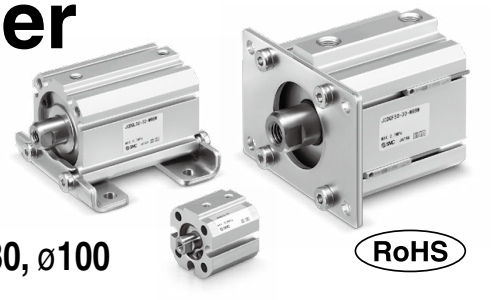
Compact Cylinder
Double Acting, Single Rod
JCQ Series
ø12, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100



RoHS

How to Order

Without auto switch **JCQ** □ **12** □ – **30** – □ – □

With auto switch **JCDQ** □ **12** □ – **30** – **L** – **M9BW** □ – □

With magnet for auto switch

Mounting

Nil	Through-hole (Standard)	ø12 to ø100
A	Both ends tapped	
L	Axial foot	ø32 to ø100
F	Rod flange	
G	Head flange	

∗ For the cylinder for the axial foot type or the rod flange type mounting bracket, the cylinder rod protrusion dimensions (Dimensions L and L_1) vary from those of the standard cylinder. When ordering only the cylinder, refer to the cylinder for the foot type or the rod flange type mounting bracket (-XC103) on page 14.

Bore size

12	12 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Nil	M thread	ø12 to ø40
	Rc	
TN	NPT	ø50 to ø100
TF	G	

Cylinder stroke [mm]
Refer to page 4 for standard strokes.

Mounting bolt

Nil	None
L	Shipped with the product

∗ A mounting bolt is shipped with the product only when the mounting symbol is Nil (through-hole).
∗ For details on mounting bolt sizes, refer to page 7.
∗ The mounting bolt is shipped with the product.

Auto switch

Nil	Without auto switch

∗ For applicable auto switches, refer to the table below.

Number of auto switches

Nil	2
S	1
n	n

Made to order
(For details, refer to page 4.)

Applicable Auto Switches/Refer to the **Web Catalog** for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length [m] 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 (NPN)	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	○	○	●	○	—	○	—	

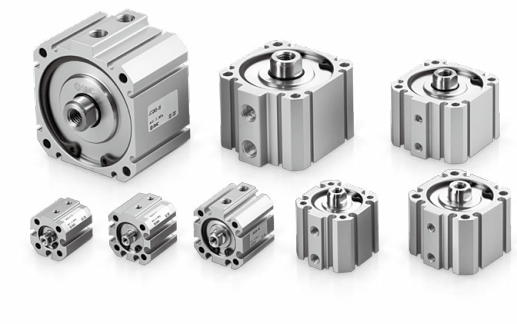
∗1 Water-resistant type auto switches can be mounted on the above models, but SMC cannot guarantee water resistance. Please contact SMC regarding water-resistant types with the above model numbers.

∗ Lead wire length symbols: 0.5 m……Nil (Example) M9NW
1 m……M (Example) M9NWM
3 m……L (Example) M9NWL
5 m……Z (Example) M9NWZ

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

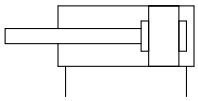
∗ For details on auto switches with pre-wired connectors, refer to the **Web Catalog**.
∗ Auto switches are shipped together with the product but do not come assembled.

SMC



Symbol

Rubber bumper



Made to Order
(For details, refer to page 14.)

-XC103	Cylinder for the foot type or the rod flange type mounting bracket

Specifications

Bore size [mm]	12	16	20	25	32	40	50	63	80	100
Action	Double acting, Single rod									
Fluid	Air									
Proof pressure	1.0 MPa									
Max. operating pressure	0.7 MPa*2									
Min. operating pressure	0.07 MPa		0.05 MPa							
Ambient and fluid temperatures	5 to 60°C									
Lubrication	Not required (Non-lube)									
Piston speed∗3	50 to 500 mm/s∗2					50 to 300 mm/s∗2				
Cushion	Rubber bumper									
Allowable kinetic energy [J]	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77	1.36	2.27
Rod end thread	Female thread									
Stroke length tolerance	$^{+1.3}_{0}$ mm∗1									

∗1 Stroke length tolerance does not include the deflection of the bumper.

∗2 Max. operating pressure and piston speed are different from those of the existing model (CQ2 series).
∗3 Depending on the system configuration selected, the specified speed may not be satisfied.

Standard Strokes

∗ When using with auto switches, refer to the Minimum Stroke for Auto Switch Mounting table on page 12.

Bore size [mm]	Standard stroke [mm]
12, 16	5, 10, 15, 20, 25, 30
20, 25, 32, 40	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
50, 63, 80, 100	10, 15, 20, 25, 30, 35, 40, 45, 50

∗ Intermediate strokes are available as a special order.

Mounting Brackets/Part Nos.

Mounting bracket	Min. order quantity	Bore size [mm] 32	40	50	63	80	100	Contents
Foot bracket∗1	2	JCQ-L032	JCQ-L040	JCQ-L050	JCQ-L063	JCQ-L080	JCQ-L100	1 foot bracket, 2 hexagon socket head cap screws
Flange bracket	1	JCQ-F032	JCQ-F040	JCQ-F050	JCQ-F063	JCQ-F080	JCQ-F100	1 flange bracket, 4 hexagon socket head cap screws

∗1 Order 2 pieces per cylinder.

Mounting Brackets/Material, Surface Treatment

Segment	Description	Material	Surface treatment
Mounting brackets	Foot bracket	Carbon steel	Zinc chromating
	Flange bracket	Carbon steel	Zinc chromating

Theoretical Output

[N]

Bore size [mm]	Rod size [mm]	Operating direction	Piston area [mm²]	Operating pressure [MPa] 0.2	0.3	0.4	0.5	0.6	0.7
12	6	OUT	113	23	34	45	57	68	79
		IN	85	17	25	34	42	51	59
16	6	OUT	201	40	60	80	101	121	141
		IN	173	35	52	69	86	104	121
20	8	OUT	314	63	94	126	157	188	220
		IN	264	53	79	106	132	158	185
25	10	OUT	491	98	147	196	245	295	344
		IN	412	82	124	165	206	247	289
32	12	OUT	804	161	241	322	402	483	563
		IN	691	138	207	276	346	415	484
40	14	OUT	1257	251	377	503	628	754	880
		IN	1103	221	331	441	551	662	772
50	18	OUT	1963	393	589	785	982	1178	1374
		IN	1709	342	513	684	855	1025	1196
63	18	OUT	3117	623	935	1247	1559	1870	2182
		IN	2863	573	859	1145	1431	1718	2004
80	22	OUT	5027	1005	1508	2011	2513	3016	3519
		IN	4646	929	1394	1859	2323	2788	3252
100	26	OUT	7854	1571	2356	3142	3927	4712	5498
		IN	7323	1465	2197	2929	3662	4394	5126

Refer to page 12 for cylinders with auto switches.

