



Rotary Table: High Precision Type Vane Style

Series *MSUA*

Size: 1, 3, 7, 20



How to Order

Bearing type

A	High precision type
----------	---------------------

Free mount type

Nil	Side ported
E	Axial ported

Available with side ported only, when equipped with switch unit.

Without auto switch

MSUA 20-90 S

With auto switch

M D SUA 20-90 S-T79 L

With auto switch unit

Nominal size (Torque)

1	MSUA1
3	MSUA3
7	MSUA7
20	MSUA20

Rotating angle

Applicable	Symbol	Rotating angle
Single vane	90	90°
	180	180°

Rotation adjustment range
Single vane: Both ends 5° each

Vane type

S	Single vane
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Number of auto switches

S	1 pc. *
Nil	2 pcs.

* For 1 piece, a right hand auto switch is installed.

Electrical entry/Lead wire length

Nil	Grommet/Lead wire: 0.5 m
L	Grommet/Lead wire: 3 m
C	Connector/Lead wire: 0.5 m
CL	Connector/Lead wire: 3 m
CN	Connector/Without lead wire

* Available only with R73, R80 and T79 type connectors.
** Lead wire with connector part nos.
D-LC05: Lead wire 0.5 m
D-LC30: Lead wire 3 m
D-LC50: Lead wire 5 m

Auto switch

Nil	Without auto switch
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* For the applicable auto switch model, refer to the table below.
* Auto switches are shipped together (but not assembled).

- CRB2
- CRBU2
- CRB1
- MSU**
- CRJ
- CRA1
- CRQ2
- MSQ
- MRQ
- D-
- 20-

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

Applicable model	Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire type	Lead wire length (m) *				Pre-wire connector	Applicable load		
						DC	AC	Perpendicular	In-line		0.5 (Nil)	3 (L)	5 (Z)	None (N)				
																	97	93A
MDSUA1 MDSUA3	Reed switch	—	Grommet	Yes	2-wire	24 V	—	100 V	—	97	Parallel cord	●	●	●	—	—	—	
												●	●	●	—			
	Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—	S99V	S99	Heavy-duty cord	●	●	—	○	IC circuit	Relay, PLC
													●	●	—	○		
MDSUA7 MDSUA20	Reed switch	—	Grommet Connector	Yes	2-wire	24 V	—	100 V	—	R73	Heavy-duty cord	●	●	—	—	—	—	
												●	●	●	●			
	Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	—	S79	S79	Heavy-duty cord	●	●	—	○	IC circuit	Relay, PLC
													●	●	—	○		
			Connector		2-wire	12 V				T79		●	●	—	○	—		
												●	●	●	●			

* Lead wire length symbols: 0.5 m Nil (Example) R73C
3 m L (Example) R73CL
5 m Z (Example) R73CZ
None N (Example) R73CN

* Auto switches marked with "O" are made-to-order specifications.

Order example: MSUA20 single vane type (connection port side location selected)

- Standard type (Without auto switches), Rotation 90°, side port location
MSUA20-90S
- With switch unit (Without auto switches), Rotation 180°, side port location
MDSUA20-180S
- With switch unit + Auto switch R73, Rotation 180°, Side port location
MDSUA20-180S-R73



Refer to page 11-11-36 for detailed solid state switches with pre-wire connectors.

Series MSUA

Specifications

Model *2		MSUA1		MSUA3		MSUA7		MSUA20	
Vane type		Single vane		Single vane		Single vane		Single vane	
Rotating angle *1		90° ±10°	180° ±10°	90° ±10°	180° ±10°	90° ±10°	180° ±10°	90° ±10°	180° ±10°
Fluid		Air (Non-lube)							
Proof pressure (MPa)		1.05						1.5	
Ambient and fluid temperature		5 to 60°C							
Operating pressure range (MPa)		0.2 to 0.7		0.15 to 0.7		0.15 to 0.7		0.15 to 1.0	
Rotation time adjustment range (sec/90°)		0.07 to 0.3							
Shaft load	Allowable radial load	20 N		40 N		50 N		60 N	
	Allowable thrust load	15 N		30 N		60 N		80 N	
	Allowable moment	0.3 N·m		0.7 N·m		0.9 N·m		2.9 N·m	
Bearing		Special bearing							
Port location		Side ported or Top ported							
Port size	Side ported	M3 x 0.5			M5 x 0.8			M5 x 0.8	
	Top ported	M3 x 0.5			M5 x 0.8			M5 x 0.8	
Deflection accuracy		0.03 mm or less							

*1 Single vane 90° can be adjusted to 90° ±10° (both ends of rotation ±5° each)

Single vane 180° can be adjusted to 180° ±10° (both ends of rotation ±5° each)

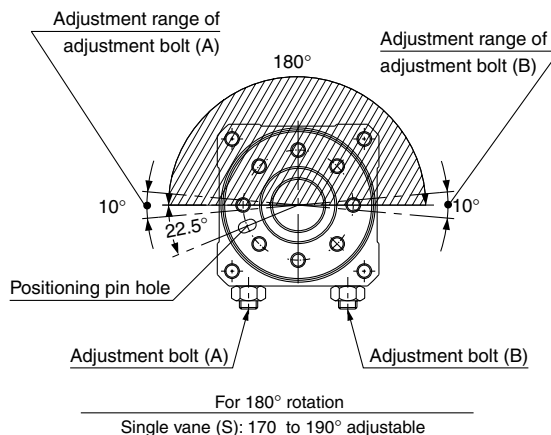
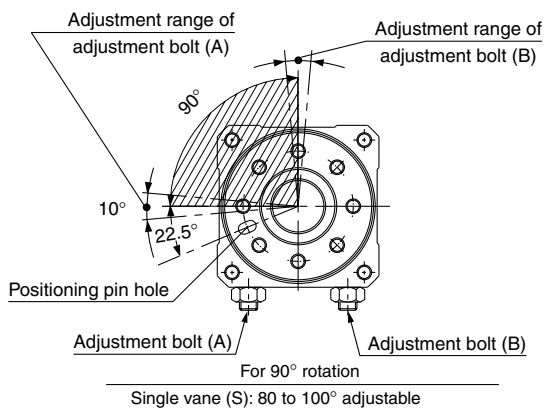
Note) Refer to page 11-1-34 for allowable kinetic energy.

*2 Correspondence to equivalent conventional free-mount types

Rotary table	Free-mount rotary actuator
MSUA1	CRBU2W10
MSUA3	CRBU2W15
MSUA7	CRBU2W20
MSUA20	CRBU2W30

Table Rotation Range

Angle adjustment is possible as shown in the drawings below using adjustment bolts (A) and (B).



