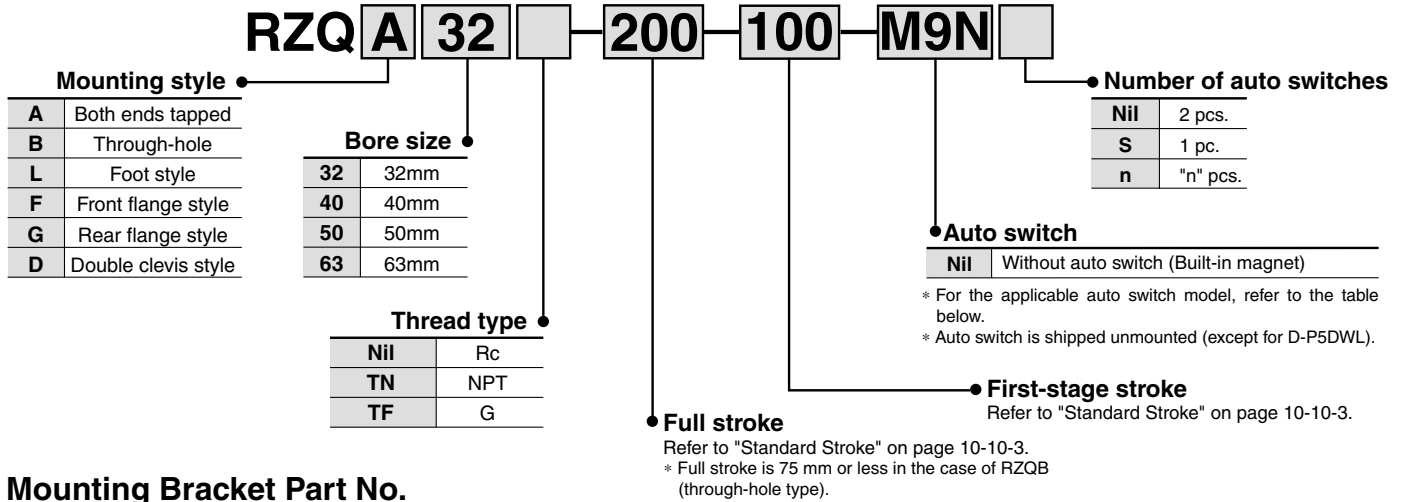


3 Position Cylinder

Series RZQ

ø32, ø40, ø50, ø63

How to Order



Mounting Bracket Part No.

Bore size (mm)	Foot ^{Note 1)}	Flange	Double clevis ^{Note 2)}
32	RZQ-L032	RZQ-F032	RZQ-D032
40	RZQ-L040	RZQ-F040	RZQ-D040
50	RZQ-L050	RZQ-F050	RZQ-D050
63	RZQ-L063	RZQ-F063	RZQ-D063

Note 1) When ordering foot brackets, order two pieces per cylinder.

Note 2) The following parts are included with each mounting bracket.

Foot, Flange/Body mounting bolts

Double clevis/Clevis pins, type C snap ring for axis, Body mounting bolts

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Rail mounting		Direct mounting		Lead wire length* (m)				Pre-wire connector	Applicable load				
					DC	AC	Perpendicular	In-line	Perpendicular	In-line	0.5 (Nil)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC			
Reed switch	—	Grommet	Yes	3-wire (NPN)	—	5V	—	—	A76H	A96V	A96	●	●	—	—	—	IC circuit	—		
				2-wire	24V	12V	200V	A72	A72H	—	—	●	●	—	—	—	—	—	—	Relay, PLC
								—	—	A93V	A93	●	●	—	—	—	—			
								A73C	—	—	—	●	●	—	—	—	—			
								A79W	—	—	—	●	●	—	—	—	—			
Solid state switch	—	Grommet	Yes	3-wire (NPN)	—	5V,12V	—	F7NV	F79	M9NV	M9N	●	●	○	—	○	IC circuit	—		
				3-wire (PNP)				F7PV	F7P	M9PV	M9P	●	●	○	—	○				
		Connector		2-wire	24V	12V	—	F7BV	J79	M9BV	M9B	●	●	○	—	○	—	—	—	
				J79C				—	—	—	●	●	●	—	—	—				
		Grommet		3-wire (NPN)	24V	5V,12V	—	F7NVV	F79W	F9NVV	F9NW	●	●	○	—	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				—	F7PW	F9PWW	F9PW	●	●	○	—	○				
				2-wire				—	F7BWW	J79W	F9BWW	F9BW	●	●	○	—	○			
				—				—	F7BA	—	F9BA	—	●	●	○	—	○			
				F7BAV				—	—	—	—	●	●	○	—	○				
				—				—	F79F	—	—	—	●	●	○	—	○			
With diagnostic output (2-color indication)	2-wire	—	—	—	P5DW	—	—	—	—	●	●	—	○	—	—					
Magnetic field resistant (2-color indication)				—	—	—	—	—	—	—	—	○	—	—						

* Lead wire length symbols: 0.5 m Nil (Example) A73C
3 m L (Example) A73CL
5 m Z (Example) A73CZ
None N (Example) A73CN

* Auto switches marked with a "○" symbol are produced upon receipt of order.

• D-P5DWL is available in sizes ø40 to ø63.

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 10-10-14.

Specifications



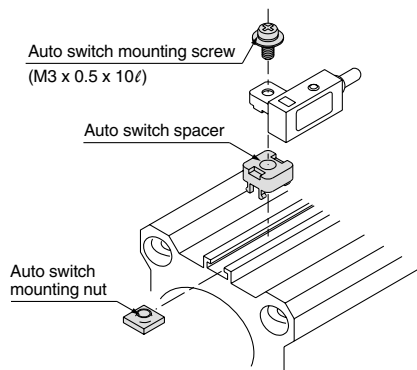
Bore size (mm)	32	40	50	63
Action	Double acting, Single rod			
Fluid	Air			
Proof pressure	1.5MPa			
Maximum operating pressure	1.0MPa			
Minimum operating pressure	0.1MPa			
Ambient and fluid temperature	-10 to 60°C (with no freezing)			
Lubrication	Non-lube			
Operating piston speed	50 to 300mm/s			
Stroke length tolerance	+1.0 0			
Cushion	Rubber bumper			
Thread tolerance	JIS class 2			
Port size (Rc, NPT, G)	1/8		1/4	

Auto Switch Mounting Bracket Part No. (Rail mounting)

Bore size (mm)	Mounting Bracket Part no.	Note
32, 40 50, 63	BQ-2	<ul style="list-style-type: none"> Switch mounting screws (M3 x 0.5 x 10ℓ) Switch spacer Switch mounting nut
Applicable auto switch		
Reed switch		Solid state switch
D-A7□, A80 D-A73C, A80C D-A7□H, A80H D-A79W		D-F7□, J79 D-F7□V D-J79C D-F7□W, J79W D-F7□WV D-F7BAL D-F79F D-F7NTL

[Stainless steel mounting screw kit]
Use the following stainless steel mounting screw kit (including nuts) if the operating environment requires. (Auto switch spacer must be ordered separately.)
BBA2: D-A7/A8/F7/J7

The above stainless steel screw kit is used for water resistant auto switch type D-F7BAL when they are shipped mounted on a cylinder.
Also, BBA2 is included when an auto switch alone is shipped.



