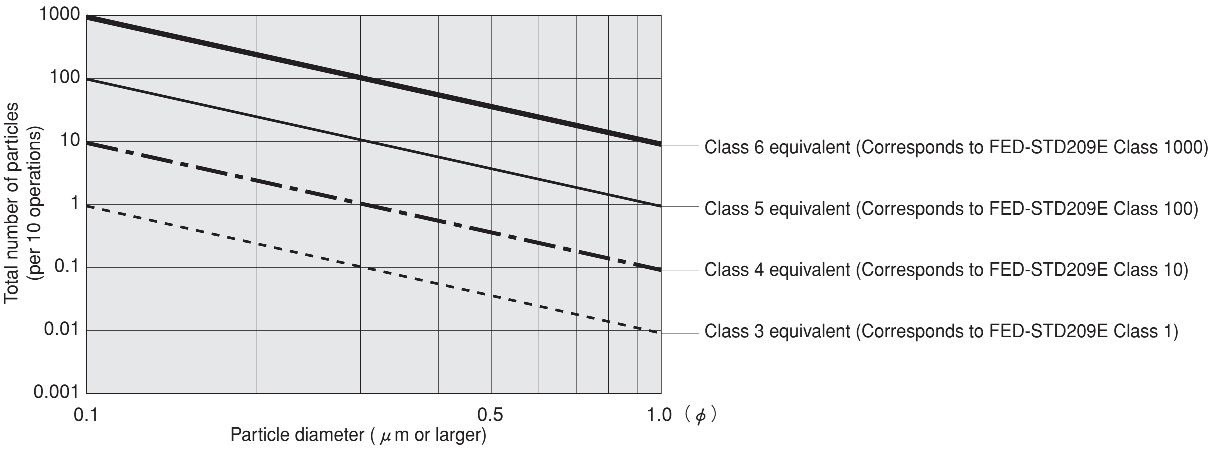
Koganei Clean System products provide complete support for the maintenance of a clean environment inside the cleanroom.

Koganei Clean System products meet the needs of the ultra-clean production environment. In everything from actuators and valves to air preparation and auxiliary equipment, anti-corrosion materials processing and other Koganei-developed design concepts serve to prevent particle contamination within the cleanroom. These perfectly designed mechanisms, which resolve even the slightest leaks to the outside during operations, have already won a high level of reliability.

Koganei Cleanliness

There is currently no standard in JIS or elsewhere for methods of evaluating cleanliness for pneumatic equipment in the cleanroom specifications. Therefore, to measure the effects of cleanroom contamination by pneumatic equipment, Koganei has decided to use “number of particles generated per 10 operations,” rather than particle density. Koganei has also developed classifications for application classes in cleanroom, based on JIS and other upper limit density tables, and on the company’s own experience.

Particle generation classification of Koganei pneumatic equipment



Remarks:
1. In the above table, product performance in terms of the number of particles generated per 10 operations is expressed as the upper limit of particles corresponding to the equivalent JIS or ISO class.
2. In the above table, values in the JIS, ISO, and FED-STD upper limit density tables are calculated as upper density per liter.
3. The classes shown are clean levels as classified in JIS and ISO.

From the above definitions, the Koganei clean level classes can be viewed as the level of average contamination per liter of surrounding air over a period of 10 operations in cleanroom. Air ventilation in cleanrooms is usually faster than 1 cycle per minute, and clean volumetric capacity is usually larger than 1 liter, which should provide a sufficient safety margin in practice.

Caution: The above conclusions are based on an ideal situation in which air ventilation is being implemented. For specific cases where air ventilation is not ensured, caution is needed since the clean classes cannot be maintained.

The clean system diagrams shown here are for Class 5 equivalent products.
For Class 4 or Class 3 equivalent products, consult us.

Evaluations of Cleanliness

Koganei has therefore specified its in-house measurement methods, to conduct evaluations on the cleanroom rating.

The number of particles of the Air Cylinder Cleanroom Specification is measured as shown in the method below.

1. Measurement conditions

1-1 Test circuit: Figure 1 (no suction), Figure 2 (with suction)

Cleanroom Class 7 equivalent
(Corresponds to FED-STD209E Class 10000)

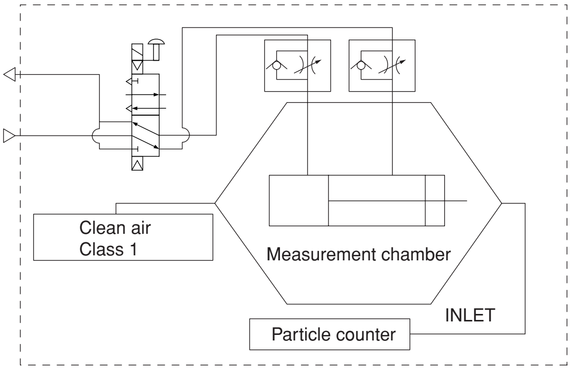


Figure 1 (no suction from dust collection port)

Cleanroom Class 7 equivalent
(Corresponds to FED-STD209E Class 10000)

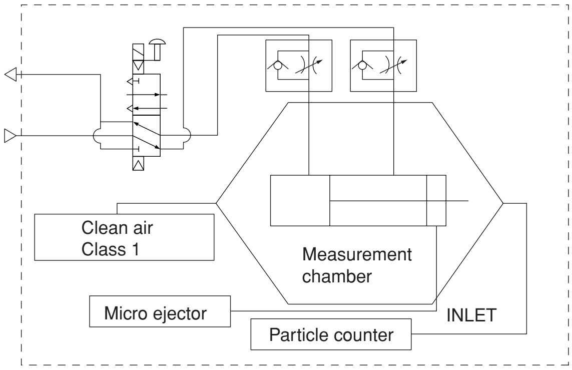


Figure 2 (with suction from dust collection port)

