

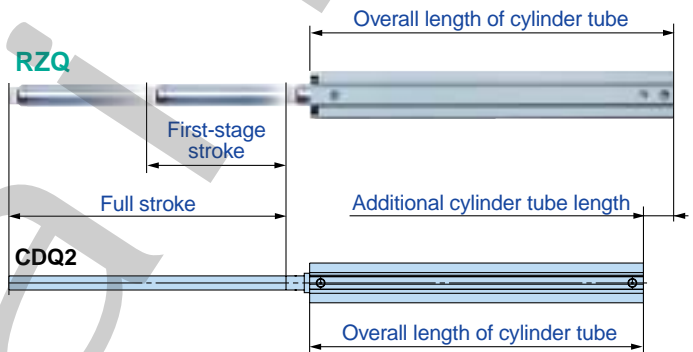
3 Position Cylinder

Provides intermediate stop mechanism



Series RZQ
 ø32, ø40, ø50, ø63

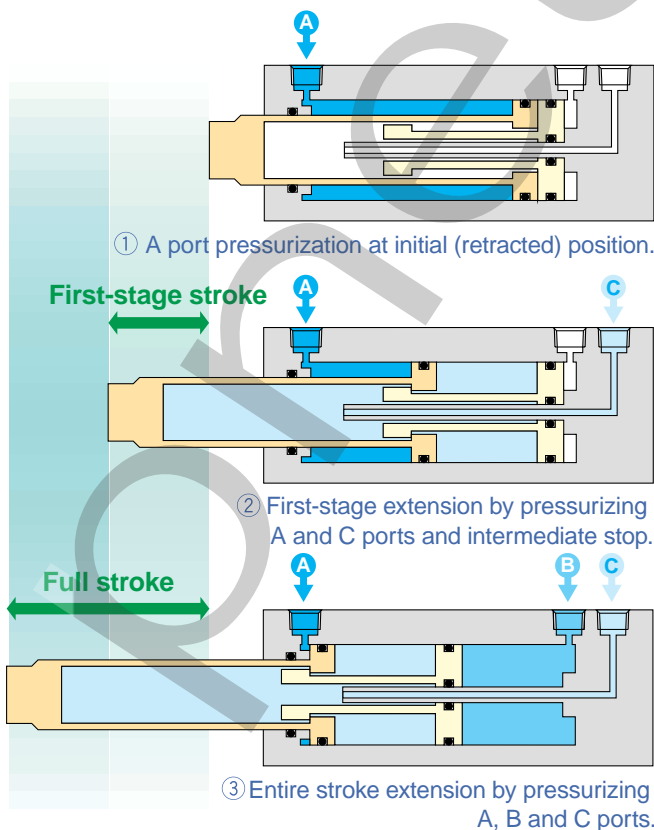
• 2-stage stroke enabled with a small increase in length



Comparison of cylinder tube overall length (mm)

Full stroke = 300 mm (150 + 150 = 300 mm in case of CG1BN)

Bore Size (mm)	RZQA□-300-150	CDQ2A□-300D	RZQ-CDQ2 Additional cylinder tube length	CG1BN□-150+150-XC11 Dual stroke cylinder
32	382.5	345.5	37	591
40	392	355	37	606
50	396.5	355.5	41	631
63	402	357.5	44.5	631



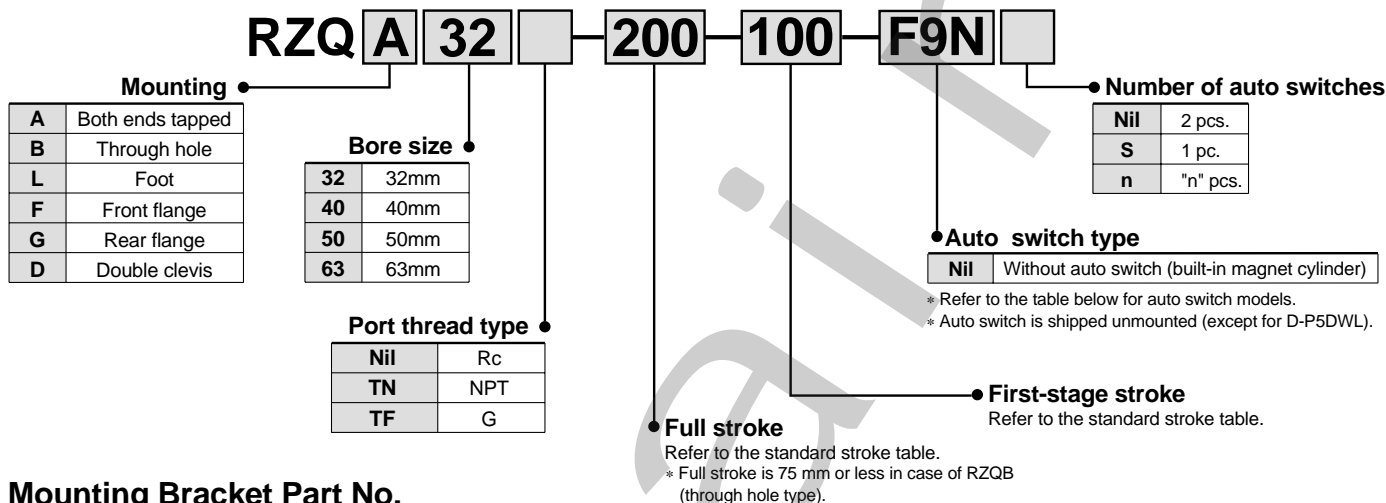
- ◆ **First-stage stroke can be specified without changing the overall length.**
- ◆ **±0.02 or less repeatability in intermediate stop positioning**
 High accuracy is achieved by an intermediate stop method of pressing metallic components against each other
- ◆ **First-stage stroke can be freely specified.**
 Standard: Available in 5 mm increments
 Optional: Available in 1 mm increments
- ◆ **Large bore tube rod to withstand lateral load**
 Use of a tube rod with a large bore which is 70% the piston diameter
- ◆ **Wide variations in mounting**
 Direct mounting: Mounting taps of the same dimensions as those of Series CQ2.
 Through holes are also available for full strokes of 75 mm or less.
 Static mounting: Foot type, Front flange type
 Rotation bracket: Double clevis

3 Position Cylinder

Series RZQ

∅32, ∅40, ∅50, ∅63

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, C-type snap ring for axis, Body mounting bolts