Weight

Size	Rotating angle	Basic weight (g)	
		Single vane	Auto switch unit + Auto switch 2 pcs.
1	90°	162	25
	180°	161	
3	90°	261.5	30
	180°	259.5	
7	90°	440	50
	180°	436	
20	90°	675	60
	180°	670.5	

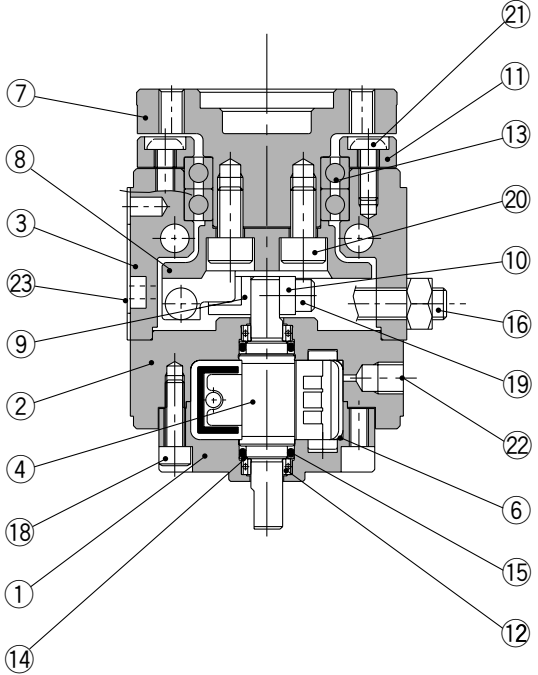
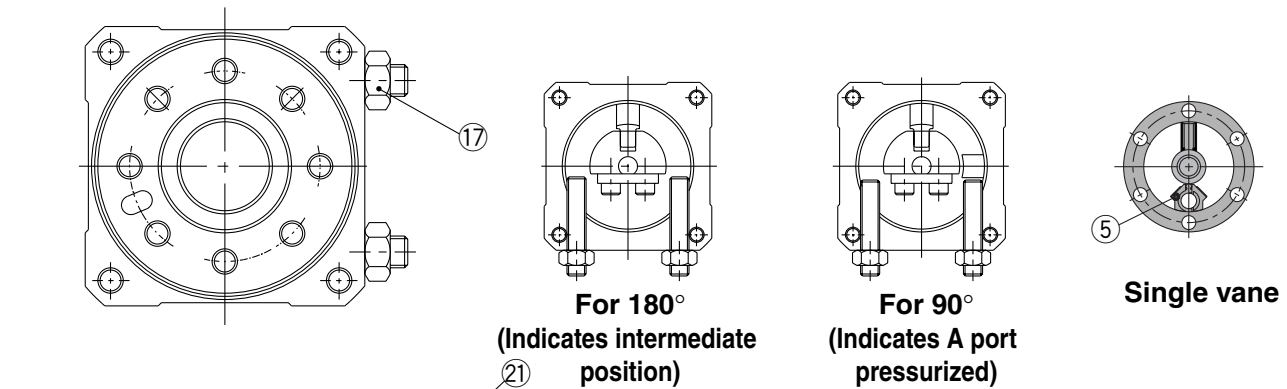
Allowable Load

Do not permit the load and moment applied to the table to exceed the allowable values shown in the table below. (Operation above the allowable values can cause adverse effects on service life, such as play in the table and loss of accuracy.)

Size	Allowable Load (N)	
	Allowable radial load (N)	Allowable thrust load (N)
1	20	15
3	40	30
7	50	60
20	60	80

Rotary Table: High Precision Type Vane Style **Series MSUA**

Construction

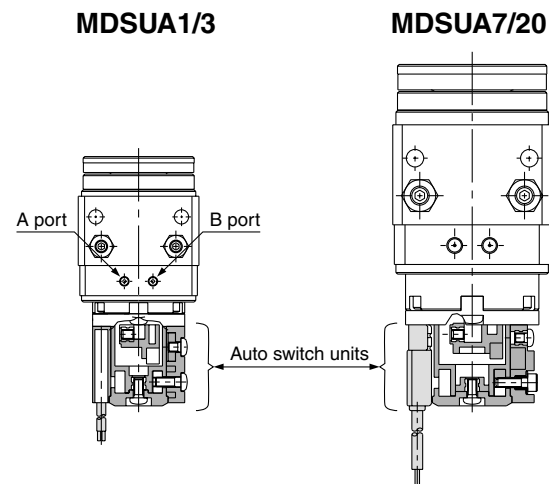


Component Parts

No.	Description	Material	Note
①	Body A	Aluminum alloy	Light gray color
②	Body B	Aluminum alloy	Light gray color
③	Body C	Aluminum alloy	Light gray color
④	Vane shaft	Stainless steel (MSUA20 is carbon steel)	Single vane
⑤	Stopper	Resin	Single vane
⑥	Stopper seal	NBR	
⑦	Table	Aluminum alloy	Light gray color
⑧	Stopper lever	Carbon steel	
⑨	Stopper guide	Stainless steel	
⑩	Lever retainer	Carbon steel	
⑪	Bearing retainer	Aluminum alloy	Light gray color
⑫	Bearing	High carbon chrome bearing steel	
⑬	Special bearing	High carbon chrome bearing steel	
⑭	Back-up ring	Stainless steel	
⑮	O-ring	NBR	
⑯	With adjustment bolt	Carbon steel	
⑰	Hexagon nut	Carbon steel	
⑱	Hexagon socket head cap screw	Stainless steel	
⑲	Hexagon socket head cap screw	Stainless steel	
⑳	Hexagon socket head cap screw	Carbon steel	
㉑	Button bolt	Carbon steel	
㉒	Hexagon socket head cap screw	Stainless steel	SE type only
㉓	Label		

* The plug ㉒ is used only when the connection port is type SE.

Internal construction with auto switch



* Each unit can be retrofit onto a rotary actuator.
* When auto switches are needed after the initial order, they can be ordered separately from the rotary actuator. Auto switches should be ordered separately, since they are not included.

Model	Auto switch unit part no.
MDSUA1	P211070-1
MDSUA3	P211090-1
MDSUA7	P211060-1
MDSUA20	P211080-1

* Auto switches are not included with switch units.

