

Compact Cylinder with Air Cushion

Series RQ

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100



Uses a unique air cushion mechanism with no cushion ring.

The **new standard** for the future
New **Air Cushion Cylinder**



CUJ

CU

CQS

CQ2

RQ

CQM

MU

Model	Mounting	Rod end configuration	Standard stroke								Auto switch
			15	20	25	30	40	50	75	100	
R(D)Q□20	- Through-hole - Double end tapped - Foot style - Rod side flange style - Head side flange style - Double clevis style	- Female thread - Male thread	●	●	●	●	●	●	●	●	- Direct mounting auto switch (ø20 to ø100) - Rail mounting auto switch (ø32 to ø100)
R(D)Q□25			●	●	●	●	●	●	●	●	
R(D)Q□32			●	●	●	●	●	●	●	●	
R(D)Q□40			●	●	●	●	●	●	●	●	
R(D)Q□50			●	●	●	●	●	●	●	●	
R(D)Q□63			●	●	●	●	●	●	●	●	
R(D)Q□80			●	●	●	●	●	●	●	●	
R(D)Q□100			●	●	●	●	●	●	●	●	

*Size ø20 and ø25 have through-holes and double end taps in common.

D-□

-X□

Individual

-X□

Technical data

Future new standard for shock elimination,



Employs a new construction
for the air cushion mechanism.



Compact Cylinder with Air Cushion

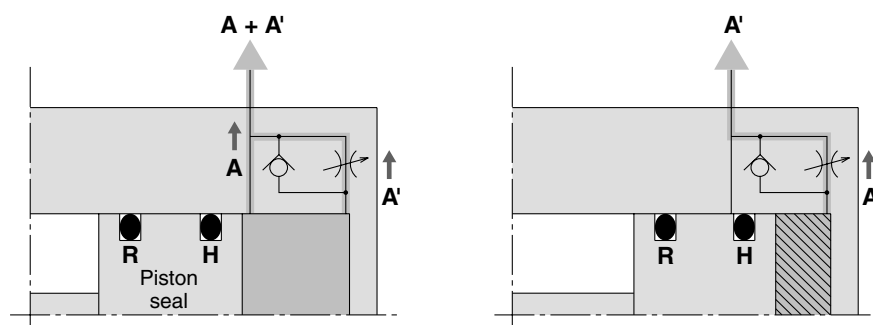
Series *RQ*



Unique air cushion construction with no cushion ring

Elimination of the cushion ring used in conventional cushion ring type air cushions has made it possible to reduce the overall length of the cylinder. This produces an air cushion cylinder which retains the merits of a compact design.

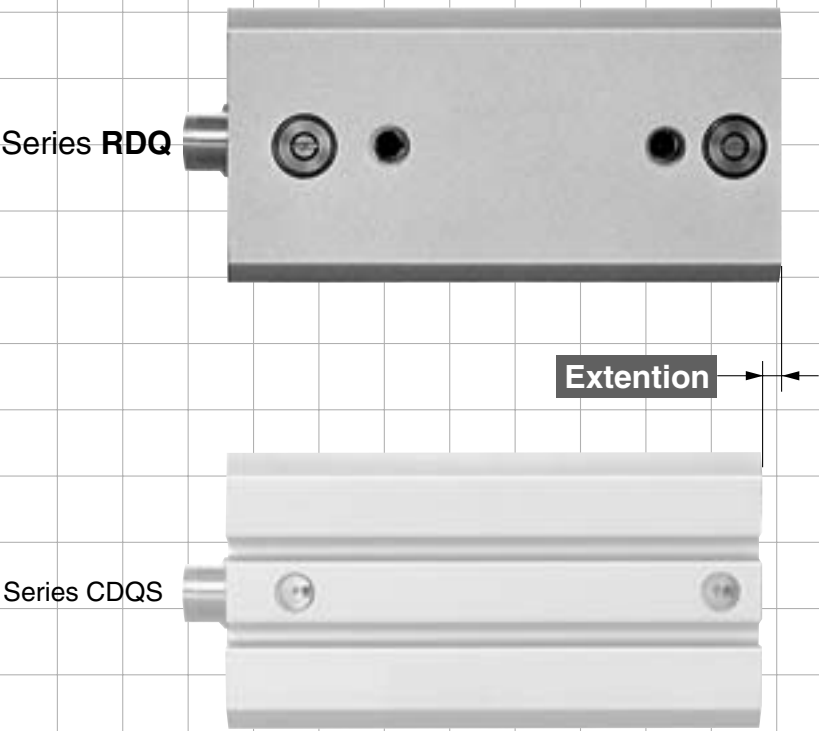
Working principle



- ① When the piston is retracting, exhaust is discharged from both A and A' until piston seal H passes the air passage A.
- ② After piston seal H has passed the air passage A, exhaust is discharged only from A'. The section marked with diagonal lines becomes a cushion chamber, and a cushioning effect is achieved.
- ③ When air is supplied for piston extension, the check seal opens and the piston starts with no delay.

noise reduction and improvement in repeatability

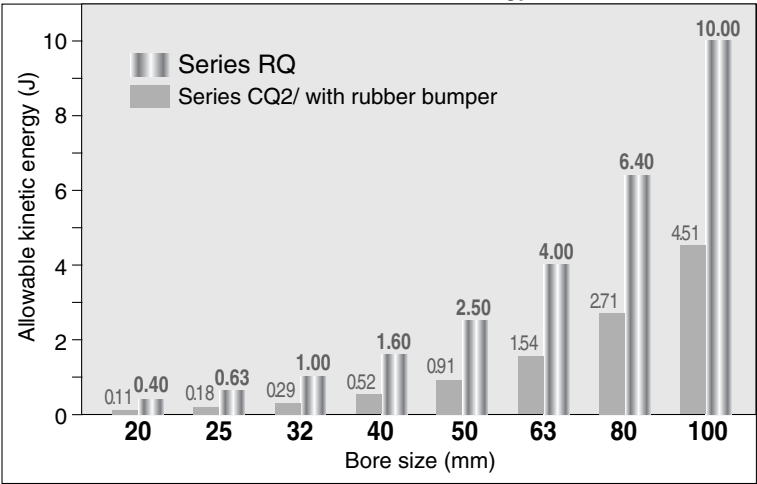
Minimal extended dimensions from **+2.5mm to 13mm**
(Compared with series CDQS/CDQ2 of the same bore size with auto switches)



Series	Bore size	Extended dimension	Comparable cylinder
Series RDQ	20	+2.5mm	Series CDQS
	25	+4mm	
	32	+4mm	
	40	+4.5mm	Series CDQ2
	50	+9mm	
	63	+9mm	
	80	+10mm	
	100	+13mm	

Nearly three times the allowable kinetic energy

(Compared to Series CQS/CQ2 with rubber bumper)
Improved energy absorption allows selection of a cylinder that is two sizes smaller for the same kinetic energy.

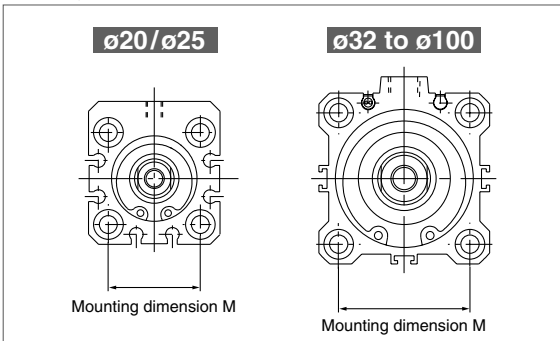


Improved noise reduction (Stroke end impact noise reduced)

- Decrease of 19dB or more (Compared with Series CQ2 without cushion)
- Decrease of 14dB or more (Compared with Series CQ2 with rubber bumper)

Interchangeable mounting

The mounting dimension "M" is the same as the compact cylinder Series CQS/CQ2.
(CQS/CQ2 mounting brackets can be used without any changes.)



Improved repeatability

The piston contact surface at the stroke end is metal, providing improved repeatability for the stopping position as compared with a rubber bumper.

CUJ

CU

CQS

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D-□

-X□

Individual
-X□

Technical
data

Compact Cylinder with Air Cushion

Series *RQ*

ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100

How to Order

With auto switch

RQ B 32 - 50 - M9BW

With auto switch
(Built-in magnet)

Mounting bracket

B	Through-hole (Standard)	F	Rod side flange style
A	Both ends tapped style	G	Head side flange style
L	Foot style	D	Double clevis style

Note 1) Mounting brackets are packed together when shipped (unassembled).

Note 2) Since sizes ø20 and ø25 have a body with type B (Through-hole) and type A (Both ends tapped style) in common, there is no type A part number.

Example) RQA 20-30 does not exist.

Note 3) Cylinder mounting bolts are not included. Order them separately referring to Mounting Bolts for RQB on page 776.

Bore size

20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Body option

Nil	Rod end female thread (Standard)
M	Rod end male thread

Cylinder stroke (mm)

Refer to "Standard Stroke" on page 775.

Thread type

Nil	M thread	ø20, 25
	Rc	
TN	NPT	ø32 to ø100
TF	G	

Made to Order
For details, refer to page 775.