Applicable auto switches/Refer to page 5.3-2 of Best Pneumatics Vol. 2 for detailed auto switch specifications.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Rail mount		Direct mount		Lead wire length* (m)				Pre-wired 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	100V	A72	A72H	—	—	●	●	—	—	—	—	—	—	Relay, PLC
								—	—	A93V	A93	●	●	—	—	—	—			
								A73C	—	—	—	●	●	●	●	—	—			
Diagnostic indicator (2-color indicator)	Grommet	—	—	A79W	—	—	—	●	●	—	—	—	—	—	—	—				
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	F7NV	F79	F9NV	F9N	●	●	○	—	○	IC circuit	Relay, PLC		
				3-wire (PNP)				F7PV	F79	F9PV	F9P	●	●	○	—	○				
		Connector		2-wire	12V	—	F7BV	J79	F9BV	F9B	●	●	○	—	○	—	—			
				3-wire (NPN)			F7NVV	F79W	F9NVV	F9NW	●	●	○	—	○					
		Grommet		3-wire (PNP)	5V, 12V	—	—	F7PW	F9PWW	F9PW	●	●	○	—	○	—	—			
				2-wire			12V	—	F7BA	—	F9BA	—	●	●	○	—	○		—	
		Water resistant (2-color indicator)		Grommet	2-wire	12V	—	—	—	—	—	●	●	○	—	○	—			
		With diagnostic output (2-color display)						—	F7BAV	—	—	—	—	●	●	○	—		○	—
		Latch type with diagnostic output (2-color display)		Grommet	4-wire (NPN)	5V, 12V	—	—	F79F	—	—	—	●	●	○	—	○		IC circuit	—
		Magnetic field resistant (2-color display)						2-wire	—	—	—	—	—	—	●	●	—		○	—
—	Grommet	2-wire	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
—					—	—	—	—	—	—	—	—	—	—	—	—	—			

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

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

• D-P5DWL is available in sizes ∅40 to ∅63.

• In addition to the models in the above table, there are some other auto switches that are applicable. For more information, refer to page 13.



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 mount)

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 10 /) Switch spacer Switch mounting nut

Applicable switch	
Reed switch	Solid state switch
D-A7□, A80	D-F7□, J79
D-A73C, A80C	D-F7□V
D-A7□H, A80H	D-J79C
D-A79W	D-F7□W, J79W
	D-F7□WV
	D-F7BAL
	D-F7□F
	D-F7NTL

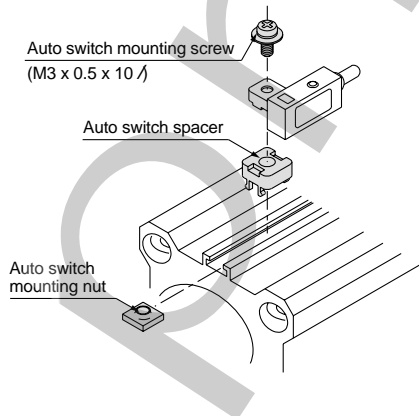
[Stainless steel mounting screw kit]

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 Strokes

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.

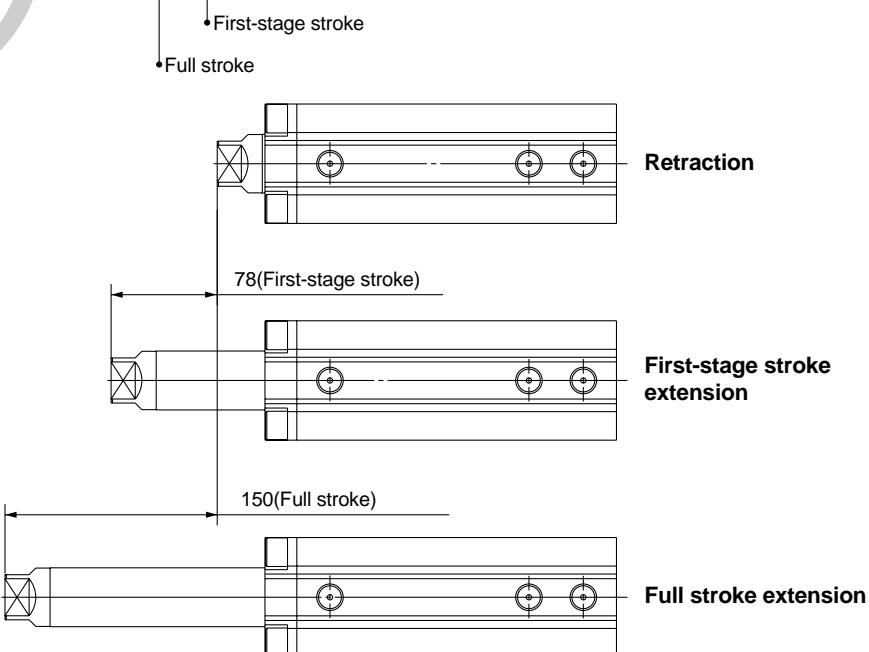
Note 2) Available in 1 mm increments.

Manufacture of intermediate strokes

Method	Spacers installed in standard stroke body.
Ordering	Refer to standard part number and ordering on page 1.
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 number: 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



* Consult P/A for intermediate strokes of a full stroke.

Series RZQ

Theoretical Output

Theoretical Output **Table 1**

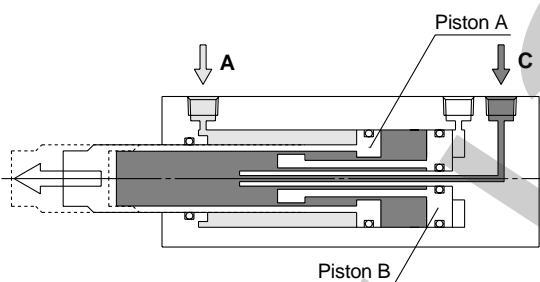
Bore size (mm)	Piston area [mm ²]				Air pressure [MPa] (with same air pressure applied to each port)											
					First stage						Second stage					
	Piston A		Piston B		Extension			Retraction			Extension			Retraction		
	Front side q*	Rear side w*	Front side e*	Rear side r*	0.3	0.5	0.7	0.3	0.5	0.7	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

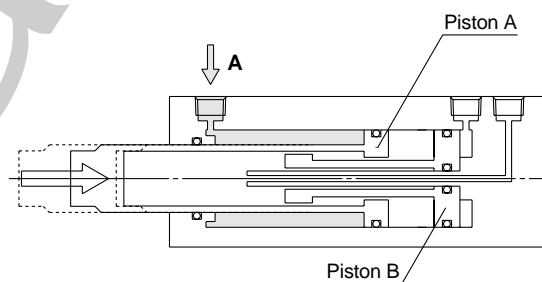
Action	First stage				Second stage				
	Extension		Retraction		Extension			Retraction	
Pressure port	A	C	A		A	B	C	A	C
Air pressure [MPa]	P _A	P _C	P _A		P _A	P _B *	P _C *	P _A	P _C
Formula for theoretical output F[N]	F = -q x P _A + w x P _C		F = q x P _A		F = q x P _A + r x P _B + (w-e) x P _C			F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

* q, w and e are piston areas. (Refer to [Table 1](#).)

