Model Selection

Selection Step

Setting Conditions

1. Mounting (Horizontal, Inclined, Vertical)
2. Load mass W (kg)
3. Operating pressure P (MPa)
   P ≤ 0.7 MPa
4. Speed V (mm/s)
   V ≤ 500 mm/s

↓

Selection of bearing type

↓

Provisional selection of cylinder bore size

↓

Confirmation of sum of load ratio to the guide unit
$\Sigma\alpha n \leq 1$

NO → back to Provisional selection of cylinder bore size

YES ↓

Calculation of resistance force f

↓

Calculation of theoretical output F

↓ Refer to "Theoretical Output" on page 713.

Calculation of load ratio β to the theoretical output of cylinder
$\beta = f / F$

$\beta > 0.5$ → back to Provisional selection of cylinder bore size

$\beta \leq 0.5$ ↓

Confirmation of adjusting bolt capacity
$W \leq W_A$

NO → Determine the movable weight W_A which can be operated only by adjusting bolts.

YES ↓

Model selected Without shock absorber

Model selected With shock absorber

Guideline for Selection of Bearing Type

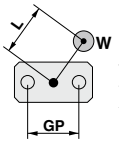
Bearing type	Required conditions
Slide bearing	• Impact load and vibration load are added. • Change in load is large. • Long life span is required.
Ball bushing bearing	• High accuracy (Little rattle is allowed.) • Smooth operation

$$\Sigma\alpha n = \frac{\text{Load mass [W]}}{\text{Maximum load mass [Wmax]}} + \frac{\text{Moment [Mn]}}{\text{Allowable moment [Mn]}}$$

Load mass [W] are as follows in compliance to the mounting way.
Horizontal mounting: W
Inclined mounting: W$\cos\theta$ (θ: Angle of inclination, refer to the figure below.)
Vertical mounting: 0 (None)

The moment load rate must be calculated in accordance with the above formula for all types, **M1** to **M3**.
As for **Wmax** and **Mn**, refer to the maximum load weight and allowable moment table in the next section.
The moment for the inclined mounting must be calculated taking the moment caused by the load into consideration.
Note) Make sure that the distance between the guide shaft center to the center of gravity of the load does not exceed the distance **GP** between the guide shafts given in the table below. If the distance must be exceeded due to unavoidable circumstances, decrease the load rate that is applied to the guide as indicated below in order to determine the distance.

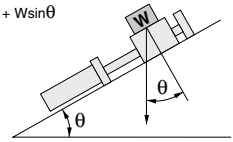
$$\Sigma\alpha n \leq \frac{1}{(L/GP)^2}$$ (Provided that **L > GP**)



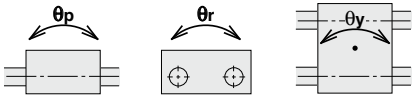
(mm)

Bore size	12	16	20	25	32	40
Distance between guide rods **GP**	50	65	80	90	110	130

Horizontal mounting: f = μ x W
Inclined mounting: f = μ x W$\cos\theta$ + W$\sin\theta$
(Refer to the figure on the right.)
Vertical mounting: f = W
μ = 0.3 (Slide bearing)
μ = 0.1 (Ball bushing bearing)



Non-rotating Accuracy of Slide Block

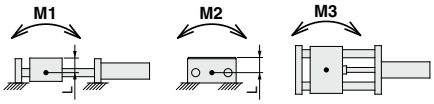


Pitching direction | Rolling direction | Yawing direction

Bore size (mm)	CXTM (Slide bearing)		CXTL (Ball bushing bearing)	
	θp (= θy)	θr	θp (= θy)	θr
12	± 0.09°	± 0.12°	± 0.05°	± 0.05°
16	± 0.08°	± 0.10°	± 0.05°	± 0.04°
20	± 0.07°	± 0.08°	± 0.04°	± 0.03°
25	± 0.07°	± 0.07°	± 0.04°	± 0.03°
32	± 0.08°	± 0.07°	± 0.04°	± 0.03°
40	± 0.06°	± 0.06°	± 0.03°	± 0.03°

Maximum Load Mass and Allowable Moment

Bore size (mm)	Bearing	Maximum load mass **Wmax** (kg)	Allowable moment (N·m)	
			M1 (= M3)	**M2**
12	Slide bearing	3	1.25	1.68
	Ball bushing bearing		0.53	0.70
16	Slide bearing	7	3.34	4.25
	Ball bushing bearing		1.53	2.11
20	Slide bearing	12	11.4	17.1
	Ball bushing bearing		5.60	7.28
25	Slide bearing	20	11.4	19.3
	Ball bushing bearing		5.60	8.19
32	Slide bearing	30	19.8	23.3
	Ball bushing bearing		10.1	14.8
40	Slide bearing	50	37.3	46.2
	Ball bushing bearing		21.3	27.5



Note) For the purpose of calculating the moment, the length of the arm is the distance that is measured from the guide shaft center ("●" mark). Dimension L from the guide shaft center to the top surface of the table is indicated below.

