

Compact Cylinder with Air Cushion

Series RQ

ø20, ø25, ø32, ø40, ø50

The new standard for the future!



New Air Cushion Cylinder



Uses a unique air cushion mechanism with no cushion ring

The new standard for the future!

Employs a new construction for the air cushion mechanism



Compact Cylinder with Air Cushion
Series RQ

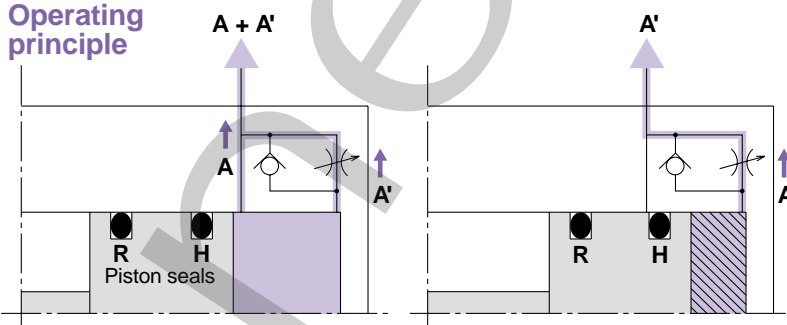
New Debut of the air cushion series!!

New AIR CUSHION

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.

Operating 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.

Wide size variations from ø20 to ø50

Model	Mounting	Rod end configuration	Standard stroke	Auto switch
R(D)Q□20	<ul style="list-style-type: none"> Through hole Double end tapped Foot type Front flange type Rear flange type Double clevis type 	<ul style="list-style-type: none"> Female threads Male threads 	15	<ul style="list-style-type: none"> • ø20 to ø50 Direct mount auto switch • ø32 to ø50 Rail mount auto switch
R(D)Q□25			20	
R(D)Q□32			25	
R(D)Q□40			30	
R(D)Q□50			40	
			50	
			75	
			100	

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

Features 1

Responding to demands for reduced shock, noise reduction and improved repeatability at the stroke end

Minimal extended dimensions from +2.5mm to 9mm

(Compared with series CDQS/CDQ2 of the same bore size with auto switches)

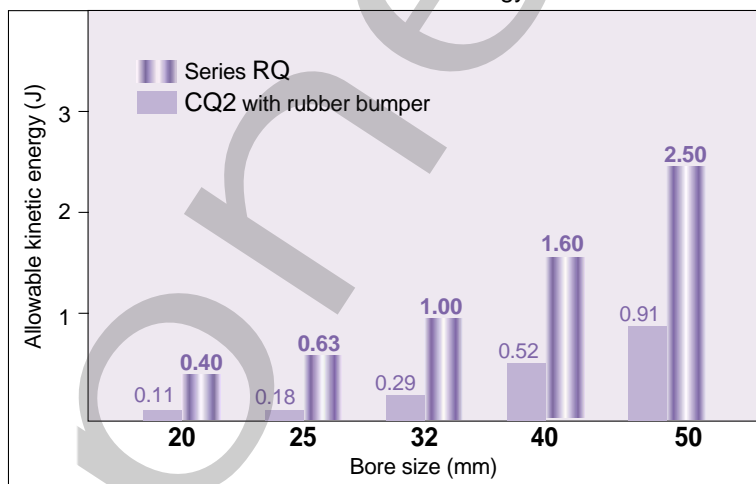
Series	Bore size	Extended dimension	Comparable cylinder
Series RDQ	20	+2.5mm	Series CDQS
	25	+4mm	CDQS

Series	Bore size	Extended dimension	Comparable cylinder
Series RDQ	20	+0.5mm	Series CDQ2
	25	+4mm	
	32	+4mm	
	40	+4.5mm	
	50	+9mm	

Nearly three times the allowable kinetic energy

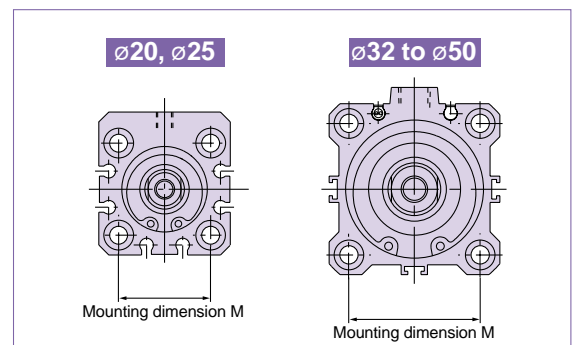
(Compared to CQS/CQ2 with rubber bumper)

Improved energy absorption allows selection of a cylinder that is two sizes smaller for the same kinetic energy.



Interchangeable mounting

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



Improved noise reduction (Stroke end impact noise reduced)

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

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.

Compact Cylinder with Air Cushion Double Acting: Single Rod

Series RQ

ø20, ø25, ø32, ø40, ø50

How to Order

Without Auto Switch

RQ B 32 50

With Auto Switch

RDQ B 32 50 F9BV

With auto switch
(built-in magnet)

Mounting

B	Through hole (standard)	F	Front flange
A	Double end tapped	G	Rear flange
L	Foot	D	Double clevis

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

Note 2) Since sizes ø20 and ø25 have a body with B type (through hole) and A type (double end tapped) in common, there is no A type part number.

Example) RQA20-30 does not exist.

Bore size

20	20mm
25	25mm
32	32mm
40	40mm
50	50mm

Port thread type
(for ø32 to ø100)

Nil	Rc
TN	NPT
TF	G

Note) ø20 and ø25 are M5.

Number of auto switches

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

Auto switch type

Nil	Without auto switch (built-in magnet)
-----	---------------------------------------

* Select auto switch models from the table below.

Body option

Nil	Rod end female threads (standard)
M	Rod end male threads

Cylinder stroke (mm)

Refer to page 2 for standard strokes.

