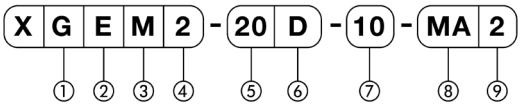
X Series

Compact Air Cylinder/Standard type
∅10, ∅16, ∅20, ∅25, ∅32, ∅40, ∅50, ∅63, ∅80, ∅100

Ordering Instructions



① Magnet
C: No magnet(without switch available)
G: Cylinder with switch available
with built-in magnet

② Mounting holes
No symbol : Through holes(Standard)
E : Female thread

③ Piston rod end spec.
No symbol : Female threaded
M : Male threaded

④ Action
2: Double-acting
1: Single-acting(Spring return)
0: Single-acting(Spring extend)

⑤ Bore(mm)
10 : ∅ 10 40 : ∅ 40
16 : ∅ 16 50 : ∅ 50
20 : ∅ 20 63 : ∅ 63
25 : ∅ 25 80 : ∅ 80
32 : ∅ 32 100 : ∅ 100

⑥ Damper
No symbol : No damper
D : Built-in damper

⑦ Stroke(mm)
Refer to Standard Strokes

⑧ Type of switch

No symbol	No switch	
MA	MA-1 (AC110V, DC24V)	M type reed switch
MB	MD-1 (DC24V)	
MC	MD-3 (DC5, 6V)	
MD	MR (AC, DC5~110V)	
ME	MA-2L (AC110V)	
MF	MA-2H (AC220V)	
MG	MT-3 (DC5~30V)	M type proximity switch
MH	MT-3U (DC5~30V)	
MJ	MT-2 (DC24V)	
MK	MT-2U (DC24V)	

⑨ Number of switch
No symbol : No switch
2 : with 2 units
1 : with 1 unit

Model No. of Switch Mounting Bracket

Bore(mm)	M type switch
∅10	X10-MJ
∅16	X16-MJ
∅20, ∅25, ∅32, ∅40,∅50	X20-MJ
∅63, ∅80, ∅100	K63-MJ

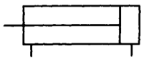
Model No. of Packing Kit

Bore(mm)	Packing Kit
∅10	X10-PS
∅16	X16-PS
∅20	X20-PS
∅25	X25-PS
∅32	X32-PS
∅40	X40-PS
∅50	X50-PS
∅63	X63-PS
∅80	X80-PS
∅100	X100-PS

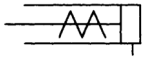
Specifications

Action	Unit		Double-acting	Single-acting
Fluid			Non-lubricated air (Lubricated air)	
Pressure range	∅10~ ∅50	MPa (kgf/cm^2)	0.1~0.7 (1.0~7.1)	0.25~0.7 (2.6~7.1)
	∅63~ ∅100		0.05~0.7 (0.5~7.1)	0.2~0.7 (2.0~7.1)
Temperature range	℃		5~60	
Piston speed range	mm/s		50~500	
Cushion			unavailable	
Piston stroke allowance	mm		+1.0 0	
Mounting			basic	

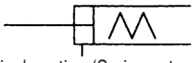
JIS Label



Double acting



Single acting (Spring return)



Single acting (Spring extend)

Value shown in this catalog is shown in SI unit. However, value within this output table is in generic unit. Use the following formula to convert to SI unit：

Pressure Y(MPa) = X(kgf/cm^2)×9.80665×10^{-2}
Force Y(N) = X(kgf)×9.80665

Standard Stroke

(Unit: mm)

Action	Bore	Standard Stroke	Max. Stroke
Double-acting	∅10	5, 10	30 (25)
	∅16		
	∅20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	100 (95)
	∅25		
	∅32		
	∅40		
	∅50		150 (140)
	∅63	10, 25, 30, 40, 50	
	∅80		
	∅100		
Single-acting	∅10	5, 10	20 (15)
	∅16		
	∅20		50 (45)
	∅25		
	∅32		
	∅40		
	∅50	5, 10, 15, 20	

Note: Value within bracket is the maximum stroke with damper

Theoretical output

Double acting

(Unit: mm)