Number of auto switches

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

Auto switch

Nil	Without auto switch
-----	---------------------

* Refer to the table below for the applicable auto switch model.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) RDQL40-50

Applicable Auto Switch/Refer to pages 1263 to 1371 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model				Lead wire length (m)					Pre-wired connector	Applicable load				
					DC	AC	Perpendicular		In-line		0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)						
							ø20, ø25	ø32 to ø100	ø20, ø25	ø32 to ø100											
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	—	M9NV		M9N		●	●	●	○	—	○	IC circuit	Relay, PLC			
		3-wire (PNP)		M9PV			M9P		●	●	●	○	—	○							
		M9BV		M9B			●	●	●	○	—	○									
	Connector	2-wire		12 V			—		J79C		—		●	—	●	●	○		—	—	
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)			5 V, 12 V	M9NWV		M9NW		●	●	●	○	—	○		IC circuit		
				3-wire (PNP)			12 V	M9PWV		M9PW		●	●	●	○	—	○				
				2-wire			12 V	M9BWV		M9BW		●	●	●	○	—	○				
	Water resistance (2-color indication)			3-wire (NPN)			5 V, 12 V	M9NAV **		M9NA **		○	○	●	○	—	○		IC circuit		
				3-wire (PNP)			12 V	M9PAV **		M9PA **		○	○	●	○	—	○				
				2-wire			12 V	M9BAV **		M9BA **		○	○	●	○	—	○				
	With diagnostic output (2-color indication)	4-wire		5 V, 12 V			—		—		F79F		●	—	●	○	—		○	IC circuit	
	Reed switch	—		Grommet			Yes	3-wire (NPN equiv.)	—	24 V	5 V	—	A96V		A96		●		—	●	—
—			200 V		—	A72					—	A72H	●	—	●	—	—	—	—		
12 V			100 V		A93V						A93		●	—	●	—	—	—	—		
5 V, 12 V			100 V or less		A90V						A90		●	—	●	—	—	—	—		
Connector			Yes	12 V	—	—		A73C			—		●	—	●	●	●	—	—	—	
			No	5 V, 12 V	24 V or less	—		A80C			—		●	—	●	●	●	—	—	—	
			Grommet	Yes	—	—		—			A79W	—		●	—	●	—	—	—	—	

** Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

* Lead wire length symbols: 0.5 m..... Nil (Example) M9NW
1 m..... M (Example) M9NWM
3 m..... L (Example) M9NWL
5 m..... Z (Example) M9NWX
None..... N (Example) J79CN

* Solid state auto switches marked with a "○" are produced upon receipt of order.

* Besides the models in the above catalog, there are some other auto switches that are applicable. For more information, refer to page 788.

* Refer to pages 1328 and 1329 for the details of auto switches with a pre-wired connector.

* When mounting D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types on a side other than the port side with ø32 to ø50 cylinders, order auto switch mounting brackets separately. Refer to page 788 for details.

* When mounting brackets (foot/flange style) are used, then in some cases auto switches cannot be retrofitted.

Specifications



Bore size (mm)	20	25	32	40	50	63	80	100
Lubrication	Not required (non-lube)							
Fluid	Air							
Proof pressure	1.5 MPa							
Maximum operating pressure	1.0 MPa							
Minimum operating pressure	0.05 MPa							
Ambient and fluid temperature	Without auto switch: -10°C to 70°C (No freezing) With auto switch: -10°C to 60°C (No freezing)							
Rod end thread	Female thread							
Stroke length tolerance	$+1.0$ 0							
Mounting	Through-hole							
Piston speed	50 to 500 mm/s							

Standard Stroke

Bore size (mm)	Standard stroke (mm)
20, 25	15, 20, 25, 30, 40, 50
32, 40	20, 25, 30, 40, 50, 75, 100
50, 63	30, 40, 50, 75, 100
80, 100	40, 50, 75, 100



Made to Order

(For details, refer to pages 1420 and 1470.)

Symbol	Specifications
-XA	Change of Rod End Shape
-XC4	With heavy duty scraper
-XC35	With coil scraper (For ø32 to 100 only)

Allowable kinetic energy

Refer to "Selection" on page 789 regarding the allowable kinetic energy.

Manufacture of Intermediate Stroke

Description	Exclusive body	
Part no.	Refer to "How to Order" for standard model	
Method	Available in stroke increments of 1mm, using an exclusive body for the specified stroke.	
Stroke range	Bore size	Stroke range
	20, 25	16 to 49
	32, 40	21 to 99
	50, 63	31 to 99
	80, 100	41 to 99
Example	Part no.: RQB32-47 A special tube is manufactured for a 47mm stroke.	

Effective Cushion Length

Bore size (mm)	20	25	32	40	50	63	80	100
Effective cushion length (mm)	5.8	6.1	6.6	6.6	7.1	7	7.5	8

Mounting Bracket Part No.

Bore size (mm)	Note 1) Foot	Flange	Note 3) Double clevis
20	CQS-L020	CQS-F020	CQS-D020
25	CQS-L025	CQS-F025	CQS-D025
32	CQ-L032	CQ-F032	CQ-D032
40	CQ-L040	CQ-F040	CQ-D040
50	CQ-L050	CQ-F050	CQ-D050
63	CQ-L063	CQ-F063	CQ-D063
80	CQ-L080	CQ-F080	CQ-D080
100	CQ-L100	CQ-F100	CQ-D100

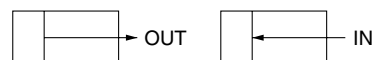
Note 1) When ordering foot brackets, order 2 pieces per cylinder.

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

Foot/Flange : Body mounting bolts.

Double clevis : Clevis pins, type C retaining ring for axis, and Body mounting bolts.

Theoretical Output



(N)

Bore size (mm)	Operating direction	Operating pressure (MPa)		
		0.3	0.5	0.7
20	IN	71	118	165
	OUT	94	157	220
25	IN	113	189	264
	OUT	147	245	344
32	IN	181	302	422
	OUT	241	402	563
40	IN	317	528	739
	OUT	377	628	880
50	IN	495	825	1150
	OUT	589	982	1370
63	IN	841	1400	1960
	OUT	935	1560	2180
80	IN	1360	2270	3170
	OUT	1510	2510	3520
100	IN	2140	3570	5000
	OUT	2360	3930	5500

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual
-X□

Technical
data

Series RQ

Mass

Basic Mass

(g)

Bore size (mm)	Standard stroke (mm)							
	15	20	25	30	40	50	75	100
20	141	156	171	186	216	245	—	—
25	203	221	239	258	294	331	—	—
32	—	271	291	312	353	394	496	598
40	—	390	413	436	482	528	643	758
50	—	—	—	731	803	875	1055	1235
63	—	—	—	940	1019	1099	1297	1495
80	—	—	—	—	1819	1950	2278	2606
100	—	—	—	—	2859	3038	3483	3928

Additional Mass

(g)

Bore size (mm)	20	25	32	40	50	63	80	100
Magnet	5	6	11	13	14	22	24	35
Both ends tapped style	—	—	6	6	6	19	45	45
Rod end male thread	Male thread	6	12	26	27	53	53	120
	Nut	4	8	17	17	32	32	49
Foot style (including bolt)	159	181	143	155	243	324	696	1062
Rod side flange style (including bolt)	143	180	180	214	373	559	1056	1365
Head side flange style (including bolt)	137	171	165	198	348	534	1017	1309
Double clevis style (including pin, retaining ring and bolt)	92	127	151	196	393	554	1109	1887

Calculation example) RQD32-20M

- Basic mass : RQB32-20 271 g
- Additional mass: Double end tapped 6 g
- Rod end male thread 43 g
- Double clevis 151 g
- 471 g

Mounting Bolts for R(D)QB

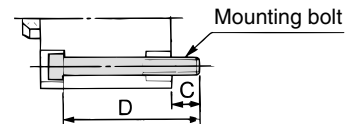
Through-hole type mounting bolts for R(D)QB are available.

Refer to the following for ordering procedures.

Order the actual number of bolts that will be used.

Example) CQ-M5x50L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Zinc chromated

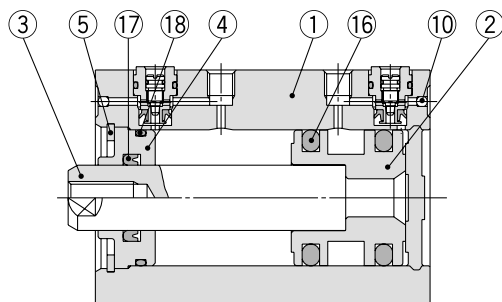


Cylinder model	C	D	Mounting bolt Part no.
R(D)QB20-15	9	50	CQ5 x 50L
-20		55	x 55L
-25		60	x 60L
-30		65	x 65L
-40		75	x 75L
-50		85	x 85L
R(D)QB25-15		55	CQ-M5 x 55L
-20	9.5	60	x 60L
-25		65	x 65L
-30		70	x 70L
-40		80	x 80L
-50		90	x 90L
R(D)QB32-20	10	60	CQ-M5 x 60L
-25		65	x 65L
-30		70	x 70L
-40		80	x 80L
-50		90	x 90L
-75		115	x 115L
-100		140	x 140L