Auto switch block unit		
MDSUA1/3		MDSUA7/20
Right-handed	Left-handed	Combination left & right-handed
Part no.: P211070-8	Part no.: P211070-9	Part no.: P211060-8

Auto switch block unit shows the necessary assembly for mounting 1 piece of auto switch to the auto switch unit.

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

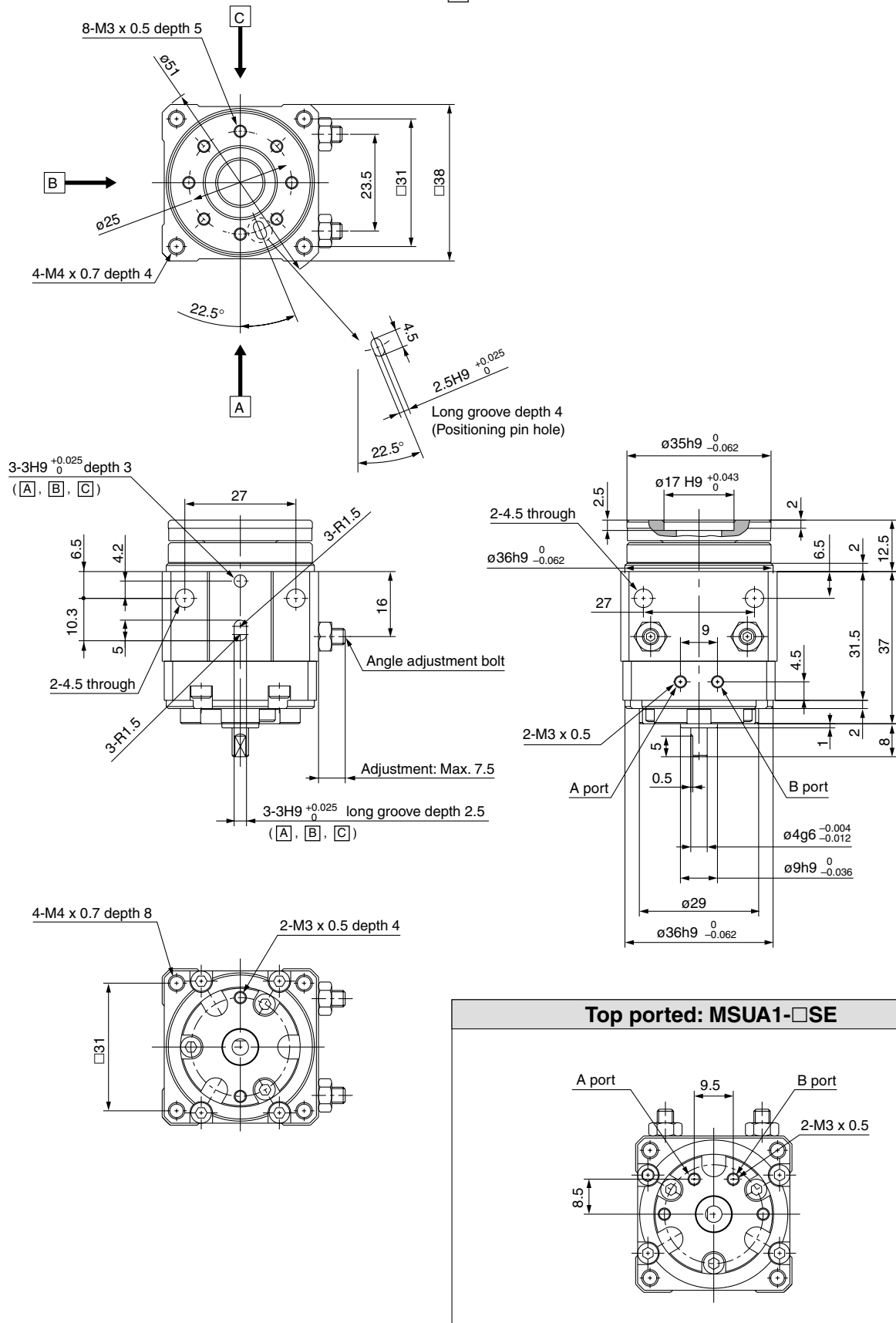
Series MSUA

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUA1

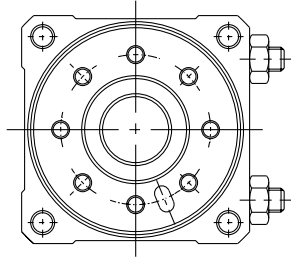
MSUA1-□S/SE



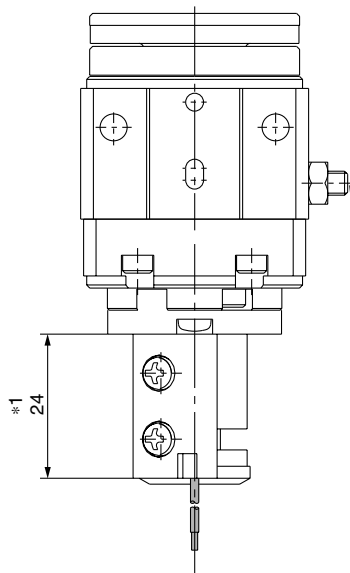
Rotary Table: High Precision Type Vane Style **Series MSUA**

These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA1-□S



- *1) 24: When using D-90/90A/S99/S99V/S9P/S9PV/T99/T99V
30: When using D-97/93A
- *2) 60°: When using D-90/90A/97/93A
69°: When using D-S99/S99V/S9P/S9PV/T99/T99V

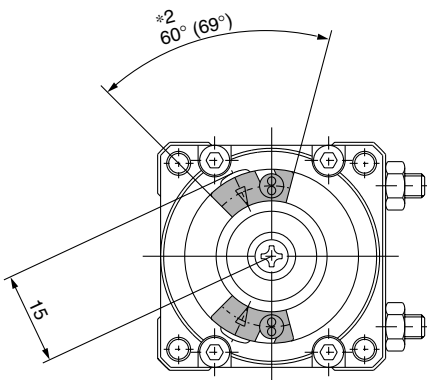
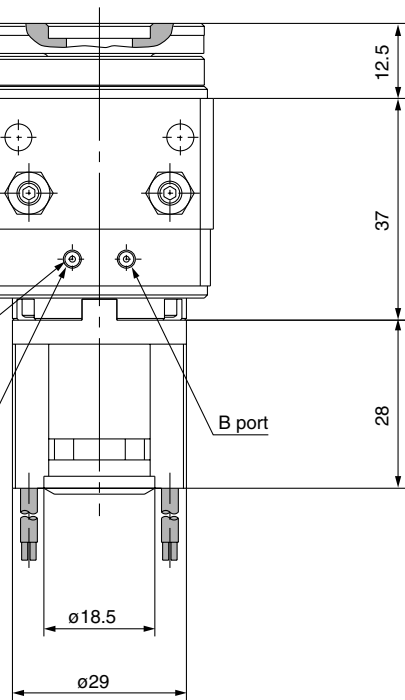