1-2 Operating conditions of tested cylinder
Operating frequency: 1Hz
Average speed: 500mm/s [20in./sec.]
Applied pressure: 0.5MPa [73psi.]
Suction condition: Microejector ME05, Primary side: 0.5MPa [73psi.] applied, Tube: ϕ6 [0.236in.]
Mounting direction: Vertical
Chamber volume: 8.3 ℓ [0.293ft^3]

2. Particle counter

Manufacturer/model: RION/KM20
Suction flow rate: 28.3 ℓ /min [1ft^3/min.]
Particle diameter: 0.1 μm, 0.2 μm, 0.3 μm, 0.5 μm, 0.7 μm, 1.0 μm

3. Measurement method

3-1 Confirmation of number of particles in the measurement system
Under the conditions in the above 1 and 2, using a particle counter to measure the sample for 9 minutes without operating the measurement sample, and confirmed the measured number of particle is 1 piece or less.

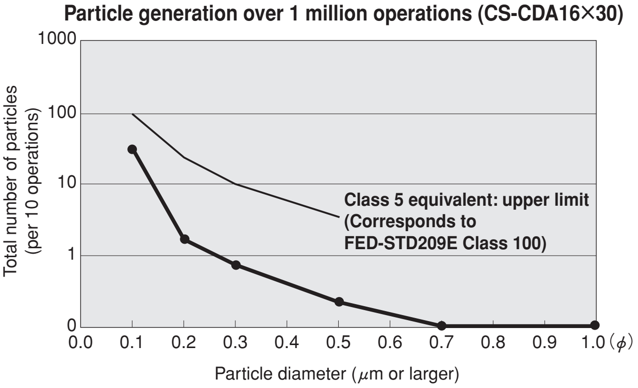
3-2 Measurement under operation
Under the conditions in the above1 and 2, operating the measurement sample for 36 minutes, and measured the total values in the latter half of 18 minutes test.

3-3 Reconfirmation
Performed the measurement in 3-1 again, to reconfirm the number of particles in the measurement system.

4. Measurement results

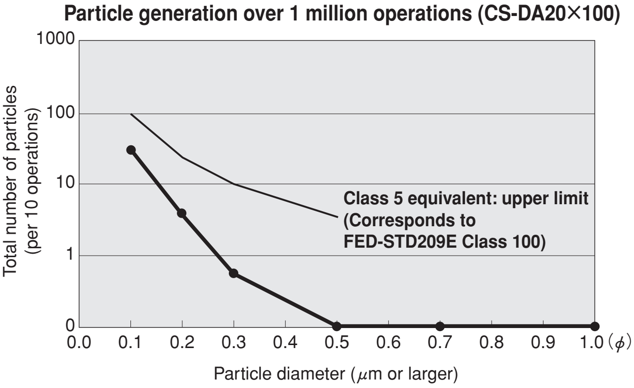
● **Cleanroom specification**
Jig Cylinder (no suction from dust collection port)

Particle generation over 1 million operations (CS-CDA16×30)



● **Cleanroom specification**
Slim Cylinder (with suction from dust collection port)

Particle generation over 1 million operations (CS-DA20×100)



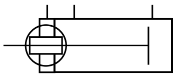
For “safety precautions” listed in the Clean System Product Drawings, see the materials below.

- For actuators, see “Safety Precautions” on p. 45 of the Actuators General Catalog .
- For valves, see “Safety Precautions” on p. 31 of the Valves General Catalog.
- For air treatment and auxiliary equipment, see “Safety Precautions” on p.31 of the General Catalog of Air Treatment, Auxiliary, Vacuum.

KOGANEI

CLEAN SYSTEM JIG CYLINDERS WITH GUIDES

Symbol



Caution : If used when a lateral load is applied, or used as a lifter, load should be 20% or less of the standard type.

Specifications

Item / Bore size mm [in.]	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
Operating type	Double acting type							
Media	Air							
Operating pressure range MPa [psi.]	0.2～1.0 [29～145]		0.15～1.0 [22～145]					
Proof pressure MPa [psi.]	1.5 [218]							
Operating temperature range °C [°F]	0～60 [32～140]							
Operating speed range mm/s [in./sec.]	100～300 [3.9～11.8]							
Cushion	Rubber bumper							
Lubrication	Prohibited							
Port size	M5×0.8		Rc1/8				Rc1/4	
Dust collection port size	M5×0.8							
Stroke tolerance mm [in.]	$^{+1.5}_{0}$ $\left[^{+0.059}_{0}\right]$							

Remark: Since plugs for connection ports in φ20～φ63 are provided, care should be taken not to get sealant into the cylinder when assembling the plugs after applying sealant, etc.

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum available stroke
12 [0.472]	10, 20, 30, 40, 50, 75, 100	100
16 [0.630]		
20 [0.787]	10, 20, 30, 40, 50, 75, 100, 125, 150, 175, 200	200
25 [0.984]		
32 [1.260]		
40 [1.575]		
50 [1.969]		
63 [2.480]		

Remarks: 1. Non-standard strokes are available at 5mm [0.197in.] intervals. Since the manufacturing method is collar packed, the total length, etc., are the same dimensions as the next size up standard stroke cylinder.
2. Strokes of 75mm [2.953in.] or longer, use long bushing type.