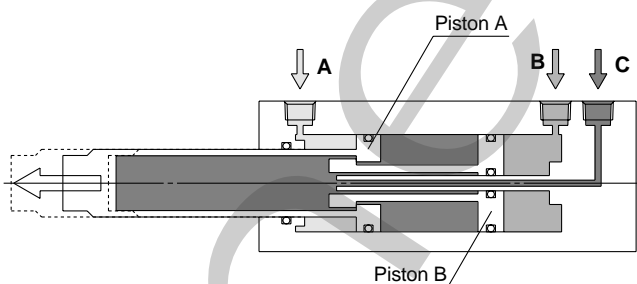
* Assume P_B ≤ P_C.



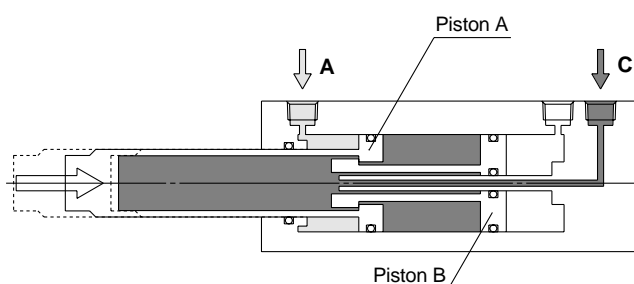
First-stage extension



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 type (including bolts)	RZQL	143	155	243	324
Flange type (including bolts)	RZQG,RZQF	165	198	348	534
Double clevis type (including bolts, pins and snap ring)	RZQD	151	196	393	554

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

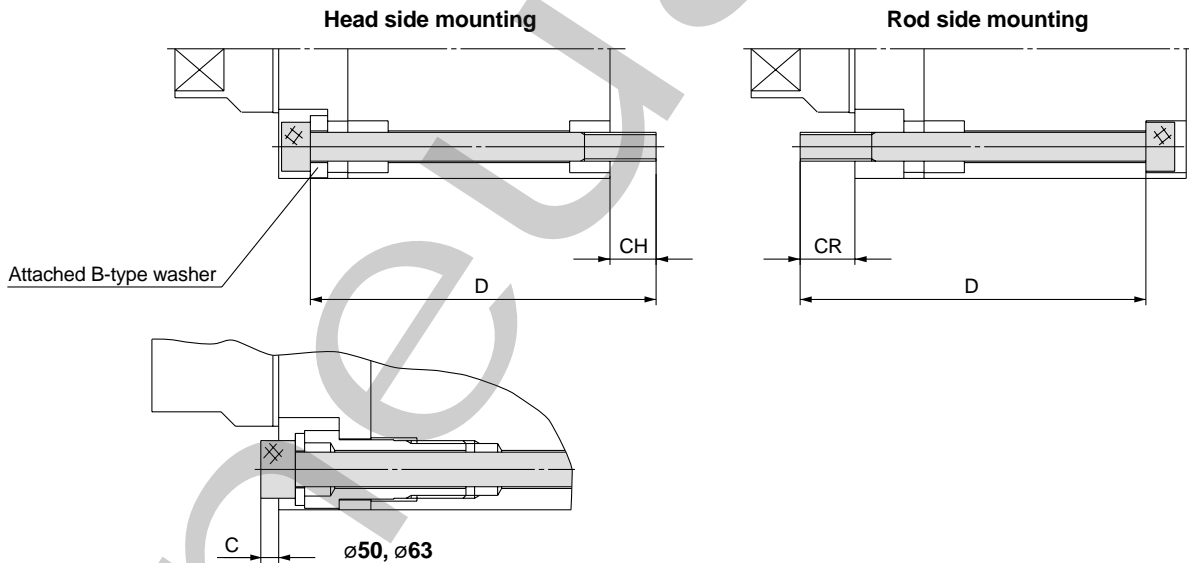
RZQ Mounting Bolt

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 110 /

(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 110 /
RZQB32-50-□				135	M5 x 135 /
RZQB32-75-□				160	M5 x 160 /
RZQB40-25-□	8.5	10	-	120	M5 x 120 /
RZQB40-50-□				145	M5 x 145 /
RZQB40-75-□				170	M5 x 170 /
RZQB50-25-□	11.5	16.5	3	130	M6 x 130 /
RZQB50-50-□				155	M6 x 155 /
RZQB50-75-□				180	M6 x 180 /
RZQB63-25-□	12.5	17.5	3.5	135	M8 x 135 /
RZQB63-50-□				160	M8 x 160 /
RZQB63-75-□				185	M8 x 185 /

Series RZQ

Model Selection

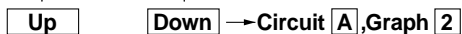
Selection chart for pneumatic circuit and selection graph

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

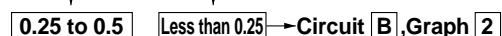
1) Transfer direction of load



2) Cylinder orientation



3) Cylinder load ratio

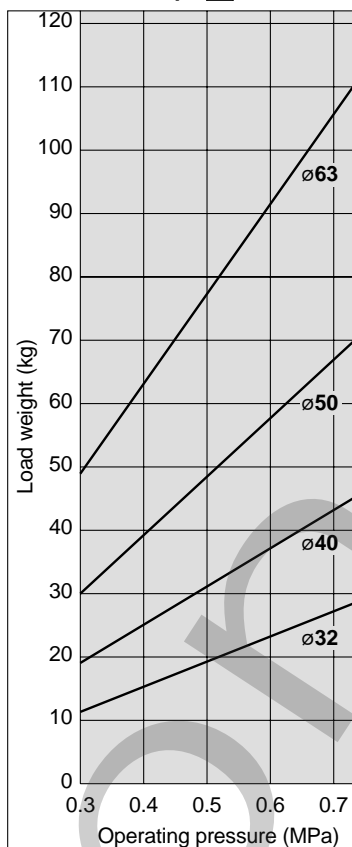


Circuit C, Graph 1, Minimum load weight = Graph 2

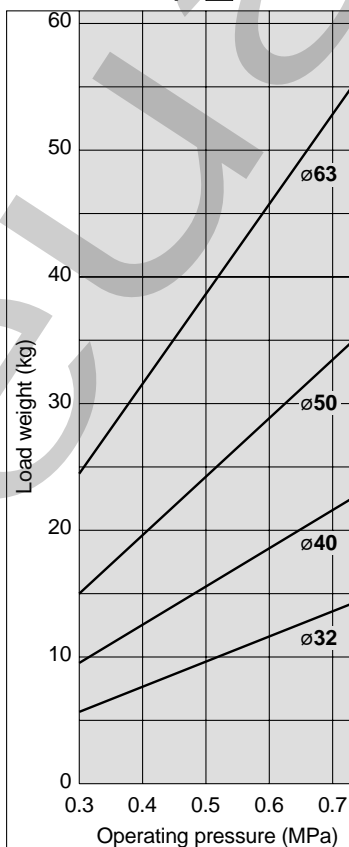
Selection graph

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

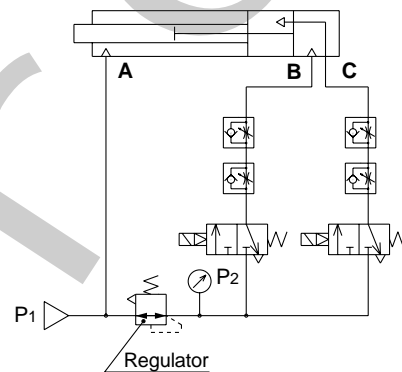
→ **Circuit A** and **Graph 2** are selected according to the chart.