Standard Stroke

Full stroke ^{Note 1)}	25, 50, 75, 100, 125, 150, 175, 200, 250, 300
First-stage stroke ^{Note 2)}	5 mm to "Full stroke" -5 mm

Note 1) RZQB (through hole type) is only available for full strokes 25, 50 and 75.

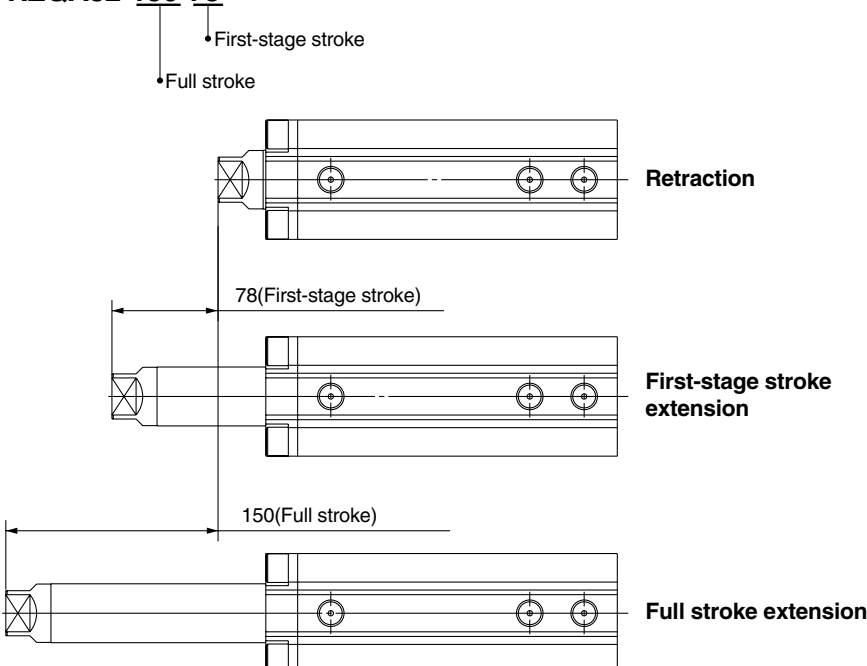
Note 2) Available in 1 mm increments.

Manufacture of Intermediate Stroke

Method	Spacers installed in standard stroke body.
Ordering	Refer to standard part number and ordering on page 10-10-2.
Description	Strokes are available in 5 mm increments by installing spacers in standard stroke cylinders.
Stroke range	Only available for full strokes of 5 to 295 mm
Example	Part no.: RZQA50-135-50 A 15 mm spacer is installed in a standard cylinder RZQA50-150-50. The B dimension is 246.5 mm.

How to Order Strokes

RZQA32-150-78



* Please consult with SMC for intermediate strokes of a full stroke.

RE^A_B
REC
C□X
C□Y
MQ^Q_M
RHC
MK(2)
RS^Q_G
RS^H_A
RZQ
MI^W_S
CEP1
CE1
CE2
ML2B
C¹₅-S
CV
MVGQ
CC
RB
J
D-
-X
20-
Data

Series RZQ

Theoretical Output

Theoretical Output **Table 1**

[N]

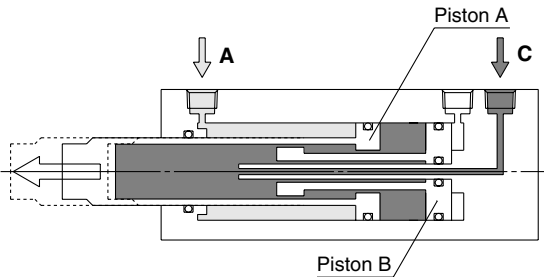
Bore size (mm)	Piston area [mm ²]				Air pressure [MPa] (with same air pressure applied to each port)											
	Piston A		Piston B		First stage						Second stage					
	Front side	Rear side	Front side	Rear side	Extension			Retraction			Extension			Retraction		
	①*	②*	③*	④*	0.3	0.5	0.7	0.3	0.5	0.7	0.3	0.5	0.7	0.3	0.5	0.7
32	410	804	792	792	118	197	276	123	205	287	118	197	276	119	199	279
40	641	1257	1244	1244	185	308	431	192	321	449	185	308	431	188	314	440
50	1001	1963	1935	1935	289	481	673	300	501	701	289	481	673	292	487	681
63	1527	3117	3067	3067	477	795	1113	458	764	1069	477	795	1113	443	739	1034

Theoretical Output

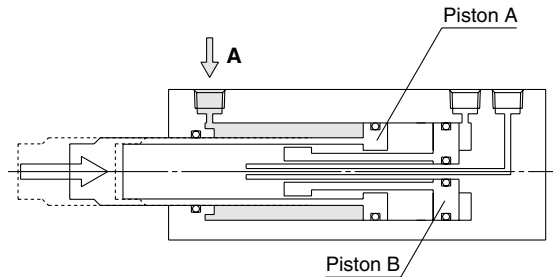
Action	First stage				Second stage				
	Extension		Retraction		Extension			Retraction	
Pressure port	A	C	A		A	B	C	A	C
Air pressure [MPa]	P _A	P _C	P _A		P _A	P _B *	P _C *	P _A	P _C
Formula for theoretical output F[N]	F = -① x P _A + ② x P _C		F = ① x P _A		F = -① x P _A + ④ x P _B + (② - ③) x P _C			F = ① x P _A + (③ - ①) x P _C	

* ①, ② and ③ are piston areas. (Refer to [Table 1](#).)

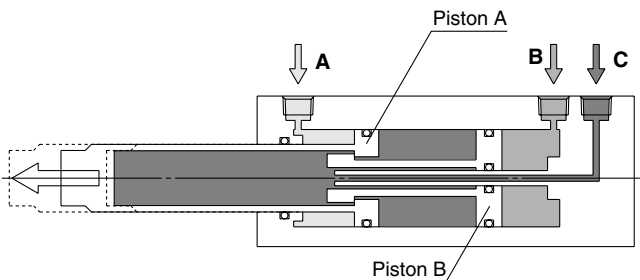
* Assume P_B ≤ P_C.