Order Codes

■ Dust prevention specification

P1 : Single seal (Vacuum type)
P2 : Double seal (Relief type)

Remark : **P1** and **P2** are compatible to Class 5[Note].

Note: FED-STD209E Class 100 equivalent

■ Bearing specification

Q : Rolling bearing type

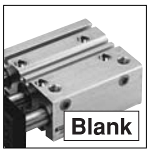
■ Operating type

DA : Double acting type

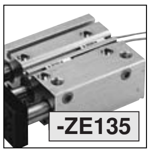
■ Clean system product

■ Sensor switch [Note]

Without sensor switch

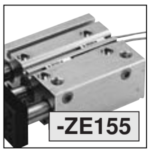


With ZE135



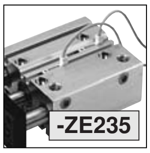
- 2-lead wire Solid state type
- With indicator lamp
- DC10～28V
- Horizontal lead wire

With ZE155



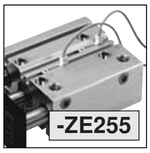
- 3-lead wire Solid state type
- With indicator lamp
- DC4.5～28V
- Horizontal lead wire

With ZE235



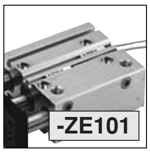
- 2-lead wire Solid state type
- With indicator lamp
- DC10～28V
- Vertical lead wire

With ZE255



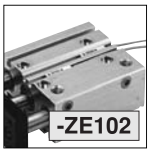
- 3-lead wire Solid state type
- With indicator lamp
- DC4.5～28V
- Vertical lead wire

With ZE101



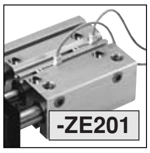
- 2-lead wire Reed switch type
- Without indicator lamp
- DC5～28V, AC85～115V
- Horizontal lead wire

With ZE102



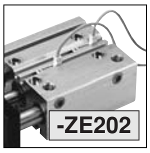
- 2-lead wire Reed switch type
- With indicator lamp
- DC10～28V, AC85～115V
- Horizontal lead wire

With ZE201



- 2-lead wire Reed switch type
- Without indicator lamp
- DC5～28V, AC85～115V
- Vertical lead wire

With ZE202



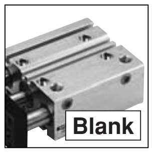
- 2-lead wire Reed switch type
- With indicator lamp
- DC10～28V, AC85～115V
- Vertical lead wire

■ Lead wire length

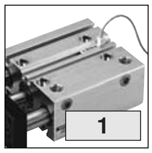
A : 1000mm [39in.]
B : 3000mm [118in.]

■ Number of sensor switches

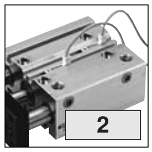
Without sensor switch



With 1 sensor switch



With 2 sensor switches



	Basic type			Bore size×Stroke				
CS-	SG	DA	Q	×	-P1 -P2	-ZE135 -ZE235 -ZE155 -ZE255 -ZE101 -ZE201 -ZE102 -ZE202	A B	1 2 ⋮ n

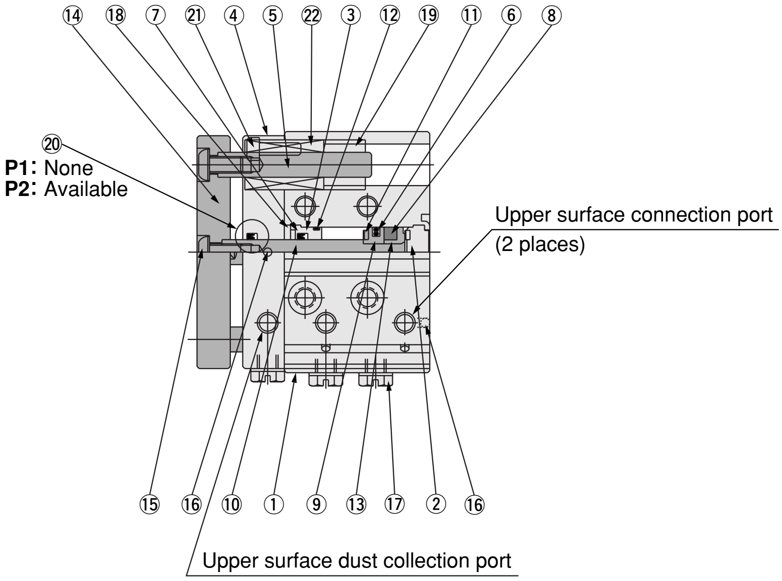
● See the bore size and stroke on p.43.

● For the order codes for sensor switches only, see p.49.

Note: For details of sensor switches, see p.111～121.

Inner Construction and Major Parts

■**Jig Cylinder with Guide** (Diagram shows ϕ12 [0.472in.].)



Remark: The number of bearings for 50mm [1.969in.] stroke or shorter is 1 bearing per shaft. At 75mm [2.953in.] stroke or longer, 2 bearings per shaft. The plate, piston rod, and guide rod cannot be disassembled.