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

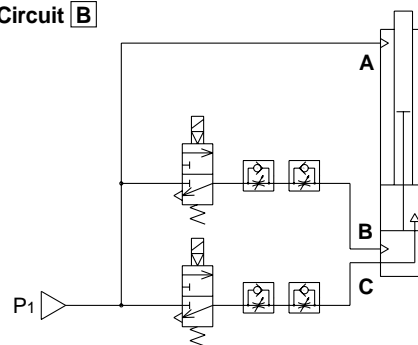
→ **ø50** is selected.

Pneumatic circuit

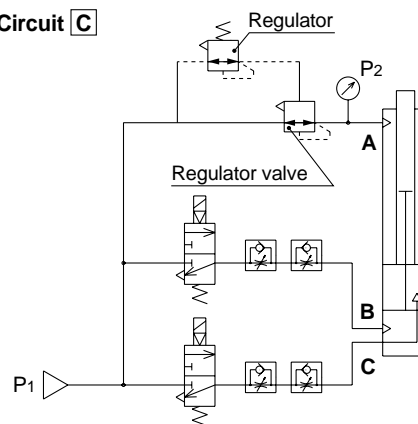
Circuit A



Circuit B



Circuit C



Confirmation of allowable kinetic energy

Confirm the internal stopper strength at extension and retraction ends in the graph on page 7.

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]

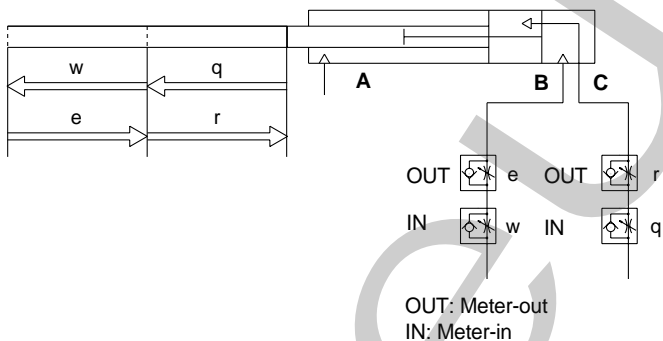
* In cases with load fluctuations, substitute the median value of the weight.

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.

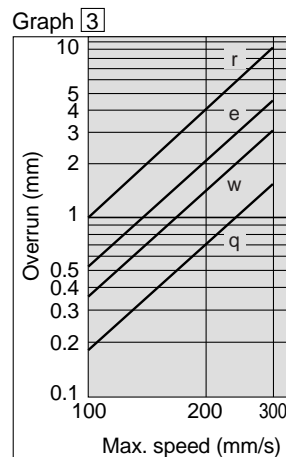


Overrun at intermediate stop

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 q to r can be selected from the following table.

Circuit	Orientation	Movement	Line
[A]	Horizontal	Extension	e
		Retraction	r
[A]	Down	Extension	e
		Retraction	e
[B]	Up	Extension	q
		Retraction	e
[C]	Up	Extension	w
		Retraction	r

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



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.



Series RZQ Specific Product Precautions

Be sure to read before handling.

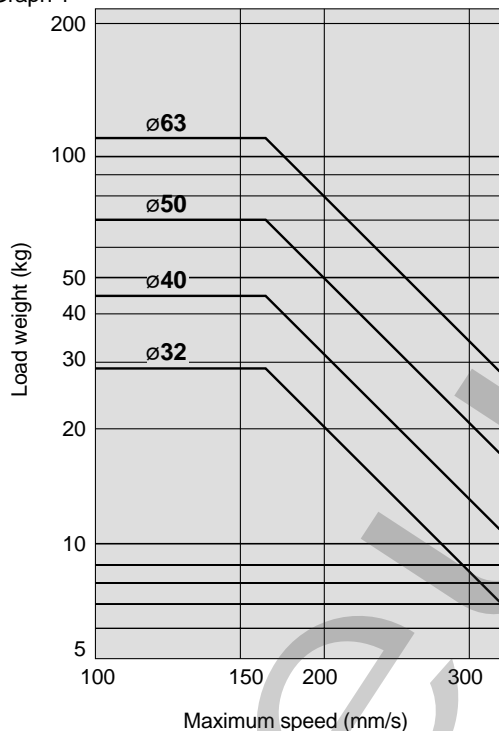
Selection

⚠ 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 6 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.

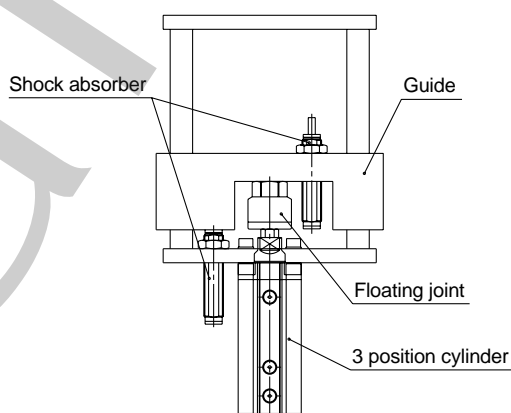
If a moment or torque directly acts on the cylinder, it will lead to reduced service life or damage to machinery.