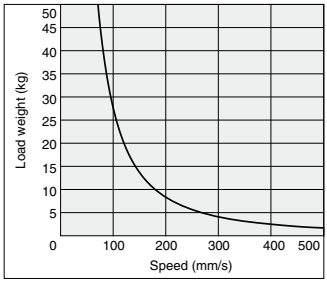
(mm)

Bore size	12	16	20	25	32	40
L dimension	19.5	24	28	31	39.5	47.5

Allowable Load Only by Adjustment Bolt

If only the adjustment bolt is used for stopping the load, make sure that the load weight and the speed will be below the curve in the graph on the right, taking into consideration the durability of the rubber bumper that is attached to the end of the adjustment bolt and the vibration and noise that are created when stopping (provided that the maximum load weight is not exceeded).

In conditions in which the load weight and the speed will be above the curve, use a shock absorber (provided that the maximum load weight not exceeded).



⚠ Caution

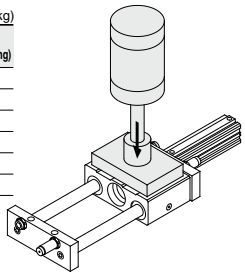
In the case of the ball bushing type, the service life could be drastically shortened if shocks or excessive moments are applied. Therefore, even if the conditions given above are not exceeded, the use of a shock absorber is recommended.

Static Movable Mass when Stopped

When the CXT series cylinder is used for moving the workpiece receptacle, such as in a stamping or press-fitting process, a vertical load will be applied to the top surface of the stopped slide block (refer to the figure on the right). In this case, the allowable mass is greater than the maximum load weight, as given in the table on the right.

Allowable Static Mass (kg)

Bore size (mm)	CXTM (Slide bearing)	CXTL (Ball bushing bearing)
12	350	60
16	500	70
20	900	125
25	900	125
32	1100	140
40	1900	170



⚠ Caution

1. Make sure that the slide block is stopped at the stroke end.
2. Match the center of the mass to be applied with the center of the slide block. The direction of the mass must be vertically downward in relation to the surface on which the workpiece is mounted, as shown in the figure on the right.
3. Do not apply a load that involves shocks such as those caused by pounding (particularly with the ball bushing type).
4. If this mass is applied, the deflection of the guide shaft will also have a large value.

Platform Cylinder
CXT Series
ø12, ø16, ø20, ø25, ø32, ø40

How to Order

Port thread type

Nil	M thread	ø12 to ø25
	Rc	
TN	NPT	ø32, ø40
TF	G	

CXT M 20 [ ] – 100 B – M9BW [ ] – [ ]

- **Platform cylinder**
- **Bearing type**

M	Slide bearing
L	Ball bushing bearing

- **Bore size/Stroke (mm)**

Bore size (mm)	Stroke (mm) 15 25 50 75 100 125 150 175 200 250 300
12	● ● ○ ○ ○ ○ ○ ○ ○ ○ ○
16	● ● ○ ○ ○ ○ ○ ○ ○ ○ ○
20	● ● ● ○ ○ ○ ○ ○ ○ ○ ○
25	● ● ● ○ ○ ○ ○ ○ ○ ○ ○
32	● ● ● ● ○ ○ ○ ○ ○ ○ ○
40	● ● ● ● ○ ○ ○ ○ ○ ○ ○

● ·····Standard stroke ○ ·····Long stroke

∗ For minimum strokes for auto switch equipped type, refer to page 718.

- **Auto switch**

Nil	Without auto switch (Built-in magnet)

∗ For the applicable auto switch model, refer to the table below.

- **Made to Order**
Refer to page 713 for details.
- **Number of auto switches**

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

- **Option**

Nil	Adjusting bolt with bumper only (Standard)
B	With 2 shock absorbers (Set on the driving cylinder side only when packed.)
BS	With 1 shock absorber (Set on the driving cylinder side when packed.)

Shock Absorbers

Type	Bore size (mm)			
	12, 16	20	25	32, 40
Standard (shock absorber RB series)	RB0806	RB1007	RB1411	RB2015
Shock absorber soft type RJ series type (-XB22)	RJ0806H	RJ1007H	RJ1412H	—

∗ The shock absorber service life is different from that of the CXT cylinder. Refer to "Specific Product Precautions" for each shock absorber for the replacement period.
∗ The shock absorber soft type RJ series type (-XB22) is a made to order specification. For details, refer to page 1296.

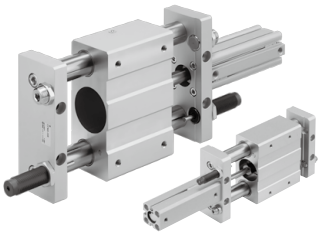
Applicable Auto Switches/Refer to pages 1119 to 1245 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch part no. Perpendicular	Auto switch part no. In-line	Lead wire length 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	M9NV	M9N	●	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)			M9PV	M9P	●	●	●	○	—	○		
				2-wire	12 V		M9BV	M9B	●	●	●	○	—	○	—	
	Diagnostic indication (2-color indicator)			3-wire (NPN)	5 V, 12 V		M9NWV	M9NW	●	●	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PWV	M9PW	●	●	●	○	—	○		
				2-wire	12 V		M9BWV	M9BW	●	●	●	○	—	○	—	
	Water resistant (2-color indicator)			3-wire (PNP)	5 V, 12 V		M9NAV∗1	M9NA∗1	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			M9PAV∗1	M9PA∗1	○	○	●	○	—	○		
				2-wire	12 V		M9BAV∗1	M9BA∗1	○	○	●	○	—	○	—	
	Magnetic field resistant(2-color indicator)			2-wire (Non-polar)	—		—	P3DWA	●	—	●	●	—	○		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	—	IC circuit	—	Relay, PLC
			No	2-wire	24 V	12 V	100 V	A93V∗2	A93	●	●	●	●	—	—	—	
						5 V,12 V	100 V or less	A90V	A90	●	—	●	—	—	—	IC circuit	

∗1 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.
∗2 1 m type lead wire is only applicable to D-A93.
∗ Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
1 m ····· M (Example) M9NWM
3 m ····· L (Example) M9NWL
5 m ····· Z (Example) M9NWZ

∗ Solid state auto switches marked with "○" are produced upon receipt of order.
∗ D-P3DWA□ is compatible with ø25 to ø40.