Bore	Direction of rod	Operating pressure(kgf/cm²)		
		3	5	7
∅10	Out stroke	2.3	3.9	5.4
	In stroke	1.7	2.9	4.1
∅16	Out stroke	6	10	14
	In stroke	5	8.5	12
∅20	Out stroke	9	15	21
	In stroke	7	13	18
∅25	Out stroke	14	24	24
	In stroke	12	20	28
∅32	Out stroke	24	40	56
	In stroke	20	34	48
∅40	Out stroke	37	62	87
	In stroke	31	52	73
∅50	Out stroke	58	98	137
	In stroke	49	82	115
∅63	Out stroke	93	155	218
	In stroke	84	140	196
∅80	Out stroke	150	251	351
	In stroke	136	226	317
∅100	Out stroke	235	392	549
	In stroke	214	357	500

Note: Effective output = Theoretical output x 0.85

Single acting(Spring return)

(Unit: mm)

Bore (mm)	Direction of rod	Operating pressure(kgf/cm²)		
		3	5	7
∅10	Out stroke	1.4	2.9	4.5
∅16		5	9	13
∅20		7	13	19
∅25		11.5	21.5	31.5
∅32		18.5	34.5	50.5
∅40		29	54	79
∅50		45	85	124

Single acting(Spring extend)

(Unit: mm)

Bore (mm)	Direction of rod	Operating pressure(kgf/cm²)		
		3	5	7
∅10	In stroke	0.9	2.1	3.3
∅16		4	7.5	11
∅20		5	11	16
∅25		9.5	17.5	25.5
∅32		14.5	28.5	42.5
∅40		23	44	65
∅50		36	69	102

Note: The output of single acting cylinder is calculated by subtracting the spring tension.

Model With Switch

M Type Reed Switch

Lead With Wire

Model No.	Rated voltage(V)	Rated current range(mA)	Pilot lamp (Lights up at ON)	Application
MA-1	AC110	5~45	○	Relay PLC
	DC24	5~45		
MD-1	DC24	25~65	○	Relay
MD-3	DC5,6	Max.50(Inductive load) Max.300(Resistive load)	○	IC circuit
MR	AC DC 5~110	Max.50(Inductive load) Max.300(Resistive load)		Relay PLC
MA-2L	AC110	5~150	○	Relay
MA-2H	AC220	5~150	○	Relay

Note: The MA-2L is the same as the MA-1 except that MA-2L is also equipped with protective circuit SS-2L.
The MA-2H is the same as the MA-1 except that MA-2H is also equipped with protective circuit SS-2H.

M Type Proximity Switch

Lead With Wire

Model No.	Rated voltage (V)	Rated current range(mA)	Pilot lamp (Lights up at ON)	Application
MT-2 MT-2U	DC24 (DC10~30)	5~100	○	Relay PLC
MT-3 MT-3U	DC5~30	5~200	○	Relay PLC IC circuit

Minimum Stroke with M Type Switch

(Unit: mm)

Bore	Number of switchs	
	With 2 units	With 1 unit
∅10	10	5
∅16		
∅20		
∅25		
∅32		
∅40		
∅50		
∅63		
∅80		
∅100		

Cylinder Mass

Double acting

(Unit: g)

Bore (mm)	Stroke(mm)									
	5	10	15	20	25	30	35	40	45	50
∅10	28	35	–	–	–	–	–	–	–	–
∅16	48	56	–	–	–	–	–	–	–	–
∅20	80	93	105	117	130	142	155	167	180	192
∅25	113	129	146	162	179	195	212	228	245	261
∅32	180	205	230	250	275	295	320	345	370	390
∅40	280	310	340	370	400	430	460	490	520	550
∅50	460	500	540	580	625	670	710	750	795	840
∅63	–	900	–	1000	–	1100	–	1200	–	1300
∅80	–	1700	–	1900	–	2100	–	2300	–	2500
∅100	–	2500	–	2750	–	3000	–	3250	–	3500

Single acting(Spring return)

(Unit: g)

Bore (mm)	Stroke(mm)			
	5	10	15	20
∅10	28	35	–	–
∅16	48	56	–	–
∅20	83	96	–	–
∅25	118	134	–	–
∅32	180	205	–	–
∅40	285	315	–	–
∅50	440	480	525	570

Single acting(Spring extend)

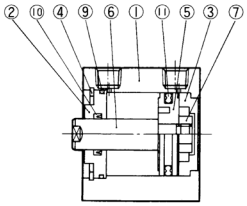
(Unit: g)

Bore (mm)	Stroke(mm)			
	5	10	15	20
∅10	28	34	–	–
∅16	48	56	–	–
∅20	82	95	–	–
∅25	115	131	–	–
∅32	185	210	–	–
∅40	285	315	–	–
∅50	460	500	545	590

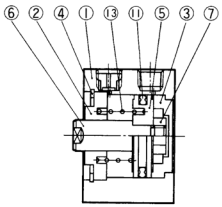
Mounting screw

1. When mounting the compact cylinder with switch XG ※※-10, please use special screws(SUS) M3.
2. For others, simply use standard mounting screws.