Angle adjustment bolt

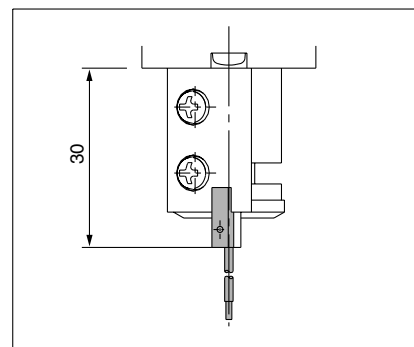
2-M3 x 0.5
(Port location: Side ported type only)

A port

B port



D-97/93A



CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

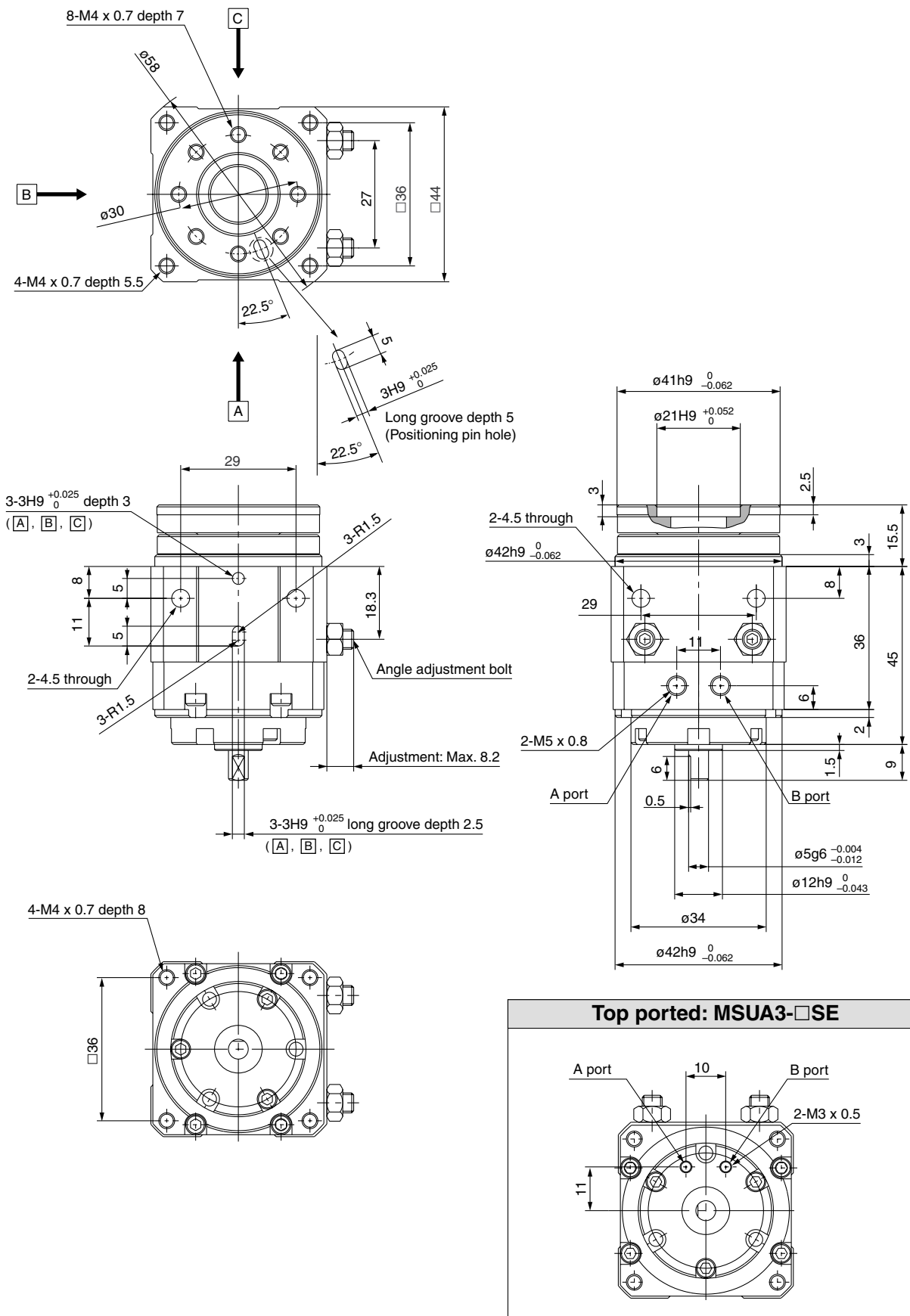
Series MSUA

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUA3

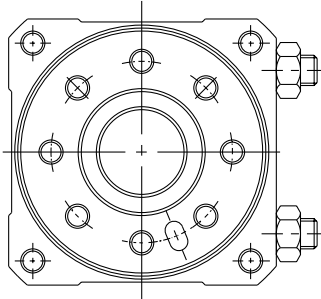
MSUA3-□S/SE



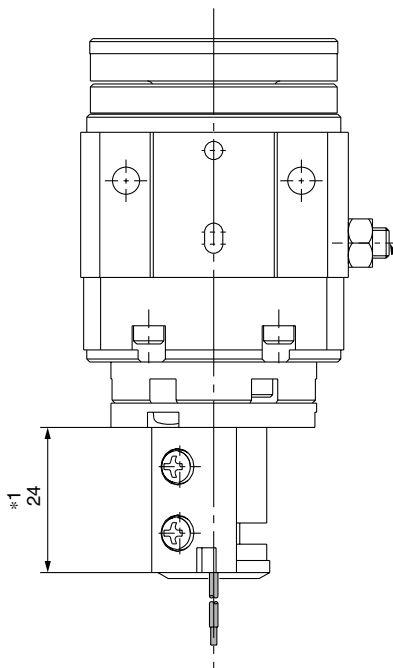
Rotary Table: High Precision Type Vane Style **Series MSUA**