∗ Since there are other applicable auto switches than listed, refer to page 720 for details.
∗ For details about auto switches with pre-wired connector, refer to pages 1192 and 1193.



Specifications

Bore size (mm)	12	16	20	25	32	40
Fluid	Air					
Action	Double acting					
Proof pressure	1.5 MPa					
Maximum operating pressure	0.7 MPa Note)					
Minimum operating pressure	0.15 MPa					
Ambient and fluid temperature	–10 to 60°C (No freezing)					
Piston speed	50 to 500 mm/s					
Cushion	Bumper (Both ends/Standard), Shock absorber (Option)					
Lubrication	Not required (Non-lube)					
Stroke adjusting range	–10 mm (Extension end, Retraction end: –5 mm each)					

Note) Maximum operating pressure for this product with the bumper feature.
The maximum operating pressure for the cylinder alone is 1 MPa.

Shock Absorber Specifications

For detailed specifications about shock absorber, /refer to Best Pneumatics No. 2-3.

Model		CXT□12 16	CXT□20	CXT□25	CXT□32 40
Shock absorber model		RB0806	RB1007	RB1411	RB2015
Max. energy absorption (J)		2.94	5.88	14.7	58.8
Stroke absorption (mm)		6	7	11	15
Collision speed		0.05 to 5 m/s			
Max. operating frequency* **(cycle/min)**		80	70	45	25
Ambient temperature		–10 to 80°C			
Spring force (N)	**Extended**	1.96	4.22	6.86	8.34
	Retracted	4.22	6.86	15.30	20.50
Weight (g)		15	25	65	150

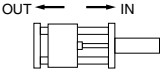
* It denotes the values at the maximum energy absorption per one cycle. Therefore, the operating frequency can be increased according to the energy absorption.

The shock absorber service life is different from that of the CXT cylinder depending on the operating conditions. Refer to the Specific Product Precautions for the replacement period.

Theoretical Output

(N)

Bore size (mm)	Operating direction	Piston area (mm^2)	Operating pressure (MPa) 0.3	0.5	0.7
12	IN	84.8	25	42	59
	OUT	113	34	57	79
16	IN	151	45	75	106
	OUT	201	60	101	141
20	IN	236	71	118	165
	OUT	314	94	157	220
25	IN	378	113	189	264
	OUT	491	147	245	344
32	IN	603	181	302	422
	OUT	804	241	402	563
40	IN	1056	317	528	739
	OUT	1257	377	628	880



Made to Order

Made to Order: Individual Specifications (For details, refer to page 721.)

Symbol	Specifications
X138	Adjustable stroke type
X777	Fluororubber seals (Actuating cylinder unit only)

Made to Order

Click here for details

Symbol	Specifications
XB13	Low speed cylinder (5 to 50 mm/s)
XB22	Shock absorber soft type RJ series type

Weight

CXTM (Slide bearing)

(kg)

Bore size (mm) \ Stroke (mm)	15	25	50	75	100	125	150	175	200	250	300
12	0.85 (0.35)	0.90 (0.35)	1.02 (0.35)	1.13 (0.36)	1.25 (0.37)	—	—	—	—	—	—
16	1.18 (0.50)	1.24 (0.50)	1.39 (0.51)	1.54 (0.52)	1.68 (0.53)	—	—	—	—	—	—
20	—	2.35 (0.85)	2.61 (0.87)	2.89 (0.88)	3.15 (0.90)	3.41 (0.91)	3.66 (0.93)	3.92 (0.94)	4.18 (0.96)	—	—
25	—	2.76 (1.09)	3.03 (1.11)	3.34 (1.14)	3.62 (1.16)	3.89 (1.18)	4.16 (1.21)	4.43 (1.23)	4.70 (1.25)	5.25 (1.30)	5.79 (1.34)
32	—	4.61 (2.06)	4.96 (2.10)	5.32 (2.14)	5.67 (2.17)	5.95 (2.21)	6.31 (2.25)	6.64 (2.29)	6.99 (2.33)	7.67 (2.41)	8.36 (2.49)
40	—	8.28 (3.71)	8.79 (3.75)	9.29 (3.79)	9.79 (3.83)	10.34 (3.87)	10.84 (3.91)	11.36 (3.95)	11.87 (3.99)	12.88 (4.07)	13.91 (4.15)

CXTL (Ball bushing bearing)

(kg)