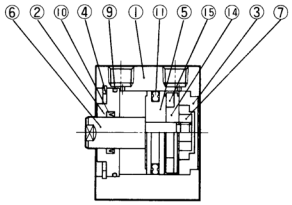
Double-acting ϕ 10 ~ ϕ 50



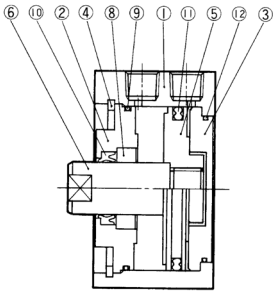
Single-acting(spring extend)



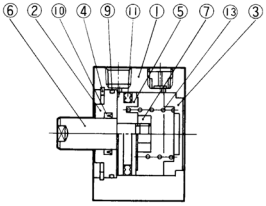
With switch



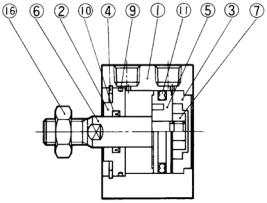
Double-acting ϕ 63 ~ ϕ 100



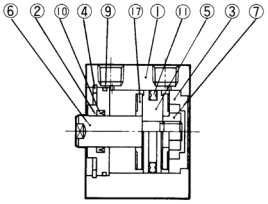
Single-acting(spring extend)



Outer threaded shaft



Built-in gasket



List of Parts

No.	Name	No.	Name	No.	Name
1	Body	7	Lock nut	13	Return spring
2	Bushing	8	Bearing	14	Magnet holder
3	End cover	9	Bushing gasket	15	Magnet
4	C clip	10	Rod packing	16	Rod end nut
5	Piston	11	Piston packing	17	Damper
6	Piston rod	12	End cover gasket		

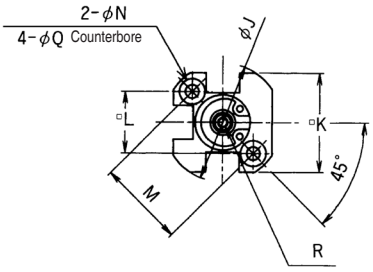
Packing List

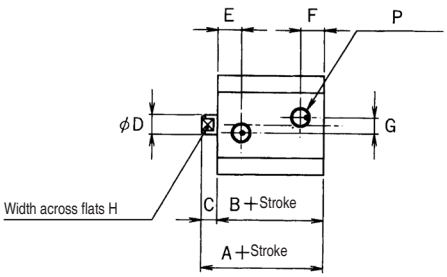
No.	Name	Bore(mm)									
		∅ 10	∅ 16	∅ 20	∅ 25	∅ 32	∅ 40	∅ 50	∅ 63	∅ 80	∅ 100
1	Bushing gasket	SO-013-7	IN-15	IN-18	SO-015-25	SO-015-29	KG-40	KG-50	IN-56	IN-75	IN-95
2	Rod packing	MYN-5	MYN-6	MYN-8	MYN-10A	MYN-12	MYN-16	MYN-20	PDU-20	PDU-25	PDU-30
3	Piston packing	PSD-10	PSD-16	PSD-20	PSD-25	PSD-32	PSD-40	PSD-50	PSD-63	PSD-80	PSD-100
4	End cover gasket	–	–	–	–	–	–	–	AS568-033	AS568-038	AS568-043

Note: Seal repair and assembly kits are also available for purchase.

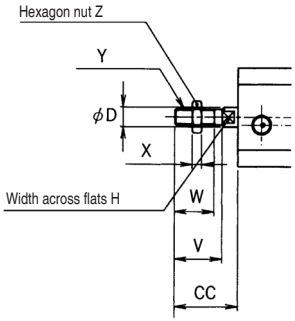
Double-acting ∅10, ∅16 / X□2

(Unit: mm)





Male threaded rod end



Damper

For damper, please add 5mm each to dimensions A and B.