- Auto Switch Proper Mounting Position (detection at stroke end) and Mounting Height
- Minimum Stroke for Auto Switch Mounting
- Operating Range
- Auto Switch Mounting

Allowable Kinetic Energy

Load Mass and Piston Speed

[J]

Bore size [mm]	12	16	20	25	32	40	50	63
Standard/ Allowable kinetic energy: **Ea**	0.022	0.038	0.055	0.09	0.15	0.26	0.46	0.77

Kinetic energy E [J] $= \dfrac{(m_1 + m_2)\, V^2}{2}$

m_1: Mass of cylinder moving parts kg
m_2: Load mass kg
V: Piston speed m/s

Mass of Cylinder Moving Parts: Without Magnet for Auto Switch

[g]

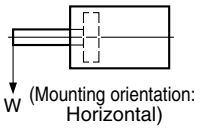
Bore size [mm]	Cylinder stroke [mm]									
	5	10	15	20	25	30	35	40	45	50
12	5	6	7	8	9	10	—	—	—	—
16	5	6	7	9	10	11	—	—	—	—
20	9	11	13	15	17	19	21	23	25	27
25	15	18	21	24	27	30	33	37	40	43
32	27	32	36	41	45	50	54	59	63	67
40	42	48	54	60	66	73	79	85	91	97
50	—	91	101	111	121	131	141	151	161	171
63	—	130	140	150	159	169	179	189	199	209
80	—	240	255	270	285	300	315	329	344	359
100	—	426	446	467	488	509	530	551	572	592

Mass of Cylinder Moving Parts: With Magnet for Auto Switch

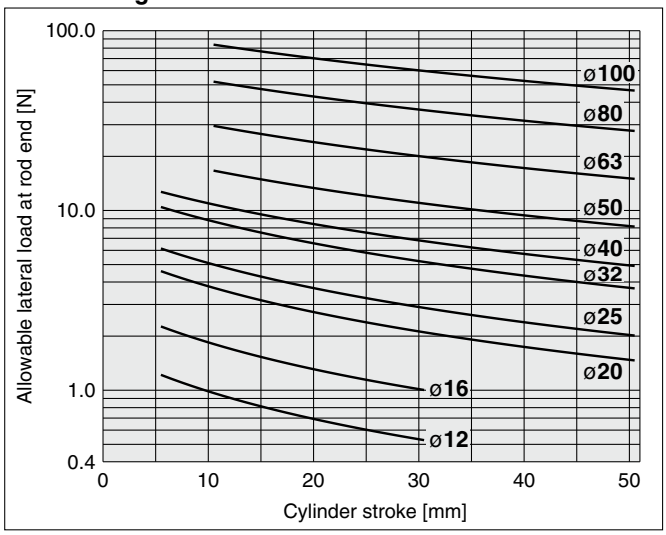
[g]

Bore size [mm]	Cylinder stroke [mm]									
	5	10	15	20	25	30	35	40	45	50
12	6	7	8	9	10	11	—	—	—	—
16	7	8	9	10	11	12	—	—	—	—
20	16	17	19	21	23	25	27	29	31	33
25	25	28	31	34	37	40	43	46	49	53
32	43	48	52	57	61	66	70	75	79	83
40	69	75	81	87	93	99	105	111	117	123
50	—	127	137	147	157	167	177	187	197	207
63	—	180	190	200	210	220	230	240	250	260
80	—	329	344	359	374	389	404	419	433	448
100	—	545	565	586	607	628	649	670	690	711

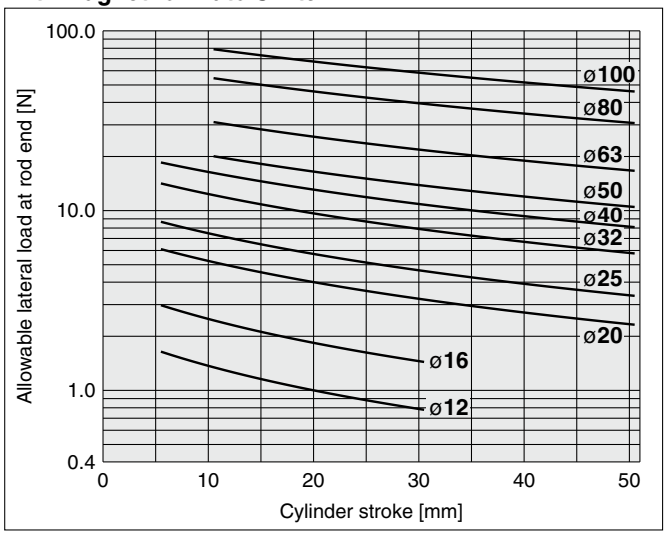
Allowable Lateral Load at Rod End



Without Magnet for Auto Switch



With Magnet for Auto Switch



Weight

Without Magnet for Auto Switch

[g]

Bore size [mm]	Cylinder stroke [mm]									
	5	10	15	20	25	30	35	40	45	50
12	21	25	30	35	39	44	—	—	—	—
16	28	33	38	43	49	54	—	—	—	—
20	40	47	55	62	69	77	84	91	99	106
25	55	64	73	83	92	101	110	119	128	138
32	94	108	121	135	148	162	175	189	202	215
40	145	161	177	194	210	226	243	259	275	292
50	—	284	309	334	359	384	410	435	460	485
63	—	452	483	514	545	576	606	637	668	699
80	—	850	899	948	997	1046	1095	1144	1193	1242
100	—	1348	1407	1465	1524	1582	1641	1700	1758	1817

[g]

Bore size [mm]		**32**	**40**	**50**	**63**	**80**	**100**
Additional weight for mounting bracket	Axial foot	51	55	90	150	293	390
	Rod flange	69	80	129	227	423	658
	Head flange	65	74	119	217	408	637

With Magnet for Auto Switch

[g]

Bore size [mm]	Cylinder stroke [mm]									
	5	10	15	20	25	30	35	40	45	50
12	25	29	34	38	43	48	—	—	—	—
16	32	37	43	48	53	58	—	—	—	—
20	53	61	68	75	83	90	98	105	112	120
25	73	82	91	100	109	119	128	137	146	155
32	122	135	149	162	176	189	203	216	230	243
40	184	201	217	233	250	266	282	299	315	331
50	—	332	357	383	408	433	458	483	508	533
63	—	513	544	575	606	637	667	698	729	760
80	—	961	1010	1059	1109	1158	1207	1256	1305	1354
100	—	1490	1549	1608	1666	1725	1783	1842	1901	1959

Calculation Example: **JCDQL50-30**

- Basic weight ····· 433 (With auto switch magnet, ø50, 30 mm stroke)
- Foot bracket (2 pcs.) ··· 90 x 2

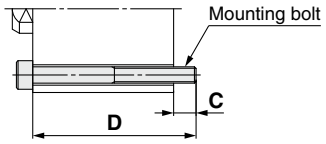
433 + (90 x 2) = **613 g**

Mounting Bolt for JCQ

Mounting method: Through-hole type mounting bolts are available. Refer to the following for ordering procedures. Order the actual number of bolts that will be used.