Bore size (mm) \ Stroke (mm)	15	25	50	75	100	125	150	175	200	250	300
12	0.75 (0.41)	0.78 (0.42)	0.85 (0.42)	0.92 (0.42)	0.98 (0.43)	—	—	—	—	—	—
16	1.05 (0.57)	1.08 (0.57)	1.18 (0.58)	1.27 (0.59)	1.35 (0.60)	—	—	—	—	—	—
20	—	2.00 (1.02)	2.15 (1.04)	2.32 (1.05)	2.46 (1.07)	2.60 (1.08)	2.75 (1.10)	2.89 (1.11)	3.03 (1.13)	—	—
25	—	2.41 (1.25)	2.57 (1.28)	2.77 (1.30)	2.92 (1.33)	3.08 (1.35)	3.24 (1.37)	3.40 (1.39)	3.56 (1.42)	3.78 (1.46)	4.19 (1.50)
32	—	4.22 (2.26)	4.45 (2.30)	4.69 (2.34)	4.92 (2.38)	5.08 (2.42)	5.32 (2.46)	5.54 (2.50)	5.77 (2.54)	6.21 (2.62)	6.66 (2.70)
40	—	7.53 (4.31)	7.83 (4.35)	8.13 (4.39)	8.42 (4.43)	8.76 (4.47)	9.06 (4.51)	9.37 (4.55)	9.67 (4.59)	10.27 (4.67)	10.88 (4.74)

Note 1) ( ): Denotes the values of the movable parts weight. (Movable parts weight of a cylinder is included, too.)
Note 2) The weight indicated above does not include a shock absorber.

Series Applicable to Operating Environments that Do Not Accept Copper

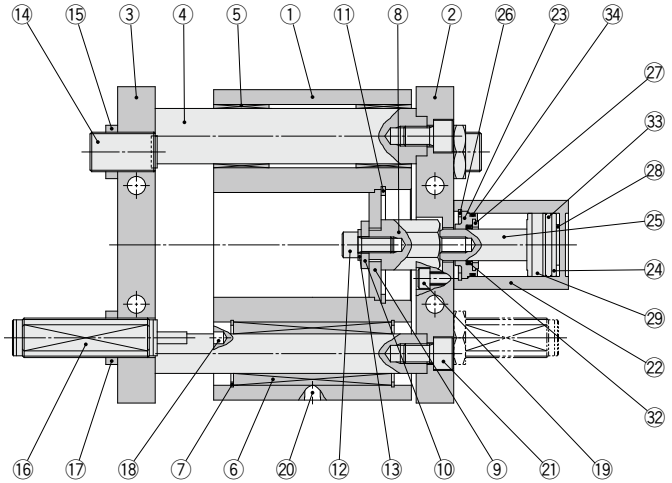
- **Copper/Fluorine-free specifications·····20- series**

∗ For details, refer to the SMC website.

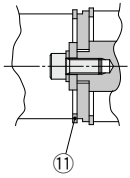
Construction

CXTM
Guide rod/bearing

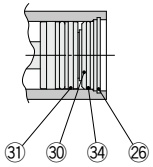
CXTL
Guide rod/bearing



ø32



Long stroke



Component Parts

No.	Description	Material	Note
1	**Slide block**	Aluminum alloy	Anodized
2	**Plate A**	Aluminum alloy	Anodized
3	**Plate B**	Aluminum alloy	Anodized
4	**Guide rod**	Carbon steel	Hard chrome plating
5	**Slide bearing**	Bearing alloy	
6	**Ball bushing bearing**	—	
7	**Type C retaining ring**	Carbon tool steel	Phosphate coating
8	**Adapter**	Carbon steel	Electroless nickel plating
9	**Connected disk**	Carbon steel	Electroless nickel plating
10	**Washer**	Carbon steel	Zinc chromated
11	**Type C retaining ring**	Carbon tool steel	Phosphate coating
12	**Hexagon socket head cap screw**	Carbon steel	Zinc chromated
13	**Spring washer**	Steel wire	Zinc chromated
14	**Adjusting bolt (With bumper)**	Carbon steel, Urethane	Zinc chromated
15	**Nut**	Carbon steel	Zinc chromated
16	**Shock absorber**	—	Option
17	**Nut**	Carbon steel	Zinc chromated
18	**Parallel pin**	Carbon steel	