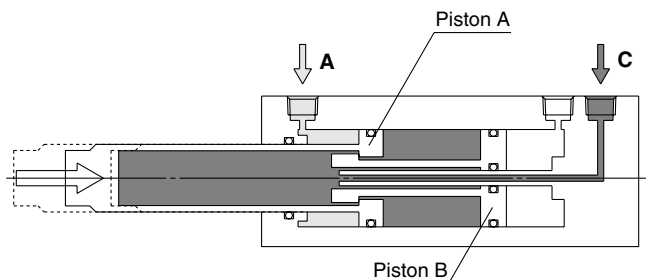
First-stage extension



First-stage retraction



Second-stage extension



Second-stage retraction

Weight

Weight Table

Unit: kg

Bore size (mm)	Cylinder stroke									
	25-5	50-5	75-5	100-5	125-5	150-5	175-5	200-5	250-5	300-5
32	0.81	0.88	0.94	1.01	1.07	1.13	1.20	1.26	1.39	1.52
40	1.19	1.27	1.35	1.43	1.50	1.58	1.66	1.73	1.89	2.04
50	1.80	1.92	2.04	2.16	2.28	2.40	2.52	2.64	2.89	3.13
63	2.53	2.71	2.87	3.04	3.20	3.36	3.53	3.69	4.02	4.35

Note) Calculate the first-stage stroke referring to the values for "10 mm increase" in the Additional Weight [Table 2] below.

Additional Weight Table 2

Unit: kg

Item	Model	Bore size (mm)			
		32	40	50	63
10 mm increase of first-stage stroke	RZQ□	3	3	6	15
Foot style (including bolts)	RZQL	143	155	243	324
Flange style (including bolts)	RZQG,RZQF	165	198	348	534
Double clevis style (including bolts, pins and snap ring)	RZQD	151	196	393	554

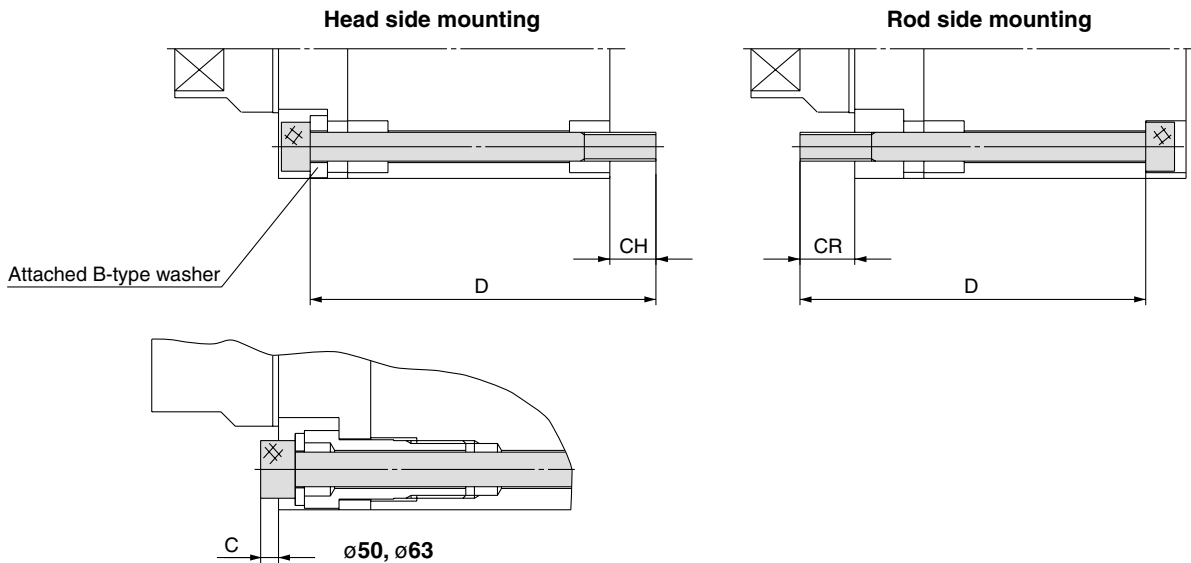
Note) Add the weight in [Table 2] to those in Weight Table.

RZQ Mounting Bolt

Mounting / Mounting bolts for the through hole type RZQB are available.
How to order: Add "Bolt" in front of the bolts to be used.

(Example) Bolt M5 x 110ℓ

(Two bolts are necessary per cylinder)



Note) Use the attached washer when inserting the bolt from the rod side.

RZQ Mounting Bolt

Model	CH	CR	C	D	Mounting bolt
RZQB32-25-□	8	9.5	—	110	M5 x 110ℓ
RZQB32-50-□				135	M5 x 135ℓ
RZQB32-75-□				160	M5 x 160ℓ
RZQB40-25-□	8.5	10	—	120	M5 x 120ℓ
RZQB40-50-□				145	M5 x 145ℓ
RZQB40-75-□				170	M5 x 170ℓ
RZQB50-25-□	11.5	16.5	3	130	M6 x 130ℓ
RZQB50-50-□				155	M6 x 155ℓ
RZQB50-75-□				180	M6 x 180ℓ
RZQB63-25-□	12.5	17.5	3.5	135	M8 x 135ℓ
RZQB63-50-□				160	M8 x 160ℓ
RZQB63-75-□				185	M8 x 185ℓ

 RE_B^A

REC

C□X

C□Y

 MQ_M^Q

RHC

MK(2)

 RS_G^Q

 RS_A^H
RZQ

 MI_S^W

CEP1

CE1

CE2

ML2B

 C_G^{1/5-S}

CV

MVGQ

CC

RB

J

D-

-X

20-

Data

Series RZQ

Model Selection

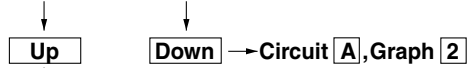
Selection chart for pneumatic circuit and selection graph

Select the pneumatic circuit and selection graph according to the following chart.

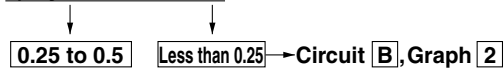
1) Transfer direction of load



2) Cylinder orientation



3) Cylinder load ratio

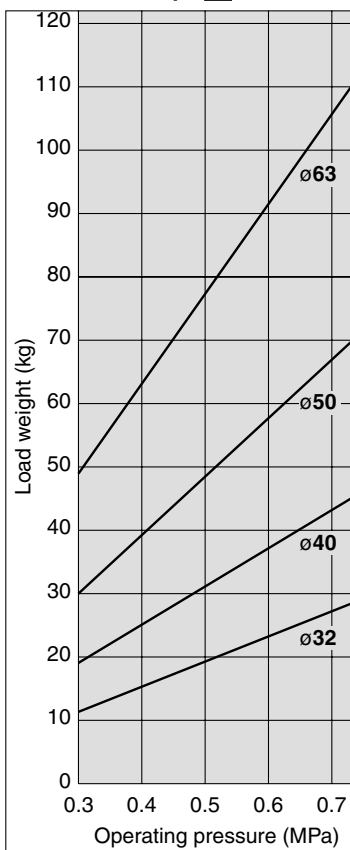


Circuit **C**, Graph **1**, Minimum load weight = Graph **2**

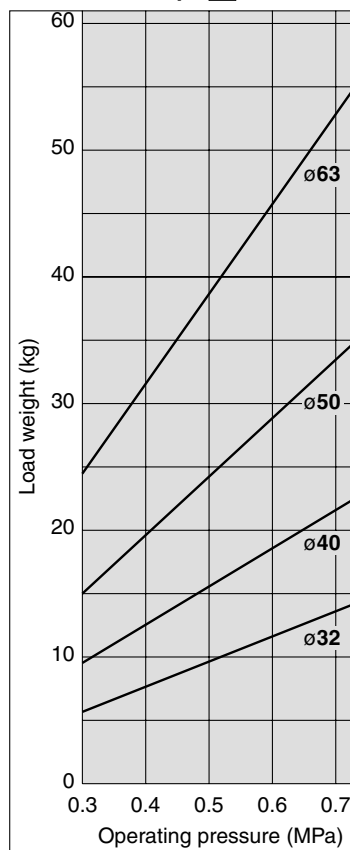
Selection graph

The optimum size is determined from the intersection of the operating pressure and load weight.