Auto switch specifications/Refer to pages 11 through 14 for detailed specifications of auto switch units.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage		Rail mount		Direct mount		Lead wire length (m)*				Applicable load																														
					DC	AC	ø32 to ø50		ø20 to ø50		0.5 (Nil)	3 (L)	5 (Z)	None (N)																															
							Perpendicular	In-line	Perpendicular	In-line																																			
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—	A76H	A96V	A96	●	●	—	—	IC circuit																														
											24V	12V	100V	A73		A73H	●	●	●	—																									
																	5V, 12V	100V or less	A80	A80H	A90V	A90	●	●	—	IC circuit																			
																							12V	—	A73C		●	●	●	—															
																											5V, 12V	24V or less	A80C	●	●	●	—	IC circuit											
																														—	—	A79W	●		●	—	—								
Grommet	Yes	Diagnostic indication (2 color indicator)	3 wire (NPN)	5V, 12V	—	F7NV	F79	F9NV	F9N	●					●																		○		—	IC circuit									
										3 wire (PNP)	12V	F7PV	F7P	F9PV	F9P	●																	●		○		—								
																2 wire	12V	F7BV	J79	F9BV	F9B	●				●							○		—										
																						Connector	No	—	—	—							—		●		●	●	—						
																											Yes	—	—					—	—		—	—	—	—					
																														Yes	—	—									—	—	—	—	—
Grommet	Yes	Diagnostic indication (2 color indicator)	3 wire (NPN)	5V, 12V	—	F7NWV	F79W	F9NWV	F9NW																											●									
										3 wire (PNP)	12V	—	F7PW	F9PWV	F9PW																					●									
																2 wire	12V	—	—	—	—															●									
																						Grommet	Yes	Water resistant (2 color indicator)	2 wire	12V							—			F7BA									
																											With timer	3 wire (NPN)	5V, 12V					—	—		—	—	—	—					
																														With diagnostic output (2 color indicator)	4 wire (NPN)	—									—	—	—	—	—
Latch type with diagnostic output (2 color indicator)	—	—	—	—	—	—	—	—	●																																				

Bracket part numbers

Bore size (mm)	Note 3) Foot	Flange	Note 5) 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

Note 3) When ordering foot brackets, order 2 pieces per cylinder.

Note 4) The following parts are included with each bracket.
Foot/Flange: Body mounting bolts
Double clevis: Clevis pins, C type snap ring for shaft, and body mounting bolts

Note 5) Clevis pins and snap rings are included with the double clevis.

* Lead wire length symbols 0.5m Nil (Example) A80C 5m Z (Example) A80CZ 3m L (Example) A80CL None N (Example) A80CN

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

Refer to page 4 regarding auto switch mounting bracket part numbers.

Specifications



Type	Pneumatic (non-lube) type
Fluid	Air
Proof pressure	1.5MPa
Maximum operating pressure	1.0MPa
Minimum operating pressure	0.05MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C (with no freezing) With auto switch: -10°C to 60°C (with no freezing)
Rod end threads	Female threads
Rod end thread tolerance	JIS class 2
Stroke length tolerance	$^{+1.0}_0$
Mounting	Through hole
Piston speed	50 to 500mm/s

Standard Strokes

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

Manufacture of Intermediate Strokes

Method	Special body type	
Ordering	Refer to ordering procedure for standard part numbers.	
Method	Available in stroke increments of 1mm, using a special body for the specified stroke.	
Stroke range	Bore size	Stroke range
	20, 25	16 to 49
	32, 40	21 to 99
	50	31 to 99
Example	Part number: RQB32-47 A special tube is manufactured for a 47mm stroke.	

Allowable kinetic energy

Refer to "Selection" on page 22 regarding the allowable kinetic energy.

Effective Cushion Length

Bore size (mm)	20	25	32	40	50
Effective cushion length (mm)	5.8	6.1	6.6	6.6	7.1

Theoretical Output



Unit: 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

Series RQ

Weights

Basic weights

Unit: 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

Additional weights

Unit: g

Bore size (mm)	20	25	32	40	50
Magnet	5	6	11	13	14
Double end tapped	—	—	6	6	6
Rod end male threads	Male threads		6	12	26
	Nut		4	8	17
Foot (including bolt)	159	181	143	155	243
Front flange (including bolt)	143	180	180	214	373
Rear flange (including bolt)	137	171	165	198	348
Double clevis (including pin, snap ring, bolt)	92	127	151	196	393

Calculation example) RQD32-20M

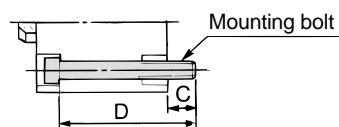
• Basic weight:	RQB32-20	271g
• Additional weight:	Double end tapped	6g
	Rod end male threads	43g
	Double clevis type	151g
		471g

Mounting

Through hole type mounting bolts for RQB are available.

How to order: Add "Bolt" in front of the bolts to be used.

Example) Bolt M5 x 50/4pcs.



Model	C	D	Mounting bolt
R(D)QB20-15	9	50	M5 x 50/
-20		55	x 55/
-25		60	x 60/
-30		65	x 65/
-40		75	x 75/
-50		85	x 85/
R(D)QB25-15	9.5	55	M5 x 55/
-20		60	x 60/
-25		65	x 65/
-30		70	x 70/
-40		80	x 80/
-50		90	x 90/
R(D)QB32-20	10	60	M5 x 60/
-25		65	x 65/
-30		70	x 70/
-40		80	x 80/
-50		90	x 90/
-75		115	x 115/
-100	140	x 140/	

Model	C	D	Mounting bolt
R(D)QB40-20	8	65	M5 x 65/
-25		70	x 70/
-30		75	x 75/
-40		85	x 85/
-50		95	x 95/
-75		120	x 120/
-100	145	x 145/	
R(D)QB50-30	13.5	85	M6 x 85/
-40		95	x 95/
-50		105	x 105/
-75		130	x 130/
-100	155	x 155/	

Replacement Parts/Seal Kits

Series	Bore size	Kit no.	Contents
RQ	20	RQB20-PS	Kits consist of piston seal, rod seal, and gasket.
	25	RQB25-PS	
	32	RQB32-PS	
	40	RQB40-PS	
	50	RQB50-PS	

Auto Switch Mounting Bracket Part Nos. (Rail Mount)

Bore size (mm)	Bracket no.	Note	Applicable switch	
			Reed switch	Solid state switch
32, 40, 50	BQ-2	<ul style="list-style-type: none"> • Switch mounting screw (M3 x 0.5 x 10) • Switch spacer • Switch mounting nut 	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]

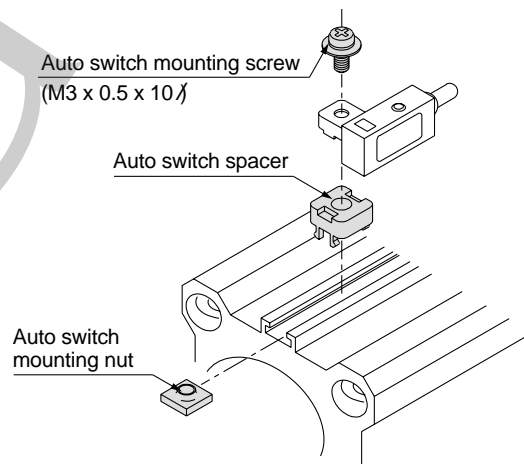
Use the following stainless steel mounting screw kit (includes nut) depending on the operating environment.