These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA3-□S



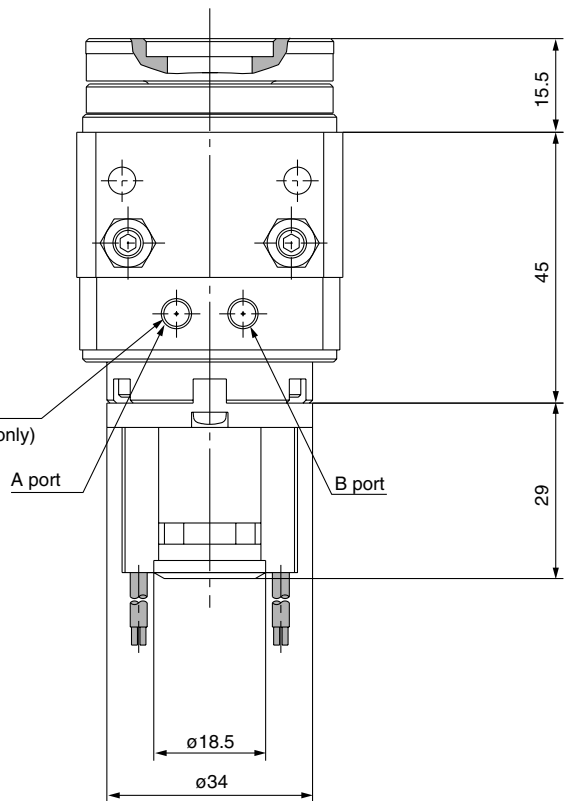
- * 1) 24: When using D-90/90A/S99/S99V/S9P/S9PV/T99/T99V
30: When using D-97/93A
- * 2) 60°: When using D-90/90A/97/93A
69°: When using D-S99/S99V/S9P/S9PV/T99/T99V



Angle adjustment bolt

2-M5 x 0.8
(Port location: Side ported type only)

*1
24



15.5

45

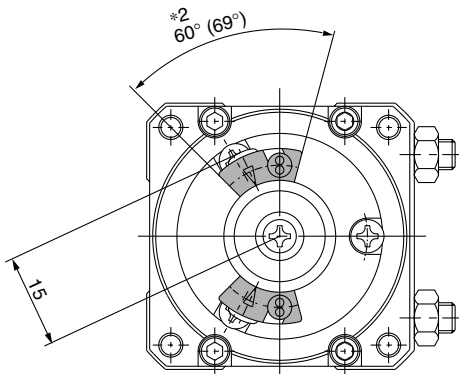
29

A port

B port

ø18.5

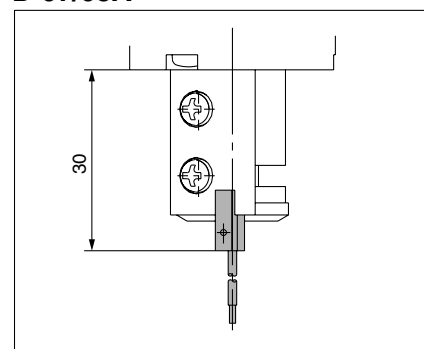
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*2
60° (69°)

15

D-97/93A



30

CRB2

CRBU2

CRB1

MSU

CRJ

CRA1

CRQ2

MSQ

MRQ

D-

20-

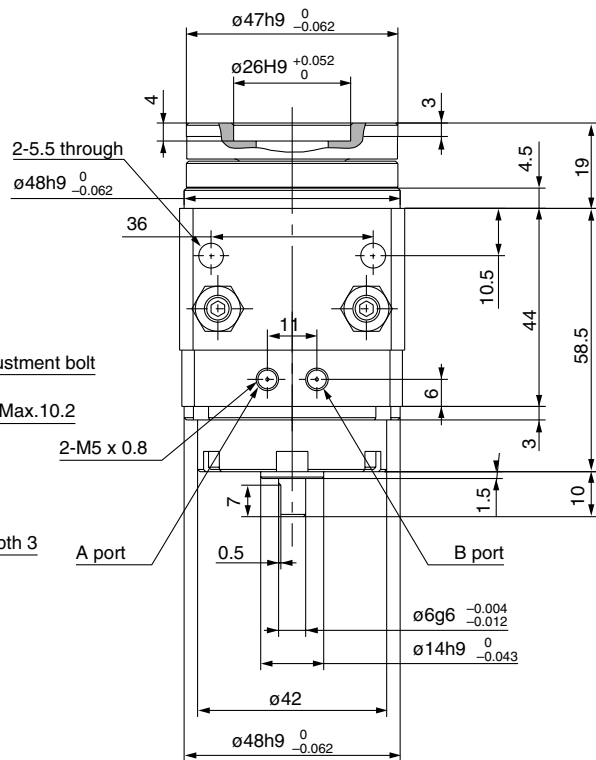
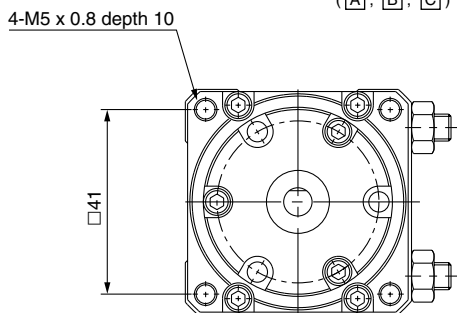
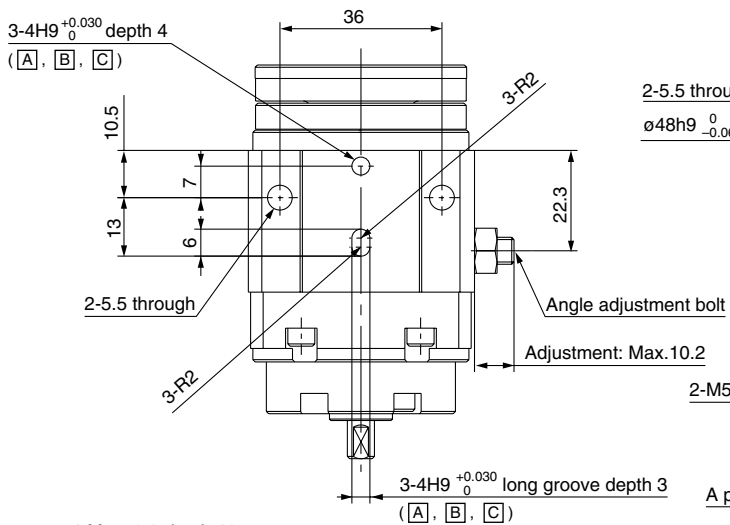
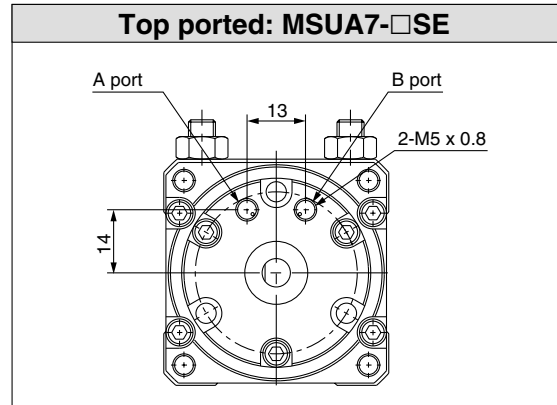
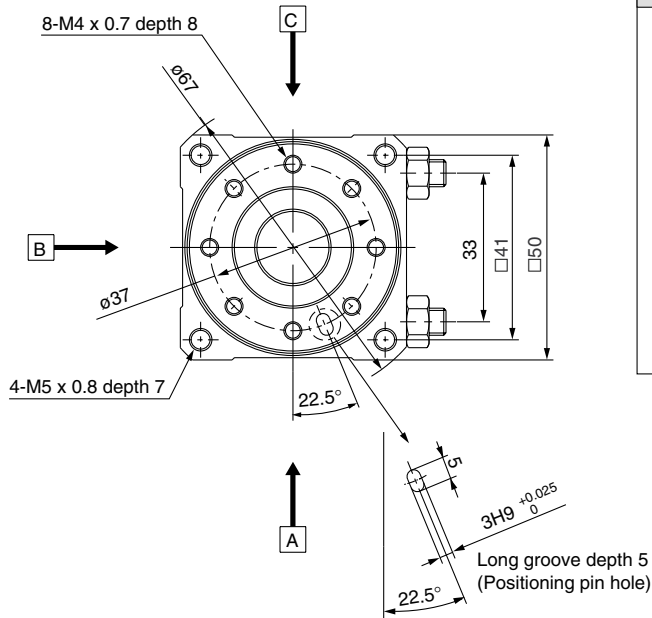
Series MSUA