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

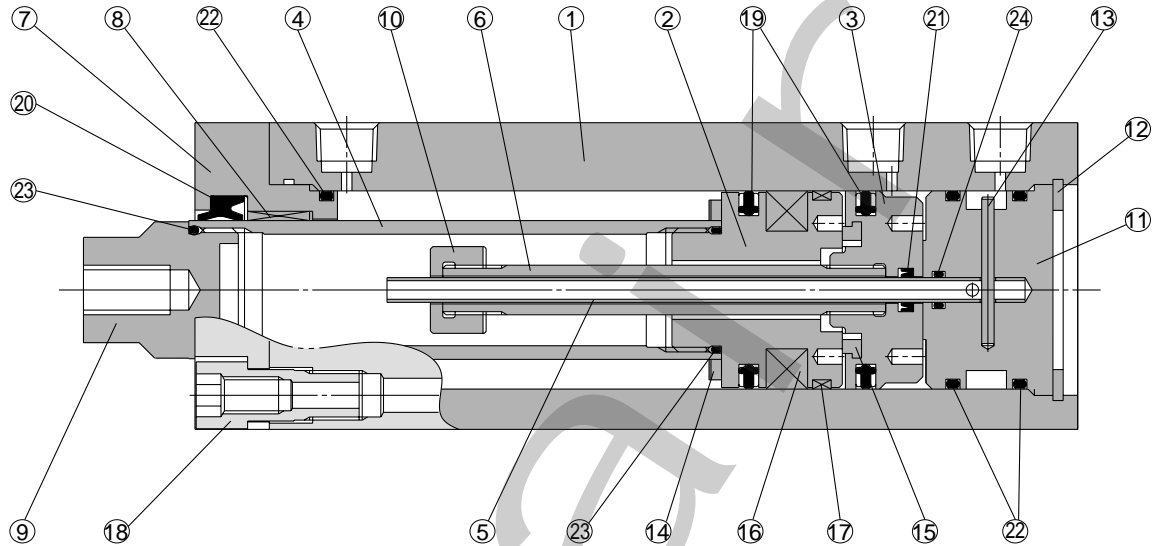
Part No.: 10 g GR-L-010

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 8.

Construction



Parts list

No.	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

No.	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 list/Seal kits

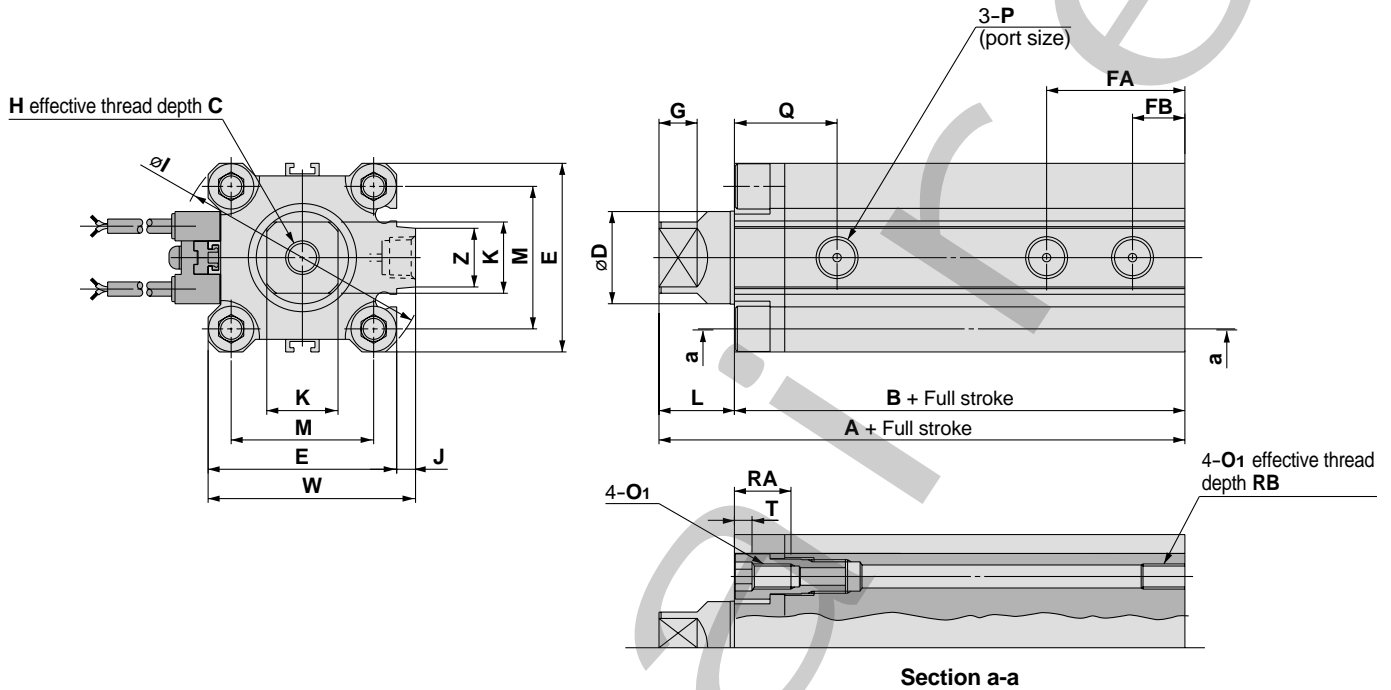
Bore size (mm)	Seal kit No.	Contents
32	RZQ32-PS	A set of Nos. 19, 20, 21, 22 and 24 from the table above
40	RZQ40-PS	
50	RZQ50-PS	
63	RZQ63-PS	

* 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.