Component Parts

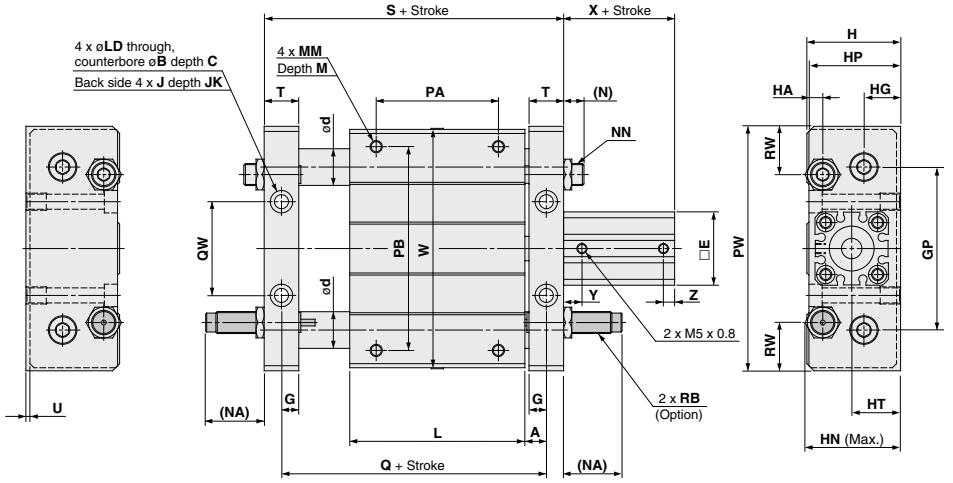
No.	Description	Material	Note	
19	**Hexagon socket head cap screw**	Carbon steel	Zinc chromated	
20	**Grease nipple**	—	ø16 to ø40	Nickel plating
21	**Hexagon socket head cap screw**	Carbon steel	Zinc chromated	
22	**Cylinder tube**	Aluminum alloy	Hard anodized	
23	**Collar**	Aluminum alloy	Anodized	
24	**Piston**	Aluminum alloy	Chromated	
25	**Piston rod**	Stainless steel	ø12 to ø25	—
		Carbon steel	ø32, ø40	Hard chrome plating
26	**Type C retaining ring**	Carbon tool steel	Phosphate coating	
27	**Bumper A**	Urethane		
28	**Bumper B**	Urethane		
29	**Magnet**	—		
30	**Bottom plate**	Aluminum alloy	Anodized	
31	**Wear ring**	Resin		
32	**Rod seal**	NBR		
33	**Piston seal**	NBR		
34	**Tube gasket**	NBR		

Replacement Parts/Seal Kit

Model / Cylinder / Stroke	Kit no.					
	CXT□12	**CXT□16**	**CXT□20**	**CXT□25**	**CXT□32**	**CXT□40**
Standard stroke	CQSB12-PS	CQSB16-PS	CQSB20-PS	CQSB25-PS	CQ2B32-PS	CQ2B40-PS
Long stroke	CQSB12-L-PS	CQSB16-L-PS	CQSB20-L-PS	CQSB25-L-PS	CQ2A32-L-PS	CQ2A40-L-PS

∗ Seal kit includes ㉜, ㉝ and ㉞. Order the seal kit with the kit number.
∗ Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Dimensions: ø12 to ø25



Cylinder form

ø12

ø16

(mm)

Bore size (mm)	Standard stroke (mm)	A	B	C	d		E	G	GP	H	HA	HG	HN	HP	HT	J	JK	L	LD
					Slide	Ball bushing													
12	15, 25	8.5	8	4	16	10	25	7.5	50	34	6	14.5	34	33	18	M5 x 0.8	9.5	68	4.3
16	15, 25	7.5	9.5	5	18	12	29	6.5	65	40	6.5	16	39.5	39	21	M6 x 1	9.5	75	5.2
20	25, 50	9.5	11	6.5	25	16	36	8.5	80	46	9	18	44.1	45	24	M8 x 1.25	10	86	6.9
25	25, 50	9.5	11	6.5	25	16	40	8.5	90	54	9	23	55	53	28	M8 x 1.25	10	86	6.9

Bore size (mm)	MM	M	(N)	(NA)	NN	PA*	PB	PW	Q	QW	RB	RW	S	T	U	W	X	Y	Z
12	M4 x 0.7	6	8	27	M8 x 1.0	30	60	80	85	26	RB0806	17.5	96	13	1	77	22	7.5	5
16	M5 x 0.8	8	8	27	M8 x 1.0	45	70	95	90	40	RB0806	15	103	13	2	92	22	7.5	5
20	M6 x 1	10	10	29	M10 x 1.0	60	100	120	105	46	RB1007	26	122	17	2	117	29.5	8	5.5
25	M6 x 1	10	12	50	M14 x 1.5	60	100	130	105	50	RB1411	22	122	17	2	127	32.5	9	5.5

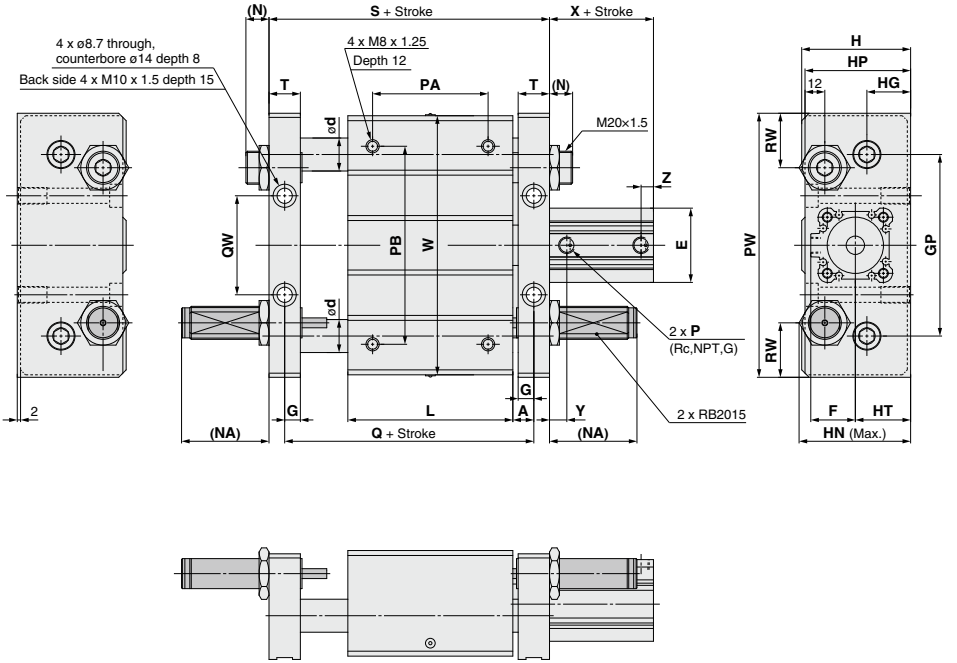
* PA dimension is the center sorted factor of the L dimension.