Example) CQ-M3 x 25L 4 pcs.

Material: Chromium molybdenum steel
Surface treatment: Zinc chromating



Without Magnet for Auto Switch

Cylinder model	C	D	Mounting bolt part no.
JCQ12-5	4	25	CQ-M3 x 25L
-10		30	x 30L
-15		35	x 35L
-20		40	x 40L
-25		45	x 45L
-30		50	x 50L
JCQ16-5	8	30	CQ-M3 x 30L
-10		35	x 35L
-15		40	x 40L
-20		45	x 45L
-25		50	x 50L
-30		55	x 55L
JCQ20-5	7.5	30	CQ-M3 x 30L
-10		35	x 35L
-15		40	x 40L
-20		45	x 45L
-25		50	x 50L
-30		55	x 55L
-35		60	x 60L
-40		65	x 65L
-45		70	x 70L
-50		75	x 75L
JCQ25-5	6	30	CQ-M3 x 30L
-10		35	x 35L
-15		40	x 40L
-20		45	x 45L
-25		50	x 50L
-30		55	x 55L
-35		60	x 60L
-40		65	x 65L
-45		70	x 70L
-50		75	x 75L

Cylinder model	C	D	Mounting bolt part no.
JCQ32-5	9	35	CQ-M4 x 35L
-10		40	x 40L
-15		45	x 45L
-20		50	x 50L
-25		55	x 55L
-30		60	x 60L
-35		65	x 65L
-40		70	x 70L
-45		75	x 75L
-50		80	x 80L
JCQ40-5	10	40	CQ-M4 x 40L
-10		45	x 45L
-15		50	x 50L
-20		55	x 55L
-25		60	x 60L
-30		65	x 65L
-35		70	x 70L
-40		75	x 75L
-45		80	x 80L
-50		85	x 85L
JCQ50-10	11	50	CQ-M5 x 50L
-15		55	x 55L
-20		60	x 60L
-25		65	x 65L
-30		70	x 70L
-35		75	x 75L
-40		80	x 80L
-45		85	x 85L
-50		90	x 90L

Cylinder model	C	D	Mounting bolt part no.
JCQ63-10	11.5	55	CQ-M5 x 55L
-15		60	x 60L
-20		65	x 65L
-25		70	x 70L
-30		75	x 75L
-35		80	x 80L
-40		85	x 85L
-45		90	x 90L
-50		95	x 95L
JCQ80-10	15	65	CQ-M8 x 65L
-15		70	x 70L
-20		75	x 75L
-25		80	x 80L
-30		85	x 85L
-35		90	x 90L
-40		95	x 95L
-45		100	x 100L
-50		105	x 105L
JCQ100-10	14	70	CQ-M8 x 70L
-15		75	x 75L
-20		80	x 80L
-25		85	x 85L
-30		90	x 90L
-35		95	x 95L
-40		100	x 100L
-45		105	x 105L
-50		110	x 110L

With Magnet for Auto Switch

Cylinder model	C	D	Mounting bolt part no.
JCDQ12-5	5.5	30	CQ-M3 x 30L
-10		35	x 35L
-15		40	x 40L
-20		45	x 45L
-25		50	x 50L
-30		55	x 55L
JCDQ16-5	9.5	35	CQ-M3 x 35L
-10		40	x 40L
-15		45	x 45L
-20		50	x 50L
-25		55	x 55L
-30		60	x 60L
JCDQ20-5	6	35	CQ-M3 x 35L
-10		40	x 40L
-15		45	x 45L
-20		50	x 50L
-25		55	x 55L
-30		60	x 60L
-35		65	x 65L
-40		70	x 70L
-45		75	x 75L
-50		80	x 80L
JCDQ25-5	4.5	35	CQ-M3 x 35L
-10		40	x 40L
-15		45	x 45L
-20		50	x 50L
-25		55	x 55L
-30		60	x 60L
-35		65	x 65L
-40		70	x 70L
-45		75	x 75L
-50		80	x 80L

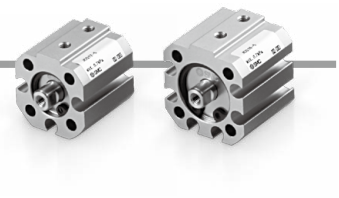
Cylinder model	C	D	Mounting bolt part no.
JCDQ32-5	7.5	40	CQ-M4 x 40L
-10		45	x 45L
-15		50	x 50L
-20		55	x 55L
-25		60	x 60L
-30		65	x 65L
-35		70	x 70L
-40		75	x 75L
-45		80	x 80L
-50		85	x 85L
JCDQ40-5	8.5	45	CQ-M4 x 45L
-10		50	x 50L
-15		55	x 55L
-20		60	x 60L
-25		65	x 65L
-30		70	x 70L
-35		75	x 75L
-40		80	x 80L
-45		85	x 85L
-50		90	x 90L
JCDQ50-10	10.5	55	CQ-M5 x 55L
-15		60	x 60L
-20		65	x 65L
-25		70	x 70L
-30		75	x 75L
-35		80	x 80L
-40		85	x 85L
-45		90	x 90L
-50		95	x 95L

Cylinder model	C	D	Mounting bolt part no.
JCDQ63-10	11.5	60	CQ-M5 x 60L
-15		65	x 65L
-20		70	x 70L
-25		75	x 75L
-30		80	x 80L
-35		85	x 85L
-40		90	x 90L
-45		95	x 95L
-50		100	x 100L
JCDQ80-10	14	70	CQ-M8 x 70L
-15		75	x 75L
-20		80	x 80L
-25		85	x 85L
-30		90	x 90L
-35		95	x 95L
-40		100	x 100L
-45		105	x 105L
-50		110	x 110L
JCDQ100-10	13	75	CQ-M8 x 75L
-15		80	x 80L
-20		85	x 85L
-25		90	x 90L
-30		95	x 95L
-35		100	x 100L
-40		105	x 105L
-45		110	x 110L
-50		115	x 115L