(Auto switch spacer must be ordered separately.)

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

The above stainless steel screw kit is used for water resistant auto switch type D-F7BAL when it is shipped mounted on a cylinder.

Also, BBA2 is included when an auto switch alone is shipped.



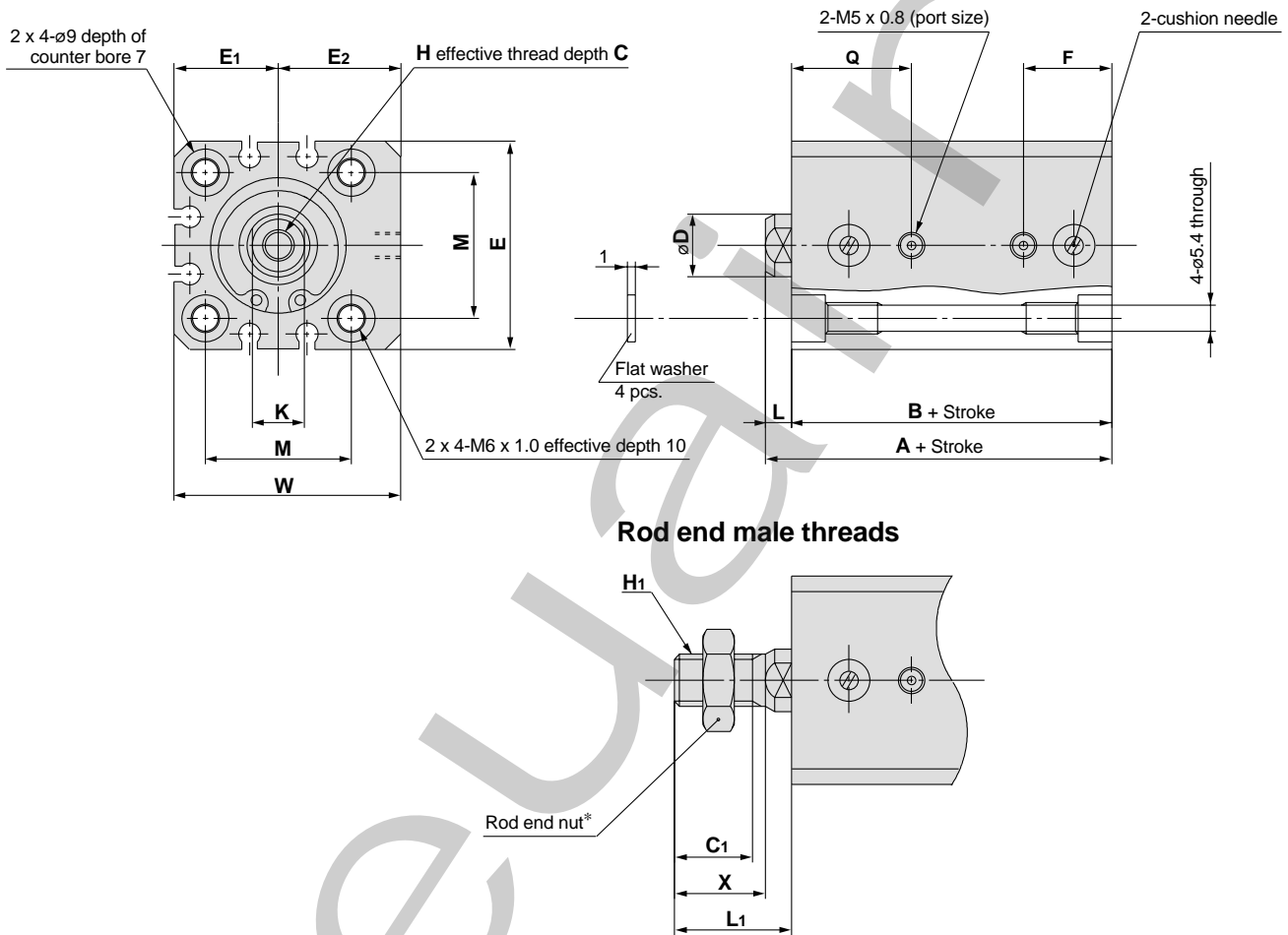
POWER AIRE

Series RQ

Dimensions/ø20, ø25

* Refer to pages 12 and 13 for proper auto switch mounting positions and height.

Standard type (through hole, double end tapped common)/RQB, RDQB



Rod end male threads

Bore size (mm)	C1	X	H1	L1
20	12	14	M8 x 1.25	18.5
25	15	17.5	M10 x 1.25	22.5

Standard type

Bore size (mm)	Stroke range (mm)	A	B	C	D	E	E1	E2	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

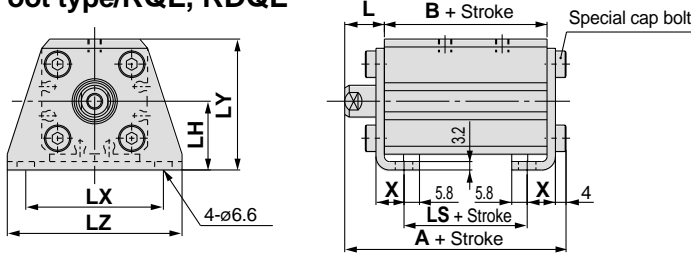
* Refer to page 9 for details on rod end nut and accessories.



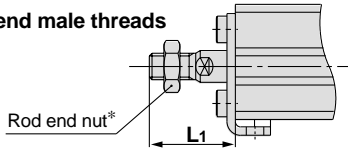
Add the stroke to calculate the length of intermediate strokes.

Mounting Bracket Dimensions

Foot type/RQL, RDQL



Rod end male threads



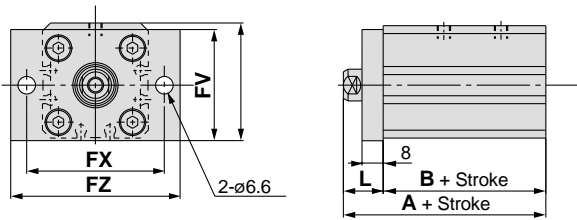
Foot type

Bore size (mm)	Stroke range (mm)	A	LS	L	L1
20	15 to 50	53.7	20	14.5	28.5
25	15 to 50	58.7	21.5	15	32.5

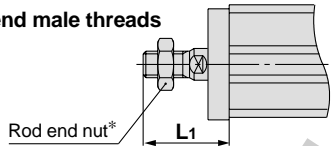
Bore size (mm)	B	LH	LX	LY	LZ	X
20	32	24	48	45	62	9.2
25	36.5	26	52	49.5	66	10.7

(Only dimensions A, LS, L, and L1 are different and other dimensions are identical.)