Graph **1**



Graph **2**



Selection example

Selection conditions: Transfer direction: Vertical movement

Cylinder orientation: Down

Load weight: 15 kg

Operating pressure: 0.4 MPa

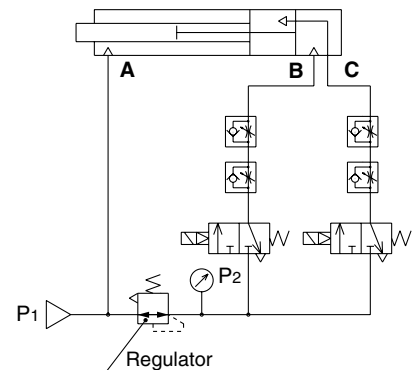
→ Circuit **A** and Graph **2** are selected according to the chart.

Find the intersection of an operation pressure of 0.4 MPa and load weight of 15 kg in Graph **2**.

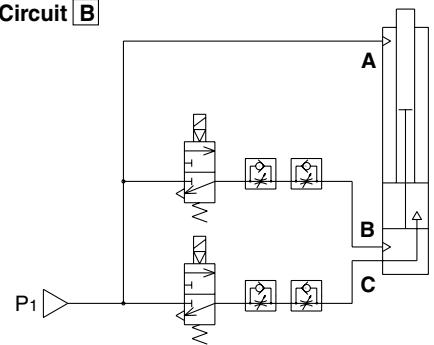
→ ø50 is selected.

Pneumatic circuit

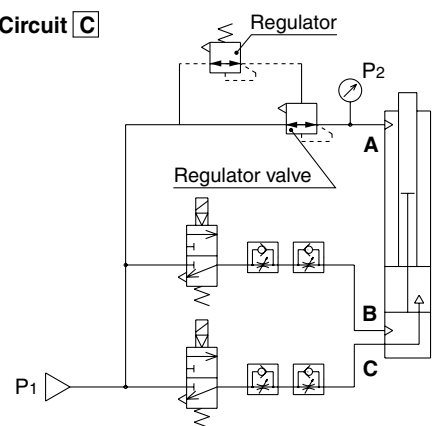
Circuit **A**



Circuit **B**



Circuit **C**



Confirmation of allowable kinetic energy

Confirm the internal stopper strength at extension and retraction ends in the graph on page 10-10-8.

Pneumatic Circuit Adjustment

Regulator set pressure

Set the pressures of circuit [A] and circuit [C] regulators at values found by the formula in the following table.

Circuit	Orientation	Bore size (mm)	P ₂ [MPa]
[A]	Horizontal	—	0.75P ₁
[A]	Down	32	0.75P ₁ -0.012m
		40	0.75P ₁ -0.0078m
		50	0.75P ₁ -0.0050m
		63	0.75P ₁ -0.0031m
[C]	Up	32	1.5P ₁ -0.024m
		40	1.5P ₁ -0.016m
		50	1.5P ₁ -0.010m
		63	1.5P ₁ -0.0063m

P₁: Operating pressure [MPa], m: Load weight [kg]

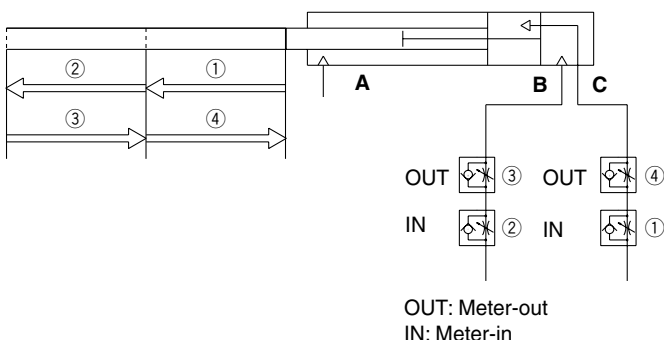
* In cases with load fluctuations, substitute the median value of the weight.

Example) Assume circuit [C] with an operating pressure of 0.5 MPa, load weight of 10 kg, fluctuation to 20 kg and a cylinder bore of 32 mm.

$$\rightarrow P_2 = 1.5 \times 0.5 - 0.024 \times 15 = 0.39 \text{ MPa}$$

Speed adjustment

The data below illustrates the strokes controlled by the respective speed controllers. Gradually increase from a low speed to the desired speed setting.



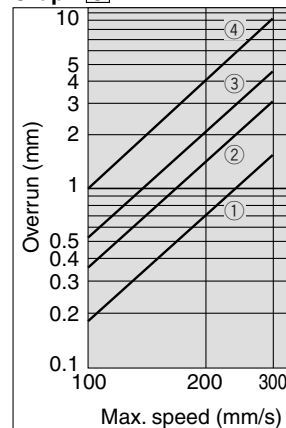
Overrun at intermediate stop

When stopping at an intermediate point, the cylinder first moves the piston past the intermediate point and then returns it. To confirm this distance of an extra travel (overrun) in Graph [3], Lines ① to ④ can be selected from the following table.

Circuit	Orientation	Movement	Line
[A]	Horizontal	Extension	③
		Retraction	④
[A]	Down	Extension	③
		Retraction	③
[B]	Up	Extension	①
		Retraction	③
[C]	Up	Extension	②
		Retraction	④

* The above values are for cases where the maximum payload found by the selection method is loaded.

Graph [3]



Change of the return point at the time of power failure

At the time of power failure, circuits [A] to [C] return the piston to the retraction end.

To return the piston to the intermediate point at the time of power failure, add changes to the 3 port valve on the cylinder rear side so that it will be normally open.

To return the piston to the extension end at the time of power failure, add changes to both 3 port valves so that they will be normally open.

Change to motion holding circuit

To hold the present motion at the time of power failure instead of performing a return to the specified stop point, change both 3 port valves to 5 port double valves and plug A or B port, whichever is open.

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_G

RS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C¹_{5-S}

CV

MVGQ

CC

RB

J

D-

-X

20-

Data



Series RZQ

Specific Product Precautions

Be sure to read before handling.