Bore Size

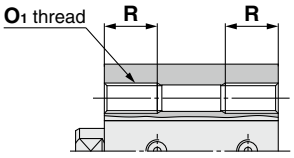
ø12, ø16

Standard (Through-hole): JCQ, JCDQ



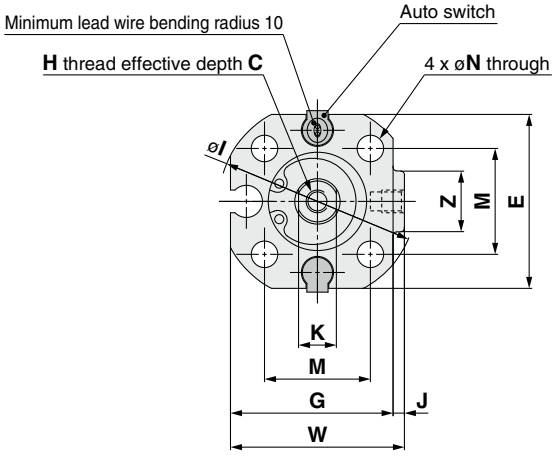
ø12

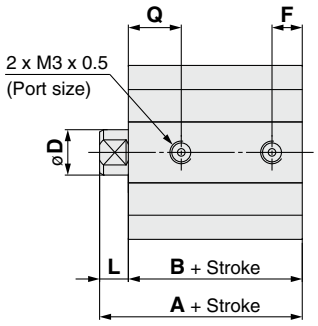
Both ends tapped: JCQA, JCDQA



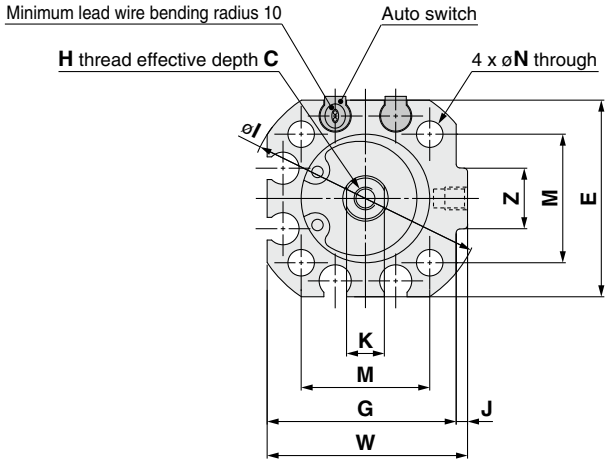
Both Ends Tapped [mm]

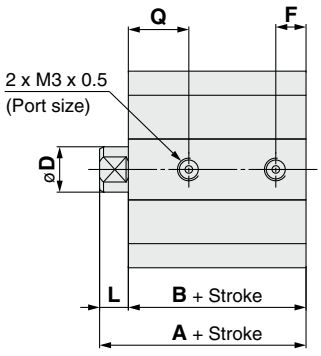
Bore size	O_1	R
12	M4 x 0.7	7
16	M4 x 0.7	7





ø16



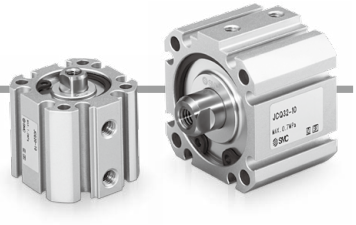


[mm]

Bore size	Stroke range	Without magnet for auto switch		With magnet for auto switch		C	D	E	F	G	H	I	J	K	L	M	N	Q	W	Z
		A	B	A	B															
12	5 to 30	19.5	16	23	19.5	6	6	23	4	21.5	M3 x 0.5	26	1.5	5	3.5	14	3.5	7	23	8
16	5 to 30	20.5	17	24	20.5	6	6	26	4	25	M3 x 0.5	31	1.5	5	3.5	17	3.5	8	26.5	8

Bore Size

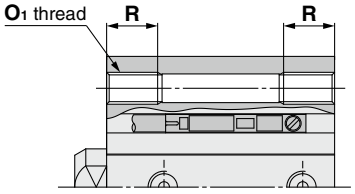
ø20 to ø40



Standard (Through-hole): JCQ, JCDQ

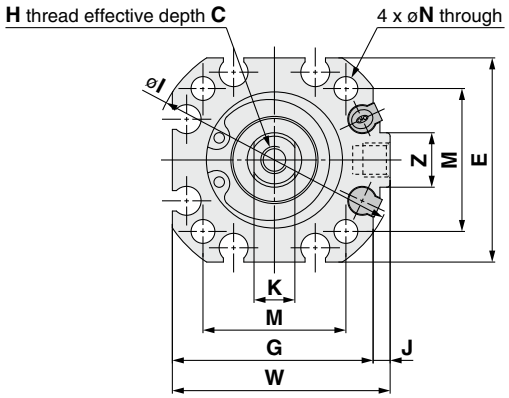
ø20

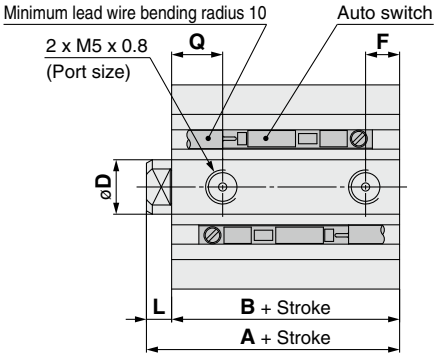
Both ends tapped: JCQA, JCDQA



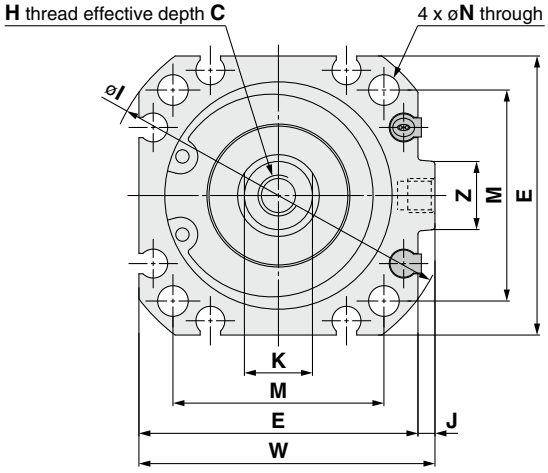
Both Ends Tapped [mm]

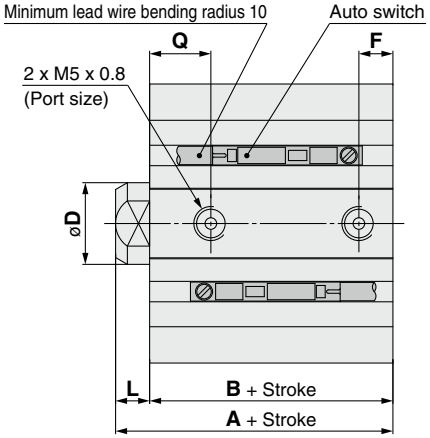
Bore size	O_1	R
20	M4 x 0.7	7
25	M4 x 0.7	7
32	M5 x 0.8	8
40	M5 x 0.8	8





ø25 to ø40





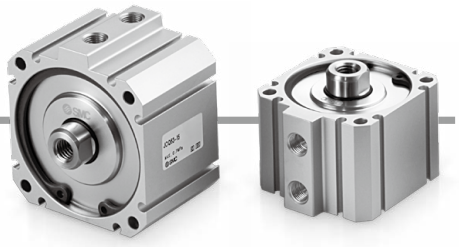
[mm]