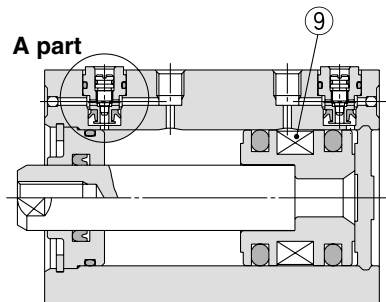
Cylinder model	C	D	Mounting bolt Part no.
R(D)QB40-20	8	65	CQ-M5 x 65L
-25		70	x 70L
-30		75	x 75L
-40		85	x 85L
-50		95	x 95L
-75		120	x 120L
-100		145	x 145L
R(D)QB50-30	13.5	85	CQ-M6 x 85L
-40		95	x 95L
-50		105	x 105L
-75		130	x 130L
-100		155	x 155L
R(D)QB63-30	15.5	90	CQ-M8 x 90L
-40		100	x 100L
-50		110	x 110L
-75		135	x 135L
-100		160	x 160L
R(D)QB80-40	15	105	CQ-M10 x 105L
-50		115	x 115L
-75		140	x 140L
-100		165	x 165L
R(D)QB100-40	17.5	120	CQ-M10 x 120L
-50		130	x 130L
-75		155	x 155L
-100		180	x 180L

Construction

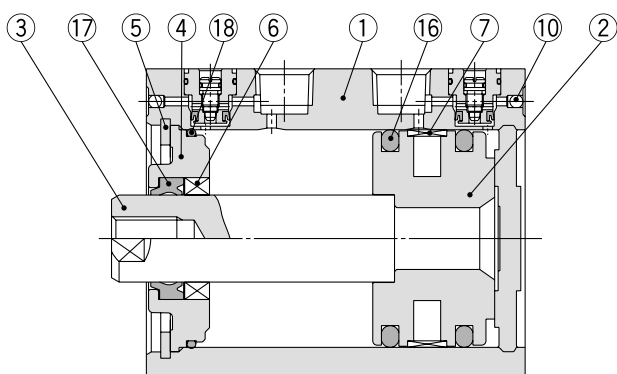
ø20 to ø40



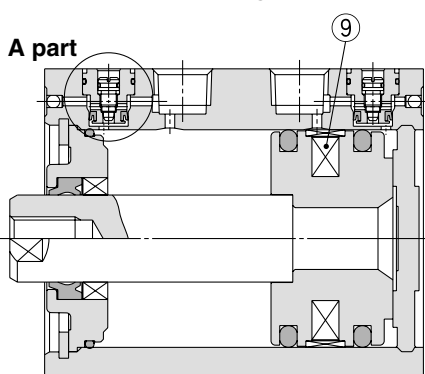
With auto switch (Built-in magnet)



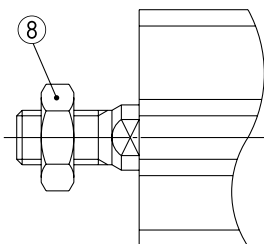
ø50 to ø100



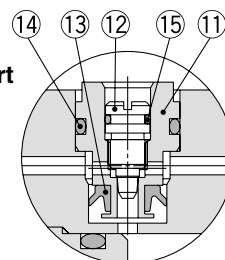
With auto switch (Built-in magnet)



M: Rod end male thread



Details of A part



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminum alloy	Hard anodized
2	Piston	Aluminum alloy	Chromated
3	Piston rod	Stainless steel	ø20, ø25
		Carbon steel	ø32 to ø100, Hard chrome plated
4	Collar	Aluminum alloy	ø20 to ø40, Anodized
		Aluminum alloy casted	ø50 to ø100, Chromated, Painted
5	Retaining ring	Carbon tool steel	Phosphate coating
6	Bushing	Bearing alloy	ø50 to ø100
7	Wear ring	Resin	ø63 to ø100
8	Rod end nut	Carbon steel	Nickel plated
9	Magnet	—	
10	Steel ball	High carbon chrome bearing steel	
11	Check seal retainer	Brass	Electroless nickel plated
12	Cushion needle	Stainless steel	
13	Check seal	NBR	
14	Check gasket	NBR	
15	Needle gasket	NBR	
16	Piston seal	NBR	
17	Rod seal	NBR	
18	Tube gasket	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Part no.	Contents
20	RQB20-PS	Set of nos. above 16, 17, 18.
25	RQB25-PS	
32	RQB32-PS	
40	RQB40-PS	
50	RQB50-PS	
63	RQB63-PS	
80	RQB80-PS	
100	RQB100-PS	

* Seal kit includes 16, 17 and 18. Order the seal kit, based on each bore size.

* Since the seal kit does not include a grease pack, order it separately.

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

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual

-X□

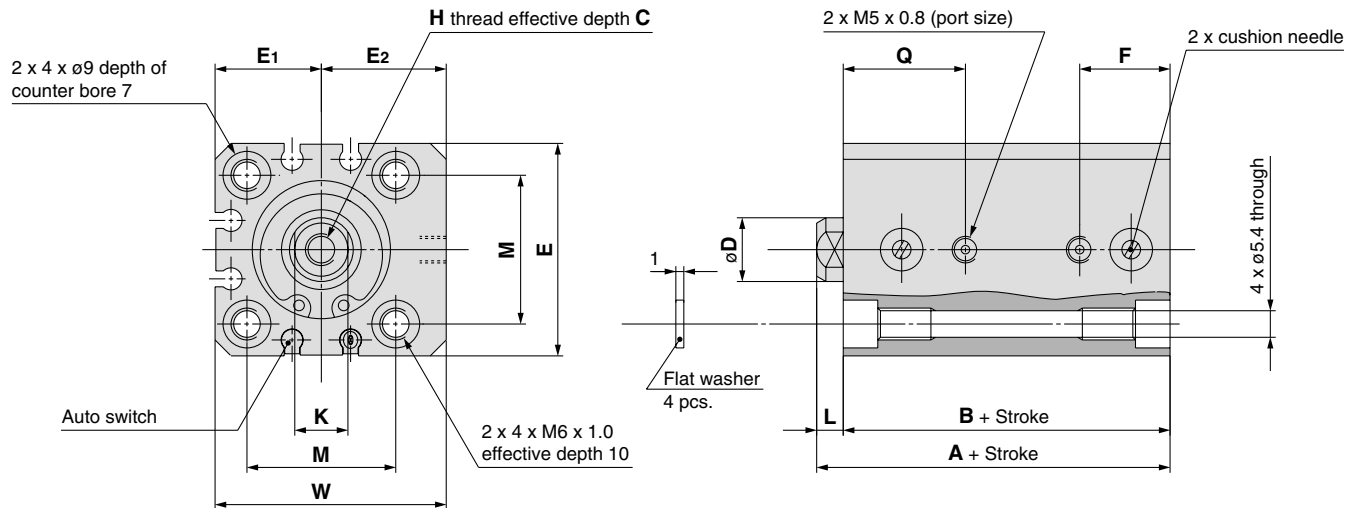
Technical data

Series RQ

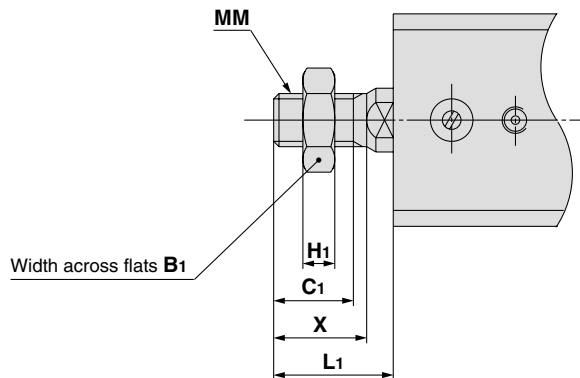
Dimensions: $\phi 20$, $\phi 25$

* For the auto switch mounting position and its mounting height, refer to page 786.

Basic style (Through-hole/Both ends tapped common): RQB/RDQB



Rod end male thread



Rod End Male Thread

Bore size (mm)	B ₁	H ₁	C ₁	X	MM	L ₁
20	13	5	12	14	M8 x 1.25	18.5
25	17	6	15	17.5	M10 x 1.25	22.5

Basic Style

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	E ₁	E ₂	F	H	K	L	M	Q	W
20	15 to 50	36.5	32	7	10	36	18	21	15.5	M5 x 0.8	8	4.5	25.5	21	39
25	15 to 50	41.5	36.5	12	12	40	20	23.5	17	M6 x 1.0	10	5	28	23	43.5

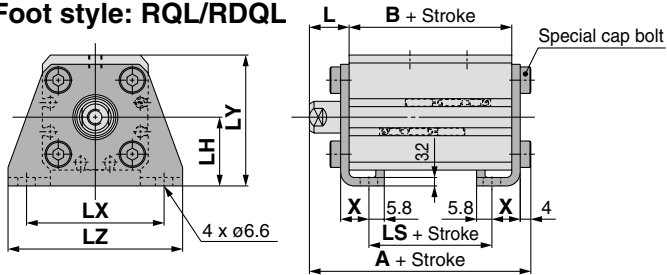
* Refer to page 784 for details on rod end nut and accessories.



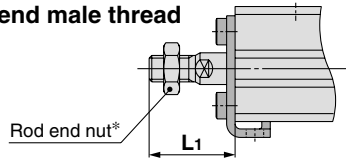
• Add the stroke to calculate the length of intermediate strokes.