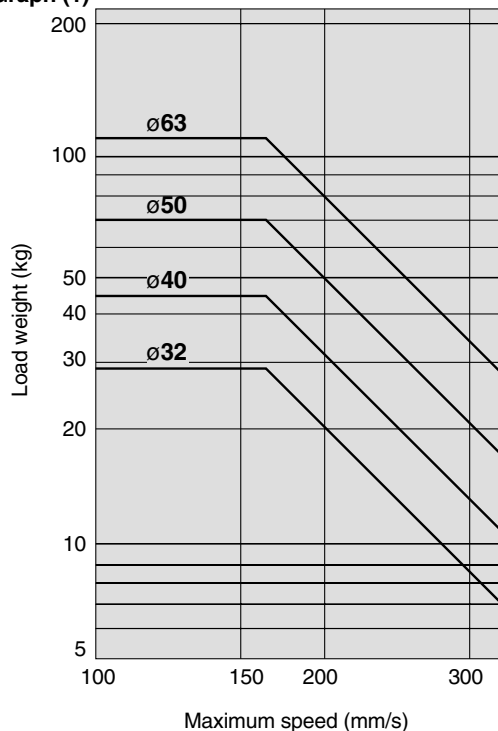
Selection

⚠ Caution

1. Keep the relation between the load weight and the maximum speed below the limit lines in Graph (1). If it exceeds the limit line, receive the load with an external stopper.

Operation beyond the limiting lines will cause damage to machinery.

Graph (1)



2. Use the cylinder in applications in which the overrun will not cause any problem.

When stopping at an intermediate point, this cylinder first moves the piston past the intermediate point and then returns it. Confirm this distance of an extra travel (overrun) in Graph [3] on page 10-10-7 and use the cylinder in applications in which the overrun will not cause any problem.

3. In cases where a positioning repeatability of 0.1 mm or less is required at the retraction and extension ends, use an external stopper for stops.

Use of an internal stopper will result in approximately 0.1 mm of displacement due to changes in the operating pressure and external forces.

4. Use an external guide to receive a moment or torque which can generate a load.

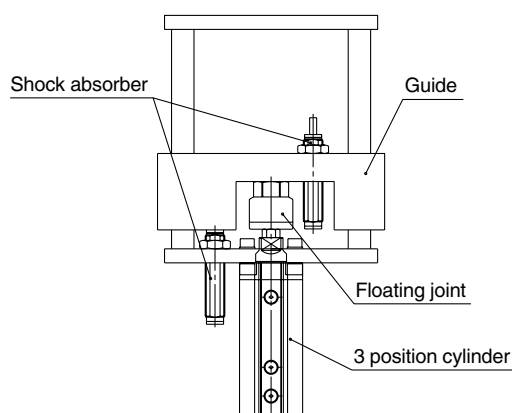
If a moment or torque directly acts on the cylinder, it will lead to reduced service life or damage to machinery.

Selection

5. To connect a direct acting guide, use floating joints in the following table.

If the direct acting guide is directly connected in operation, it may lead to malfunction or reduced service life.

Model	Applicable floating joint
RZQ□32	JB40-8-125
RZQ□40/50	JB63-10-150
RZQ□63	JB80-16-200



Maintenance

⚠ Caution

1. If reapplication of grease is needed, apply grease specifically provided for this purpose:

Grease: Product name: Grease pack

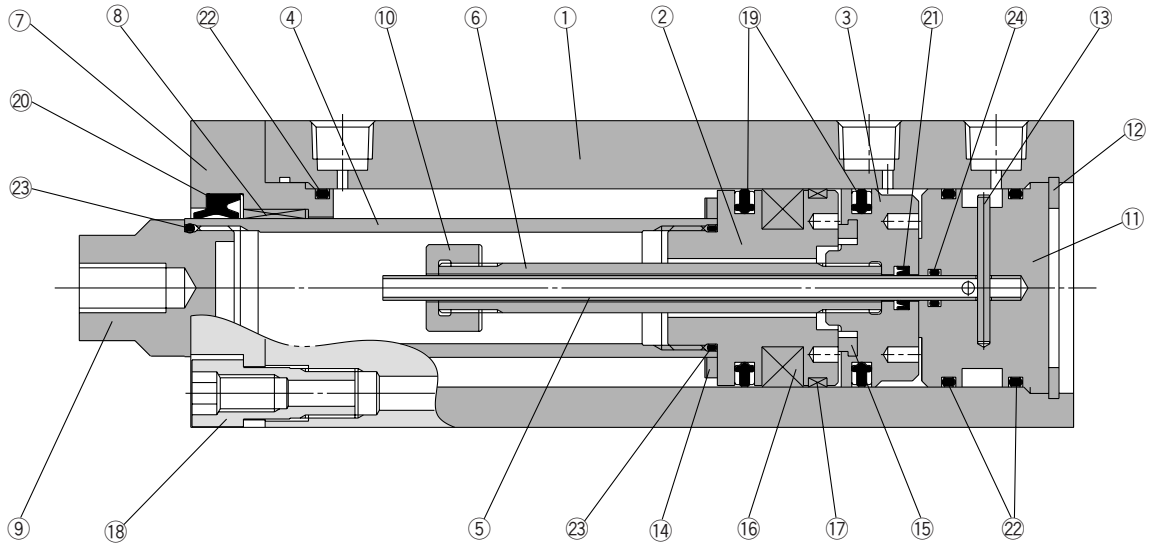
Part no.: 10 g GR-L-010

150 g GR-L-150

2. When dynamic seals are replaced, use a seal kit provided for each bore size.

Dedicated seal kit: Refer to "Construction" on page 10-10-9.

Construction



Component Parts

	Description	Material	Note
①	Cylinder tube	Aluminum alloy	Hard anodized
②	Piston A	Aluminum alloy	Chromated
③	Piston B	Aluminum alloy	Chromated
④	Tube rod	Carbon steel	Hard chrome plated
⑤	Inner pipe	Stainless steel	
⑥	Outer pipe	Carbon steel	Zinc chromated
⑦	Rod cover	Aluminum alloy	White hard anodized
⑧	Bushing	Special friction lining	
⑨	Tube rod cover	Carbon steel	Electroless nickel plated
⑩	Nut	Carbon steel	Zinc chromated
⑪	Head cover	Aluminum alloy	Colorless chromated
⑫	Snap ring	Carbon tool steel	Phosphate coated

	Description	Material	Note
⑬	Parallel pin	Carbon steel	
⑭	Bumper A	Polyurethane	
⑮	Bumper B	Polyurethane	
⑯	Magnet	Synthetic rubber	
⑰	Wear ring	Resin	
⑱	Fitting bolt	Carbon steel	Nickel plated
⑲	Piston seal	NBR	
⑳	Rod seal A	NBR	
㉑	Rod seal B	NBR	
㉒	Gasket A	NBR	
㉓	Gasket B	NBR	
㉔	Gasket C	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
32	RZQ32-PS	A set of Nos. ⑲, ⑳, ㉑, ㉒ and ㉔ from the table above
40	RZQ40-PS	
50	RZQ50-PS	
63	RZQ63-PS	

* Seal kits are sets consisting of items 19, 20, 21, 22 and 24 and can be ordered using the seal kit number for each cylinder bore size.