Major Parts and Materials

No.	Parts / Bore mm [in.]	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
①	Cylinder body	Aluminum alloy (anodized)							
②	Head cover	Aluminum alloy (anodized)							
③	Rod cover	Aluminum alloy (special wear-resistant treatment)							
④	Dust prevention cover	Aluminum alloy (anodized)							
⑤	Guide rod	Stainless steel							
⑥	Piston seal	Synthetic rubber (NBR)							
⑦	Rod seal	Synthetic rubber (NBR)							
⑧	Magnet	Plastic magnet							
⑨	Piston	Aluminum alloy (special rust prevention treatment)							
⑩	Piston rod	Stainless steel (hard chrome plated)							
⑪	Bumper	Synthetic rubber (NBR)							
⑫	O-ring	Synthetic rubber (NBR)							
⑬	Support	Aluminum alloy (special rust prevention treatment)							
⑭	Plate	Aluminum alloy (anodized)							
⑮	Bolt	Steel (nickel plated)				Stainless steel			
⑯	Steel ball	Stainless steel							
⑰	Plug	Brass (nickel plated)		Stainless steel (supplied at shipping for ϕ20 [0.787]～ϕ63 [2.480])					
⑱	Snap ring	Steel (nickel plated)							
⑲	Collar	Aluminum alloy (special rust prevention treatment)							
⑳	Dust leak prevention seal	Synthetic rubber (NBR)							
㉑	Bolt	Stainless steel							
㉒	Rolling bearing	Steel, plastic (low dust generation treatment)							

Seals

Bore size mm \ Parts \ Type	Jig cylinders with guides			
	Rod seal Dust leak prevention seal	Piston seal	Tube gasket	
			Rod side	Head side
12	MYR-6	PSD-12	Y090260	None
16	MYR-8	PSD-16	Y090207	Y090207
20	MYR-10	PSD-20	Y090216	Y090216
25	MYR-12	PSD-25	Y090210	Y090210
32	MYR-16	PSD-32	L090084	L090084
40	MYR-16	PSD-40	L090151	L090151
50	MYR-20	PSD-50	L090174	L090174
63	MYR-20	PSD-63	L090180	L090180

Mass

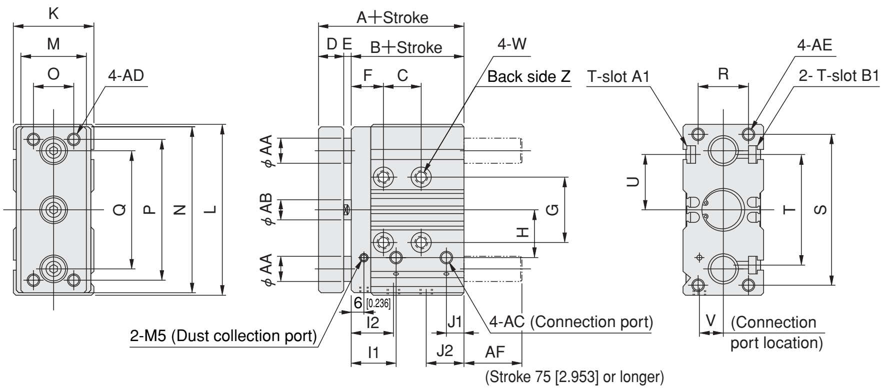
g [oz.]

Bore size mm [in.] \ Mass \ Type		Jig cylinders with guides		Options	
		Zero stroke mass	Additional mass for each 1mm [0.0394in.] stroke	Additional mass of sensor switch	
				ZE□□□A	ZE□□□B
12 [0.472]	50 [1.969] st or shorter	158 [5.57]	3.63 [0.1280]	15 [0.53]	35 [1.23]
	75 [2.953] st or longer	168 [5.93]	3.63 [0.1280]		
16 [0.630]	50 [1.969] st or shorter	256 [9.03]	5.17 [0.1824]		
	75 [2.953] st or longer	297 [10.48]	5.17 [0.1824]		
20 [0.787]	50 [1.969] st or shorter	440 [15.52]	8.4 [0.296]		
	75 [2.953] st or longer	521 [18.38]	8.4 [0.296]		
25 [0.984]	50 [1.969] st or shorter	642 [22.65]	10.12 [0.3570]		
	75 [2.953] st or longer	720 [25.40]	10.12 [0.3570]		
32 [1.260]	50 [1.969] st or shorter	1012 [35.70]	13.71 [0.4836]		
	75 [2.953] st or longer	1227 [43.28]	13.71 [0.4836]		
40 [1.575]	50 [1.969] st or shorter	1230 [43.39]	15.78 [0.5566]		
	75 [2.953] st or longer	1530 [53.97]	15.78 [0.5566]		
50 [1.969]	50 [1.969] st or shorter	2082 [73.44]	23.27 [0.8208]		
	75 [2.953] st or longer	2419 [85.33]	23.27 [0.8208]		
63 [2.480]	50 [1.969] st or shorter	2700 [95.24]	26.97 [0.9513]		
	75 [2.953] st or longer	3038 [107.16]	26.97 [0.9513]		

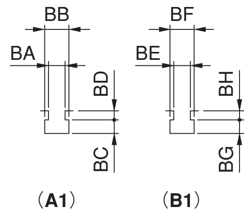
Dimensions mm [in.]

Rolling bearing type CS-SGDAQ [Bore size] × [Stroke]