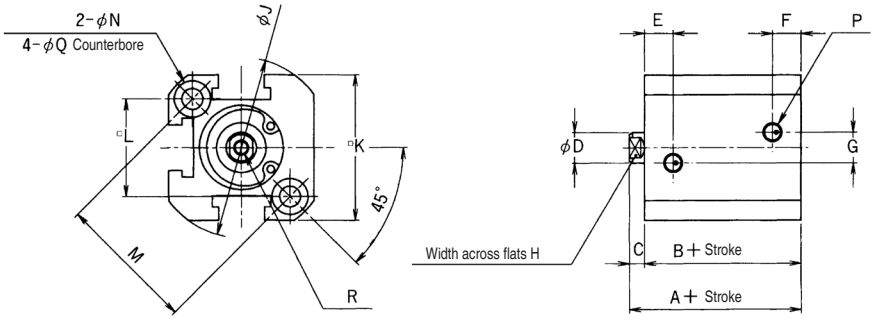
Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
∅10	21 31	17 27	4	5	6	6	4	4	30	25	15.6	22	3.4	M5×0.8	6.5 depth 4
∅16	22.5 32.5	18.5 28.5	4	6	6.5	6.5	6	5	38	30	20	28.3	3.4	M5×0.8	6.5 depth 4

Model No.	R	CC	V	W	X	Y	Z
∅10	M2.6×0.45 depth 5	16	12	10	2.4	M4×0.7	7
∅16	M3×0.5 depth 5	16	12	10	2.4	M4×0.7	7

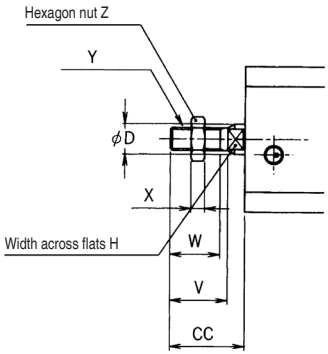
- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
- Non-standard stroke: For over standard stroke range, please follow the 5mm unit.
- 5mm stroke with magnet: The same size as 10mm stroke length.

Double-acting ∅20, ∅25, ∅32 / X□2

(Unit: mm)



Male threaded rod end



Damper

For damper, please add 5mm each to dimensions A and B.

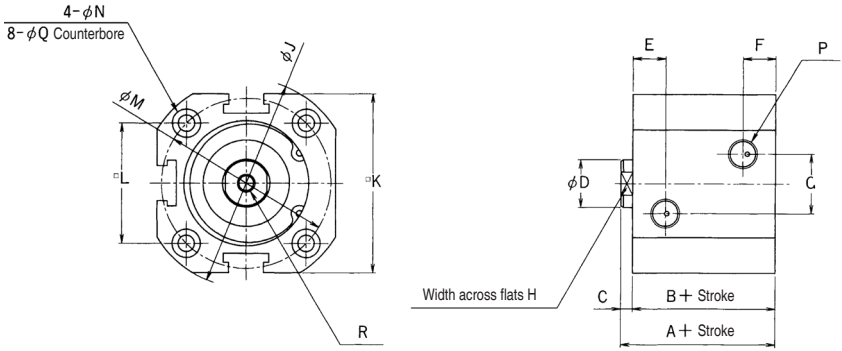
Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
∅20	25 30	21 26	4	8	7.5	7.5	8	6	47	38	25.5	36	5.5	M5×0.8	9.5 depth 5.5
∅25	26.5 31.5	22.5 27.5	4	10	8	8	8	8	52	43	28	39.6	5.5	M5×0.8	9.5 depth 5.5
∅32	29 34	25 30	4	12	9.5	9.5	15	10	60	51	34	48	5.5	Rc(PT)⅛	9.5 depth 5.5

Model No.	R	CC	V	W	X	Y	Z
∅20	M4×0.7 depth 6	19.5	15	13	3.6	M6×1	10
∅25	M5×0.8 depth 10	21	16	14	5	M8×1.25	13
∅32	M6×1 depth 11	22.5	17	15	6	M10×1.25	17

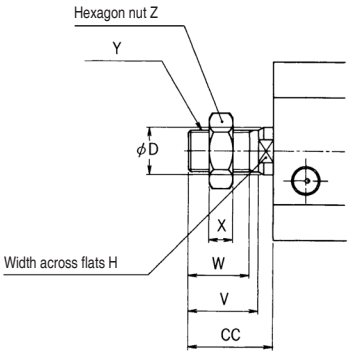
- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
  Please add 1mm to A and B size for the cynlider without magnet and the stroke upper than 60mm or with magnet the 55mm stroke.
- Non-standard stroke: For over standard stroke range, please follow the 5mm unit.
- 5mm stroke with magnet: The same size as 10mm stroke length.