Mounting Bracket Dimensions

Foot style: RQL/RDQL



Rod end male thread



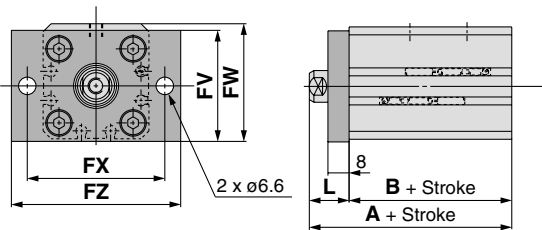
Foot Style

Bore size (mm)	Stroke range (mm)	A	B	LS	L
20	15 to 50	53.7	32	20	14.5
25	15 to 50	58.7	36.5	21.5	15

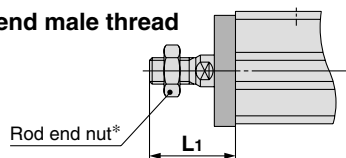
Bore size (mm)	L1	LH	LX	LY	LZ	X
20	28.5	24	48	45	62	9.2
25	32.5	26	52	49.5	66	10.7

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod side flange style: RQF/RDQF



Rod end male thread



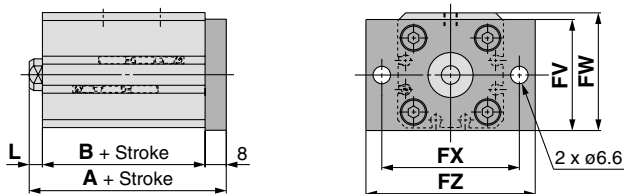
Rod Side Flange Style

Bore size (mm)	Stroke range (mm)	A	B	L
20	15 to 50	46.5	32	14.5
25	15 to 50	51.5	36.5	15

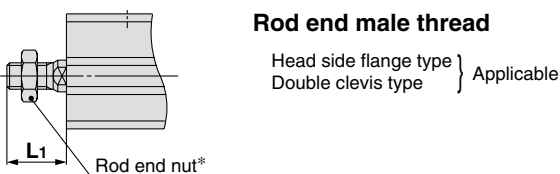
Bore size (mm)	L1	FV	FW	FX	FZ
20	28.5	39	40.5	48	60
25	32.5	42	44.5	52	64

Flange material: Carbon steel
Surface treatment: Nickel plated

Head side flange style: RQG/RDQG



Rod end male thread



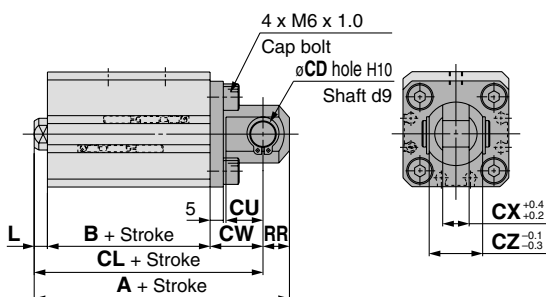
Head Side Flange Style

Bore size (mm)	Stroke range (mm)	A	L	L1
20	15 to 50	44.5	4.5	18.5
25	15 to 50	49.5	5	22.5

* All dimensions but A, L and L1 are identical to those of the rod side flange style.

Flange material: Carbon steel
Surface treatment: Nickel plated

Double clevis style: RQD/RDQD



Double Clevis Style

Bore size (mm)	Stroke range (mm)	A	B	CL	CD	CU
20	15 to 50	63.5	32	54.5	8	12
25	15 to 50	71.5	36.5	61.5	10	14

Bore size (mm)	CW	CX	CZ	L	L1	RR
20	18	8	16	4.5	18.5	9
25	20	10	20	5	22.5	10

* Double clevis pins and retaining rings are included in the package.
* Refer to page 784 for details on rod end nut and accessories.

Double clevis bracket material: Carbon steel
Surface treatment: Nickel plated

Series RQ

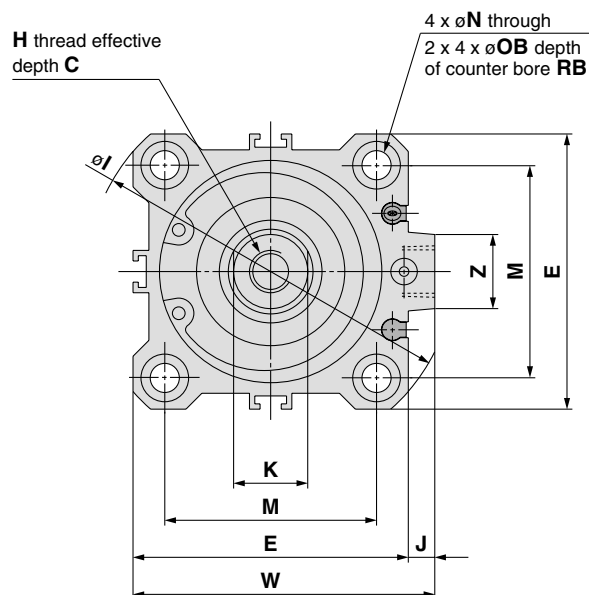
Dimensions: $\phi 32$, $\phi 40$, $\phi 50$

* For the auto switch mounting position and its mounting height, refer to pages 786 to 787.

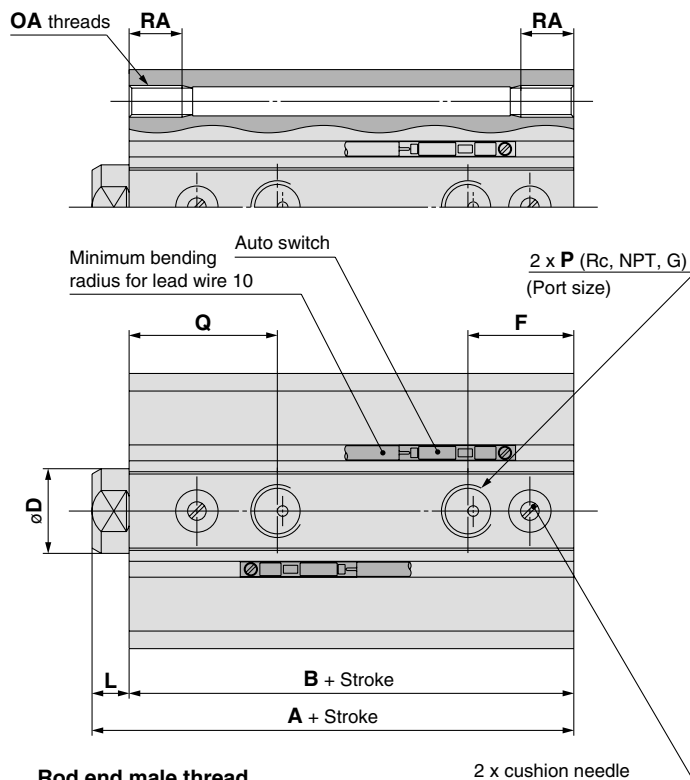
Basic style (Through-hole): RQB/RDQB

Double end tapped

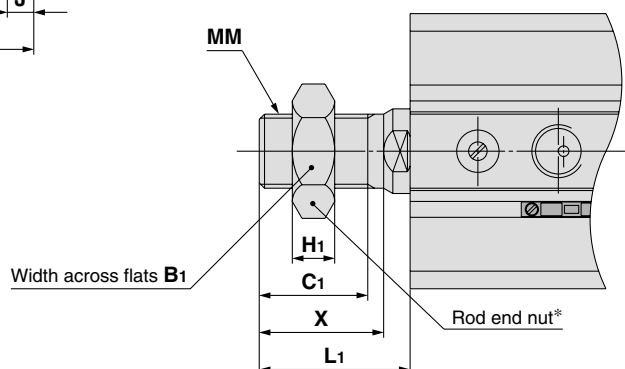
Bore size (mm)	OA	RA
32	M6 x 1.0	10
40	M6 x 1.0	10
50	M8 x 1.25	14



Both ends tapped style: RQA/RDQA



Rod end male thread



Rod End Male Thread

Bore size (mm)	B ₁	H ₁	C ₁	X	MM	L ₁
32	22	8	20.5	23.5	M14 x 1.5	28.5
40	22	8	20.5	23.5	M14 x 1.5	28.5
50	27	11	26	28.5	M18 x 1.5	33.5

Basic Style

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	J	K	L	M	N
32	20 to 100	44	37	13	16	45	18.5	M8 x 1.25	60	4.5	14	7	34	5.5
40	20 to 100	51	44	13	16	52	20	M8 x 1.25	69	5	14	7	40	5.5
50	30 to 100	57.5	49.5	15	20	64	28.5	M10 x 1.5	86	7	17	8	50	6.6

Bore size (mm)	OB	P	Q	RB	W	Z
32	9	1/8	23	7	49.5	14
40	9	1/8	28	7	57	14
50	11	1/4	31.5	8	71	19

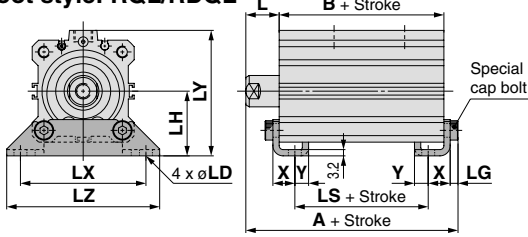
* Refer to page 784 for details on rod end nut and accessories.



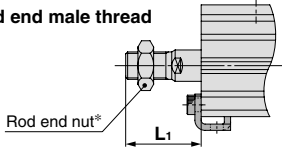
• Add the stroke to calculate the length of intermediate strokes.