Front flange type/RQF, RDQF



Rod end male threads



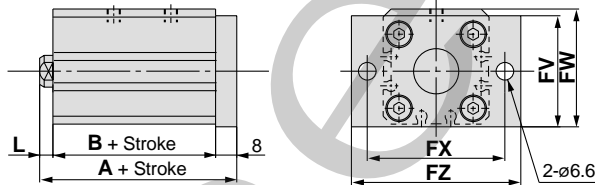
Front flange type

Bore size (mm)	Stroke range (mm)	A	L	L1
20	15 to 50	46.5	14.5	28.5
25	15 to 50	51.5	15	32.5

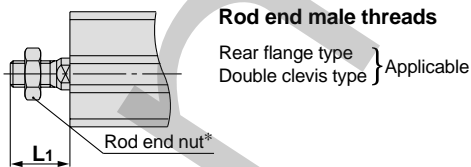
Bore size (mm)	B	FV	FW	FX	FZ
20	32	39	40.5	48	60
25	36.5	42	44.5	52	64

(Only dimensions A, L, and L1 are different and other dimensions are identical.)

Rear flange type/RQG, RDQG



Rod end male threads



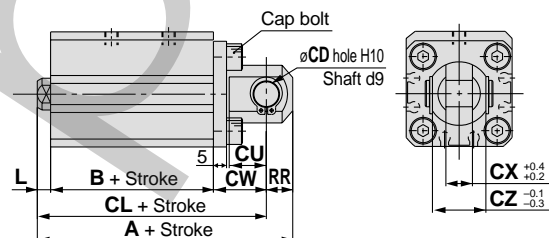
Rear flange type

Bore size (mm)	Stroke range (mm)	A
20	15 to 50	44.5
25	15 to 50	49.5

Bore size (mm)	B	L	FV	FW	FX	FZ
20	32	4.5	39	40.5	48	60
25	36.5	5	42	44.5	52	64

(Only dimension A is different and other dimensions are identical.)

Double clevis type/RQD, RDQD



Double clevis type

Bore size (mm)	Stroke range (mm)	A	CL
20	15 to 50	63.5	54.5
25	15 to 50	71.5	61.5

Bore size (mm)	B	L	L1	CD	CU	CW	CX	CZ	RR
20	32	4.5	18.5	8	12	18	8	16	9
25	36.5	5	22.5	10	14	20	10	20	10

(Only dimensions A and CL are different and other dimensions are identical.)

* Refer to page 9 for details on rod end nut and accessories.

Series RQ

Dimensions/ø32, ø40, ø50

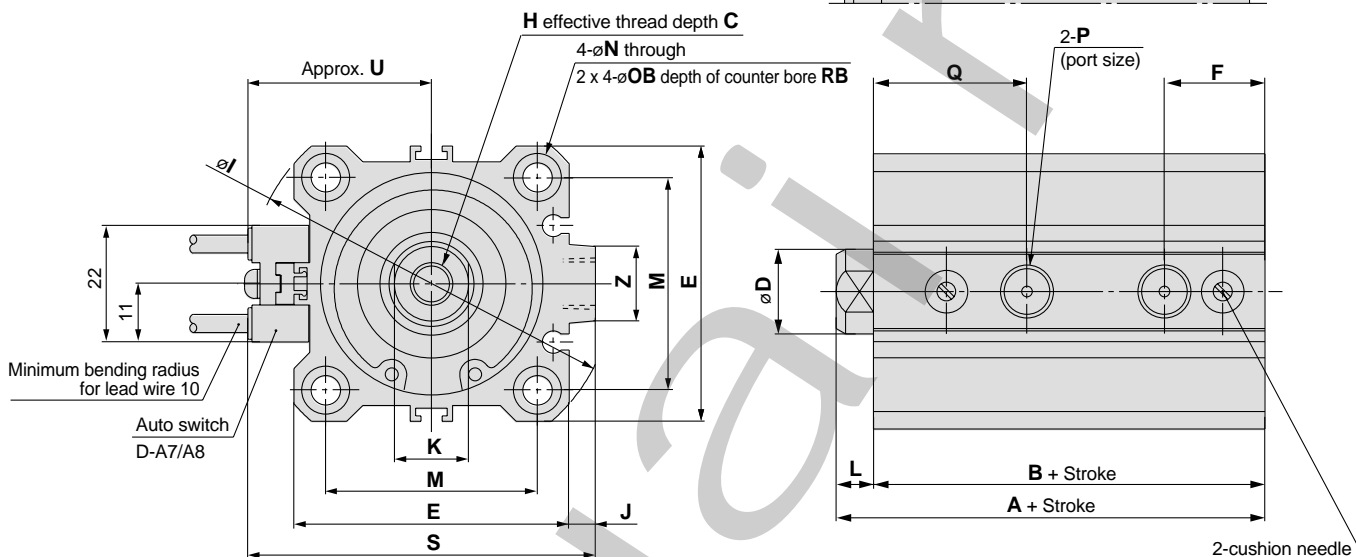
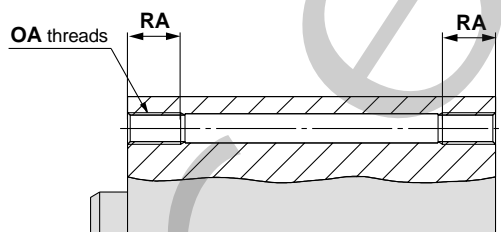
* Refer to pages 12 and 13 for proper auto switch mounting positions and height.

Standard type (through hole type)/RQB, RDQB

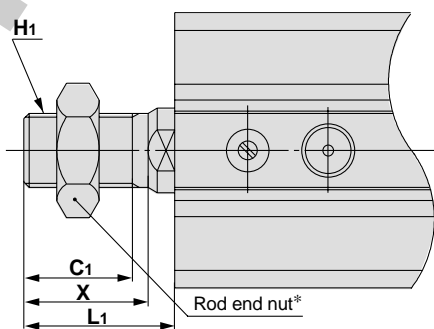
Double end tapped

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

Double end tapped type: RQA, RDQA



Rod end male threads



Rod end male threads

Bore size (mm)	C ₁	X	H ₁	L ₁
32	20.5	23.5	M14 x 1.5	28.5
40	20.5	23.5	M14 x 1.5	28.5
50	26	28.5	M18 x 1.5	33.5

Standard type

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	S	U	Z
32	9	Rc 1/8	23	7	58.5	31.5	14
40	9	Rc 1/8	28	7	66	35	14
50	11	Rc 1/4	31.5	8	80	41	19

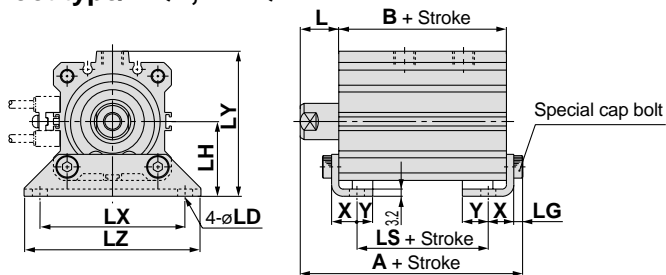
* Refer to page 9 for details on rod end nut and accessories.