Double-acting ∅40, ∅50 /X□2

(Unit: mm)



Male threaded rod end



Damper

For damper, please add 5mm each to dimensions A and B.

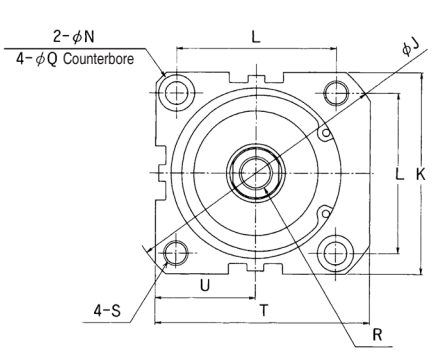
Model No.	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
∅40	32 37	28 33	4	16	11	11	20	14	70	60	40.3	57	5.5	Rc(PT)⅛	9.5 depth 5.5
∅50	34 39	30 35	4	20	11.5	11.5	20	16	80	70	47.4	67	6.6	Rc(PT)⅛	11 depth 6.5

Model No.	R	CC	V	W	X	Y	Z
∅40	M6×1 depth 11	28.5	23.5	20.5	8	M14×1.5	22
∅50	M8×1.25 depth 13	33.5	28.5	26	11	M18×1.5	27

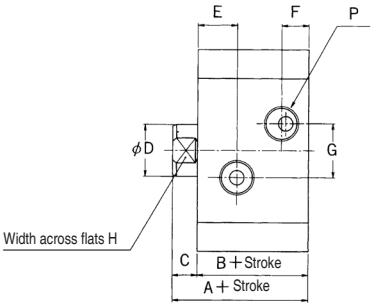
- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
  Please add 1mm to A and B size for the cynlider without magnet and the stroke upper than 60mm or with magnet the 55mm stroke.
- Non-standard stroke: For over standard stroke range, please follow the 5mm unit.
- 5mm stroke with magnet: The same size as 10mm stroke length.

Double-acting ∅63, ∅80, ∅100 /X□2

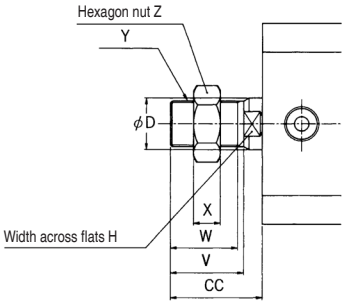
(Unit: mm)



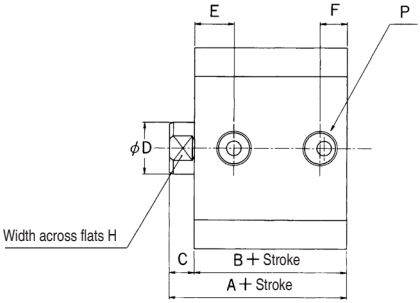
10mm stroke



Male threaded rod end



Upper than 20mm stroke



Damper

For damper, please add 5mm each to dimensions A and B.

Model No.	A	B	C	D	E	F	G	H	J	K	L	N	P	Q
∅63	46 56	36 46	10	20	18	11	20	17	102	76	60	9	Rc(PT)¼	14 depth 9
∅80	55.5 65.5	43.5 53.5	12	25	19	13	26	22	130	97	77	11	Rc(PT)⅜	17.5 depth 11
∅100	67 77	53 63	14	30	24.5	13	26	27	154	115	94	11	Rc(PT)⅜	17.5 depth 11

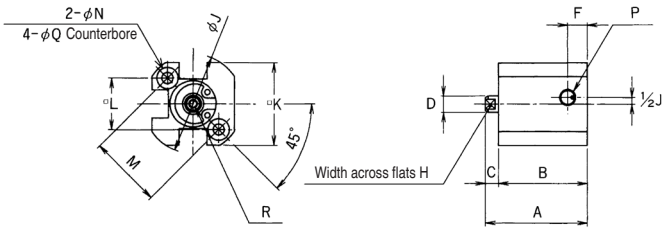
Model No.	R	S	T	U	CC	V	W	X	Y	Z
∅63	M10×1.5 depth 15	M10×1.5 depth 15	83	38	36	28.5	26	11	M18×1.5	27
∅80	M16×2 depth 21	M12×1.75 depth 20	103.5	48.5	44.5	35.5	32.5	13	M22×1.5	32
∅100	M20×2.5 depth 27	M14×2 depth 20	122.5	57.5	46.5	35.5	32.5	16	M26×1.5	41

- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
  Please add 1mm to A and B size for the cynlider without magnet and the stroke upper than 70mm or with magnet the 60mm stroke.
- Non-standard stroke: For over standard stroke range, please follow the 10mm unit.
- 10mm stroke with magnet: The same size as 20mm stroke length.