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^QRS_A^H**RZQ**MI_S^W

CEP1

CE1

CE2

ML2B

C₆¹/5-S

CV

MVGQ

CC

RB

J

D-

-X

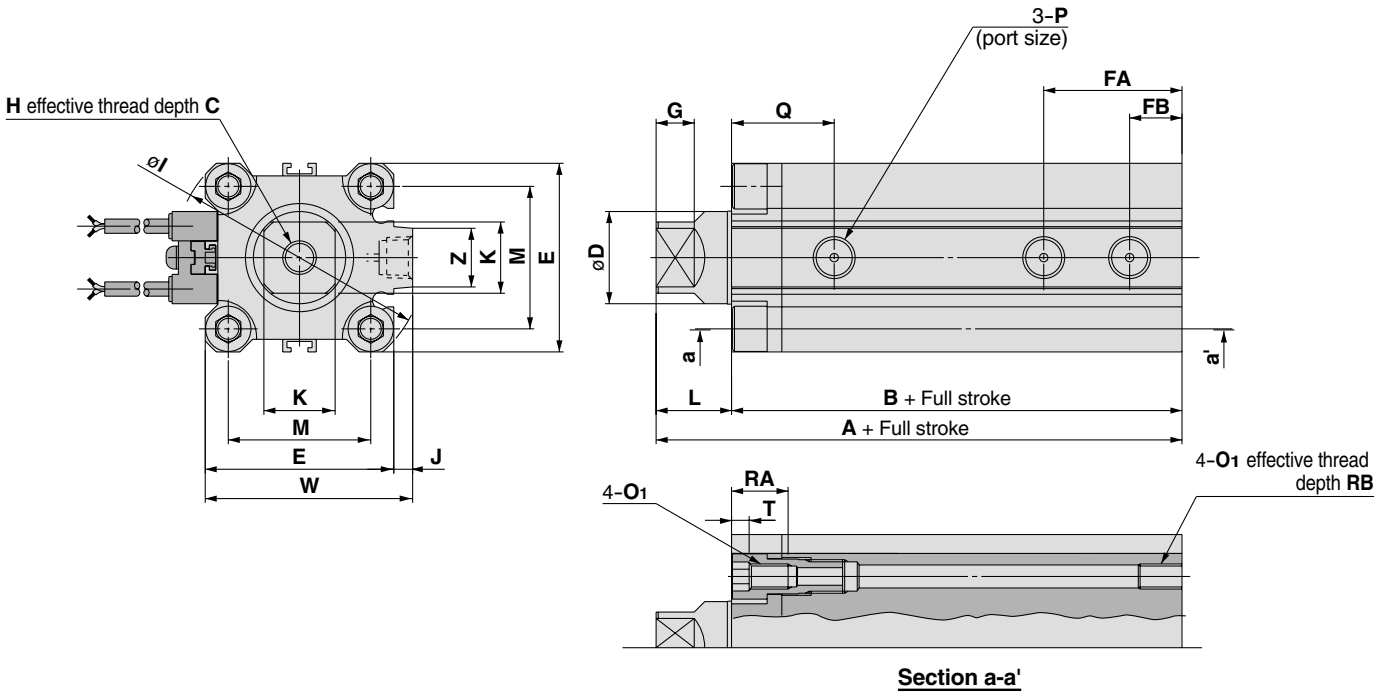
20-

Data

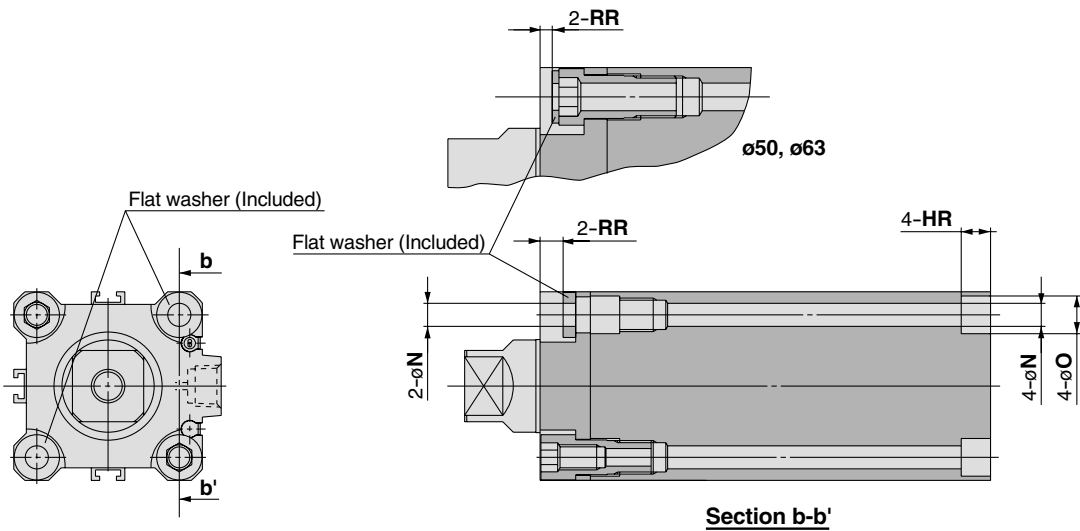
Series RZQ

Dimensions

Basic style (Double end tapped): RZQA

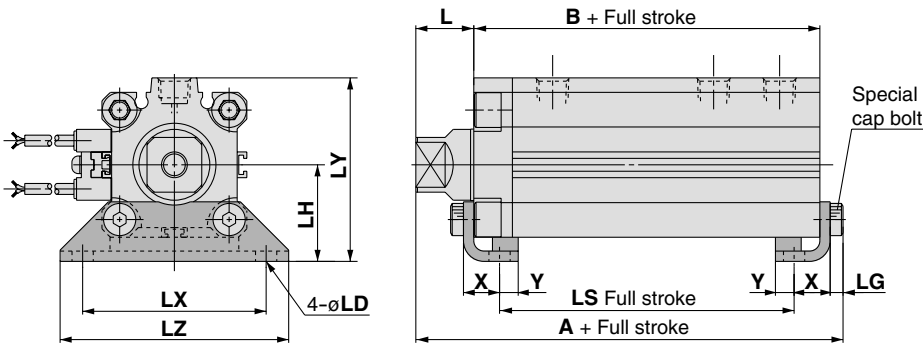


Basic style (Through-hole): RZQB



Bore size (mm)	A	B	C	D	E	FA	FB	G	H	I	J	K	L	M	N	O ₁	O	P	Q	RA	RB	RR	RH	T	W	Z
32	100.5	82.5	14	22.4	45	33	12.5	9	M8 x 1.25	60	4.5	17	18	34	5.5	M6 x 1.0	9	Rc1/8	24.5	14	10	5.5	7	4.5	49.5	14
40	110	92	16	28	52	35	14	9	M10 x 1.5	69	5	24	18	40	5.5	M6 x 1.0	9	Rc1/8	26	14	10	5.5	7	4.5	57	14
50	118.5	96.5	16	35	64	37	14	12	M10 x 1.5	86	7	30	22	50	6.6	M8 x 1.25	11	Rc1/4	30	17	14	3	8	5.5	71	19
63	130	102	21	45	77	39.5	16.5	15	M16 x 2.0	103	7	36	28	60	9	M10 x 1.5	14	Rc1/4	36.5	21.5	18	4.5	10.5	6.5	84	19