Long Stroke

(mm)

Bore size (mm)	Stroke range (mm)	X	Y	Z
12	50, 75, 100	32	7.5	7.5
16	50, 75, 100	32	7.5	7.5
20	75, 100, 125, 150, 175, 200	41	8	8
25	75, 100, 125, 150, 175, 200, 250, 300	44	9	9

Dimensions: ø32, ø40



(mm)

Bore size (mm)	Standard stroke (mm)	A	d		E	F	G	GP	H	HG	HN	HP	HT	L	(N)	(NA)	P[Note]	PA*	PB	PW	Q
			Slide	Ball bushing																	
32	25, 50, 75, 100	10.5	28	20	45	27	9.5	110	66	26.5	67.6	64	33.5	100	14	53	1/8	70	120	160	121
40	25, 50, 75, 100	11.5	36	25	52	31	10.5	130	78	30.5	77.6	74	40.5	136	12	51	1/8	90	140	190	159

Bore size (mm)	QW	RW	S	T	W	X	Y	Z
32	60	33	140	19	157	33	10	7.5
40	84	35	180	21	187	39.5	12.5	7.5

∗ PA dimension is the center sorted factor of the L dimension.

Note) Rc, NPT and G ports can be selected.

Long Stroke

(mm)

Bore size (mm)	Stroke range (mm)	X	Y	Z
32	125, 150, 175, 200, 250, 300	45.5	10	10
40	125, 150, 175, 200, 250, 300	55	12.5	12.5

Auto Switch Mounting 1

Minimum Stroke for Mounting of Auto Switch

(mm)

Application	No. of auto switches mounted \ Auto switch model	D-M9□V	D-A9□V	D-A9□	D-M9□WV D-M9□AV	D-M9□	D-M9□W D-M9□A	D-P3DWA
CXT□12 to CXT□25	1	5	5	10	10	15	20	15
	2	5	10	10	10	15	20	15
CXT□32 to 40	1	5	5	10	10	10	15	15
	2	5	10	10	15	10	15	15

∗ D-P3DW is compatible with ø25 to ø40.

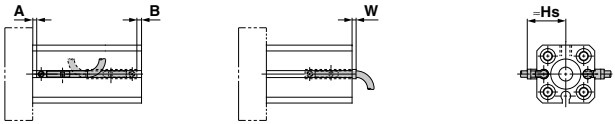
(mm)

Application	No. of auto switches mounted \ Auto switch model	D-F7□V D-J79C	D-A7□ D-A8□ D-A73C D-A80C	D-F7□WV D-F7BAV	D-A7□H D-A80H D-F7□ D-J79	D-A79W	D-F7□W D-J79W D-F7BA D-F7NT D-F79F
CXT□32 to 40	1	5	5	10	15	15	20
	2	5	10	15	15	20	20

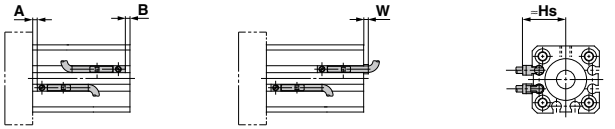
Proper Auto Switch Mounting Position (Detection at stroke end) and Its Mounting Height

D-M9□
D-M9□W
D-M9□A
D-M9□V
D-M9□WV
D-M9□AV
D-A9□
D-A9□V
D-P3DWA□

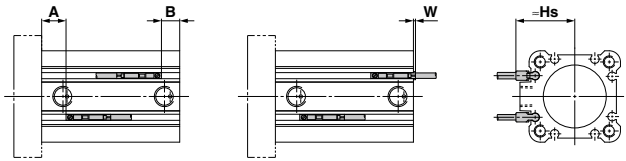
ø12



ø16, 20, 25



ø32, 40



Proper Auto Switch Mounting Position/Standard Stroke

(mm)

Auto switch model \ Bore size	D-M9□/M9□V D-M9□W/M9□WV			D-M9□A D-M9□AV			D-A9□ D-A9□V			D-P3DWA	
	A	B	W	A	B	W	A	B	W	A	B
12	5.5	4.5	5.5	5.5	4.5	7.5	1.5	0	1.5 (4)	—	—
16	6	4	6	6	4	8	2	0	2 (4.5)	—	—
20	10	7.5	2.5	10	7.5	4.5	6	3.5	–1.5 (1)	—	—
25	11	9.5	0.5	11	9.5	2.5	7	5.5	–3.5 (–1)	6.5	5
32	12	9	1	12	9	3	8	5	–3 (–0.5)	7.5	4.5
40	16	11.5	–1.5	16	11.5	0.5	12	7.5	–5.5 (–3)	11.5	7

Proper Auto Switch Mounting Position/Long Stroke

(mm)