Single-acting ∅10, ∅16

(Unit: mm)

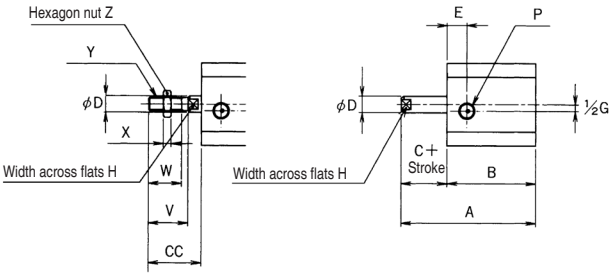
Single acting(spring return) / X□1



Bore		A	B
∅10	5st	26 41	22 37
	10st	31 41	27 37
∅16	5st	27.5 42.5	23.5 38.5
	10st	32.5 42.5	28.5 38.5

Male threaded rod end

Single acting(spring extend) / X□0



Bore		A	B
∅10	5st	26 + Stroke 41 + Stroke	22 37
	10st	31 + Stroke 41 + Stroke	27 37
∅16	5st	27.5 + Stroke 42.5 + Stroke	23.5 38.5
	10st	32.5 + Stroke 42.5 + Stroke	28.5 38.5

Damper

For damper, please add 5mm each to dimensions A and B.

Model No.	C	D	E	F	G	H	J	K	L	M	N	P	Q
∅10	4	5	6	6	4	4	30	25	15.6	22	3.4	M5×0.8	6.5 depth 4
∅16	4	6	6.5	6.5	6	5	38	30	20	28.3	3.4	M5×0.8	6.5 depth 4

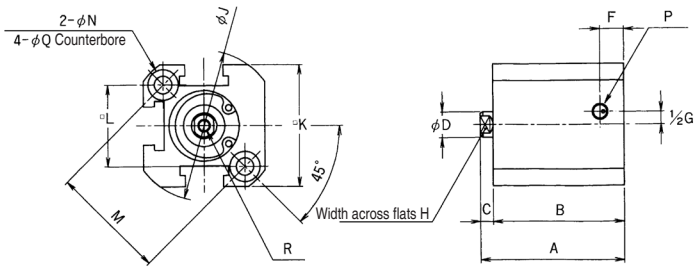
Model No.	R	CC	V	W	X	Y	Z
∅10	M2.6×0.45 depth 5	16	12	10	2.4	M4×0.7	7
∅16	M3×0.5 depth 5	16	12	10	2.4	M4×0.7	7

- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
- Non-standard stroke: For over standard stroke range, consult FONTAL first to avoid malfunciton

Single-acting ∅20, ∅25, ∅32

(Unit: mm)

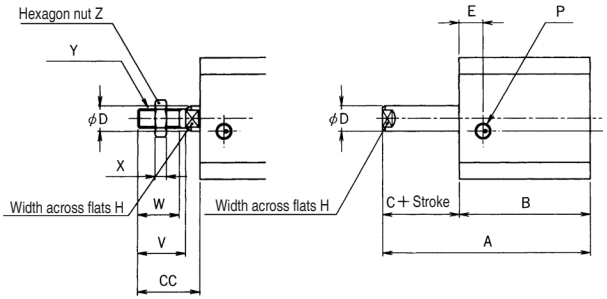
Single acting(spring return) / X□1



Bore		A	B
∅20	5st	30 40	26 36
	10st	35 40	31 36
∅25	5st	31.5 41.5	27.5 37.5
	10st	36.5 41.5	32.5 37.5
∅32	5st	34 44	30 40
	10st	39 44	35 40

Male threaded rod end

Single acting(spring extend) X□0



Bore		A	B
∅20	5st	30 + Stroke 40 + Stroke	26 36
	10st	35 + Stroke 40 + Stroke	31 36
∅25	5st	31.5 + Stroke 41.5 + Stroke	27.5 37.5
	10st	36.5 + Stroke 41.5 + Stroke	32.5 37.5
∅32	5st	34 + Stroke 44 + Stroke	30 40
	10st	39 + Stroke 44 + Stroke	35 40

Damper

For damper, please add 5mm each to dimensions A and B.