Bore size	Stroke range	Without magnet for auto switch		With magnet for auto switch		C	D	E	F	G	H	I	J	K	L	M	N	Q	W	Z
		A	B	A	B															
20	5 to 50	21	17.5	27.5	24	8	8	30	5	29.5	M4 x 0.7	36	2.5	6	3.5	21	3.5	7.5	32	8
25	5 to 50	23.5	19	30	25.5	7	10	33.5	5	—	M5 x 0.8	40	2.5	8	4.5	24	3.5	8	36	8
32	5 to 50	26	21	32.5	27.5	12	12	41	5	—	M6 x 1.0	51	2.5	10	5	31	4.5	9	43.5	10
40	5 to 50	31	25	37.5	31.5	13	14	47	6	—	M8 x 1.25	60	3.5	12	6	37	4.5	11	50.5	10

Bore Size

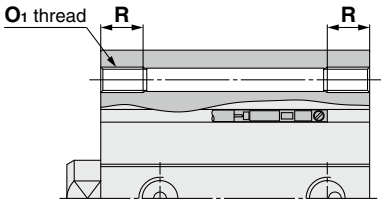
ø50 to ø100

Standard (Through-hole): JCQ, JCDQ



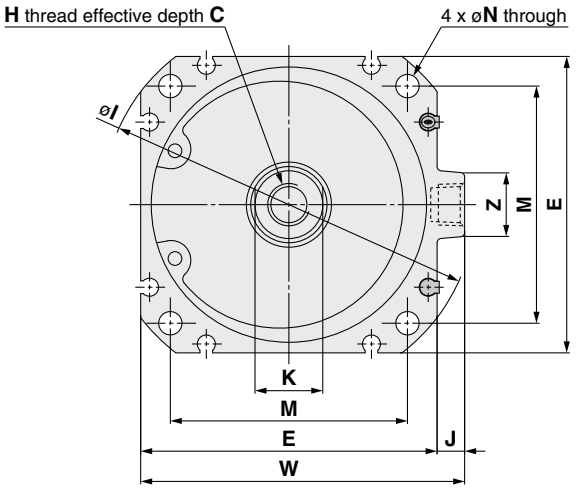
ø50 to ø80

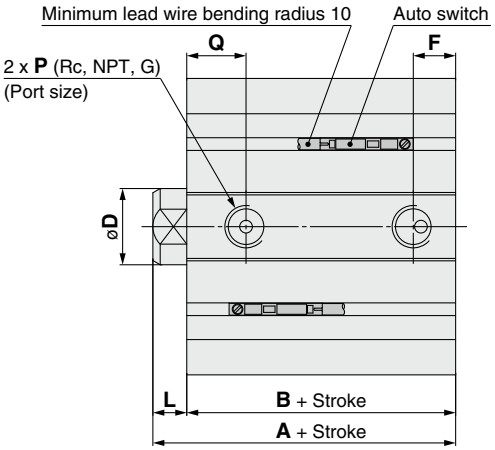
Both ends tapped: JCQA, JCDQA



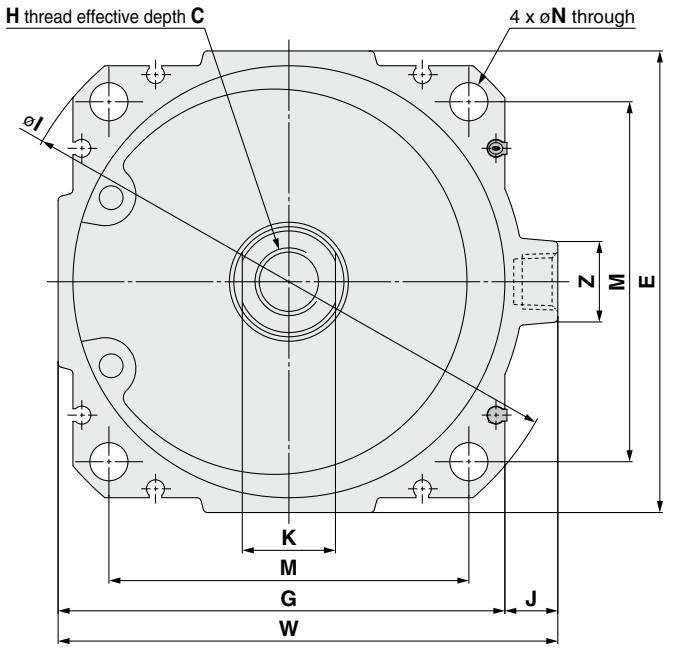
Both Ends Tapped [mm]

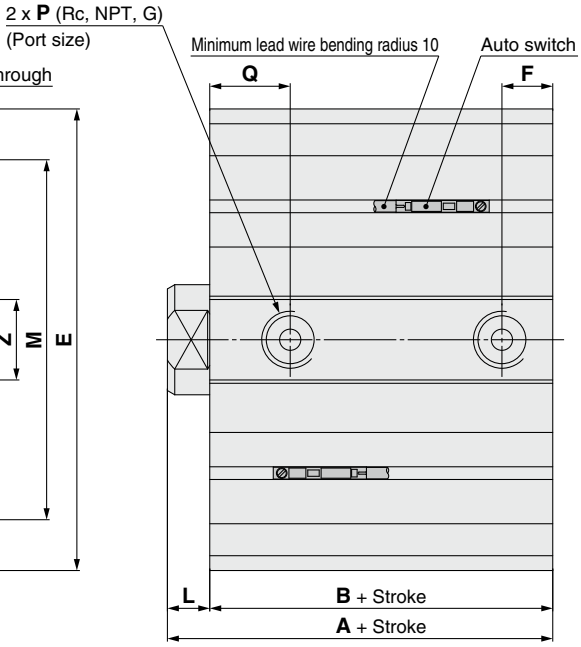
Bore size	O_1	R
50	M6 x 1.0	10
63	M6 x 1.0	10
80	M10 x 1.5	18
100	M10 x 1.5	18





ø100





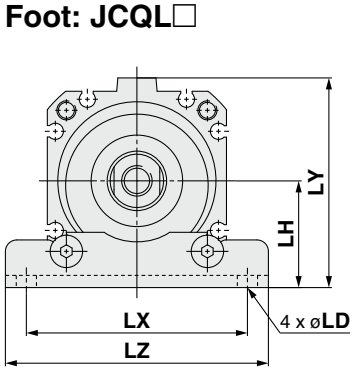
[mm]

