	AW	AX	AY	BA	BB	BC	BD	BE	CB	D	DD	DE	DF	DG	FA	FB	FC	FD	H	J	JA	JB
70	90	92	84	42	25.5	27	8	17	75	44.5	110	57	36	88h9	90h9	46H9	16	22H9	12.5	5	3.5	9	22	10.4	17.5	10.5
100	101	102	95	50	29.5	27	8	17	85	50.5	130	66	42	98h9	100h9	56H9	19	24H9	14.5	6	3.5	12	27	10.4	17.5	10.5
200	119	120	113	60	36.5	36	10	24	103	65.5	150	80	57	116h9	118h9	64H9	24	32H9	16.5	9	5.5	15	32	14.2	20	12.5

(mm)

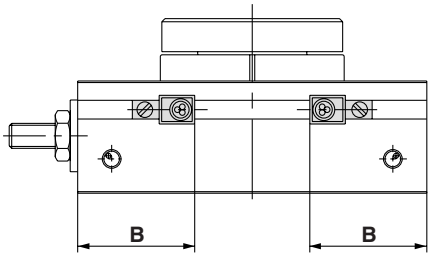
Size	JC	JD	JJ	JK	JU	Q	S	SD	SF	SU	UU	WA	WB	WC	WD	WE	WF	XA	XB	XC	YA	YB	YC
70	M12 x 1.75	18	M8 x 1.25	10	M20 x 1.5	53	170	18	79	34.2	75	32.5	5H9	5.5	M8 x 1.25	12.5	67	54	5H9	3.5	39	5H9	3.5
100	M12 x 1.75	18	M8 x 1.25	10	M20 x 1.5	59	189	22	90	34.3	86	37.5	6H9	6.5	M10 x 1.5	14.5	77	59	6H9	4.5	49	6H9	4.5
200	M16 x 2	25	M12 x 1.75	13	M27 x 1.5	74	240	29	108	40.2	106	44	8H9	8.5	M12 x 1.75	16.5	90	69	8H9	4.5	54	8H9	6.5

Proper Auto Switch Mounting Position at Rotation End

• Size: 1 to 7



When D-F9 and M9 are used

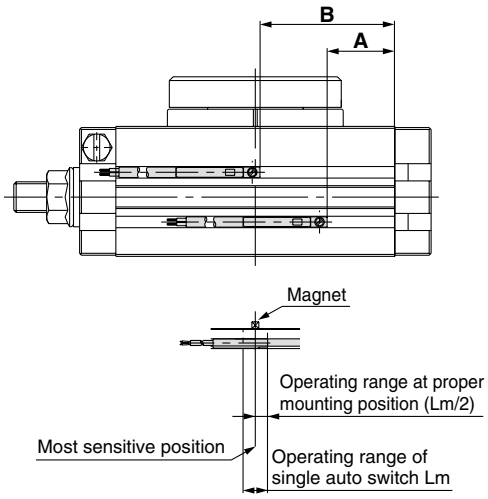


When D-F8 is used

Size	Rotation	Solid state switch								
		D-F9□W			D-M9□			D-F8□		
		A	Operating angle θ m	Hysteresis angle	A	Operating angle θ m	Hysteresis angle	B	Operating angle θ m	Hysteresis angle
1	190°	20.9	40°	10°	20.9	55°	10°	16.9	20°	10°
2	190°	22.8	35°	10°	22.8	45°	10°	18.8	20°	10°
3	190°	24.4	30°	10°	24.4	40°	10°	20.4	15°	10°
7	190°	28.7	25°	10°	28.7	40°	10°	24.7	15°	10°

Operating angle θ m: Value of the operating range Lm of a single auto switch converted to an axial rotation angle.
Hysteresis angle : Value of auto switch hysteresis converted to an angle.

• Size: 10 to 200



Size	Rotation	Reed switch				Solid state switch							
		D-A9□, D-A9□V				D-M9□V, D-F9□W, D-F9□WV, D-F9BAL				D-M9□			
		A	B	Operating angle θ m	Hysteresis angle	A	B	Operating angle θ m	Hysteresis angle	A	B	Operating angle θ m	Hysteresis angle
10	190°	17	36	90°	10°	21	40	90°	10°	21	40	60°	10°
20	190°	23	50	80°	10°	27	54	80°	10°	27	54	50°	10°
30	190°	27	66	65°	10°	31	60	65°	10°	31	60	50°	10°
50	190°	33	68	50°	10°	37	72	50°	10°	37	72	40°	10°
70	190°	37	78	45°	10°	41	82	45°	10°	41	82	40°	10°
100	190°	44	91	40°	10°	48	95	40°	10°	48	95	30°	10°
200	190°	57	115	35°	10°	61	19	35°	10°	61	19	20°	10°

Operating angle θ m: Value of the operating range Lm of a single auto switch converted to an axial rotation angle.
Hysteresis angle: Value of auto switch hysteresis converted to an angle.