KOGANEI

Catalog No. BKAR0004

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ISO9001
ISO14001

TÜV CERT ISO 9001 / ISO 14001

Clean System Product Drawings

CLEAN SYSTEM

Clean System Product Drawings

Ver. 4

C O N T E N T S

KOGANEI CLEAN SYSTEM

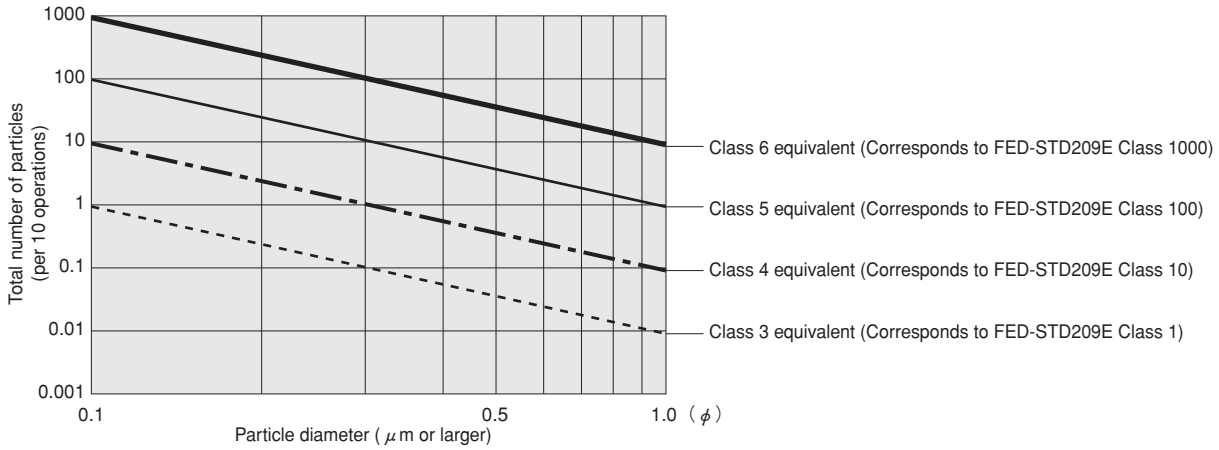
Koganei Clean System products provide complete support for the maintenance of a clean environment inside the cleanroom.

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)

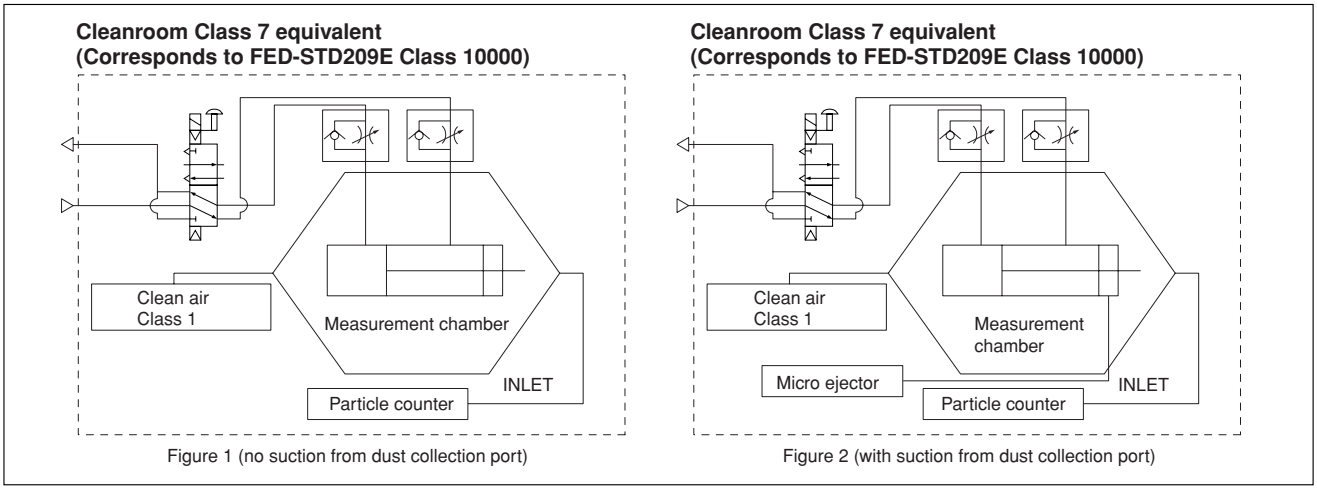


Figure 1 (no suction from dust collection port)

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.