Mounting Bracket Dimensions

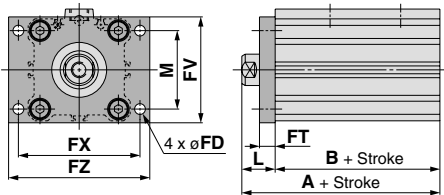
Foot style: RQL/RDQL



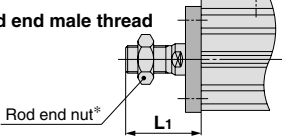
Rod end male thread



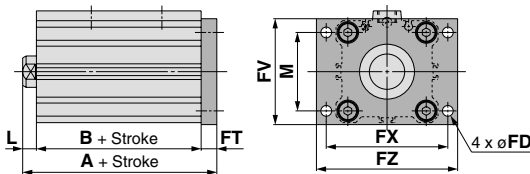
Rod side flange style: RQF/RDQF



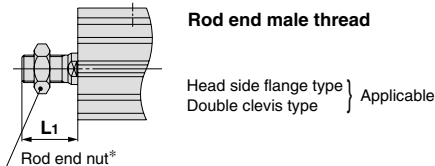
Rod end male thread



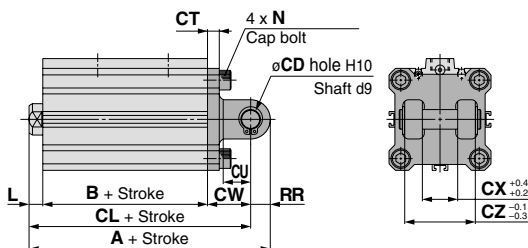
Head side flange style: RQG/RDQG



Rod end male thread



Double clevis style: RQD/RDQD



Foot Style

Bore size (mm)	Stroke range (mm)	A	B	LS	L	L ₁	LD
32	20 to 100	61.2	37	21	17	38.5	6.6
40	20 to 100	68.2	44	28	17	38.5	6.6
50	30 to 100	75.7	49.5	26.5	18	43.5	9

Bore size (mm)	LG	LH	LX	LY	LZ	X	Y
32	4	30	57	57	71	11.2	5.8
40	4	33	64	64	78	11.2	7
50	5	39	79	78	95	14.7	8

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod Side Flange Style

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV
32	20 to 100	54	37	5.5	8	48
40	20 to 100	61	44	5.5	8	54
50	30 to 100	67.5	49.5	6.6	9	67

Bore size (mm)	FX	FZ	L	L ₁	M
32	56	65	17	38.5	34
40	62	72	17	38.5	40
50	76	89	18	43.5	50

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head Side Flange Style

Bore size (mm)	Stroke range (mm)	A	L	L ₁
32	20 to 100	52	7	28.5
40	20 to 100	59	7	28.5
50	30 to 100	66.5	8	33.5

* All dimensions but A, L and L₁ are identical to those of the rod side flange style.

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double Clevis Style

Bore size (mm)	Stroke range (mm)	A	B	CL	CD	CT	CU
32	20 to 100	74	37	64	10	5	14
40	20 to 100	83	44	73	10	6	14
50	30 to 100	99.5	49.5	85.5	14	7	20

Bore size (mm)	CW	CX	CZ	L	L ₁	N	RR
32	20	18	36	7	28.5	M6 x 1.0	10
40	22	18	36	7	28.5	M6 x 1.0	10
50	28	22	44	8	33.5	M8 x 1.25	14

* Double clevis pins and retaining rings are included in the package.

* Refer to page 784 for details on rod end nut and accessories.

Double clevis bracket material: Cast iron
Surface treatment: Painted

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual

-X□

Technical data

Series RQ

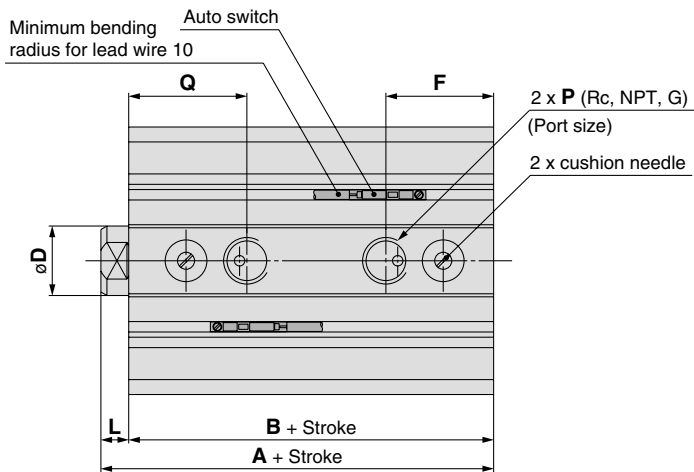
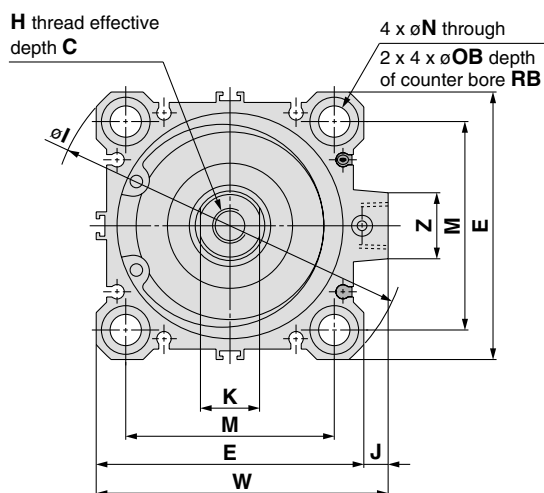
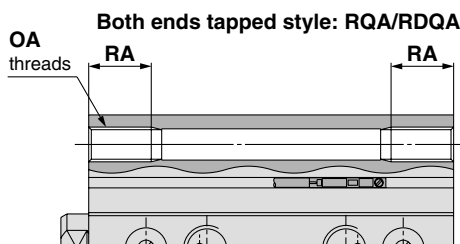
Dimensions: ø63 to ø100

* For the auto switch mounting position and its mounting height, refer to pages 786 to 787.

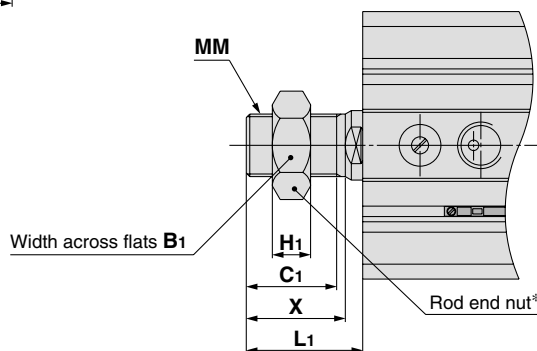
Basic style (Through-hole)

Both Ends Tapped Style

Bore size (mm)	OA	RA
63	M10 x 1.5	18
80	M12 x 1.75	22
100	M12 x 1.75	22



Rod end male thread



Rod End Male Thread

Bore size (mm)	B1	H1	C1	X	MM	L1
63	27	11	26	28.5	M18 x 1.5	33.5
80	32	13	32.5	35.5	M22 x 1.5	43.5
100	41	16	32.5	35.5	M26 x 1.5	43.5

Basic Style

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	F	H	I	J	K	L	M	N	OB	P
63	30 to 100	63	55	15	20	77	31	M10 x 1.5	103	7	17	8	60	9	14	1/4
80	40 to 100	73.5	63.5	21	25	98	35.5	M16 x 2.0	132	6	22	10	77	11	17.5	3/8
100	40 to 100	88	76	27	30	117	40	M20 x 2.5	156	6.5	27	12	94	11	17.5	3/8

Bore size (mm)	Q	RB	W	Z
63	34	10.5	84	19
80	39	13.5	104	26
100	43	13.5	123.5	26

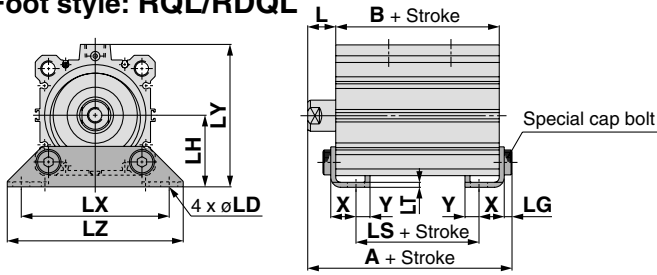
* Refer to page 784 for details on rod end nut and accessories.



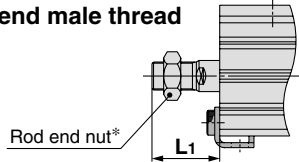
• Add the stroke to calculate the length of intermediate strokes.