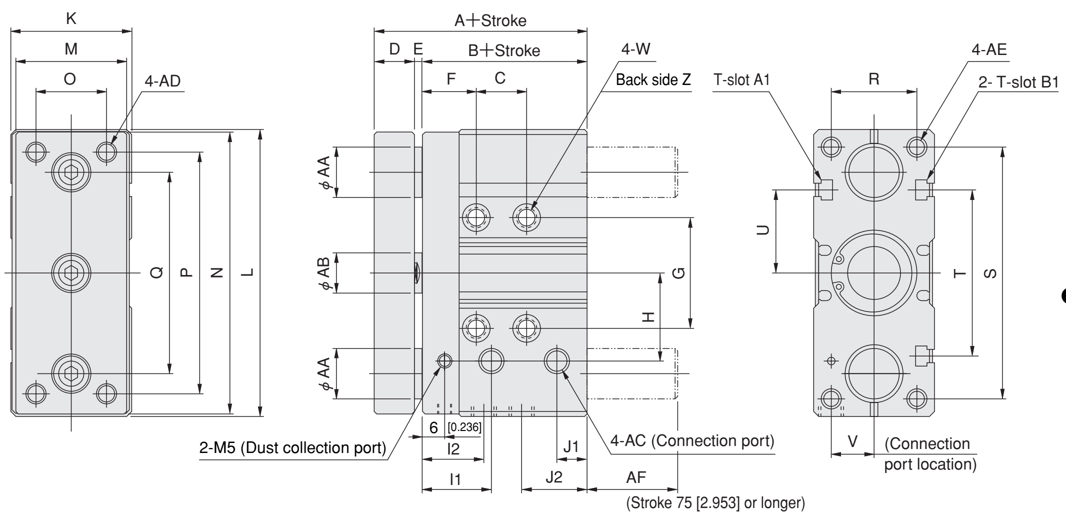
● ϕ12 [0.472], ϕ16 [0.630]



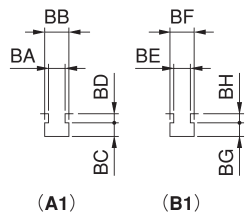
● T-slot **A1**, **B1** dimensions



● ϕ20 [0.787]～ϕ63 [2.480]



● T-slot **A1**, **B1** dimensions



mm [in.]

Bore size \ Code	A	B	C Stroke 10	C Stroke 20	C Stroke 30	C Stroke 40	C Stroke 50～100	C Stroke 125 or longer	D	E	F	G	H	I1	I2	J1	J2
12 [0.472]	46 [1.811]	35 [1.378]	15 [0.591]	25 [0.984]	35 [1.378]	45 [1.772]	55 [2.165]	—	8 [0.315]	3 [0.118]	15 [0.591]	22 [0.866]	17 [0.669]	20 [0.787]	19 [0.748]	6 [0.236]	14 [0.551]
16 [0.630]	50 [1.969]	37 [1.457]	15 [0.591]	25 [0.984]	35 [1.378]	45 [1.772]	55 [2.165]	—	10 [0.394]	3 [0.118]	15 [0.591]	26 [1.024]	19 [0.748]	20 [0.787]	19 [0.748]	7.5 [0.295]	16 [0.630]
20 [0.787]	62 [2.441]	46 [1.811]	20 [0.787]	30 [1.181]	40 [1.575]	50 [1.969]	60 [2.362]	110 [4.331]	12 [0.472]	4 [0.157]	16 [0.630]	30 [1.181]	27 [1.063]	21 [0.827]	21 [0.827]	10 [0.394]	20 [0.787]
25 [0.984]	64 [2.520]	48 [1.890]	20 [0.787]	30 [1.181]	40 [1.575]	50 [1.969]	60 [2.362]	110 [4.331]	12 [0.472]	4 [0.157]	16 [0.630]	33 [1.299]	29 [1.142]	22 [0.866]	22 [0.866]	10 [0.394]	21 [0.827]
32 [1.260]	69 [2.717]	50 [1.969]	20 [0.787]	30 [1.181]	40 [1.575]	50 [1.969]	60 [2.362]	110 [4.331]	15 [0.591]	4 [0.157]	17 [0.669]	44 [1.732]	35 [1.378]	23 [0.906]	20 [0.787]	12 [0.472]	25 [0.984]
40 [1.575]	73 [2.874]	54 [2.126]	20 [0.787]	30 [1.181]	40 [1.575]	50 [1.969]	60 [2.362]	110 [4.331]	15 [0.591]	4 [0.157]	17 [0.669]	52 [2.047]	40 [1.575]	24 [0.945]	24 [0.945]	13 [0.512]	25 [0.984]
50 [1.969]	80 [3.150]	57 [2.244]	20 [0.787]	30 [1.181]	40 [1.575]	50 [1.969]	60 [2.362]	110 [4.331]	18 [0.709]	5 [0.197]	18 [0.709]	66 [2.598]	52.5 [2.067]	25.5 [1.004]	20 [0.787]	15 [0.591]	31 [1.220]
63 [2.480]	80 [3.150]	57 [2.244]	20 [0.787]	30 [1.181]	40 [1.575]	50 [1.969]	60 [2.362]	110 [4.331]	18 [0.709]	5 [0.197]	18 [0.709]	78 [3.071]	60 [2.362]	27 [1.063]	20 [0.787]	14 [0.551]	31 [1.220]

mm [in.]