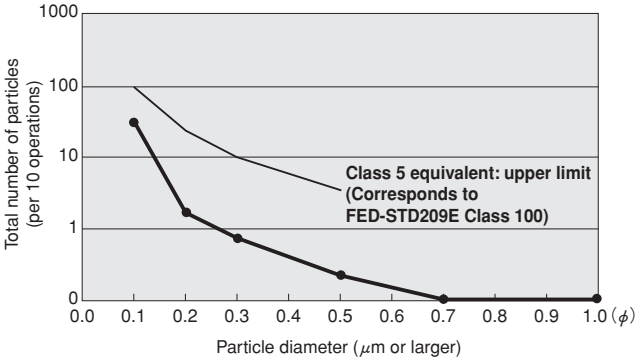
3-2 Measurement under operation
Under the conditions in the above1 and 2, operating the measurement sample for 36 minutes, and measured the total values in the latter half of 18 minutes test.

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

4. Measurement results

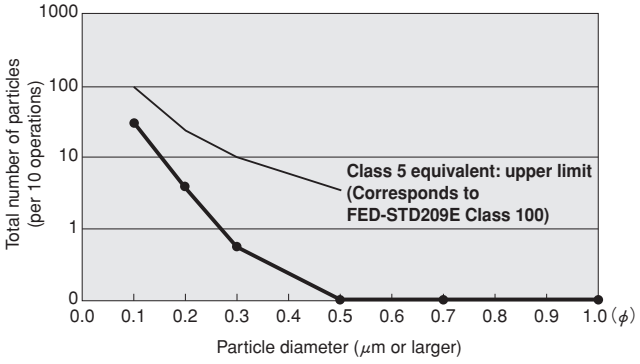
● **Cleanroom specification**
Jig Cylinder (no suction from dust collection port)

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)

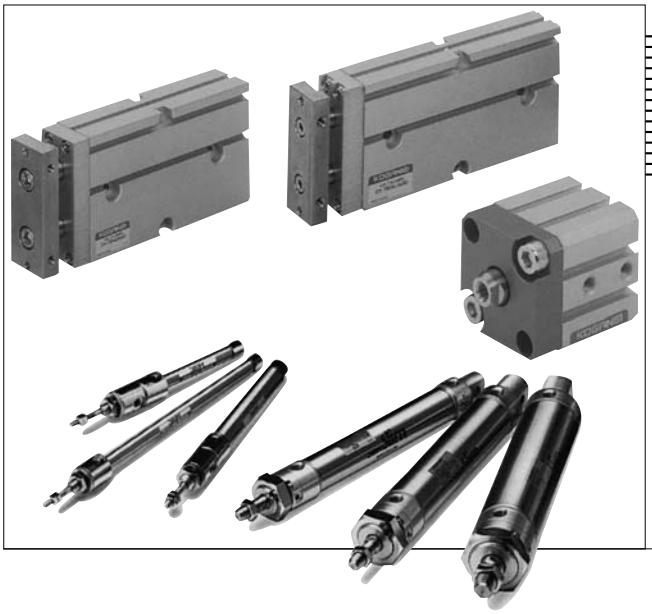


Safety Precautions

Always read these precautions carefully before use.