Foot style: RZQL

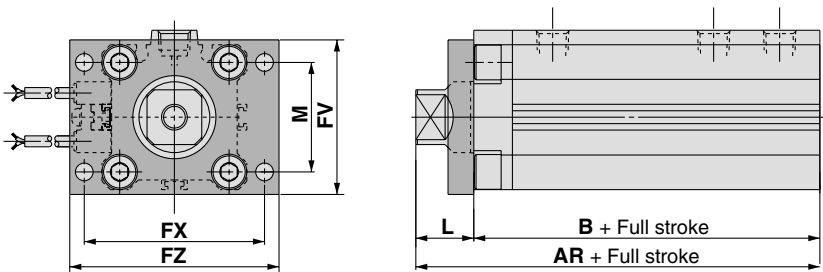


Foot Style

		(mm)						
Bore size (mm)	A	B	L	LD	LG	LH	LS	
32	107.7	82.5	18	6.6	4	30	66.5	
40	117.2	92	18	6.6	4	33	76	
50	126.7	96.5	22	9	5	39	73.5	
63	138.2	102	28	11	5	46	76	

Bore size (mm)	LX	LY	LZ	X	Y
32	57	57	71	11.2	5.8
40	64	64	78	11.2	7
50	79	78	95	14.7	8
63	95	91.5	113	16.2	9

Front flange style: RZQF

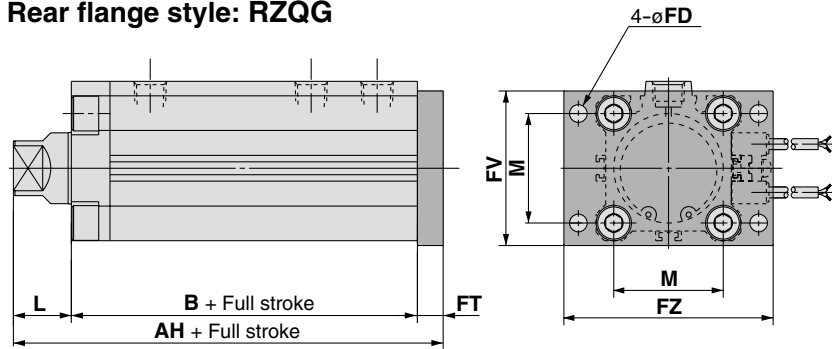


Flange Style

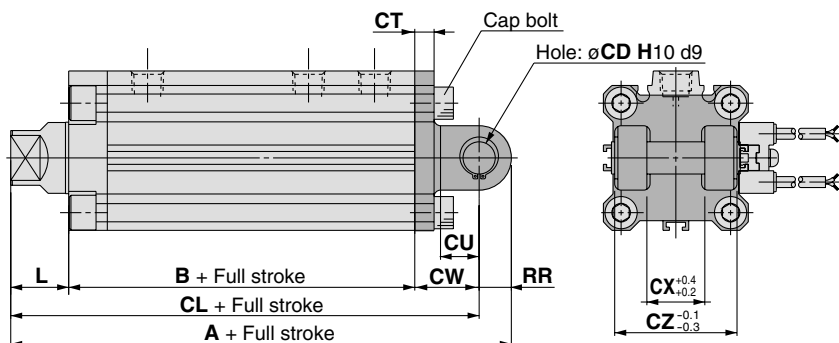
		(mm)						
Bore size (mm)	AR	AH	B	FD	FT	FV	FX	
32	100.5	108.5	82.5	5.5	8	50	56	
40	110	118	92	5.5	8	56	62	
50	118.5	127.5	96.5	6.6	9	67	76	
63	130	139	102	9	9	90	92	

Bore size (mm)	FZ	L	M
32	65	18	34
40	72	18	40
50	90	22	50
63	108	28	60

Rear flange style: RZQG



Double clevis style: RZQD



Double Style

		(mm)						
Bore size (mm)	A	B	CD	CL	CT	CU	CW	
32	112.5	82.5	10	102.5	5	14	20	
40	124	92	10	114	6	14	22	
50	134.5	96.5	14	124.5	7	20	28	
63	146	102	14	132	8	20	30	

Bore size (mm)	CX	CZ	RR
32	18	36	10
40	18	36	10
50	22	44	14
63	22	44	14

RE^A_B

REC

C□X

C□Y

MQ^Q_M

RHC

MK(2)

RS^Q_GRS^H_A

RZQ

MI^W_S

CEP1

CE1

CE2

ML2B

C_G5-S

CV

MVGQ

CC

RB

J

D-

-X

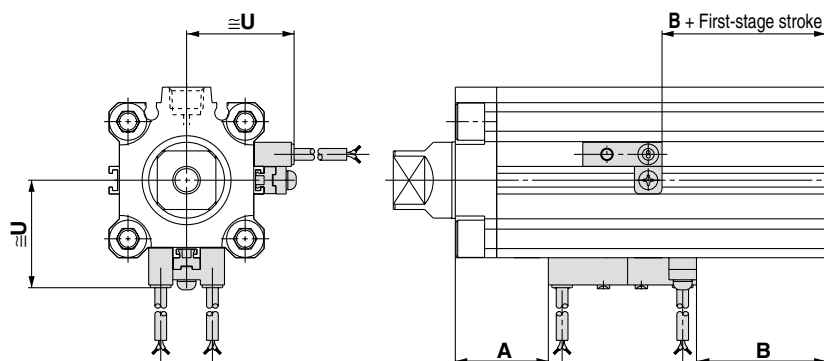
20-

Data

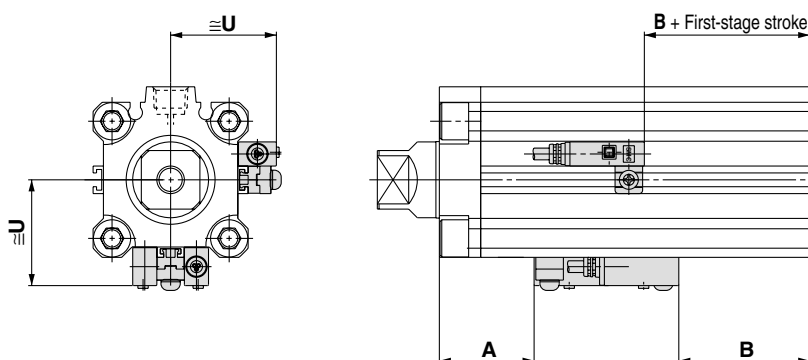
Series RZQ

Proper Auto Switch Mounting Position (For Detection of Piston A Stop Position) and Its Mounting Height