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUA7

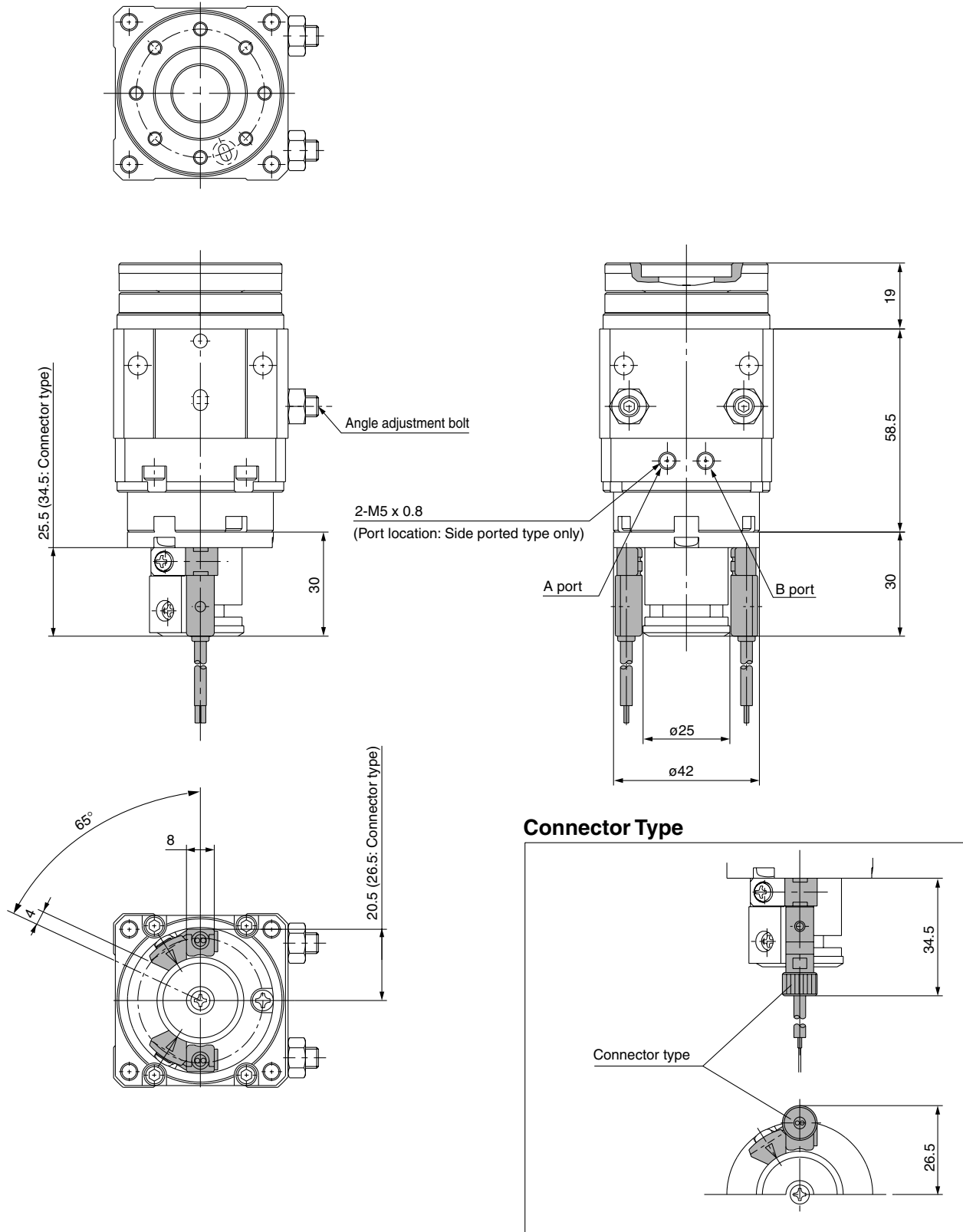
MSUA7-□S/SE



Rotary Table: High Precision Type Vane Style **Series MSUA**

These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA7-□S



- CRB2
- CRBU2
- CRB1
- MSU**
- CRJ
- CRA1
- CRQ2
- MSQ
- MRQ
- D-