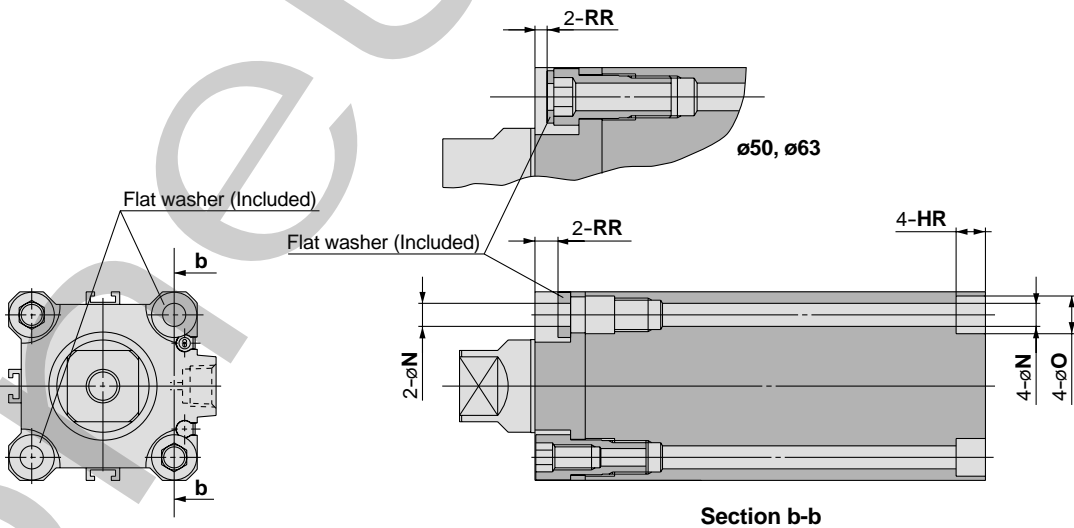
Series RZQ

Dimensions

Standard type (Double end tapped type)/RZQA

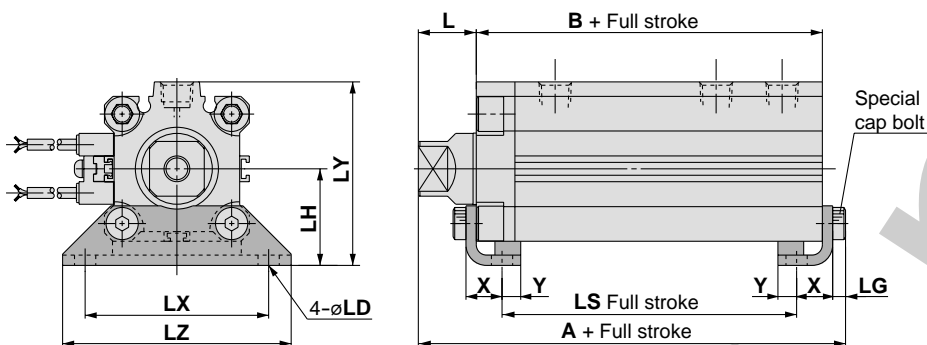


Standard type (Through hole type)/RZQB



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 type/RZQL

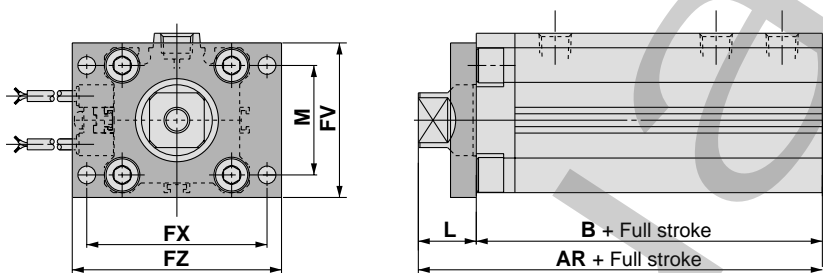


Foot type (mm)

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 type/RZQF

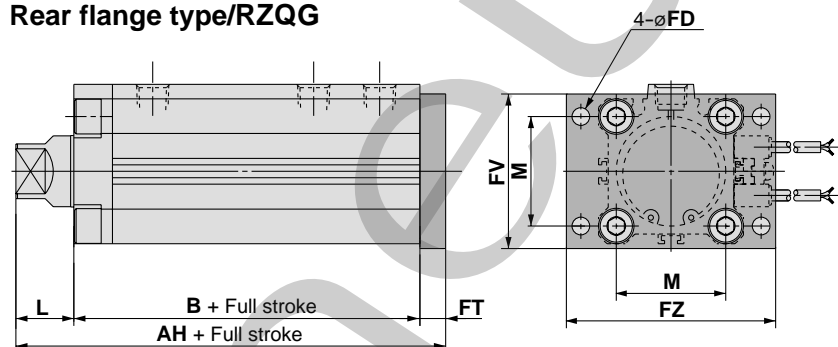


Flange (mm)

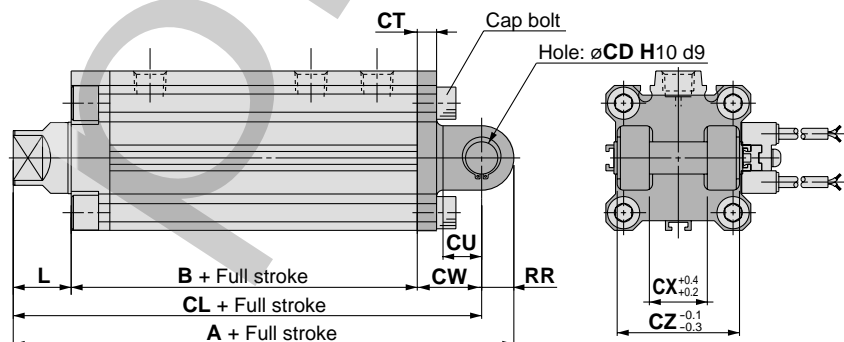
Bore size (mm)	AR	AH	B	FD	FT	FV	FX
32	100.5	108.5	82.5	5.5	8	50	56
40	110	118	92	5.5	8	56	62
50	118.5	127.5	96.5	6.6	9	67	76
63	130	139	102	9	9	90	92

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

Rear flange type/RZQG



Double clevis type/RZQD



Double clevis (mm)

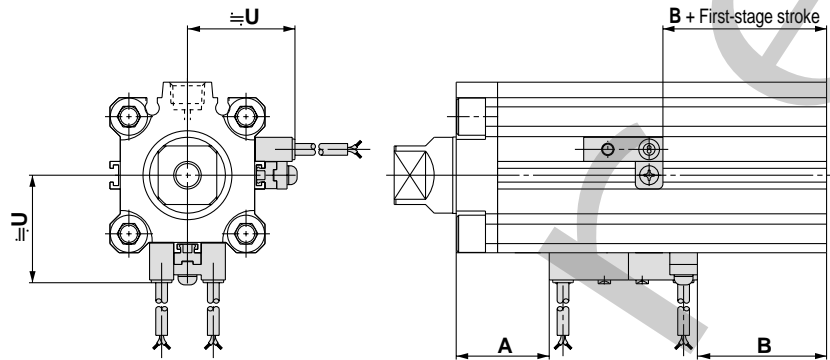
Bore size (mm)	A	B	CD	CL	CT	CU	CW
32	112.5	82.5	10	102.5	5	14	20
40	124	92	10	114	6	14	22
50	134.5	96.5	14	124.5	7	20	28
63	146	102	14	132	8	20	30