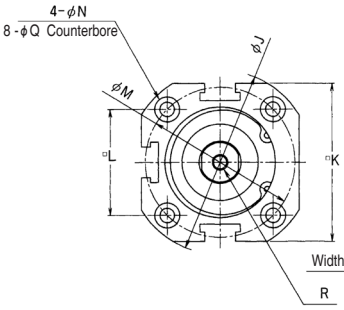
Model No.	C	D	E	F	G	H	J	K	L	M	N	P	Q
∅20	4	8	7.5	7.5	8	6	47	38	25.5	36	5.5	M5×0.8	9.5 depth 5.5
∅25	4	10	8	8	8	8	52	43	28	39.6	5.5	M5×0.8	9.5 depth 5.5
∅32	4	12	9.5	9.5	15	10	60	51	34	48	5.5	Rc(PT)⅛	9.5 depth 5.5

Model No.	R	CC	V	W	X	Y	Z
∅20	M4×0.7 depth 6	19.5	15	13	3.6	M6×1	10
∅25	M5×0.8 depth 10	21	16	14	5	M8×1.25	13
∅32	M6×1 depth 11	22.5	17	15	6	M10×1.25	17

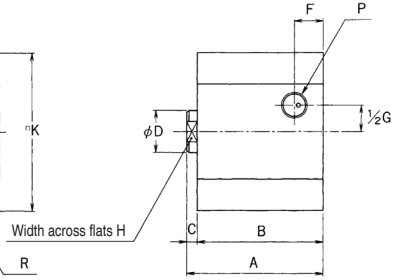
- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
- Non-standard stroke: For over standard stroke range, consult FONTAL first to avoid malfunciton

Single-acting ∅40, ∅50

(Unit: mm)

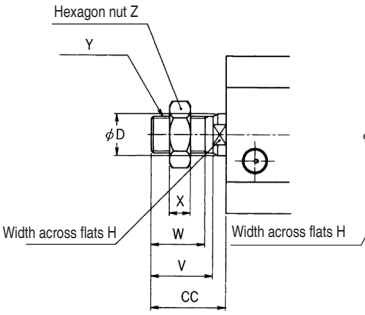


Single acting(spring return) / X□1

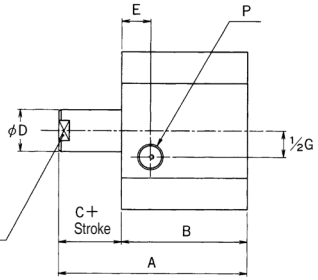


Bore		A	B
∅40	5st	37 47	33 43
	10st	42 47	38 43
∅50	5st	39 49	35 45
	10st	44 49	40 45
	15st	49 54	45 50
	20st	54 59	50 55

Male threaded rod end



Single acting(spring extend) / X□0



Bore		A	B
∅40	5st	37 + Stroke 47 + Stroke	33 43
	10st	42 + Stroke 47 + Stroke	38 43
∅50	5st	39 + Stroke 49 + Stroke	35 45
	10st	44 + Stroke 49 + Stroke	40 45
	15st	49 + Stroke 54 + Stroke	45 50
	20st	54 + Stroke 59 + Stroke	50 55

Damper

For damper, please add 5mm each to dimensions A and B.

Model No.	C	D	E	F	G	H	J	K	L	M	N	P	Q
∅40	4	16	11	11	20	14	70	60	40.3	57	5.5	Rc(PT)⅛	9.5 depth 5.5
∅50	4	20	11.5	11.5	20	17	80	70	47.4	67	6.6	Rc(PT)⅛	11 depth 6.5

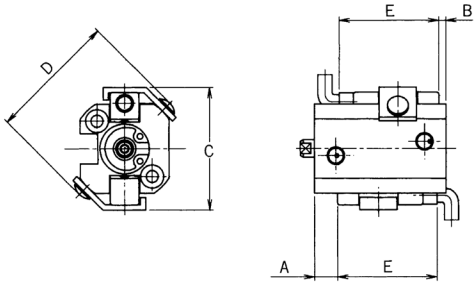
Model No.	R	CC	V	W	X	Y	Z
∅40	M6×1 depth 11	28.5	23.5	20.5	8	M14×1.5	22
∅50	M8×1.25 depth 13	33.5	28.5	26	11	M18×1.5	27

- Dimensions A and B: Upper value displayed is without magnet
  Lower value displayed is with magnet
- Non-standard stroke: For over standard stroke range, consult FONTAL first to avoid malfunciton