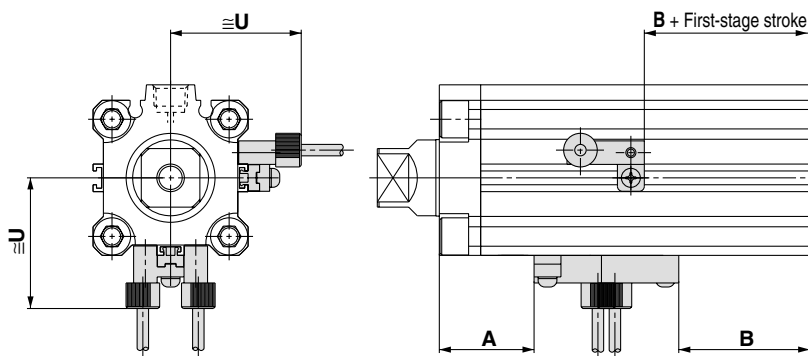
D-A7□
D-A80



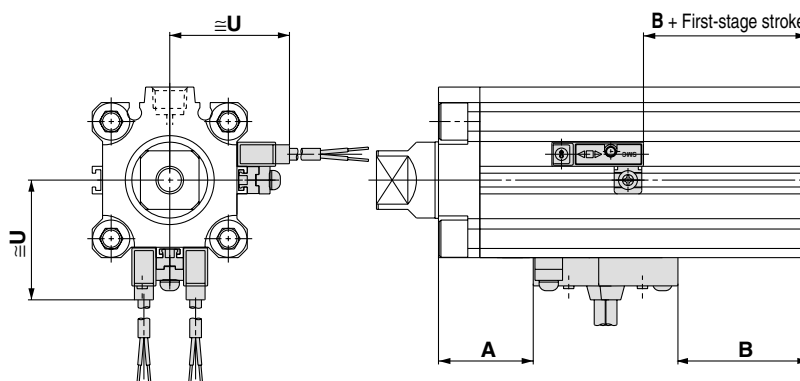
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F
D-Y7NTL
D-F7BAL



D-A73C
D-A80C
D-J79C



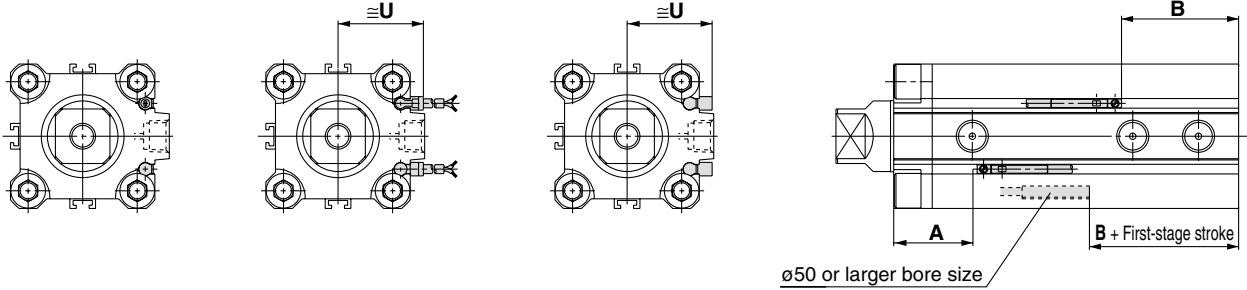
D-A79W
D-F7□WV
D-F7□V
D-F7BAVL



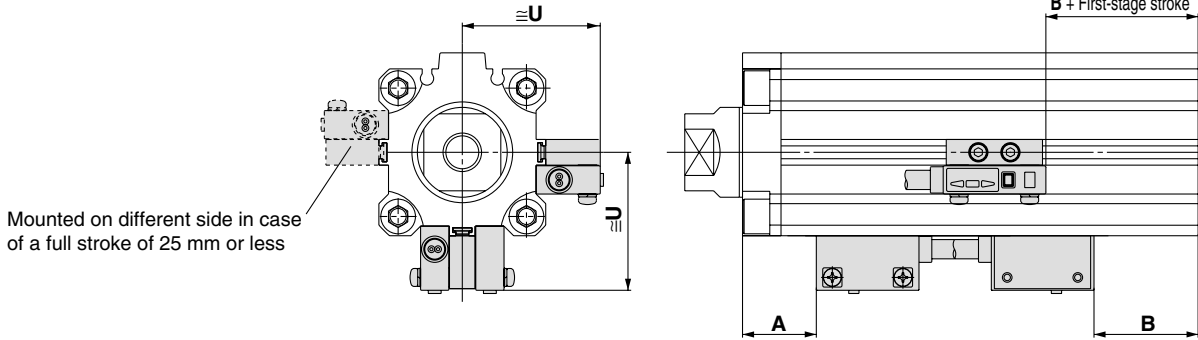
D-A9□
D-M9□
D-F9□W

D-A9□V
D-M9□V
D-F9□WV

D-F9BAL



D-P5DW
ø40, 50, 63



Proper Mounting Position

Bore size (mm)	D-A7□, A80		D-A7□H, A80H D-A73C, A80C D-F7□, J79, J79W D-F7□V, J79C D-F7□W, F7□WV D-F7BAL, F7BAVL D-F79F		D-A79W		D-A9□ D-A9□V		D-M9□ D-M9□V D-F9□W D-F9□WV		D-F9BAL		D-P5DWL	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B
32	27	37.5	27.5	38	24.5	35	26	36.5	30	40.5	29	39.5	—	—
40	31	43	31.5	43.5	28.5	40.5	30	42	34	46	33	45	27	39
50	33.5	44	34	44.5	31	41.5	32.5	43	36.5	47	35.5	46	29.5	40
63	37	47	37.5	47.5	34.5	44.5	36	46	40	50	39	49	33	43

Bore size (mm)	D-A7□, A80	D-A7□H, A80H D-F7□, D-F79F D-J79, J79W D-F7□W D-F7BAL D-F7NTL	D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAVL	D-J79C	D-A79W	D-A9□V	D-M9□V D-F9□WV	D-F9BAL	D-P5DWL
	U	U	U	U	U	U	U	U	U	U
32	31.5	32.5	38.5	35	38	34	27	29	26.5	—
40	35	36	42	38.5	41.5	37.5	30.5	32.5	30	44
50	41	42	48	44.5	47.5	43.5	36.5	38.5	36	50
63	47.5	48.5	54.5	51	54	50	40	42	39.5	56.5

RE_B^A

REC

C□X

C□Y

MQ_M^Q

RHC

MK(2)

RS_G^Q

RS_A^H

RZQ

MI_S^W

CEP1

CE1

CE2

ML2B

C_{5-S}¹

CV

MVGQ

CC

RB

J

D-

-X

20-

Data