Auto switch model \ Bore size	D-M9□/M9□V D-M9□W/M9□WV			D-M9□A D-M9□AV			D-A9□ D-A9□V			D-P3DWA	
	A	B	W	A	B	W	A	B	W	A	B
12	9	11	–1	9	11	1	5	7	-5 (-2.5)	—	—
16	9.5	10.5	–0.5	9.5	10.5	1.5	5.5	6	-4.5 (-2)	—	—
20	13	16	–6	13	16	–4	9	11.5	-10 (-7.5)	—	—
25	14	18	–8	14	18	–6	10	13.5	-12 (-9.5)	6.5	5
32	12.5	20.5	–10.5	12.5	20.5	–8.5	8.5	16.5	-14.5 (-12)	8	16
40	16	26.5	–16.5	16	26.5	–14.5	12	22.5	-20.5 (-18)	11.5	22

Note 1) ( ): Denotes the values of D-A93.
Note 2) W is applicable when mounting D-A9□, D-M9□, D-M9□W and D-M9□A.
Note 3) Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting Height/ Standard Stroke, Long Stroke

(mm)

Auto switch model \ Bore size	D-M9□V D-M9□WV D-M9□AV	D-A9□V	D-P3DWA
	Hs	Hs	Hs
12	19	17	—
16	21	19	—
20	24	22.5	—
25	26	24.5	33
32	29	27	35.5
40	32.5	30.5	39

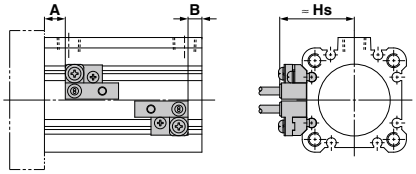
Auto Switch Proper Mounting Position (Detection at Stroke End) and Its Mounting Height

D-A7□
D-A80
D-A73C
D-A80C
D-A79W
D-A7□H
D-A80H

D-F7□
D-J79
D-F7□W
D-J79W
D-F7BA
D-F79F
D-F7NT

D-F7□V
D-J79C
D-F7□WV
D-F7BAV

ø32, 40



Auto Switch Proper Mounting Position/Standard Stroke

(mm)

Auto switch model / Bore size	D-A73, D-A80		D-A72/A7□H, D-A80H/A73C, D-A80C/F7□/J79, D-F7□W/J79W, D-F7□V/F7□WV, D-F79F/J79C, D-F7BA/F7BAV		D-A79W		D-F7NT	
	A	B	A	B	A	B	A	B
32	9	6	9.5	6.5	6.5	3.5	14.5	10.5
40	13	8.5	13.5	9	10.5	6	18.5	13

Auto Switch Proper Mounting Position/Long Stroke

(mm)

Auto switch model / Bore size	D-A73, D-A80		D-A72/A7□H, D-A80H/A73C, D-A80C/F7□/J79, D-F7□W/J79W, D-F7□V/F7□WV, D-F79F/J79C, D-F7BA/F7BAV		D-A79W		D-F7NT	
	A	B	A	B	A	B	A	B
32	9.5	17.5	10	18	7	15	15	23
40	13	23.5	13.5	24	10.5	21	18.5	29

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

Auto Switch Mounting Height/Standard Stroke, Long Stroke

(mm)

Auto switch model / Bore size	D-A7□, D-A80	D-A7□H, D-A80H, D-F7□, D-J79, D-F7□W, D-J79W, D-F79F, D-F7BA, D-F7NT	D-A73C, D-A80C	D-A79W	D-F7□V, D-F7□WV, D-F7BV	D-J79C
	Hs	Hs	Hs	Hs	Hs	Hs
32	31.5	32.5	38.5	34	35	38
40	35	36	42	37.5	38.5	41.5

Operating Range

(mm)

Auto switch model	Bore size					
	12	16	20	25	32	40
D-M9□/M9□V, D-M9□W/M9□WV, D-M9□A/M9□AV	2.5	4	5.5	5.5	6	5.5
D-A9□/A9□V	6	7.5	10	10	9.5	9.5
D-F7□/F7□V, D-J79/J79C, D-F7□W/F7□WV, D-J79W, D-F7BA/F7BAV, D-F7NT/F79F	—	—	—	—	6	6
D-A7□/A80	—	—	—	—	12	11
D-A79W	—	—	—	—	13	14
D-P3DWA	—	—	—	6	6	6

∗ Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion)
There may be the case it will 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) types. The above values indicate the operating range when mounted with the current auto switch installation groove.

Auto Switch Mounting 2

Auto Switch Mounting Bracket: Part No.