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

Clean System Product Drawings

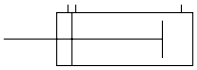
Actuators

CONTENTS

MINI BIT CYLINDERS

Symbol

● **Double acting type (CS-MBDA)**



Specifications

Item \ Bore size mm [in.]	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]
Media	Air			
Operating pressure range MPa [psi.] — Double acting type	0.15～0.7 [22～102]			0.1～0.7 [15～102]
Proof pressure MPa [psi.]	1.05 [152]			
Compatible Cleanliness	Class 4 equivalent (Corresponds to FED-STD209E Class 10) (Assuming vacuum suction from dust collection port. In accordance with Koganei standards. For details, see p.8.)			
Operating temperature range ℃ [°F]	0～60 [32～140]			
Operating speed range mm/s [in./sec.]	50～500 [2.0～19.7]			
Cushion	None			
Lubrication	Prohibited			
Port size	M3			
Stroke tolerance mm [in.]	$^{+0.5}_{0}$ [$^{+0.020}_{0}$]			

Cylinder Thrust

N [lbf.]

Bore size mm [in.]	Piston rod diameter mm [in.]	Operating type	Operating direction	Pressure area mm² [in.²]	Air pressure MPa [psi.]						
					0.1 [15]	**0.2 [29]**	**0.3 [44]**	**0.4 [58]**	**0.5 [73]**	**0.6 [87]**	**0.7 [102]**
4.5 [0.177]	2 [0.079]	Double acting type	Push side	15.9 [0.0246]	—	3.2 [0.72]	4.8 [1.08]	6.4 [1.44]	8.0 [1.80]	9.5 [2.14]	11.1 [2.50]
			Pull side	12.8 [0.0198]	—	2.6 [0.59]	3.8 [0.86]	5.1 [1.15]	6.4 [1.44]	7.7[1.73]	9.0 [2.03]
6 [0.236]	3 [0.118]	Double acting type	Push side	28.2 [0.0437]	—	5.6 [1.26]	8.5 [1.91]	11.3 [2.54]	14.1 [3.17]	16.9 [3.80]	19.7 [4.43]
			Pull side	21.2 [0.0329]	—	4.2 [0.95]	6.4 [1.44]	8.5 [1.91]	10.6 [2.39]	12.7 [2.86]	14.8 [3.33]
8 [0.315]	3 [0.118]	Double acting type	Push side	50.3 [0.0780]	—	10.1 [2.27]	15.1 [3.40]	20.1 [4.52]	25.2 [5.67]	30.2 [6.80]	35.2 [7.92]
			Pull side	43.2 [0.0670]	—	8.6 [1.94]	13.0 [2.93]	17.3 [3.89]	21.6 [4.86]	25.9 [5.83]	30.2 [6.80]
10 [0.394]	4 [0.157]	Double acting type	Push side	78.5 [0.1217]	7.9 [1.78]	15.7 [3.53]	23.6 [5.31]	31.4 [7.07]	39.3 [8.84]	47.1 [10.60]	55.0 [12.36]
			Pull side	65.9 [0.1021]	6.6 [1.49]	13.2 [2.97]	19.8 [4.46]	26.4 [5.94]	33.0 [7.43]	39.5 [8.89]	46.1 [10.37]

Bore Size and Stroke

mm [in.]

Operating type	Bore size	Standard strokes
Double acting type	**4.5 [0.177]**	4, 6, 8, 10
	6 [0.236]	4, 6, 8, 10, 15
	8 [0.315]	4, 6, 8, 10, 15, 20
	10 [0.394]	

Mass

Clean System Specification (Double Acting Type)

g [oz.]

Bore size mm [in.]	Stroke mm	Standard cylinder	Cylinder with magnet	Additional mass	
				Sensor switch (1 switch)	
				ZE□□□A	ZE□□□B
4.5 [0.177]	4	6.0 [0.212]	9.2 [0.325]	15 [0.529]	35 [1.235]
	6	6.5 [0.229]	9.8 [0.346]		
	8	7.0 [0.247]	10.4 [0.367]		
	10	7.5 [0.265]	11.0 [0.388]		
6 [0.236]	4	9.9 [0.349]	12.9 [0.455]	15 [0.529]	35 [1.235]
	6	10.6 [0.374]	13.7 [0.483]		
	8	11.3 [0.399]	14.5 [0.511]		
	10	12.0 [0.423]	15.3 [0.540]		
	15	13.8 [0.487]	17.3 [0.610]		
8 [0.315]	4	13.8 [0.487]	17.6 [0.621]	15 [0.529]	35 [1.235]
	6	14.7 [0.519]	18.7 [0.660]		
	8	15.7 [0.554]	19.8 [0.698]		
	10	16.7 [0.589]	20.9 [0.737]		
	15	19.2 [0.677]	23.7 [0.836]		
	20	21.7 [0.765]	26.5 [0.935]		
10 [0.394]	4	19.3 [0.681]	23.4 [0.825]	15 [0.529]	35 [1.235]
	6	20.6 [0.727]	24.8 [0.875]		
	8	21.9 [0.772]	26.2 [0.924]		
	10	23.2 [0.818]	27.6 [0.974]		
	15	26.6 [0.938]	31.1 [1.097]		
	20	29.9 [1.055]	34.6 [1.220]		