Mounting Bracket Dimensions

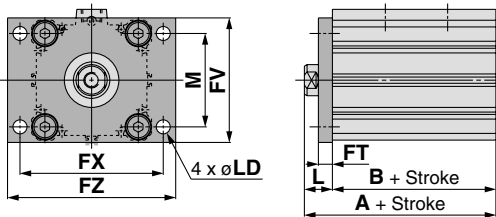
Foot style: RQL/RDQL



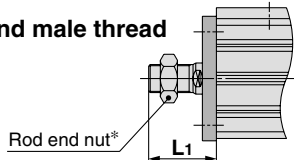
Rod end male thread



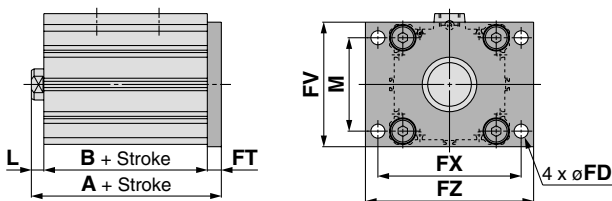
Rod side flange style: RQF/RDQF



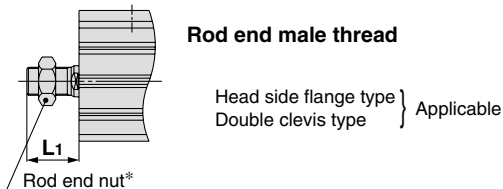
Rod end male thread



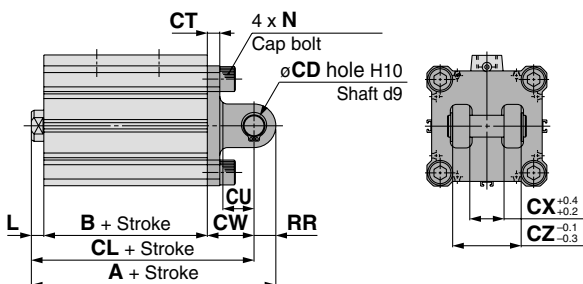
Head side flange style: RQG/RDQG



Rod end male thread



Double clevis style: RQD/RDQD



Foot Style

Bore size (mm)	Stroke range (mm)	A	B	LS	L	L1	LD	LG	LH	LT
63	30 to 100	81.2	55	29	18	43.5	11	5	46	3.2
80	40 to 100	95	63.5	33.5	20	53.5	13	7	59	4.5
100	40 to 100	111	76	42	22	53.5	13	7	71	6

Bore size (mm)	LX	LY	LZ	X	Y
63	95	91.5	113	16.2	9
80	118	114	140	19.5	11
100	137	136	162	23	12.5

Foot bracket material: Carbon steel
Surface treatment: Nickel plated

Rod Side Flange Style

Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV	FX	FZ	L	L1	M
63	30 to 100	73	55	9	9	80	92	108	18	43.5	60
80	40 to 100	83.5	63.5	11	11	99	116	134	20	53.5	77
100	40 to 100	98	76	11	11	117	136	154	22	53.5	94

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Head Side Flange Style

Bore size (mm)	Stroke range (mm)	A	L	L1
63	30 to 100	72	8	33.5
80	40 to 100	84.5	10	43.5
100	40 to 100	99	12	43.5

* All dimensions but A, L and L1 are identical to those of the rod side flange style.

Flange bracket material: Carbon steel
Surface treatment: Nickel plated

Double Clevis Style

Bore size (mm)	Stroke range (mm)	A	B	CL	CD	CT	CU	CW	CX	CZ	L
63	30 to 100	107	55	93	14	8	20	30	22	44	8
80	40 to 100	129.5	63.5	111.5	18	10	27	38	28	56	10
100	40 to 100	155	76	133	22	13	31	45	32	64	12

Bore size (mm)	L1	N	RR
63	33.5	M10 x 1.5	14
80	43.5	M12 x 1.75	18
100	43.5	M12 x 1.75	22

* Double clevis pins and retaining rings are included in the package.
* Refer to page 784 for details on rod end nut and accessories.

Double clevis bracket material: Cast iron
Surface treatment: Painted

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual

-X□

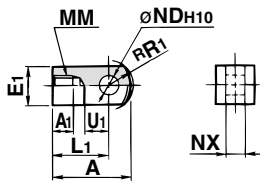
Technical data

Accessory Bracket Dimensions

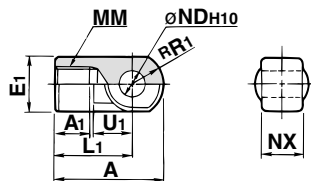
Single Knuckle Joint

For I-G02, I-G03

For I-G04, I-G05
I-G08, I-G10



Material: Carbon steel
Surface treatment: Nickel plated

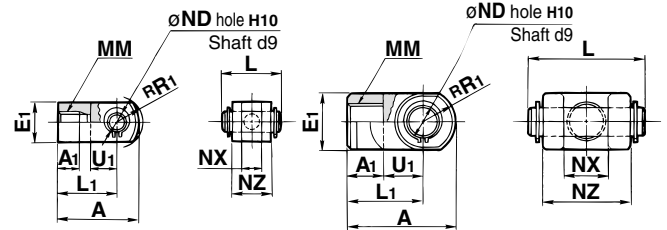


Material: Cast iron
Surface treatment: Nickel plated

Double Knuckle Joint

For Y-G02, Y-G03

For Y-G04, Y-G05
Y-G08, Y-G10



Material: Carbon steel
Surface treatment: Nickel plated

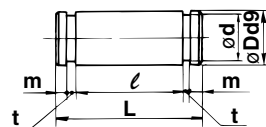
Material: Cast iron
Surface treatment: Nickel plated

Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	RR1	U1	ND	NX
I-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{-0.2} _{-0.4}
I-G03	25	41	10.5	□20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{-0.2} _{-0.4}
I-G04	32, 40	42	14	ø22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}
I-G05	50, 63	56	18	ø28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{-0.3} _{-0.5}
I-G08	80	71	21	ø38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{-0.3} _{-0.5}
I-G10	100	79	21	ø44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{-0.3} _{-0.5}

Part no.	Applicable bore size (mm)	A	A1	E1	L1	MM	RR1	U1	ND	NX	NZ	L	Applicable pin no.
Y-G02	20	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 ^{+0.058} ₀	8 ^{+0.4} _{-0.2}	16	21	IY-G02
Y-G03	25	41	10.5	□20	30	M10 x 1.25	12.8	14	10 ^{+0.058} ₀	10 ^{+0.4} _{-0.2}	20	25.6	IY-G03
Y-G04	32, 40	42	16	ø22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{+0.5} _{-0.3}	36	41.6	IY-G04
Y-G05	50, 63	56	20	ø28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{+0.5} _{-0.3}	44	50.6	IY-G05
Y-G08	80	71	23	ø38	50	M22 x 1.5	21	27	18 ^{+0.070} ₀	28 ^{+0.5} _{-0.3}	56	64	IY-G08
Y-G10	100	79	24	ø44	55	M26 x 1.5	24	31	22 ^{+0.084} ₀	32 ^{+0.5} _{-0.3}	64	72	IY-G10

* Knuckle pin and retaining ring are included.

Knuckle Pin (Common with double clevis pin)

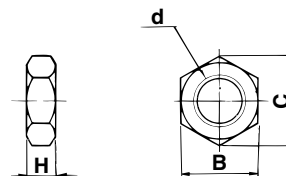


Material: Carbon steel
mm

Part no.	Applicable bore size (mm)	D	L	d	ℓ	m	t	Retaining ring
IY-G02	20	8 ^{-0.040} _{-0.076}	21	7.6	16.2	1.5	0.9	C8 type for pivot
IY-G03	25	10 ^{-0.040} _{-0.076}	25.6	9.6	20.2	1.55	1.15	C10 type for pivot
IY-G04	32, 40	10 ^{-0.040} _{-0.076}	41.6	9.6	36.2	1.55	1.15	C10 type for pivot
IY-G05	50, 63	14 ^{-0.050} _{-0.093}	50.6	13.4	44.2	2.05	1.15	C14 type for pivot
IY-G08	80	18 ^{-0.050} _{-0.093}	64	17	56.2	2.55	1.35	C18 type for pivot
IY-G10	100	22 ^{-0.065} _{-0.117}	72	21	64.2	2.55	1.35	C22 type for pivot

* Type C retaining rings for axis are included.

Rod End Nut



Material: Carbon steel
Surface treatment: Nickel plated
mm

Part no.	Applicable bore size (mm)	d	H	B	C
NT-02	20	M8 x 1.25	5	13	15.0
NT-03	25	M10 x 1.25	6	17	19.6
NT-04	32, 40	M14 x 1.5	8	22	25.4
NT-05	50, 63	M18 x 1.5	11	27	31.2
NT-08	80	M22 x 1.5	13	32	37.0
NT-10	100	M26 x 1.5	16	41	47.3

Simple Joint: $\phi 32$ to $\phi 100$



Joint And Mounting Bracket (Type A, Type B) Part No.

YA - 03

• Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket
YU	Joint

• Applicable air cylinder bore

03	For $\phi 32, \phi 40$
05	For $\phi 50, \phi 63$
08	$\phi 80$
10	$\phi 100$

Allowable Eccentricity

Bore size (mm)	32	40	50	63	80	100
Eccentricity tolerance	± 1				± 1.5	± 2
Backlash	0.5					

<Ordering>

- Joints are not included with the A or B type mounting brackets. Order them separately.

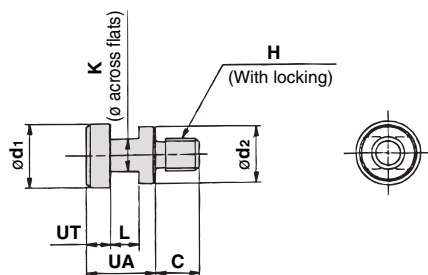
(Example)

Bore size $\phi 40$ Part no.

- Type A mounting bracket YA-03
- Joint YU-03

Joint and Mounting Bracket (A and B Types) Part No.