Applicable auto switch	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	D-F7□/F7□V/J79/J79C/F7□W/J79W/F7□WV D-F7BA/F7BAV/F79F/F7NT D-A7□/A80/A7□H/A80H/A73C/A80C/A79W	D-P3DWA
Bore size (mm)	ø12 to ø40	ø32, ø40	ø25, ø40
Auto switch mounting bracket part no.	—	BQ5-032	—
Auto switch mounting bracket fitting parts lineup/Weight	—	● Auto switch fixing screw (M2.5 x 10L) ● Auto switch mounting screw (M3 x 8L) ● Auto switch spacer ● Auto switch mounting nut Weight: 3.5 g	—
Auto switch mounting surface	Surfaces with auto switch mounting slot ø12 / ø16 / ø20, ø25 / ø32, ø40	A/B/C side except port side Port side C A B	Surfaces with auto switch mounting slot
Mounting of auto switch	Auto switch mounting screw Auto switch ● When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter. **Tightening torque for auto switch mounting screw** (N·m) Auto switch model / Tightening torque D-M9□(V), D-M9□W(V), D-A93: 0.05 to 0.15 D-M9□A(V): 0.05 to 0.10 D-A9□(V) (Excludes the D-A93): 0.10 to 0.20	①Insert the nut into the auto switch mounting slot on the cylinder tube, and place it in the roughly estimated setting position. ②With the lower tapered part of the auto switch spacer facing the outside of the cylinder tube, line up the M2.5 through hole with the M2.5 female thread of the auto switch mounting nut. ③Gently screw the auto switch mounting nut fixing screw (M2.5) into the thread of the auto switch mounting nut through the mounting hole. ④Engage the ridge on the auto switch mounting arm with the recess in the auto switch spacer. ⑤Tighten the auto switch mounting screw (M3) to fix the auto switch. The tightening torque of the M3 screw must be 0.35 to 0.45 N·m. ⑥Confirm where the mounting position is, and tighten the auto switch fixing screw (M2.5) to fix the auto switch mounting nut. The tightening torque of the M2.5 screw must be 0.25 to 0.35 N·m. ⑦The detection position can be changed under the conditions in step ⑤. Auto switch mounting screw (M3 x 0.5 x 8L) Auto switch Auto switch fixing screw (M2.5 x 0.45 x 10L) Auto switch spacer Auto switch mounting nut	①Insert the mounting bracket into the mating groove of the cylinder tube. ②Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 12L).* ③If the detecting position is changed, go back to step ①. Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch. Note 2) The tightening torque for the hexagon socket head cap screw (M2.5 x 12L) is 0.2 to 0.3 N·m. Hexagon socket head cap screw (M2.5 x 12L) (Included with auto switch)

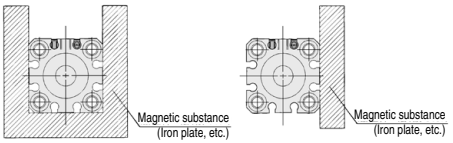
Note) When shipping cylinders, auto switch mounting brackets and auto switches are shipped together.

Other Applicable Auto Switches /Refer to pages 1119 to 1245 for the detailed specifications of auto switches.

Auto switch type	Model	Electrical entry (Fetching direction)	Features
Reed	D-A73	Grommet (Perpendicular)	—
	D-A80		Without indicator light
	D-A73H, A76H	Grommet (In-line)	—
	D-A80H		Without indicator light
Solid state	D-F7NV, F7PV, F7BV	Grommet (Perpendicular)	—
	D-F7NWV, F7BWV		Diagnostic indication (2-color indicator)
	D-F7BAV		Water resistant (2-color indicator)
	D-F79, F7P, J79	Grommet (In-line)	—
	D-F79W, F7PW, J79W		Diagnostic indication (2-color indicator)
	D-F7BA		Water resistant (2-color indicator)
	D-F7NT		With timer

* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to pages 1192 and 1193 for details.
* Normally closed (NC = b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1592-1.
* D-A7/A8/F7/J7 types cannot be mounted on ø12 to ø25.

• If the cylinder is used in an application in which a magnetic material is placed in close contact around the cylinder as shown in the graph on the below (including cases in which even one of the sides is in close contact) the operation of auto switches could become unstable. Therefore, please check with SMC for this type of application.



Made to Order: Individual Specifications

Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.

Symbol

1 Adjustable Stroke -X138

The stroke adjustment range may be expanded with a long adjustment bolt.

How to Order

CXT | Standard model no. | — X138

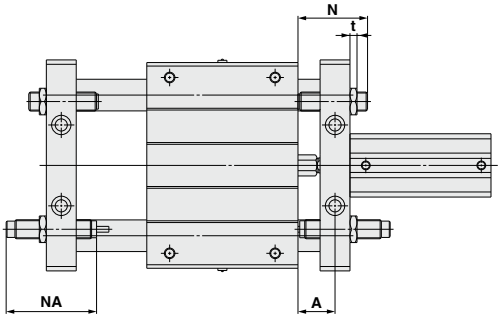
X138: Adjustable stroke

Specifications

Model	CXT□12, 16	CXT□20, 25	CXT□32	CXT□40
Stroke adjustment range	–26 mm (Single side –13 mm)	–28 mm (Single side –14 mm)	–44 mm (Single side –22 mm)	–40 mm (Single side –20 mm)

∗ Specifications other than the above are the same as the standard type.

Dimensions (Dimensions other than those below are the same as the standard type.)



(mm)

Cylinder bore (mm)	A	N	NA	t
12	8.5 to 21.5	32	40.8	4
16	7.5 to 20.5	32	40.8	4
20	9.5 to 23.5	37	46.7	4
25	9.5 to 23.5	39	67.3	6
32	10.5 to 32.5	49	73.2	6
40	11.5 to 31.5	49	73.2	6

Symbol

2 Fluororubber Seal (Cylinder unit only) -X777

Fluororubber is used only for the cylinder unit seal.

How to Order

CXT | Standard model no. | — X777

X777: Fluororubber seal (Cylinder unit only)

Specifications

Seal material	Fluororubber (Cylinder unit only)

∗ Specifications other than the above are the same as the standard type.