Order Codes

CS – **MB** □ □ × – □ – □ – □ □ □

Clean system product

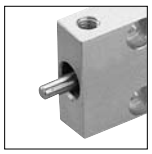
Mini bit cylinder series

Operating type
DA：Double acting type

Cylinder specification
Blank：Standard cylinder
S　：Cylinder with magnet

Bore size
×
Stroke

Piston rod specification (for ϕ 4.5 [0.177in.] only)
Blank：Male thread
N　：Plain rod



Port location
(for cylinder with magnet only)
Blank：Top surface
R　：Right side when viewed from the rod side
L　：Left side when viewed from the rod side

Sensor switch
Blank：Without sensor switch
ZE135：2-lead wire, solid state type
ZE155：3-lead wire, solid state type
ZE235：2-lead wire, solid state type
ZE255：3-lead wire, solid state type

● For sensor switch details, see p.111～121.

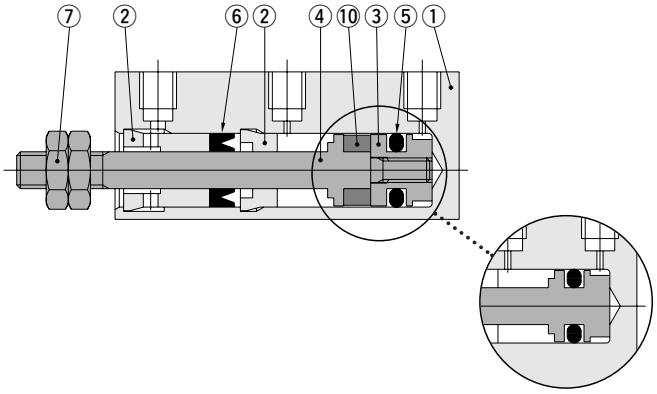
Lead wire length
A：1000mm [39in.]
B：3000mm [118in.]

Number of sensor switches
1：With 1 sensor switch
2：With 2 sensor switches
⋮
n：With n sensor switches

Inner Construction

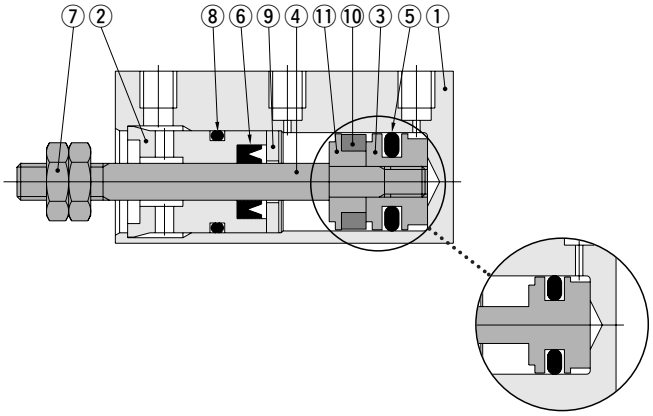
●Double acting type for CS

CS-MBDAS4.5, 6



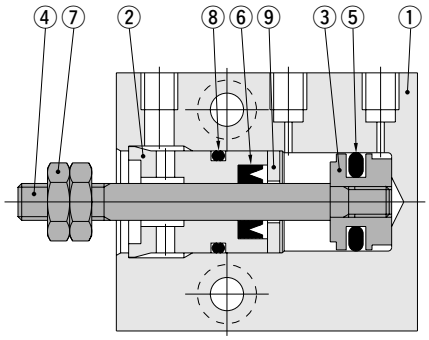
CS-MBDA4.5, 6

CS-MBDAS8, 10



CS-MBDA8

CS-MBDA10



Major Parts and Materials

mm [in.]