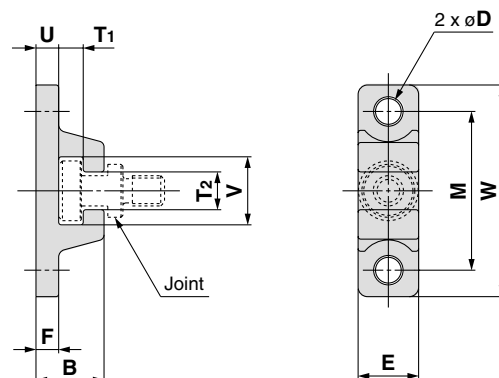
Bore size (mm)	Joint	Applicable mounting bracket	
		Type A mounting bracket	Type B mounting bracket
32, 40	YU-03	YA-03	YB-03
50, 63	YU-05	YA-05	YB-05
80	YU-08	YA-08	YB-08
100	YU-10	YA-10	YB-10



Material: Chrome molybdenum steel (Nickel plated)

Part no.	Applicable bore size (mm)	UA	C	d ₁	d ₂	H	K	L	UT	Mass (g)
YU-03	32, 40	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	50, 63	17	13	19.8	18	M10 x 1.5	10	7	6	40
YU-08	80	22	20	24.8	23	M16 x 2	13	9	8	90
YU-10	100	26	26	29.8	28	M20 x 2.5	14	11	10	160

Type A Mounting Bracket

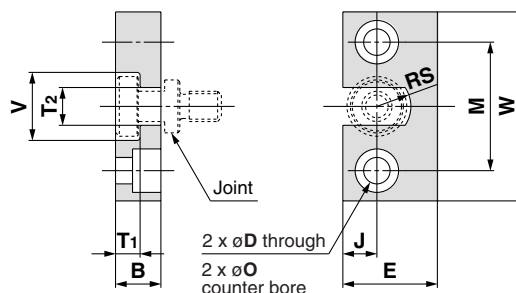


Material: Chrome molybdenum steel (Nickel plated)
mm

Part no.	Bore size (mm)	B	D	E	F	M	T ₁	T ₂
YA-03	32, 40	18	6.8	16	6	42	6.5	10
YA-05	50, 63	20	9	20	8	50	6.5	12
YA-08	80	26	11	25	10	62	8.5	16
YA-10	100	31	14	30	12	76	10.5	18

Part no.	Bore size (mm)	U	V	W	Mass (g)
YA-03	32, 40	6	18	56	55
YA-05	50, 63	8	22	67	100
YA-08	80	10	28	83	195
YA-10	100	12	36	100	340

Type B Mounting Bracket



Material: Stainless steel
mm

Part no.	Bore size (mm)	B	D	E	J	M	O
YB-03	32, 40	12	7	25	9	34	11.5 depth 7.5
YB-05	50, 63	12	9	32	11	42	14.5 depth 8.5
YB-08	80	16	11	38	13	52	18 depth 12
YB-10	100	19	14	50	17	62	21 depth 14

Part no.	Bore size (mm)	T ₁	T ₂	V	W	RS	Mass (g)
YB-03	32, 40	6.5	10	18	50	9	80
YB-05	50, 63	6.5	12	22	60	11	120
YB-08	80	8.5	16	28	75	14	230
YB-10	100	10.5	18	36	90	18	455

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual
-X□

Technical
data

Series RQ

Minimum Auto Switch Mounting Stroke

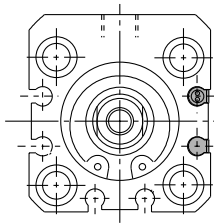
No. of auto switch mounted	D-A9□ D-A9□V D-M9□ D-M9□V		D-M9□W D-M9□WV D-M9□AL D-M9□AVL		D-A7□/A80 D-A73C/A80C D-A7□H/A80H D-F7□/J79		D-F7□V D-J79C D-F7□WV D-F7BAVL		D-A79W		D-F7□W D-J79W D-F7BAL		D-F7NTL D-F79F	
1 pc.	15		15		15		15		15		20		20	
2 pcs.	15		15		15		15		20		20		20	

(mm)

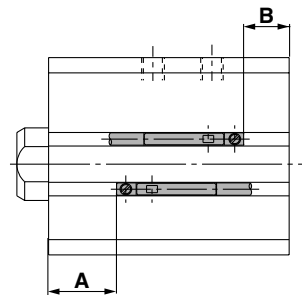
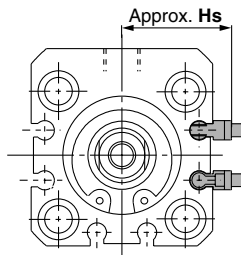
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

ø20/ø25

D-A9□
D-M9□
D-M9□W
D-M9□AL

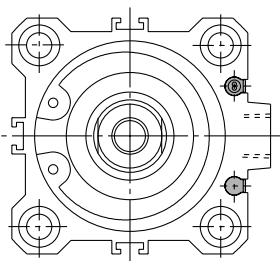


D-A9□V
D-M9□V
D-M9□WV
D-M9□AVL

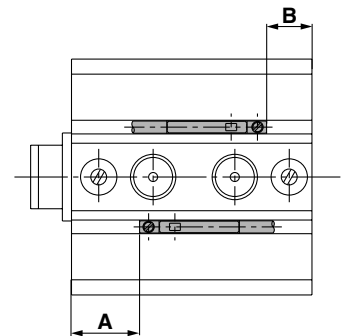
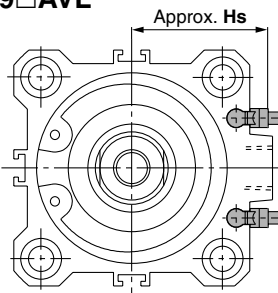


ø32 to ø100

D-A9□
D-M9□
D-M9□W
D-M9□AL



D-A9□V
D-M9□V
D-M9□WV
D-M9□AVL



Proper Auto Switch Mounting Positions

(mm)

Auto switch model	D-A9□ D-A9□V		D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL	
	A	B	A	B
20	9.5	3	13.5	7
25	11	5.5	15	9.5
32	12.5	4.5	16.5	8.5
40	17	7	21	11
50	17	12.5	21	16.5
63	19.5	15.5	23.5	19.5
80	24.5	19	28.5	23
100	31	25	35	29

Auto Switch Mounting Height

(mm)

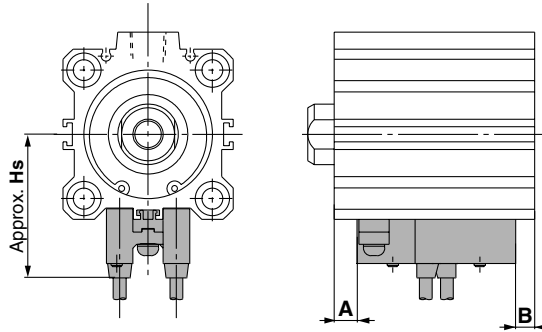
Auto switch model	D-A9□V		D-M9□V D-M9□WV D-M9□AVL	
	Hs	Hs	Hs	Hs
20	22.5	24.5	24.5	24.5
25	24.5	26.5	26.5	26.5
32	27	29	29	29
40	30.5	32.5	32.5	32.5
50	36.5	38.5	38.5	38.5
63	40	42	42	42
80	50	52	52	52
100	60	62	62	62

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

ø32 to ø100

D-A7□
D-A80
D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F79F
D-F7NTL
D-F7BAL
D-A73C
D-A80C
D-J79C
D-A79W
D-F7□V
D-F7□WV
D-F7BAVL



Proper Auto Switch Mounting Position

(mm)

Auto switch model	D-A73 D-A80		D-A72/A7□H D-A80H/A73C D-A80C/F7□ D-F7□V/F79F D-J79/J79C D-F7□W D-F7□WV D-J79W D-F7BAL D-F7BAVL		D-A79W		D-F7NTL	
	A	B	A	B	A	B	A	B
Bore size								
20	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—
32	13.5	5.5	14	6	11	3	19	11
40	18	8	18.5	8.5	15.5	5.5	23.5	13.5
50	18	13.5	18.5	14	15.5	11	23.5	19
63	20.5	16.5	21	17	18	14	26	22
80	25.5	20	26	20.5	23	17.5	31	25.5
100	32	26	32.5	26.5	29.5	23.5	37.5	31.5

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

Auto Switch Mounting Height

(mm)

Auto switch model	D-A7□ D-A80		D-A72/A7□H D-A80H/A73C D-A80C/F7□ D-F7□V/F79F D-J79/J79C D-F7□W D-F7□WV D-J79W D-F7BAL D-F7BAVL		D-A73C D-A80C		D-F7□V D-F7□WV D-F7BAVL		D-J79C		D-A79W	
	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs	Hs
Bore size												
20	—	—	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—
32	31.5	32.5	38.5	35	38	34	—	—	—	—	—	—
40	35	36	42	38.5	41.5	37.5	—	—	—	—	—	—
50	41	42	48	44.5	47.5	43.5	—	—	—	—	—	—
63	47.5	48.5	54.5	51	54	50	—	—	—	—	—	—
80	57.5	58.5	64.5	61	64	60	—	—	—	—	—	—
100	67.5	68.5	74.5	71	74	70	—	—	—	—	—	—

Operating Range

(mm)

Auto switch model	Bore size							
	20	25	32	40	50	63	80	100
D-A9□/A9□V	10	10	9.5	9.5	9.5	11.5	9	11.5
D-M9□/M9□V D-M9□W/M9□WV D-M9□AL/M9□AVL	5.5	6	6	6	7	9.5	10	11
D-A7□/A80 D-A7□H/A80H D-A73C/A80C	—	—	12	11	10	12	12	13
D-A79W	—	—	13	14	14	16	15	17
D-F7□/F7□V D-J79/J79C/J79W D-F7□W/F7□WV D-F79F/F7BAL D-F7BAVL/F7NTL	—	—	6	6	6	6.5	6.5	7

* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approximately ±30% dispersion). It may vary substantially depending on an ambient environment.

* Auto switch mounting brackets BQ2-012 are not used for sizes over ø32 of D-A9□(V)/M9□(V)/M9□W(V)/M9□A(V)L types. The above values indicate the operating range when mounted with the conventional auto switch installation groove.