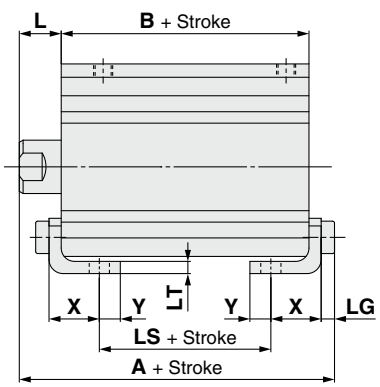
Bore size	Stroke range	Without magnet for auto switch		With magnet for auto switch		C	D	E	F	G	H	I	J	K	L	M	N	P	Q	W	Z
		A	B	A	B																
50	10 to 50	37	29	42.5	34.5	15	18	57	9	—	M10 x 1.5	74	6.5	16	8	46	5.5	1/8	13	63.5	15
63	10 to 50	41.5	33.5	46.5	38.5	15	18	70	10	—	M10 x 1.5	88	6.5	16	8	56	5.5	1/8	14	76.5	15
80	10 to 50	49	40	55	46	21	22	89	12	—	M14 x 2.0	113	9	19	9	70	9	1/4	14	98	19
100	10 to 50	56	46	62	52	21	26	109	12	105.5	M16 x 2.0	134	12.5	22	10	85	9	1/4	19	118	19

Dimensions

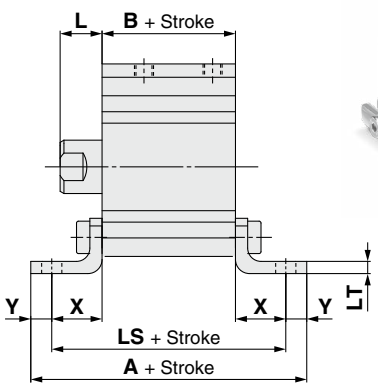
∗ For the cylinder for the foot type or the rod flange type mounting bracket, the cylinder rod protrusion dimensions (Dimensions L and L1) vary from those of the standard cylinder.
When ordering only the cylinder ⇨ Refer to the cylinder for the foot type or the rod flange type mounting bracket (-XC103) on page 14.

Foot: JCQL□





15 mm stroke or larger

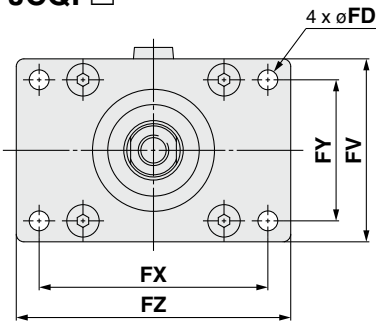


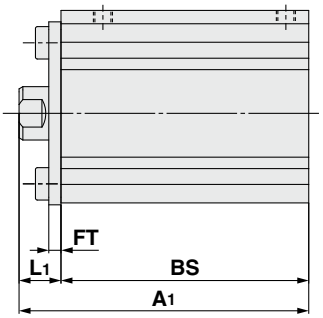
5 or 10 mm strokes

Bore size	Without auto switch						With auto switch						L	LD	LG	LH	LT	LX	LY	LZ	X	Y
	5 st or 10 st			15 st or larger			5 st or 10 st			15 st or larger												
	A	B	LS	A	B	LS	A	B	LS	A	B	LS										
32	57	21	44.4	37.7	21	4	63.5	27.5	50.9	44.2	27.5	10.5	10	5.5	3.5	26	3.2	52	49	64	11.7	6.3
40	60.4	25	49.4	42.7	25	7	66.9	31.5	55.9	49.2	31.5	13.5	11	5.5	3.5	29	3.2	58	56	69	12.2	5.5
50	71	29	57.4	49.2	29	7	76.5	34.5	62.9	54.7	34.5	12.5	13	6.5	4	36	3.2	75	71	90	14.2	6.8
63	79.5	33.5	64.5	55	33.5	11.5	84.5	38.5	69.5	60	38.5	16.5	13	6.5	4	42	4.5	86	84	100	15.5	7.5
80	97	40	77	64.5	40	12	103	46	83	70.5	46	18	14	9	6	54	4.5	114	107.5	136	18.5	10
100	110	46	87	71.5	46	14	116	52	93	77.5	52	20	15	11	6	64	4.5	138	127.5	160	20.5	11.5

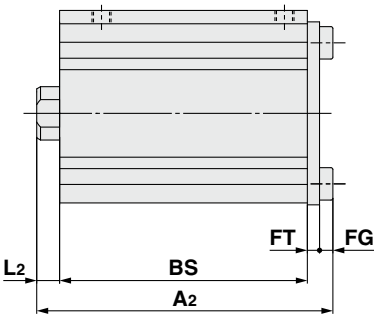
∗ Min. applicable stroke: ø32 and ø40···5 mm stroke, ø50 to ø100···10 mm stroke

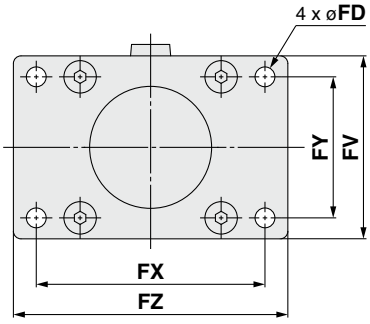
Rod flange: JCQF□





Head flange: JCQG□





BS indicates the overall length of the cylinder tube to be used.

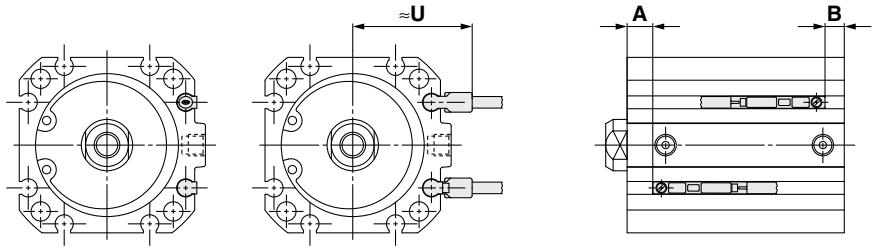
Bore size	Rod flange		Head flange			FD	FT	FV	FX	FY	FZ
	A1	L1	A2	L2	FG						
32	BS + 10	10	BS + 11.7	(5)	3.5	5.5	3.2	42	54	31	65
40	BS + 11	11	BS + 12.7	(6)	3.5	5.5	3.2	48	60	37	72
50	BS + 13	13	BS + 15.2	(8)	4	6.5	3.2	60	74	46	89
63	BS + 13	13	BS + 16.5	(8)	4	6.5	4.5	70	85	55	100
80	BS + 14	14	BS + 19.5	(9)	6	9	4.5	90	108	70	127
100	BS + 15	15	BS + 21	(10)	6	11	5	110	133	87	154

∗ The dimensions in ( ) are the same as those of the standard type.