Bore size \ Code	K	L	M	N	O	P	Q	R	S	T	U	V Note	W
12 [0.472]	28 [1.102]	58 [2.283]	22 [0.866]	56 [2.205]	14 [0.551]	48 [1.890]	42 [1.654]	18 [0.709]	51 [2.008]	37 [1.457]	18.5 [0.728]	8.5 [0.335]	ϕ 4.2 [0.165] (Thru hole) Counterbore ϕ 8 [0.315] Depth 4.5 [0.177]
16 [0.630]	32 [1.260]	68 [2.677]	26 [1.024]	66 [2.598]	16 [0.630]	56 [2.205]	47 [1.850]	20 [0.787]	60 [2.362]	44 [1.732]	22 [0.866]	9.5 [0.374]	ϕ 4.2 [0.165] (Thru hole) Counterbore ϕ 8 [0.315] Depth 4.5 [0.177]
20 [0.787]	40 [1.575]	82 [3.228]	36 [1.417]	80 [3.150]	24 [0.945]	66 [2.598]	58 [2.283]	26 [1.024]	72 [2.835]	54 [2.126]	27 [1.063]	13.5 [0.531]	ϕ 5.2 [0.205] (Thru hole) Counterbore ϕ 9.5 [0.374] Depth 5.5 [0.217]
25 [0.984]	42 [1.654]	92 [3.622]	38 [1.496]	90 [3.543]	26 [1.024]	76 [2.992]	63 [2.480]	30 [1.181]	80 [3.150]	54 [2.126]	27 [1.063]	14.5 [0.571]	ϕ 5.2 [0.205] (Thru hole) Counterbore ϕ 9.5 [0.374] Depth 5.5 [0.217]
32 [1.260]	48 [1.890]	114 [4.488]	44 [1.732]	112 [4.409]	28 [1.102]	96 [3.780]	80 [3.150]	34 [1.339]	100 [3.937]	66 [2.598]	33 [1.299]	17 [0.669]	ϕ 6.8 [0.268] (Thru hole) Counterbore ϕ 11 [0.433] Depth 7 [0.276]
40 [1.575]	54 [2.126]	124 [4.882]	50 [1.969]	122 [4.803]	34 [1.339]	106 [4.173]	90 [3.543]	40 [1.575]	106 [4.173]	82 [3.228]	41 [1.614]	18 [0.709]	ϕ 6.8 [0.268] (Thru hole) Counterbore ϕ 11 [0.433] Depth 7 [0.276]
50 [1.969]	66 [2.598]	150 [5.906]	62 [2.441]	148 [5.827]	42 [1.654]	120 [4.724]	110 [4.331]	44 [1.732]	130 [5.118]	100 [3.937]	50 [1.969]	22 [0.866]	ϕ 8.6 [0.339] (Thru hole) Counterbore ϕ 14 [0.551] Depth 9 [0.354]
63 [2.480]	76 [2.992]	162 [6.378]	72 [2.835]	160 [6.299]	52 [2.047]	132 [5.197]	122 [4.803]	44 [1.732]	144 [5.669]	120 [4.724]	60 [2.362]	24 [0.945]	ϕ 8.6 [0.339] (Thru hole) Counterbore ϕ 14 [0.551] Depth 9 [0.354]

Note: The **V** dimension shows the side connection port location.

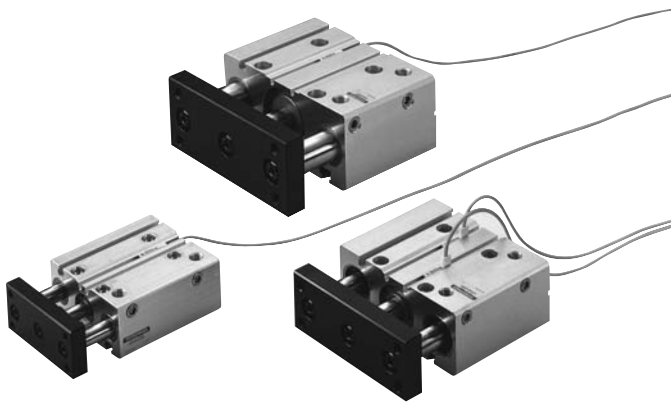
mm [in.]

Bore size \ Code	Z	AA	AB	AC	AD	AE	AF
12 [0.472]	M5×0.8 Depth 8 [0.315]	6 [0.236]	6 [0.236]	M5×0.8	M4×0.7	M4×0.7 Depth 8 [0.315]	5 [0.197]
16 [0.630]	M5×0.8 Depth 11 [0.433]	8 [0.315]	8 [0.315]	M5×0.8	M5×0.8	M5×0.8 Depth 10 [0.394]	13 [0.512]
20 [0.787]	M6×1 Depth 12 [0.472]	12 [0.472]	10 [0.394]	Rc1/8	M6×1	M6×1 Depth 12 [0.472]	17 [0.669]
25 [0.984]	M6×1 Depth 12 [0.472]	13 [0.512]	12 [0.472]	Rc1/8	M6×1	M6×1 Depth 12 [0.472]	18 [0.709]
32 [1.260]	M8×1.25 Depth 16 [0.630]	16 [0.630]	16 [0.630]	Rc1/8	M8×1.25	M8×1.25 Depth 16 [0.630]	26 [1.024]
40 [1.575]	M8×1.25 Depth 16 [0.630]	16 [0.630]	16 [0.630]	Rc1/8	M8×1.25	M8×1.25 Depth 16 [0.630]	22 [0.866]
50 [1.969]	M10×1.5 Depth 20 [0.787]	20 [0.787]	20 [0.787]	Rc1/4	M10×1.5	M10×1.5 Depth 20 [0.787]	29 [1.142]
63 [2.480]	M10×1.5 Depth 20 [0.787]	20 [0.787]	20 [0.787]	Rc1/4	M10×1.5	M10×1.5 Depth 20 [0.787]	29 [1.142]

mm [in.]