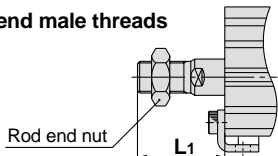
Add the stroke to calculate the length of intermediate strokes.

Mounting Bracket Dimensions

Foot type/RQL, RDQL



Rod end male threads

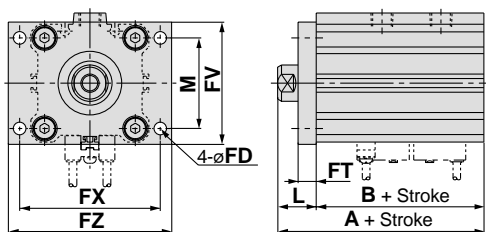


Foot type

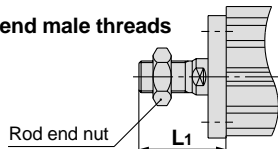
Bore size (mm)	Stroke range (mm)	A	B	LS	L	L1	LD
32	20 to 100	61.2	37	21	17	38.5	6.6
40	20 to 100	68.2	44	28	17	38.5	6.6
50	30 to 100	75.7	49.5	26.5	18	43.5	9

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

Front flange type/RQF, RDQF



Rod end male threads

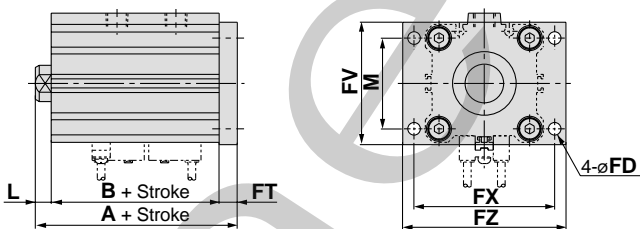


Front flange type

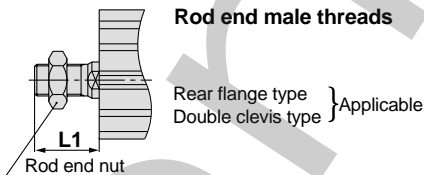
Bore size (mm)	Stroke range (mm)	A	B	FD	FT	FV
32	20 to 100	54	37	5.5	8	48
40	20 to 100	61	44	5.5	8	54
50	30 to 100	67.5	49.5	6.6	9	67

Bore size (mm)	FX	FZ	L	L1	M
32	56	65	17	38.5	34
40	62	72	17	38.5	40
50	76	89	18	43.5	50

Rear flange type/RQG, RDQG



Rod end male threads

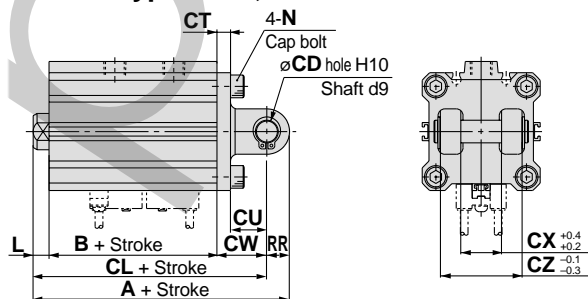


Rear flange type

Bore size (mm)	Stroke range (mm)	A	L	L1
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

(* Dimensions other than A, L, and L1 are identical with the front flange type.)

Double clevis type/RQD, RDQD



Double clevis type

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	L1	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

* Refer to page 9 for details on rod end nut and accessories.

* Clevis pin and snap ring are included in the package.

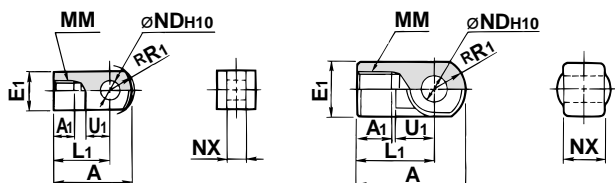
Series RQ

Accessories

Single Knuckle Joint

For I-G02, I-G03

For I-G04, I-G05



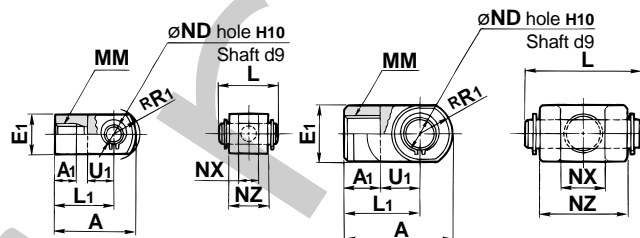
Material: Rolled steel

Material: Cast iron

Double Knuckle Joint

For Y-G02, Y-G03

For Y-G04, Y-G05



Material: Rolled steel

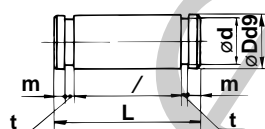
Material: Cast iron

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R _{R1}	U ₁	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	∅22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{-0.3} _{-0.5}
I-G05	50	56	18	∅28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{-0.3} _{-0.5}

Part no.	Applicable bore size (mm)	A	A ₁	E ₁	L ₁	MM	R _{R1}	U ₁	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	∅22	30	M14 x 1.5	12	14	10 ^{+0.058} ₀	18 ^{+0.5} _{-0.3}	36	41.6	IY-G04
Y-G05	50	56	20	∅28	40	M18 x 1.5	16	20	14 ^{+0.070} ₀	22 ^{+0.5} _{-0.3}	44	50.6	IY-G05

* Knuckle pins and snap ring are included.