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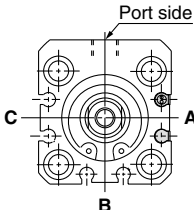
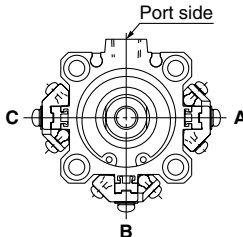
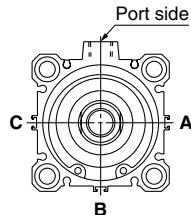
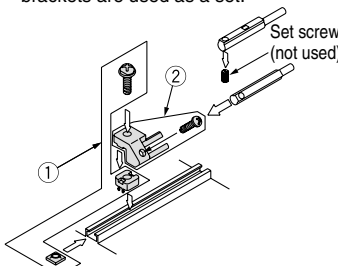
D-□

-X□

Individual
-X□

Technical
data

Auto Switch Mounting Bracket: Part No.

Auto switch mounting surface	Bore size (mm)			
	$\varnothing 20, \varnothing 25$	$\varnothing 32, \varnothing 40, \varnothing 50$	$\varnothing 63, \varnothing 80, \varnothing 100$	
				
Auto switch mounting surface	Auto switch mounting surface	Auto switch mounting surface	Auto switch mounting surface	
Auto switch model	A, B, C sides	Port side	A, B, C sides	Port, A, B, C sides
D-A9□ D-A9□V D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AVL	Auto switch mounting bracket not required.	Auto switch mounting bracket not required.	① BQ-2 ② BQ2-012 Two kinds of auto switch mounting brackets are used as a set. 	Auto switch mounting bracket not required.

Note 1) For each cylinder series, when a compact auto switch is mounted on the three sides (A, B and C above) other than the port side of bore sizes ø32 to ø50, the auto switch mounting brackets above are required. Order them separately from cylinders.

Order example

RDQB32-50-M9BW.....1

BQ-2.....2 pcs.

BQ2-012.....2 pcs.

Note 2) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

Auto switch model	Bore size (mm)					
	32	40	50	63	80	100
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/F7BAVL D-F79F/F7NTL				BQ-2		

Note 3) When shipping auto cylinders, auto switch mounting brackets and auto switches are shipped together.

[Mounting screw set made of stainless steel]

The following set of mounting screws made of stainless steel (including nuts) is available. Use it in accordance with the operating environment. (Please order BQ-2 separately, since auto switch spacers (for BQ-2) are not included.)

BBA2: For D-A7/A8/F7/J7 types

Water resistant auto switches D-F7BAL/F7BAVL are mounted on the cylinder with the stainless steel screws above when shipped. When an auto switch is shipped independently, BBA2 is attached.

Note 4) Refer to page 1361 for the details of BBA2 screws.

Note 5) When D-M9□A(V)L type is mounted on a side other than ø32, ø40 and ø50 port sides, order auto switch mounting brackets BQ2-012S and BQ-2, and a stainless steel screw set BBA2.

Auto Switch Mounting Bracket Mass

Mounting bracket part no.	Mass (g)
BQ-2	1.5
BQ2-012	5

Other than the applicable auto switches listed in “How to Order”, the following auto switches can be mounted.

Other Applicable Auto Switches

/Refer to pages 1263 to 1371 for further information on auto switches.

Type	Model	Electrical entry (Fetching direction)	Features
Reed auto switch	D-A73	Grommet (perpendicular)	—
	D-A80		Without indicator light
	D-A73H, A76H	Grommet (in-line)	—
	D-A80H		Without indicator light
Solid state auto switch	D-F7NV, F7PV, F7BV	Grommet (perpendicular)	—
	D-F7NWW, F7BWV		Diagnostic indication (2-color indication) Water resistance (2-color indication)
	D-F7BAVL		—
	D-F79, F7P, J79	Grommet (in-line)	—
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indication) Water resistance (2-color indication)
	D-F7BAL		—
	D-F7NTI		With timer

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1328 and 1329 for details.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H types) are also available. Refer to page 1290 for details.

* D-A7/A8/F7/J7 types cannot be mounted on $\varnothing 20$ and $\varnothing 25$.



Series RQ

Specific Product Precautions

Be sure to read before handling.

Refer to front matters 54 and 55 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Installation and Removal of Retaining Ring

⚠ Caution

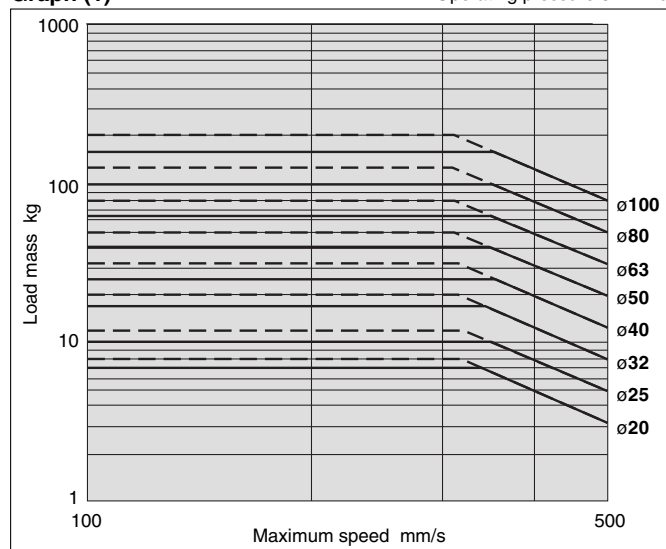
1. Use appropriate pliers (Type C retaining ring installing tool) for installation and removal.
2. Even when using appropriate pliers (Type C retaining ring installing tool), proceed with caution as there is a danger of the retaining ring flying off the end of the pliers (Type C retaining ring installing tool) and causing human injury or damage to nearby equipment. After installation, confirm that the retaining ring is securely seated into the retaining ring groove before supplying air.

Selection

⚠ Caution

1. Operate the cylinder to the stroke end.
When the stroke is restricted by an external stopper or a clamped work piece, satisfactory cushioning and noise reduction may not be achieved.
 2. Strictly observe the limiting ranges for load mass and maximum speed (Graph (1)). Also, the limiting ranges are based on operation of the cylinder to the stroke end and proper adjustment of the cushion needle.
- If operated beyond the limiting ranges, excessive impact will occur and this may cause damage to equipment.

Graph (1)



3. Adjust the cushion needle to reduce excessive kinetic energy from the piston impact at the stroke end by absorbing enough kinetic energy during the cushion stroke.

If the piston impacts the stroke end with excessive kinetic energy (values in Table 1 or more), an excessive impact will occur and this may cause damage to equipment.

Table (1) Allowable Kinetic Energy At Piston Impact Unit: [J]

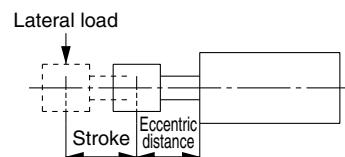
	20	25	32	40	50	63	80	100
Piston speed	50 to 500mm/s							
Allowable kinetic energy	0.055	0.09	0.15	0.26	0.46	0.77	1.30	2.27

Selection

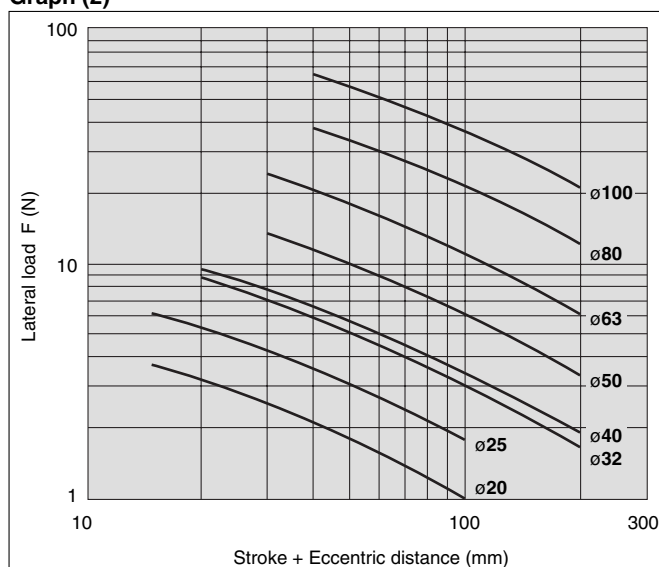
⚠ Caution

4. Strictly observe the limiting ranges for the piston rod lateral load (Graph (2)).

If operated beyond the limiting ranges, this may cause the equipment life to be reduced or damage to equipment may occur.



Graph (2)



Cushion Needle Adjustment

⚠ Caution

1. Readjust with a Cushion Needle

When the product is shipped, the cushion needle is open 1/4 to 1/2 turn from the fully closed position. Readjust the position depending on the load or operating speed before using.

Note that the needle must be fully closed first, and then gradually reopened when adjusting.

2. Keep the adjustment range for the cushion needle between the closed position and the rotations shown below.

	Rotations
ø20 to ø100	2.5 rotations or less

Use a 3 mm flat head watchmakers screw driver to adjust the cushion needle. The adjustment range for the cushion needle must be between the closed position and the open position ranges above. A retaining mechanism prevents the cushion needle from coming out, however, it may spring out during operation if it is rotated beyond the ranges shown above.

CUJ

CU

CQS

CQ2

RQ

CQM

MU

D-□

-X□

Individual

-X□

Technical

data