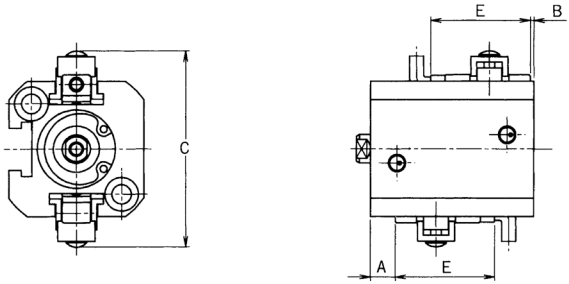
Switch installation position: M type swtich/XG

(Unit: mm)

∅10, ∅16



∅20 ~ ∅32



Action	Bore	M type reed switch				M type proximity switch			
		A	B	C	D	A	B	C	D
Double acting Single acting (Spring return)	∅10	6.5	2	37	37	10	5.5	37	37
	∅16	6.5	4.5	40	45	10	8	40	45
	∅20	7	1	54	—	10.5	4.5	54	—
	∅25	8.5	1.5	59	—	12	5	59	—
	∅32	9.5	2.5	67	—	12	6	67	—
Single acting (spring extend)	∅10	6.5	2	37	37	10	5.5	37	37
	∅16	6	5	40	45	9.5	8.5	40	45
	∅20	2	6	54	—	5.5	9.5	54	—
	∅25	2.5	7.5	59	—	6	11	59	—
	∅32	3.5	8.5	67	—	6	12	67	—

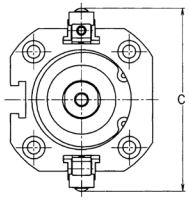
Switch	E
M type reed switch	28
M type proximity switch	26.5 (24)

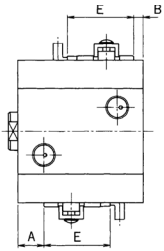
Note : the parenthesized dimension is of the MT-*U type.

Switch installation position: M type swtich/XG

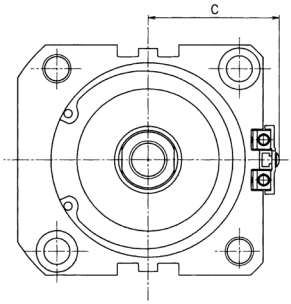
(Unit: mm)

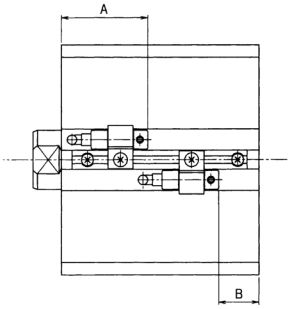
∅40, ∅50





∅63 ~ ∅100





Action	Bore	M type reed switch			M type proximity switch		
		A	B	C	A	B	C
Double acting Single acting (Spring return)	∅40	11	4	76	14.5	7.5	76
	∅50	12.5	4.5	86	16	8	86
	∅63	34	12	47.5	30.5	15.5	47.5
	∅80	36.5	17	56.5	33	20.5	56.5
	∅100	42	21	67	38.5	24.5	67
Single acting (spring extend)	∅40	5	10	76	9.5	12.5	76
	∅50	5.5	11.5	86	9	15	86

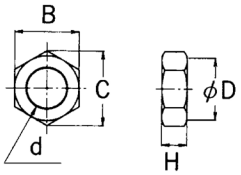
Switch	E
M type reed switch	28
M type proximity switch	26.5 (24)

Note : the parenthesized dimension is of the MT-*U type.

Accessories

(Unit: mm)

Rod end nut (Mounting at the front-tip of the cylinder axis)



Model No.	Bore	d	H	B	C	D
Z10-RN	∅10, ∅16	M4×0.7	2.4	7	8.1	6.8
X20-RN	∅20	M6×1	3.6	10	11.5	9.8
J20-RN	∅25	M8×1.25	5	13	15	12.5
X32-RN	∅32	M10×1.25	6	17	19.6	16.5
J40-RN	∅40	M14×1.5	8	22	24.5	21
K50-RN	∅50, ∅63	M18×1.5	11	27	31.2	26
K80-RN	∅80	M22×1.5	13	32	37	31
K100-RN	∅100	M26×1.5	16	41	47.3	39

Note :
Bore of 10mm and 16mm can be used in common with Z Series.
Bore of 20mm and 40mm can be used in common with J Series.
Bore of 50mm ~ 100mm can be used in common with K Series.