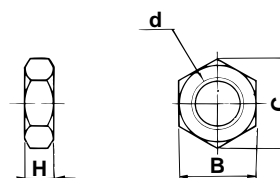
Knuckle Pin (common with double clevis pin)



Material: Carbon steel
mm

Part no.	Applicable bore size (mm)	D	L	d	/	m	t	Snap ring
IY-G02	20	8 ^{-0.040} _{-0.076}	21	7.6	16.2	1.5	0.9	C type 8 for shaft
IY-G03	25	10 ^{-0.040} _{-0.076}	25.6	9.6	20.2	1.55	1.15	C type 10 for shaft
IY-G04	32, 40	10 ^{-0.040} _{-0.076}	41.6	9.6	36.2	1.55	1.15	C type 10 for shaft
IY-G05	50	14 ^{-0.050} _{-0.093}	50.6	13.4	44.2	2.05	1.15	C type 14 for shaft

Rod End Nut



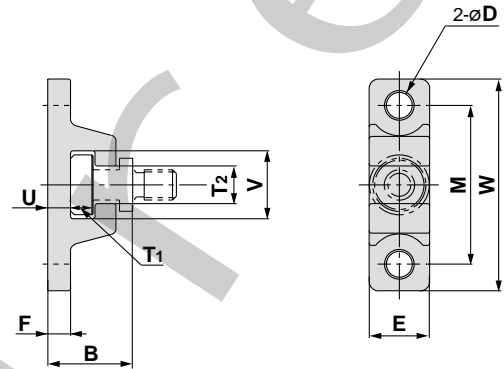
Material: Rolled steel
mm

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	M18 x 1.5	11	27	31.2

Simple Joint/ø32 to ø50



A type mounting bracket



Joint and mounting bracket
(A type, B type) part numbers

YA 03

- Mounting bracket
- Applicable air cylinder bore size

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

03	ø32, ø40
05	ø50

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	20	9	20	8	50	6.5	12

Bore size (mm)	Joint	Applicable mounting bracket	
		A type mounting bracket	B type mounting bracket
32, 40	YU-03	YA-03	YB-03
50	YU-05	YA-05	YB-05

Part no.	Bore size (mm)	U	V	W	Weight (g)
YA-03	32, 40	6	18	56	55
YA-05	50	8	22	67	100

Allowable eccentricity

Bore size	32	40	50
Eccentricity tolerance		±1	
Backlash		0.5	

<Ordering method>

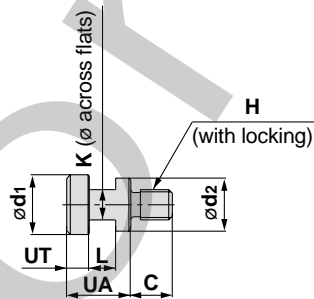
- Joints are not included with A type and B type mounting brackets. Order them separately.

(Example)

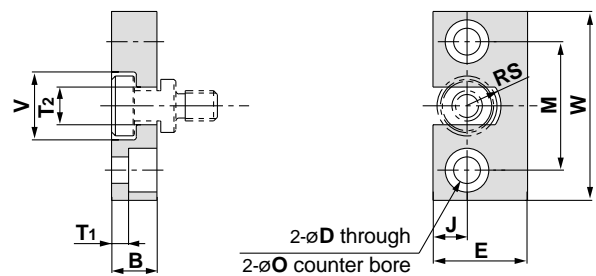
For bore size ø40 Part number

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

Joint



B type mounting bracket



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	12	9	32	11	42	14.5, depth 8.5

Part no.	Applicable bore size (mm)	UA	C	d ₁	d ₂	H	K	L	UT	Weight (g)
YU-03	32, 40	17	11	15.8	14	M8 x 1.25	8	7	6	25
YU-05	50	17	13	19.8	18	M10 x 1.5	10	7	6	40

Part no.	Bore size (mm)	T ₁	T ₂	V	W	RS	Weight (g)
YB-03	32, 40	6.5	10	18	50	9	80
YB-05	50	6.5	12	22	60	11	120

Series RQ Auto Switch Specifications

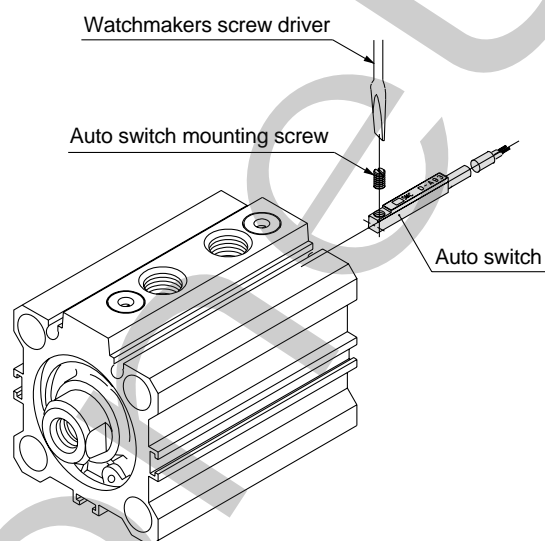
Applicable Auto Switches

Auto switch type	Auto switch model	Electrical entry/Function	Applicable bore size
Reed switch	D-A7□/A80	Grommet (perpendicular)	ø32 to ø50
	D-A7□H/A80H	Grommet (in-line)	
	D-A73C/A80C	Connector	
	D-A79W	Grommet (2 color indication, perpendicular)	
	D-A9□	Grommet (in-line)	
Solid state switch	D-A9□V	Grommet (perpendicular)	ø20 to ø50
	D-F7□/J79	Grommet (in-line)	
	D-F7□V	Grommet (perpendicular)	ø32 to ø50
	D-J79C	Connector	
	D-F7□W/J79W	Grommet (2 color indication, in-line)	
	D-F7□WV	Grommet (2 color indication, perpendicular)	
	D-F7BAL	Grommet (2 color indication, water resistant, in-line)	
	D-F79F	Grommet (2 color indication, with diagnostic output, in-line)	
	D-F7LF	Grommet (2 color indication, latch type with diagnostic output, in-line)	
	D-F7NTL	Grommet (with timer, in-line)	ø20 to ø50
	D-F9□	Grommet (in-line)	
	D-F9□V	Grommet (perpendicular)	
	D-F9□W	Grommet (2 color indication, in-line)	
	D-F9□WV	Grommet (2 color indication, perpendicular)	
D-F9BAL	Grommet (2 color indication, water resistant, in-line)		

Auto Switch Mounting

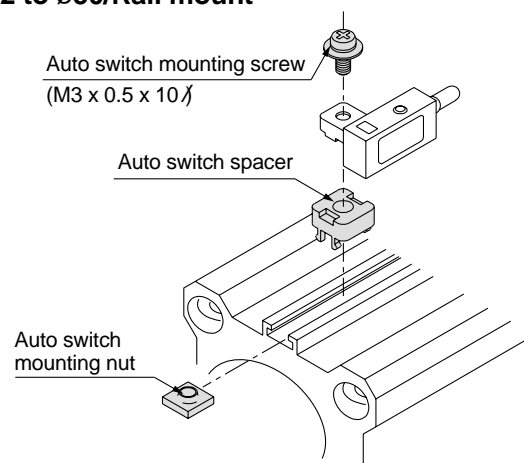
Follow the procedures below to mount auto switches.