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

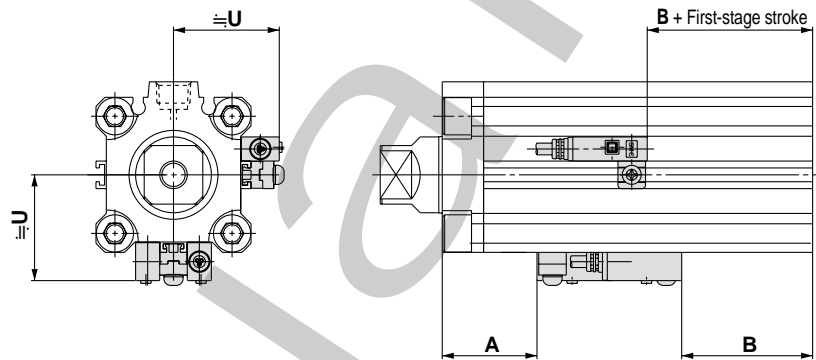
Series RZQ

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

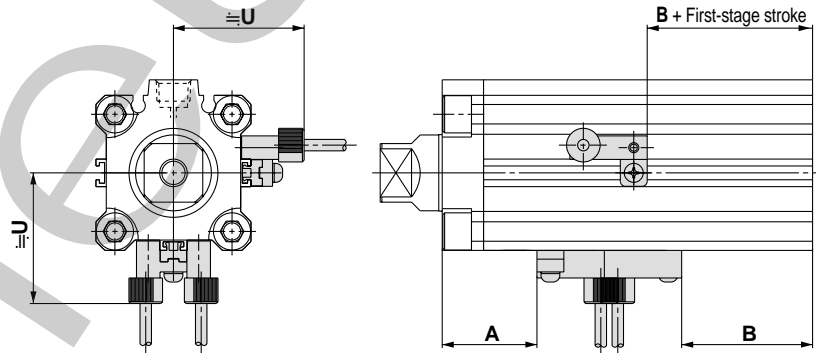
D-A7□
D-A80



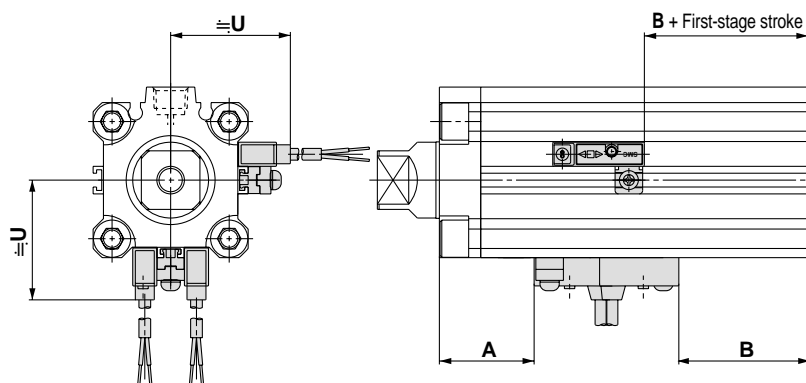
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F7□F
D-Y7NTL
D-F7BAL



D-A73C
D-A80C
D-J79C



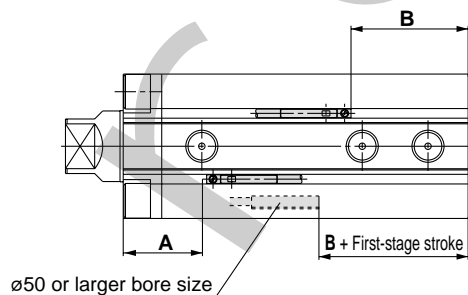
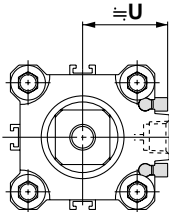
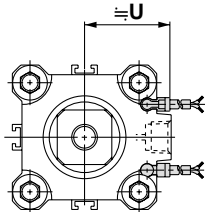
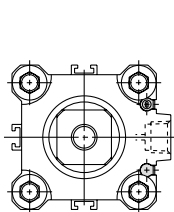
D-A79W
D-F7□WV
D-F7□V
D-F7BAVL



D-A9□
D-F9□
D-F9□W

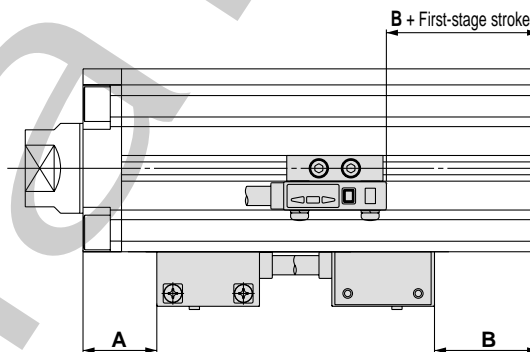
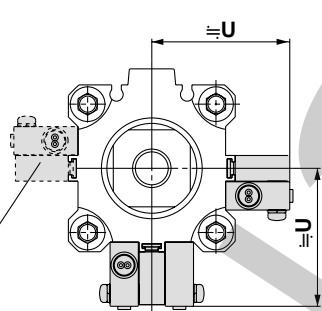
D-A9□V
D-F9□V
D-F9□WV

D-F9BAL



D-P5DW
ø40, 50, 63

Mounted on different side in case of a full stroke of 25 mm or less



Proper mounting position

[mm]

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-F7LF		D-A9□ D-A9□V		D-F9□ D-F9□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	A	B
32	27	37.5	27.5	38	24.5	35	31.5	42	26	36.5	30	40.5	29	39.5	—	—
40	31	43	31.5	43.5	28.5	40.5	35.5	47.5	30	42	34	46	33	45	27	39
50	33.5	44	34	44.5	31	41.5	38	48.5	32.5	43	36.5	47	35.5	46	29.5	40
63	37	47	37.5	47.5	34.5	44.5	41.5	51.5	36	46	40	50	39	49	33	43

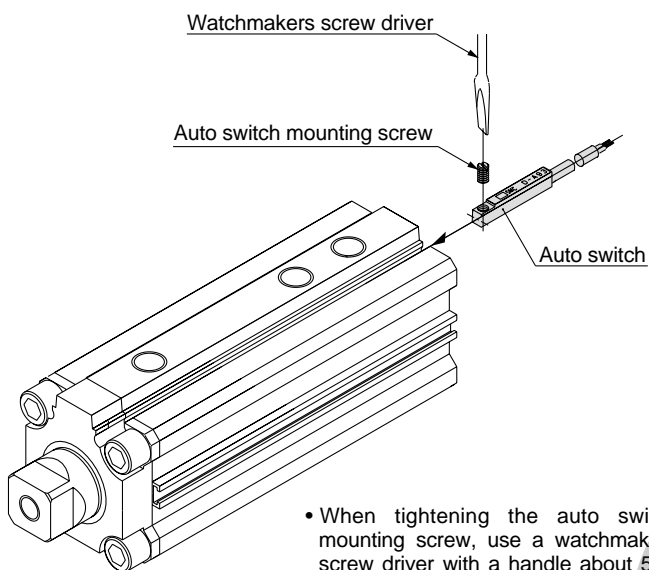
Bore size (mm)	D-A7□, A80	D-A7□H, A80H D-F7□, D-F7□F D-J79, J79W D-F7□W D-F7BAL D-F7NTL	D-A73C D-A80C	D-F7□V D-F7□WV D-F7BAVL	D-J79C	D-A79W	D-A9□V	D-F9□V D-F9□WV	D-F9BAL	D-P5DWL
	U	U	U	U	U	U	U	U	U	U
32	31.5	32.5	38.5	35	38	34	27	29	26.5	—
40	35	36	42	38.5	41.5	37.5	30.5	32.5	30	44
50	41	42	48	44.5	47.5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

Series RZQ

Auto Switch Mounting

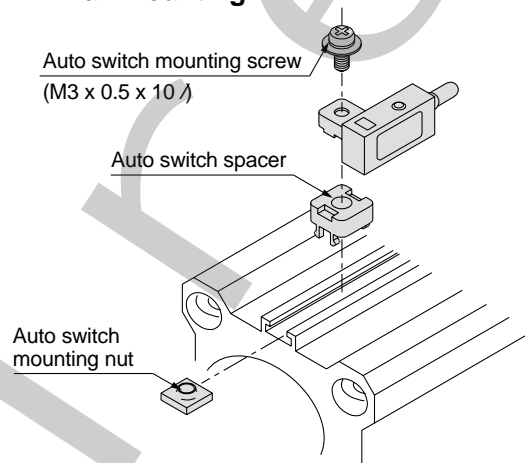
Follow the procedures below to mount auto switches.