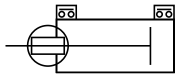
Bore size \ Code	T-slot A1	T-slot B1	BA	BB	BC	BD	BE	BF	BG	BH
12 [0.472]	M3×0.5	M4×0.7	3.3 [0.130]	5.8 [0.228]	3 [0.118]	1.5 [0.059]	4.3 [0.169]	7.3 [0.287]	3.5 [0.138]	2.5 [0.098]
16 [0.630]	M4×0.7	M4×0.7	4.3 [0.169]	7.3 [0.287]	3.5 [0.138]	1.5 [0.059]	4.3 [0.169]	7.3 [0.287]	3.5 [0.138]	3 [0.118]
20 [0.787]	M4×0.7	M5×0.8	4.3 [0.169]	7.3 [0.287]	4 [0.157]	3 [0.118]	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]
25 [0.984]	M4×0.7	M5×0.8	4.3 [0.169]	7.3 [0.287]	4 [0.157]	3 [0.118]	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]
32 [1.260]	M5×0.8	M5×0.8	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]
40 [1.575]	M5×0.8	M6×1	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]	6.3 [0.248]	10.3 [0.406]	5.5 [0.217]	3 [0.118]
50 [1.969]	M5×0.8	M8×1.25	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]	8.3 [0.327]	13.3 [0.524]	7 [0.276]	4.5 [0.177]
63 [2.480]	M5×0.8	M8×1.25	5.3 [0.209]	8.3 [0.327]	4.5 [0.177]	3 [0.118]	8.3 [0.327]	13.3 [0.524]	7 [0.276]	4.5 [0.177]

Sensor Switches

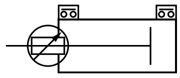


Symbols

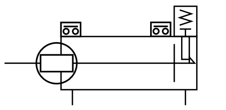
●Standard cylinder



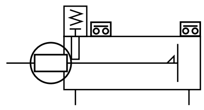
●Stroke adjusting cylinder



●End keep cylinder (Head side)



●End keep cylinder (Rod side)



Order Codes (for Sensor Switches Only)

CS — ☐ ☐ — **SGDA**

Clean system product: CS

Lead wire length
A — 1000mm [39in.]
B — 3000mm [118in.]

Sensor switch

ZE135	Solid state type with indicator lamp	DC10V～28V	Horizontal lead wire
ZE235	Solid state type with indicator lamp	DC10V～28V	Vertical lead wire
ZE101	Reed switch type without indicator lamp	DC5V～28V AC85～115V	Horizontal lead wire
ZE201	Reed switch type without indicator lamp	DC5V～28V AC85～115V	Vertical lead wire
ZE155	Solid state type with indicator lamp	DC4.5V～28V	Horizontal lead wire
ZE255	Solid state type with indicator lamp	DC4.5V～28V	Vertical lead wire
ZE102	Reed switch type with indicator lamp	DC10V～28V AC85～115V	Horizontal lead wire
ZE202	Reed switch type with indicator lamp	DC10V～28V AC85～115V	Vertical lead wire

●For details of sensor switches, see p.111～121.

Minimum Cylinder Strokes When Mounting Sensor Switches

●Solid state type

mm [in.]

Bore size mm [in.]	2 pcs. mounting[Note]		1 pc. mounting
	1-surface mounting	2-surface mounting	
12～63 [0.472～2.480]	10 [0.394]		5 [0.197]

Note: Two pcs. mounting is possible at stroke 5mm.
Be aware, however, that overlapping may occur.

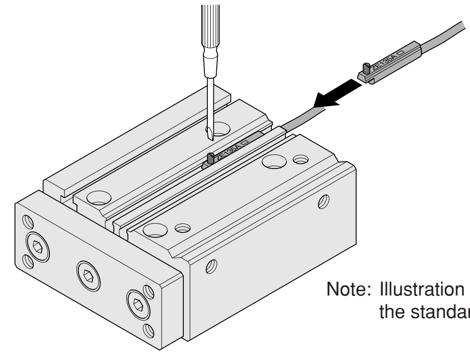
●Reed switch type

mm [in.]

Bore size mm [in.]	2 pcs. mounting		1 pc. mounting
	1-surface mounting	2-surface mounting	
12～63 [0.472～2.480]	10 [0.394]		10 [0.394]

Moving Sensor Switch

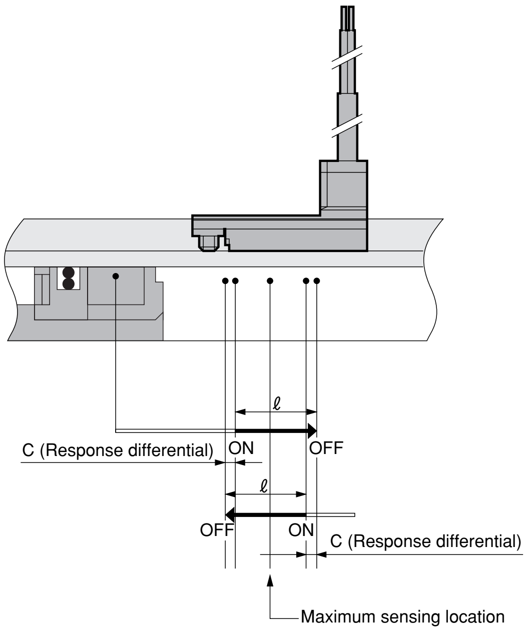
- ●Loosening the mounting screw allows the sensor switch to be moved along the switch mounting groove on the cylinder body.
- ●Tighten the mounting screw with a tightening torque of 0.1～0.2N•m [0.9～1.8in•lbf].



Note: Illustration shows the standard cylinder.

Sensor Switch Operating Range, Response Differential, and Maximum Sensing Location

- ● **Operating range: ℓ**
  The distance the piston travels in one direction, while the switch is in the ON position.
- ● **Response differential: C**
  The distance between the point where the piston turns the switch ON and the point where the switch is turned OFF as the piston travels in the opposite direction.



●Solid state type

mm [in.]