ø20 to ø50/Direct mount



- 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.

ø32 to ø50/Rail mount



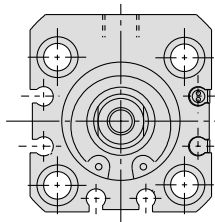
- Use a tightening torque of 0.5 to 0.7N·m for auto switch mounting screws.

* Auto switch mounting brackets are packed together for cylinders with built-in magnets.

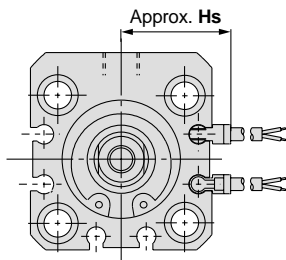
Auto Switches/Proper Mounting Positions and Height for Stroke End Detection

ø20, ø25

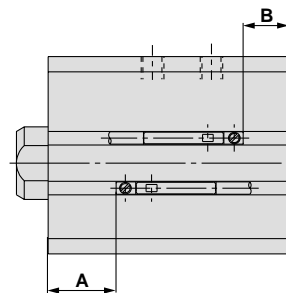
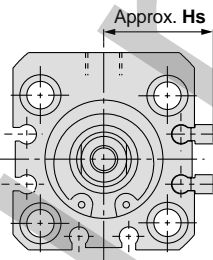
D-A9□
D-F9□



D-A9□V
D-F9□V
D-F9□WV

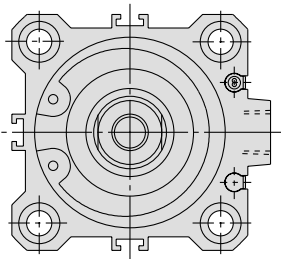


D-F9□W
D-F9BAL

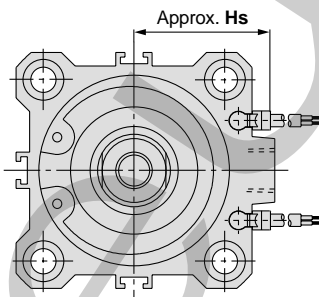


ø32 to ø50

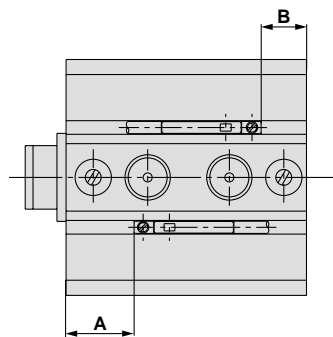
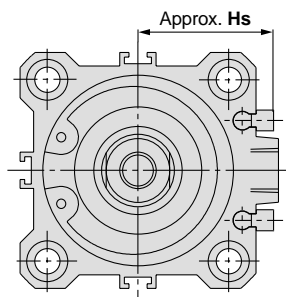
D-A9□
D-F9□



D-A9□V
D-F9□V
D-F9□WV



D-F9□W
D-F9BAL



Proper auto switch mounting positions mm

Bore size (mm)	D-A9□ D-A9□V		D-F9□ D-F9□V D-F9□W D-F9□WV		D-F9BAL	
	A	B	A	B	A	B
	20	9.5	3	13.5	7	12.5
25	11	5.5	15	9.5	14	8.5
32	12.5	4.5	16.5	8.5	15.5	7.5
40	17	7	21	11	20	10
50	17	12.5	21	16.5	20	15.5

Auto switch mounting height mm

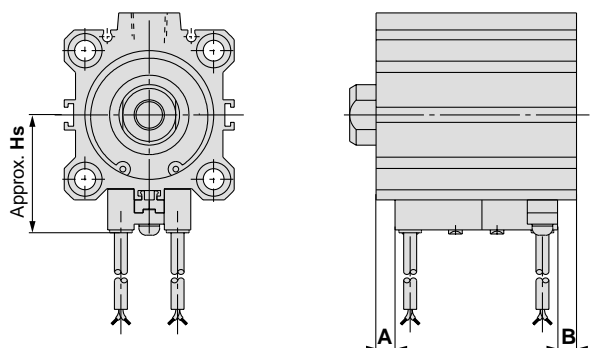
Bore size (mm)	D-A9□V	D-F9□V D-F9□WV	D-F9BAL
	Hs	Hs	Hs
20	22.5	25	22
25	24.5	27	24
32	27	29	26.5
40	30.5	32.5	30
50	36.5	38.5	36

Series RQ

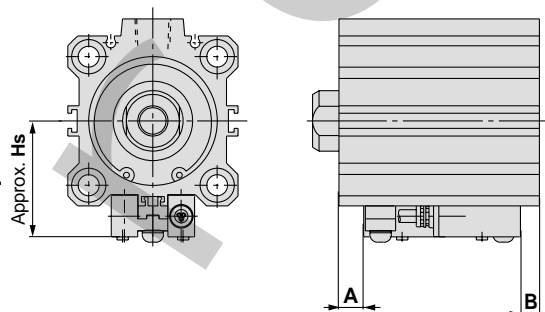
Auto Switches/Proper Mounting Positions and Height for Stroke End Detection