Auto Switch Mounting

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

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



Auto Switch Proper Mounting Position [mm]

Auto switch model / Bore size	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV	
	A	**B**
12	5	2.5
16	5.5	3
20	6	6
25	6	7.5
32	8	8
40	11	9
50	11.5	11
63	13.5	13.5
80	16.5	18
100	19.5	21

Auto Switch Mounting Height [mm]

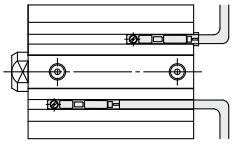
Auto switch model / Bore size	D-M9□V
	U
12	19.5
16	21
20	23
25	24.5
32	28.5
40	31.5
50	36.5
63	43
80	52.5
100	59

Minimum Stroke for Auto Switch Mounting

[mm]

Number of auto switches	D-M9□V	D-M9□WV D-M9□AV	D-M9□	D-M9□W D-M9□A
1	5	10	15 (5)	15 (10)
2	5	15	15 (5)	15

∗ The dimension stated in ( ) shows the minimum stroke for the auto switch mounting when the auto switch does not project from the end surface of the cylinder body and hinder the lead wire bending space. (Refer to the figure below.) The auto switch needs to be ordered separately.



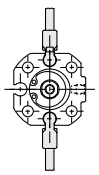
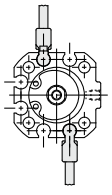
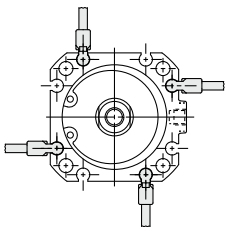
Operating Range

[mm]

Auto switch model	Bore size									
	12	**16**	**20**	**25**	**32**	**40**	**50**	**63**	**80**	**100**
D-M9□(V) D-M9□W(V) D-M9□A(V)∗1	3	3	4.5	4.5	4	4.5	5.5	6	6	6.5

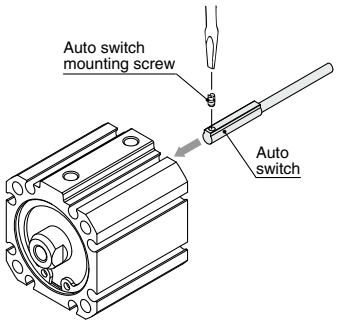
∗1 Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting

Applicable auto switch	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV		
Bore size [mm]	**ø12**	**ø16**	**ø20 to ø100**
Surfaces with auto switch mounting slot			

∗ Auto switch mounting bracket and auto switch are enclosed with the cylinder for shipment. For an environment that needs the water resistant auto switch, select the D-M9□A(V) type.

Mounting of auto switch



• When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter.

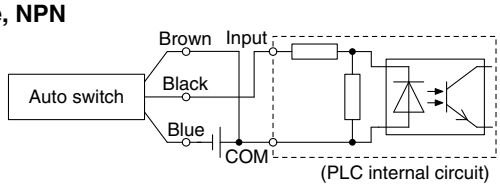
Tightening Torque for Auto Switch Mounting Screw [N·m]

Auto switch model	Tightening torque
D-M9□(V) D-M9□W(V)	0.05 to 0.15
D-M9□A(V)	0.05 to 0.10

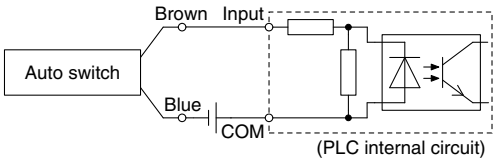
Prior to Use
Auto Switch Connections and Examples

Sink Input Specifications

3-wire, NPN

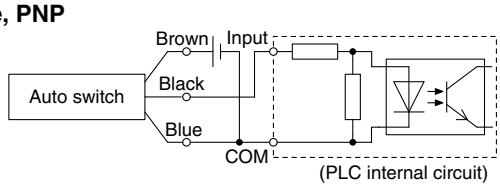


2-wire

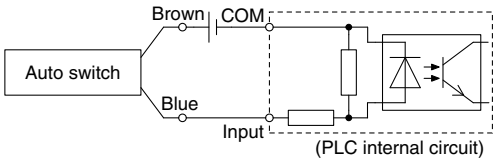


Source Input Specifications

3-wire, PNP



2-wire



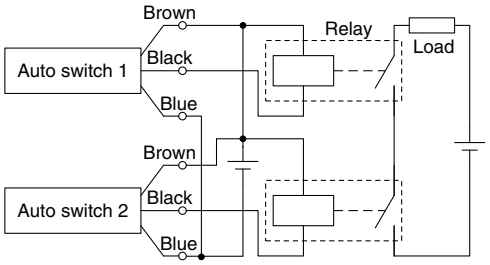
Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

Examples of AND (Series) and OR (Parallel) Connections

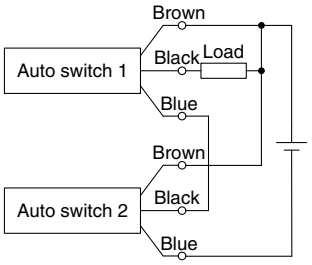
* When using solid state auto switches, ensure the application is set up so the signals for the first 50 ms are invalid. Depending on the operating environment, the product may not operate properly.

3-wire AND connection for NPN output

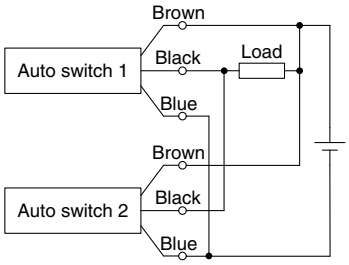
(Using relays)



(Performed with auto switches only)

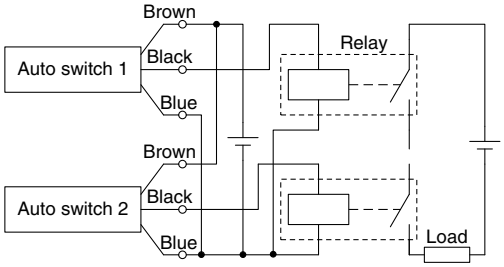


3-wire OR connection for NPN output

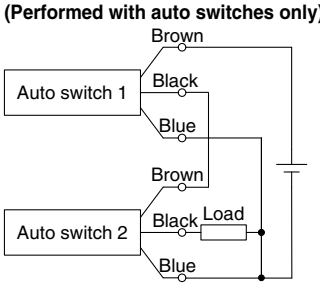


3-wire AND connection for PNP output

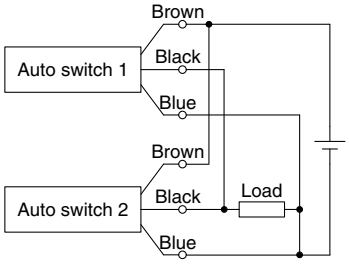
(Using relays)



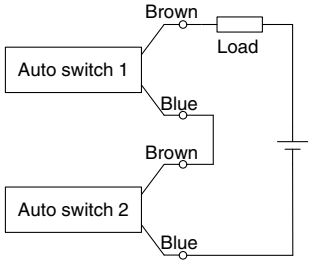
(Performed with auto switches only)



3-wire OR connection for PNP output



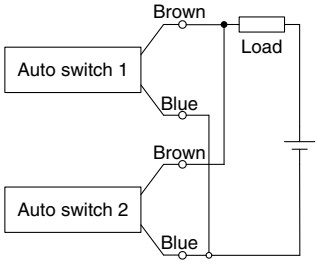
2-wire AND connection



When two auto 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 when both of the auto switches are in the ON state.
Auto switches with a load voltage less than 20 V cannot be used. Please contact SMC if using AND connection for a heat-resistant solid state auto switch or a trimmer switch.