Direct mounting



- When tightening the auto switch mounting screw, use a watchmakers screw driver with a handle about 5 to 6mm in diameter. Tighten with a torque of 0.10 to 0.20N·m.

Rail mounting



- Apply a tightening torque of 0.5 to 0.7N·m to the auto switch mounting screw.

* Auto switch mounting brackets are included with a cylinder with built-in magnet.

In addition to the models listed in "How to Order" the following auto switches can be mounted. Refer to page 5.3-2 of Best Pneumatics Vol. 2 for detailed specifications.

Auto switch type	Part No.	Electrical entry	Features	Applicable bore size
Reed switch	D-A80	Grommet (perpendicular)	Without indicator light	ø12 to ø160
	D-A80H	Grommet (in-line)		
	D-A80C	Connector (perpendicular)		ø125 to ø200
	D-Z80	Grommet (in-line)		
	D-A90	Grommet (in-line)		ø32 to ø100
	D-A90V	Grommet (perpendicular)		
Solid state switch	D-F7NTL	Grommet (in-line)	With timer	ø12 to ø160

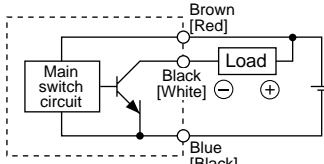
* D-F7NTL is also available with pre-wired connector.

* Normally closed type (NC = b contact) solid state auto switches are also available (D-F9G, F9H, Y7G, Y7H)

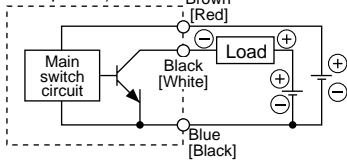
Series RZQ Auto Switch Connections and Examples

Basic Wiring

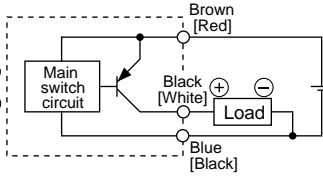
Solid state 3-wire, NPN



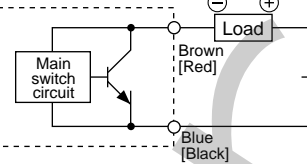
(When power supply for switch and load are separate.)



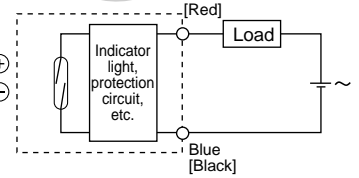
Solid state 3-wire, PNP



2-wire (Solid state)



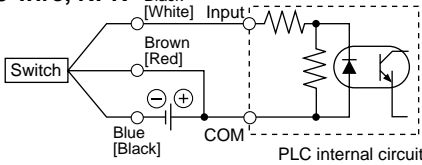
2-wire (Reed switch)



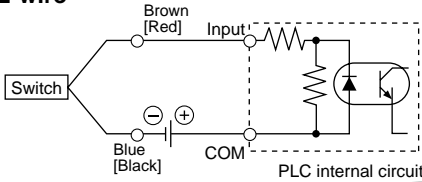
Examples of Connection to PLC

Sink input specifications

3-wire, NPN

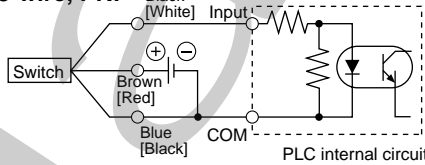


2-wire

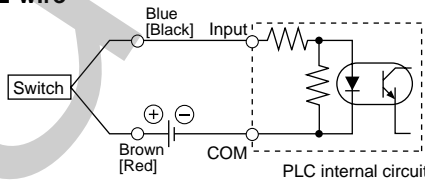


Source input specifications

3-wire, PNP



2-wire

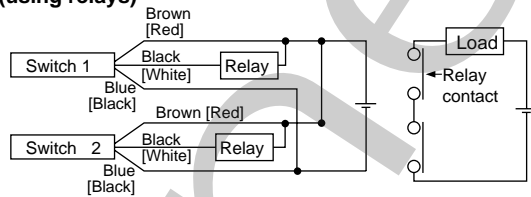


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

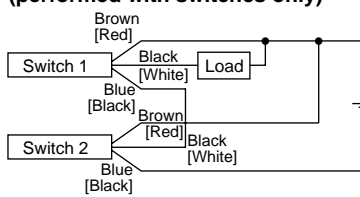
Connection Examples for AND (Series) and OR (Parallel)

3-wire

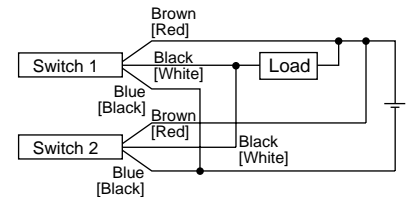
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

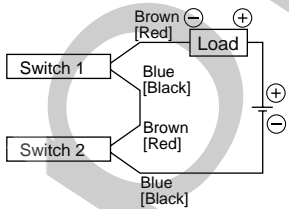


OR connection for NPN output



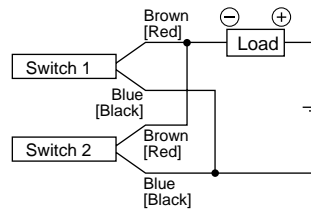
The indicator lights will light up when both switches are turned ON.

2-wire with 2 switches AND connection



When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state. The indicator lights will light up if both of the switches are in the ON state.

2-wire with 2 switches OR connection



(Solid state) When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

(Reed switch) Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes get dark or not light up, because of dispersion and reduction of the current flowing to the switches.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24\text{V} - 4\text{V} \times 2 \text{ pcs.} \\ &= 16\text{V} \end{aligned}$$

Example: Power supply is 24VDC
Voltage decline in switch is 4V

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1\text{mA} \times 2 \text{ pcs.} \times 3\text{k}\Omega \\ &= 6\text{V} \end{aligned}$$

Example: Load impedance is 3kΩ
Leakage current from switch is 1mA