ø32 to ø50

D-A7□
D-A80

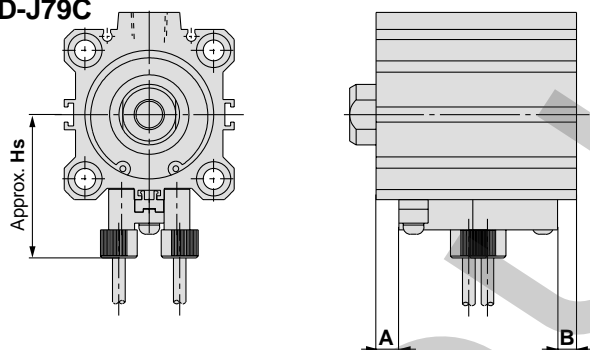


D-A7□H
D-A80H
D-F7□
D-J79
D-F7□W
D-J79W
D-F7□F
D-F7NT
D-F7BAL

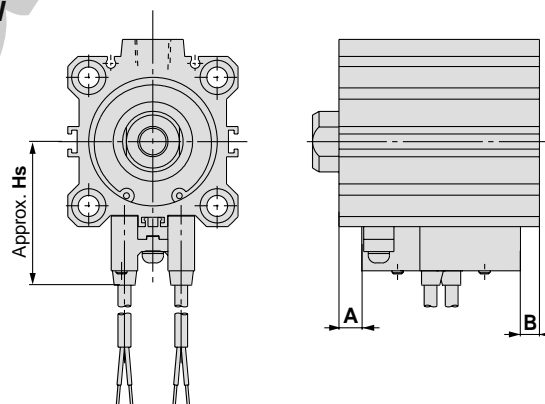


ø32 to ø50

D-A73C
D-A80C
D-J79C



D-A79W
D-F7□W
D-F7□V



Proper auto switch mounting positions mm

Bore size (mm)	D-A7□/A80		D-A7□H/A80H D-A73C/A80C D-F7□/J79 D-F7□V/J79C		D-A79W		D-F79W D-F7BA D-F7□W D-F7□F D-J79W D-F7□WV	
	A	B	A	B	A	B	A	B
20	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—
32	13.5	5.5	14	6	11	3	14	6
40	18	8	18.5	8.5	15.5	5.5	18.5	8.5
50	18	13.5	18.5	14	15.5	11	18.5	14

Auto switch mounting height mm

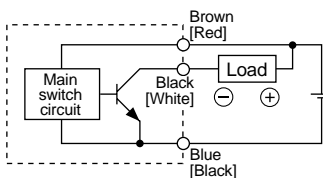
Bore size (mm)	D-A7□ D-A80	D-A7□H D-A80H D-F7□ D-J79 D-F7□W	D-J79W D-F7BAL D-F7□F D-F7NTL D-F7□V	D-A73C D-A80C	D-F7□V D-F7□WV	D-J79C	D-A79W
	Hs	Hs	Hs	Hs	Hs	Hs	Hs
20	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—
32	31.5	32.5	38.5	35	38	34	—
40	35	36	42	38.5	41.5	37.5	—
50	41	42	48	44.5	47.5	43.5	—

Series RQ Auto Switch Connections and Examples

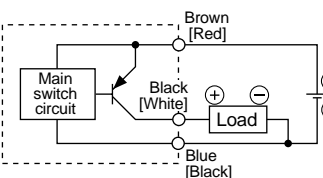
Basic Wiring

Lead wire colors inside [] are those prior to conformity with IEC standards.

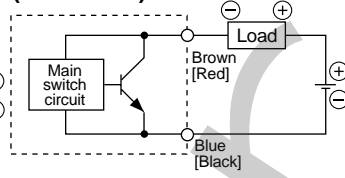
Solid state 3 wire, NPN



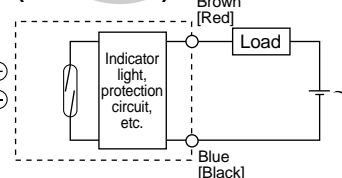
Solid state 3 wire, PNP



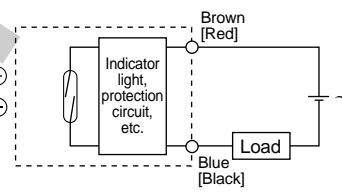
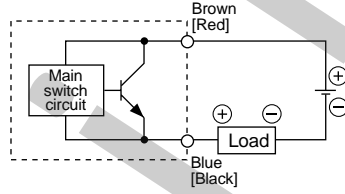
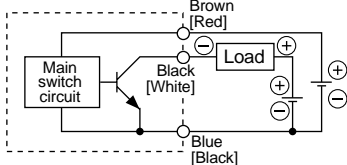
2 wire (Solid state)



2 wire (Reed switch)



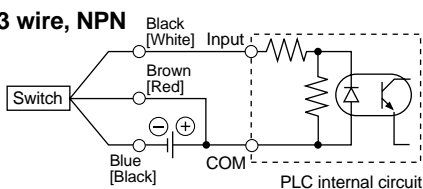
(Power supplies for switch and load are separate.)



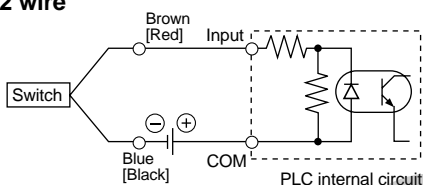
Examples of Connection to PLC

Sink input specifications

3 wire, NPN

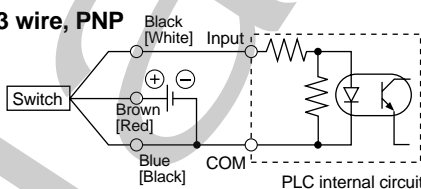


2 wire

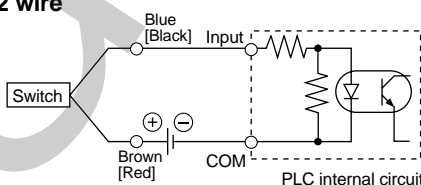


Source input specifications

3 wire, PNP



2 wire

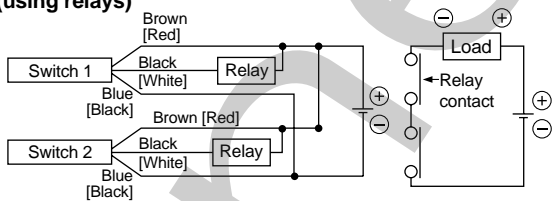


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

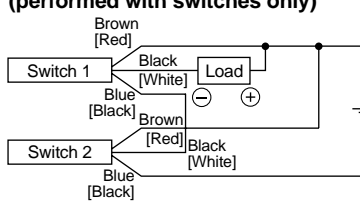
Connection Examples for AND (Series) and OR (Parallel)

3 wire

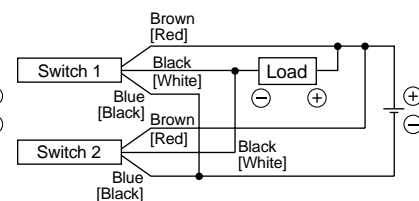
AND connection for NPN output (using relays)



AND connection for NPN output (performed with switches only)

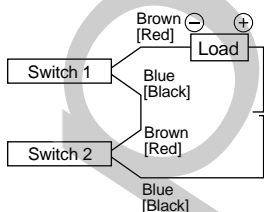


OR connection for NPN output



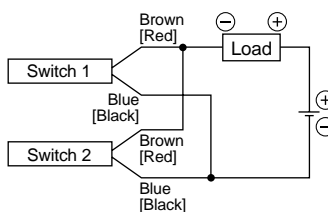
The indicator lights will light up when both switches are turned ON.

2 wire with 2 switch 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 switch 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 dim or not light up, because of dispersion and reduction of the current flowing to the switches.

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

Example: Power supply is 24VDC
Internal voltage drop 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