Example) Load voltage at ON
Power supply voltage: 24 VDC
Internal voltage drop: 4 V
Load voltage at ON = Power supply voltage – Internal voltage drop x 2 pcs.
= 24 V – 4 V x 2 pcs.
= 16 V

2-wire OR connection



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

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

Example) Load voltage at OFF
Leakage current: 1 mA
Load impedance: 3 kΩ
Load voltage at OFF = Leakage current x 2 pcs. x Load impedance
= 1 mA x 2 pcs. x 3 kΩ
= 6 V

Made to Order

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

Made to Order

Symbol

1 Cylinder for the Foot Type or the Rod Flange Type Mounting Bracket -XC103

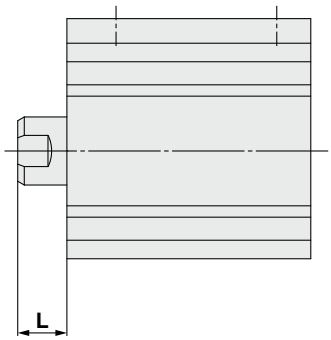
For cylinders with a foot type or a rod flange type mounting bracket (The rod end length is 5 mm longer than that of the standard model.)

How to Order

JC(D)QA | **Standard model no.** | **– XC103**

Cylinder for the foot type or the rod flange type mounting bracket

Dimensions



Bore size	L
32	10
40	11
50	13
63	13
80	14
100	15

Dimensions other than those above are the same as those of the standard model.

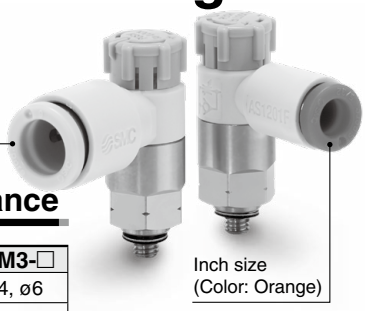
Related Product

Specialized for JCQ ø12, ø16

RoHS

Speed Controller with One-touch Fitting

Elbow Type for M3 AS12□1F-M3-□A-X790



⚠ Caution

Refer to Specific Product Precautions 2 on page 17 before use.

Specifications

Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Ambient and fluid temperatures	−5 to 60°C (No freezing)
Applicable tubing material	Nylon, Soft nylon, Polyurethane*1, FEP, PFA

*1 Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the **Web Catalog** for details.)

Flow Rate and Sonic Conductance

Model		AS12□1F-M3-□
Tubing O.D.	Metric size	ø2, ø3.2, ø4, ø6
C values: Sonic conductance dm³/(s·bar)	Free flow	0.07
	Controlled flow	0.07
b values: Critical pressure ratio	Free flow	0.3
	Controlled flow	0.2

* C and b values are for controlled flow with the needle fully open and free flow with the needle fully closed.

How to Order

AS 1 2 0 1 F − M3 − 06 A − X790

Body size
1	M3 x 0.5

Type
2	Elbow

Control type*1
0	Meter-out
1	Meter-in

*1 Meter-out and meter-in types can be visually identified by the color of the knob.
Meter-out: Gray
Meter-in: Light blue

Port size
M3	M3 x 0.5

Push-lock type

Applicable tubing O.D.

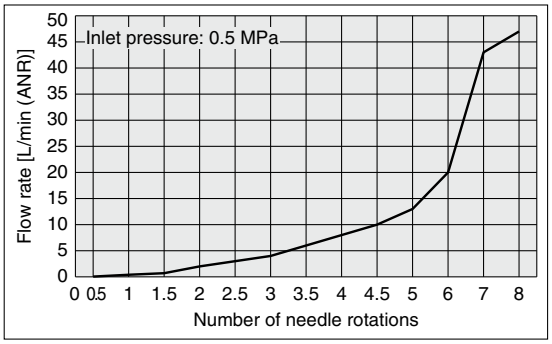
Metric size*1
02	ø2*3
23	ø3.2*2
04	ø4
06	ø6

Inch size*1
01	ø1/8"
03	ø5/32"

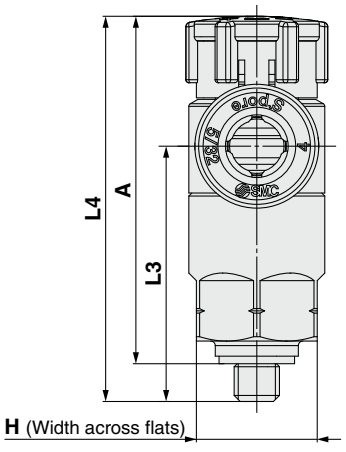
*1 Metric size: Light gray
Inch size: Orange
*2 Use ø1/8" tubing.
*3 Only polyurethane tubing is applicable for ø2.

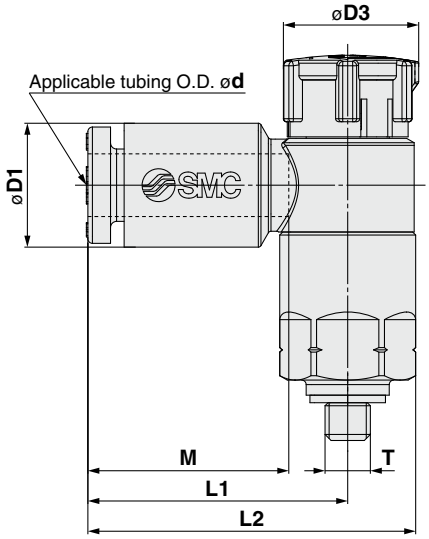
Needle Valve/Flow Rate Characteristics

AS1201F-M3-□



Dimensions





Metric Size/Inch Size

[mm]

Model	d	T	H	D1	D3	L1	L2	L3	L4*1 Unlocked	L4*1 Locked	A*2 Unlocked	A*2 Locked	M	Weight [g]
AS12□1F-M3-02A-X790	2	M3 x 0.5	8	5.8	9.4	15.8	20.3	16.9	26.5	25.4	23.5	22.4	11.9	5
AS12□1F-M3-23A-X790	3.2			7.2		17.2	21.7						13.3	
AS12□1F-M3-04A-X790	4			8.2										6
AS12□1F-M3-06A-X790	6			10.4		18.6	23.1	16.5						
AS12□1F-M3-01A-X790	1/8"			7.2		17.2	21.7	16.9						5
AS12□1F-M3-03A-X790	5/32"			8.2										

*1 Reference dimensions
*2 Reference dimensions of threads after installation