Item \ Bore size	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
Operating range: ℓ	2～4 [0.079～0.157]	2～5 [0.079～0.197]	3.5～7.5 [0.138～0.295]	4～8 [0.157～0.315]	3～7 [0.118～0.276]	3.5～7.5 [0.138～0.295]	3.5～7.5 [0.138～0.295]	4～8.5 [0.157～0.335]
Response differential: C	1.0 [0.039] or less							
Maximum sensing location[Note]	6 [0.236]							

Note: The maximum sensing location is the distance from the end of the switch on the opposite side of the lead wire.
Remark: The above table shows reference values.

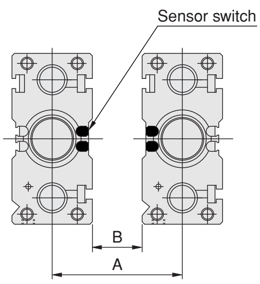
●Reed switch type

mm [in.]

Item \ Bore size	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
Operating range: ℓ	5.5～8 [0.217～0.315]	6.5～9 [0.256～0.354]	10～13 [0.394～0.512]	11.5～15 [0.453～0.591]	9～11.5 [0.354～0.453]	10～13.5 [0.394～0.531]	10.5～14.5 [0.413～0.571]	11～15.5 [0.433～0.610]
Response differential: C	1.0 [0.039] or less	1.5 [0.059] or less						
Maximum sensing location[Note]	10 [0.394]							

Note: The maximum sensing location is the distance from the end of the switch on the opposite side of the lead wire.
Remark: The above table shows reference values.

When Mounting Cylinders with Sensor Switches in Close Proximity



When mounting cylinders in close proximity, install the cylinder so that it exceeds the values in the table below.

The end plates are the same direction

mm [in.]

Bore size	Solid state type		Reed switch type	
	A	B	A	B
12	33 [1.299]	5 [0.197]	28 [1.102]	0 [0]
16	37 [1.457]		32 [1.260]	
20	45 [1.772]		40 [1.575]	
25	50 [1.969]	8 [0.315]	42 [1.654]	
32	56 [2.205]		48 [1.890]	
40	62 [2.441]		54 [2.126]	
50	78 [3.071]	12 [0.472]	66 [2.598]	
63	88 [3.465]		76 [2.992]	

The end plates are the opposite direction

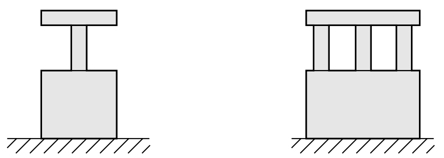
mm [in.]

Bore size	Solid state type		Reed switch type	
	A	B	A	B
12	34 [1.339]	6 [0.236]	28 [1.102]	0 [0]
16	38 [1.496]		32 [1.260]	
20	46 [1.811]		40 [1.575]	
25	54 [2.126]	12 [0.472]	42 [1.654]	
32	60 [2.362]		48 [1.890]	
40	66 [2.598]		54 [2.126]	
50	84 [3.307]	18 [0.709]	66 [2.598]	
63	94 [3.701]		76 [2.992]	

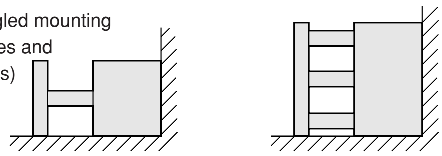
Mounting and Removing Sensor Switches

In Jig Cylinders with Guides of ϕ 12～ϕ 63, be aware that sensor switches cannot be mounted or removed when strokes of 10mm [0.394in.] or shorter installed in the application shown below.

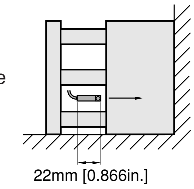
Bottom mounting



Right angled mounting (2 surfaces and 3 surfaces)



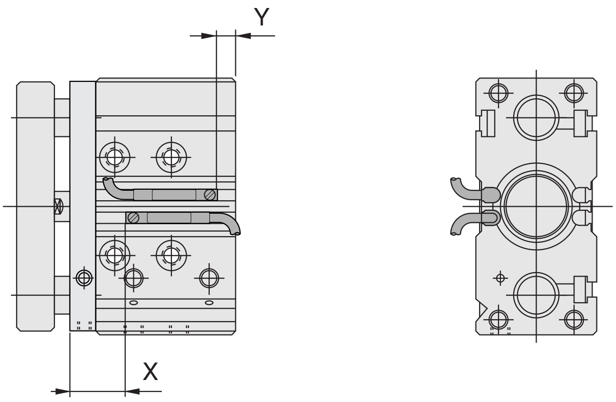
※ For strokes of 20mm [0.787in.] or longer, sensor switches can be mounted and removed when the plate (rods extend) is extended.



Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the locations shown in the diagram below (figures in the tables are reference values), the magnet comes to the maximum sensing location of the sensor switch at the end of the stroke.

●Jig cylinders with guides



■Solid state type

mm [in.]

Code \ Bore size	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
X	19.5 [0.768]	21 [0.827]	24 [0.945]	26 [1.024]	25 [0.984]	26.5 [1.043]	26.5 [1.043]	26.5 [1.043]
Y	3.5 [0.138]	4.5 [0.177]	10 [0.394]	10 [0.394]	13 [0.512]	15.5 [0.610]	18.5 [0.728]	18.5 [0.728]

■Reed switch type

mm [in.]

Code \ Bore size	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
X	15.5 [0.610]	17 [0.669]	20 [0.787]	22 [0.866]	21 [0.827]	22.5 [0.886]	22.5 [0.886]	22.5 [0.886]
Y	0 [0]	0 [0]	6 [0.236]	6 [0.236]	9 [0.354]	11.5 [0.453]	14.5 [0.571]	14.5 [0.571]