- 20-

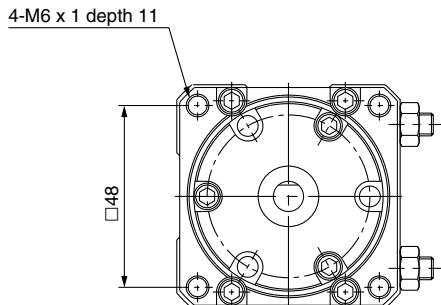
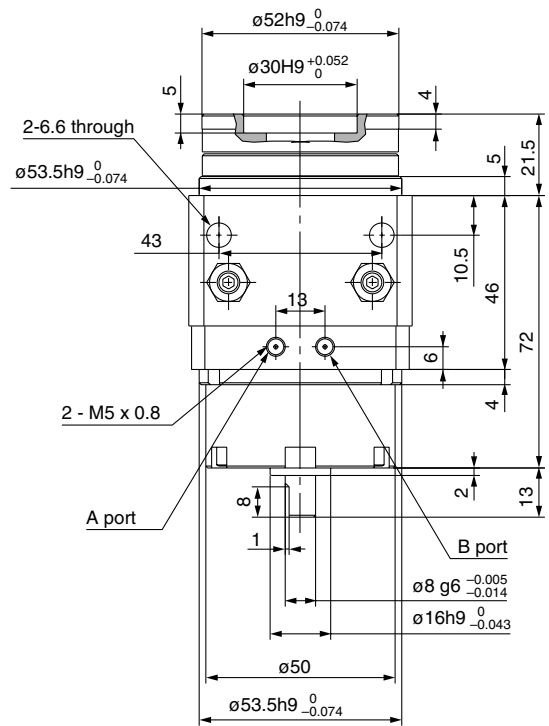
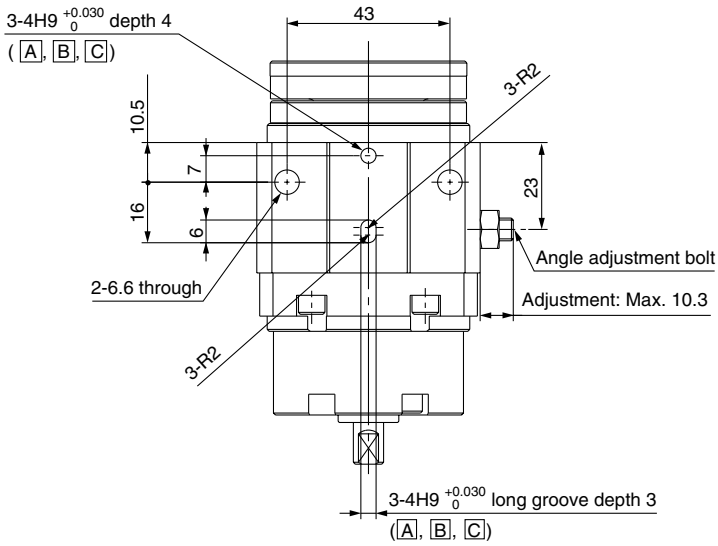
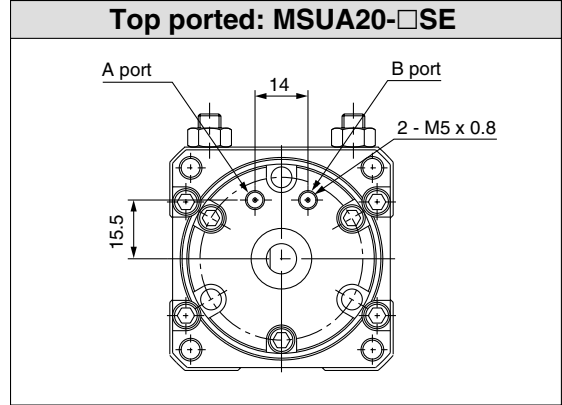
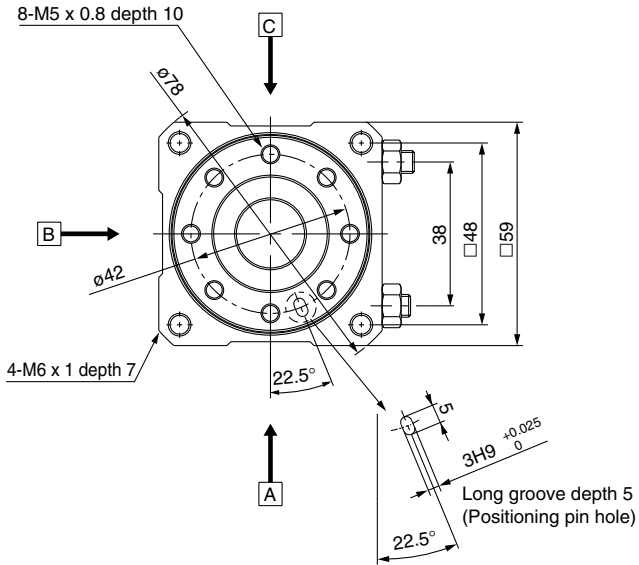
Series MSUA

Dimensions

These drawings indicate the condition when the B port is pressurized.