No.	Parts \ Bore size	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]
①	Body	Aluminum alloy (anodized)			
②	Rod cap	Oil impregnated plastic bushing (polyacetal)			
③	Piston[Note]	Aluminum alloy (special rust prevention treatment)			
④	Piston rod	Stainless steel			
⑤	Piston seal	Synthetic rubber (NBR)			
⑥	Rod seal	Synthetic rubber (NBR)			
⑦	Rod end nut	Stainless steel	Mild steel (nickel plated)		
⑧	O-ring	—		Synthetic rubber (NBR)	
⑨	Seal holder	—		Aluminum alloy (special rust prevention treatment)	
⑩	Magnet	Neodymium magnet			
⑪	Support	—		Aluminum alloy (special rust prevention treatment)	

Note: Material for **CS-MBDA4.5, 6, 8** is stainless steel, and the piston is one-piece construction with the piston rod.

Evaluations of Cleanliness (Mini Bit Cylinder)

There is currently no standard in JIS or elsewhere for methods of evaluating cleanliness for pneumatic equipment in the cleanroom specifications. Koganei has therefore independently established our in-house measurement methods, to conduct the cleanliness evaluation.

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

1. Measurement sample

ϕ4.5×6, ϕ6×6, ϕ8×6, ϕ10×6 3 units each, for total of 12 units

2. Measurement conditions

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

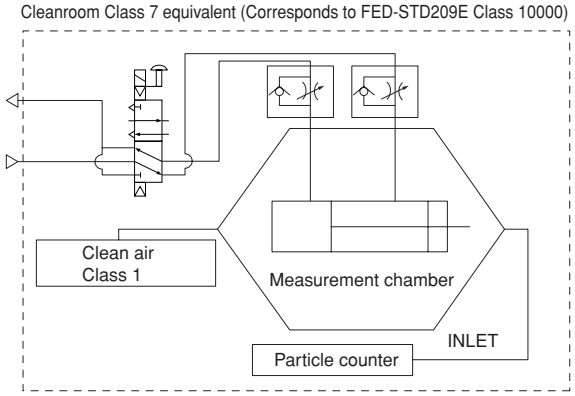


Figure 1

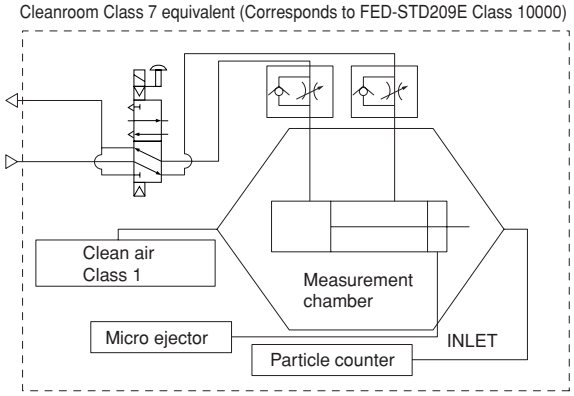


Figure 2

2-2 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 [0.29ft^3]

3. 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

4. Measurement method

4-1 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.

4-2 Measurement under operation

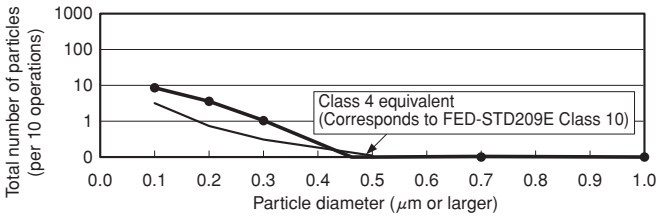
Under the conditions in the above1 and 2, operating the measurement sample for 36 minutes, and measured the total values in the latter half of 18 minutes test.