MSUA20

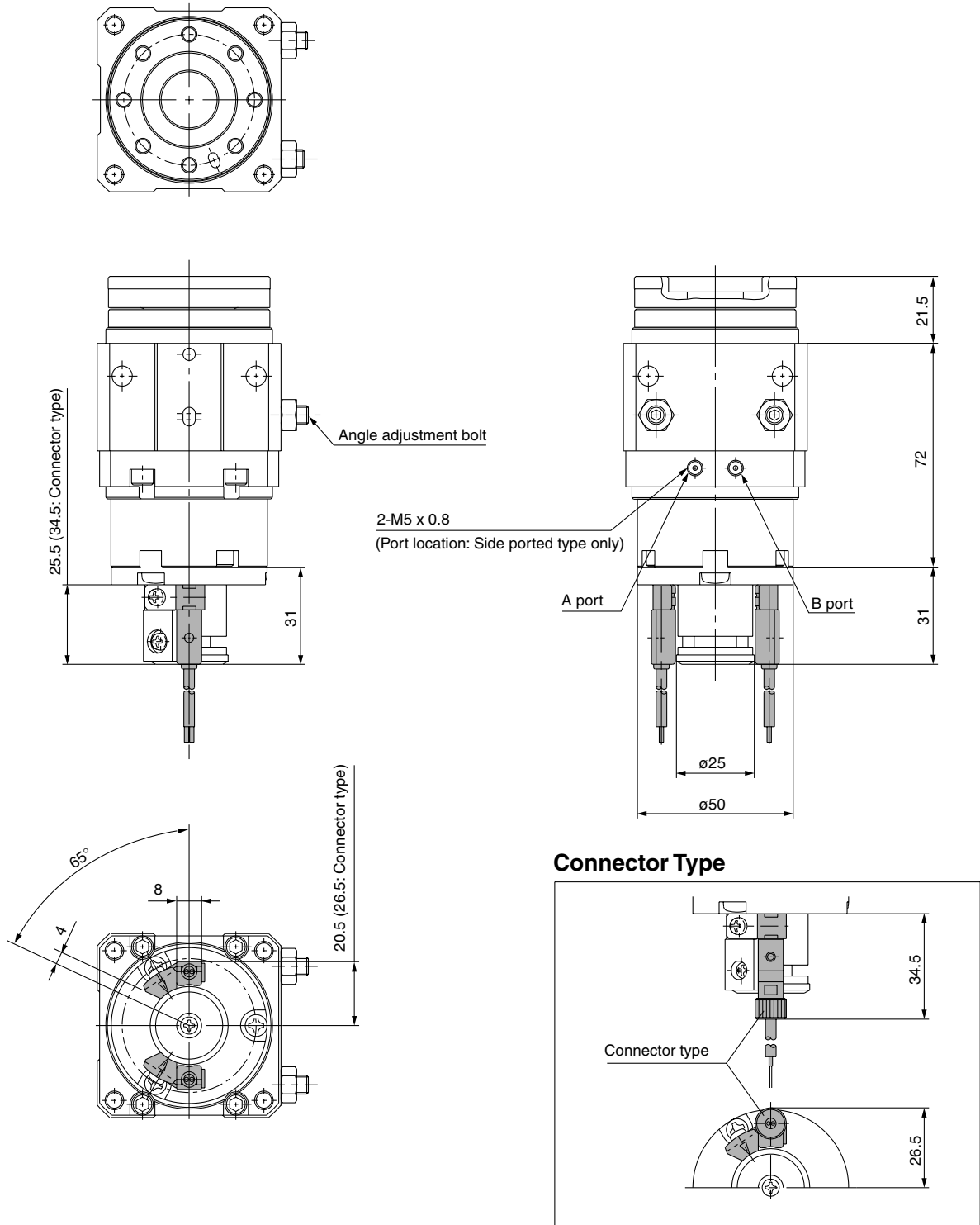
MSUA20-□S/SE



Rotary Table: High Precision Type Vane Style **Series MSUA**

These drawings indicate the condition when the B port is pressurized.

With auto switch: MDSUA20-□S



- CRB2
- CRBU2
- CRB1
- MSU**
- CRJ
- CRA1
- CRQ2
- MSQ
- MRQ
- D-
- 20-

Series MDSU

Auto Switch Specifications



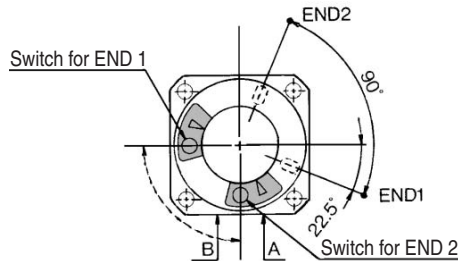
The auto switches below are also mountable in addition to the models in "How to Order". Refer to pages 11-11-10 to 11-11-15 for detailed auto switch specifications.

Applicable series	Type	Model	Electrical entry (Entry direction)	Features
MDSU□1	Reed switch	D-90	Grommet (In-line)	With no indicator light, Parallel cord
MDSU□3		D-90A	Grommet (In-line)	With no indicator light, Heavy-duty cord
MDSU□7		D-R80	Grommet (In-line)	No indicator light
MDSU□20		D-R80C	Connector (In-line)	

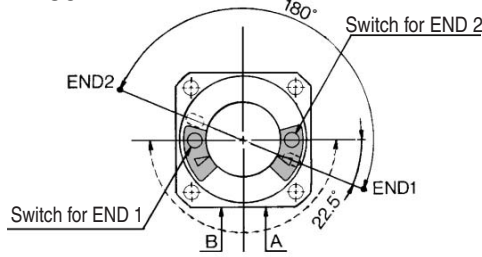
Table Positioning Pin Hole Rotation Range and Auto Switch Mounting Position

MSU□1/3

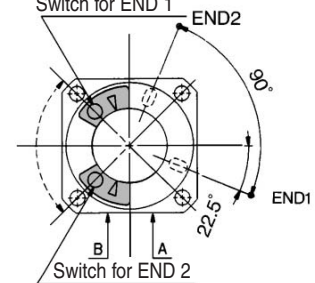
Single vane type 90°



180°

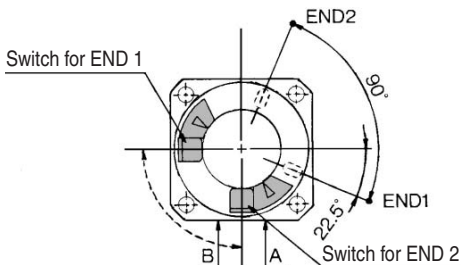


Double vane type (MSUB only) 90°

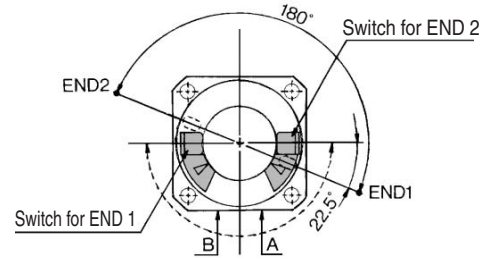


MSU□7/20

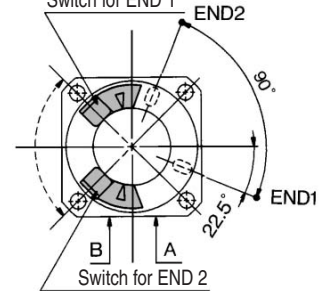
Single vane type 90°



180°



Double vane type (MSUB only) 90°



- In drawings that show the rotation range, the arrows on the solid line 90° (180°) indicate the rotation range of the positioning pin holes on the table surface. When the pin hole is at END1, the END1 switch operates, and when the pin hole is at END2, the END2 switch operates.
- The arrows on the broken line indicate the rotation range of the internal magnet. The rotation range of each switch can be reduced by moving the END1 switch clockwise and the END2 switch counterclockwise.

Auto Switch Operating Angle and Hysteresis Angle

Model	Operating angle	Hysteresis angle
MDSU□1, 3	110°	10°
MDSU□7, 20	90°	

Refer to page 11-4-24 for operating angle of auto switch and angle of hysteresis and the procedure for moving the auto switch detection position.