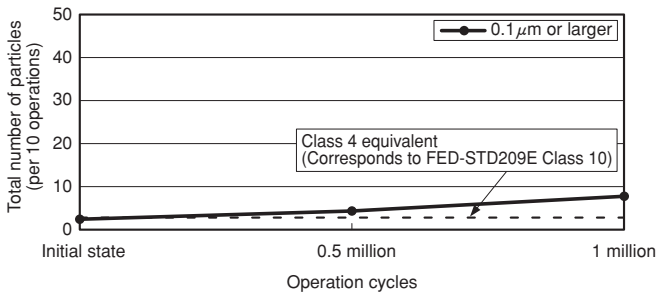
4-3 Reconfirmation

Performed the measurement in 4-1 again, to reconfirm the number of particles in the measurement system.

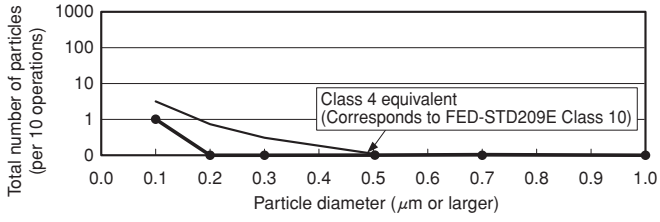
5. Measurement results (for ϕ 10×6) Note: The graphs by particle diameter are based on measurements after 1 million operations of products.

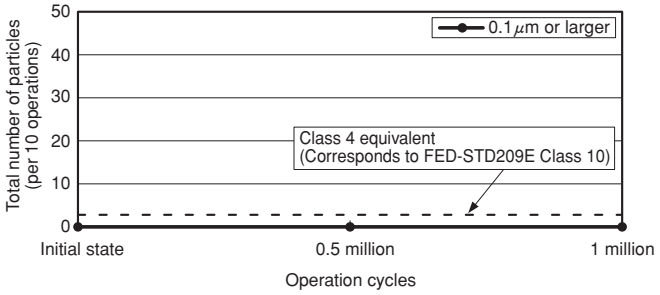
● No suction from dust collection port





● With suction from dust collection port

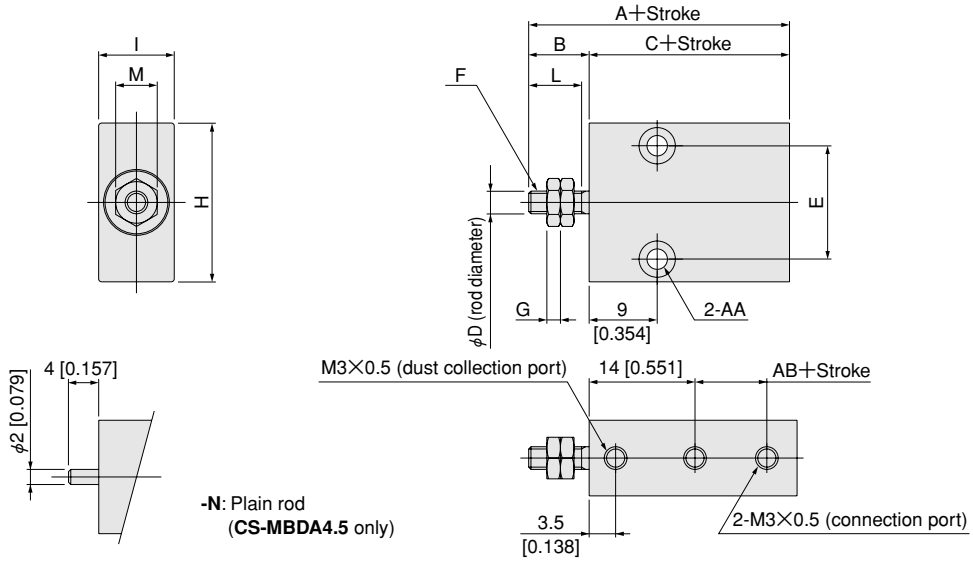




Dimensions mm [in.]

●Double acting type for CS (standard cylinder)

CS-MBDA4.5, 6, 8, 10

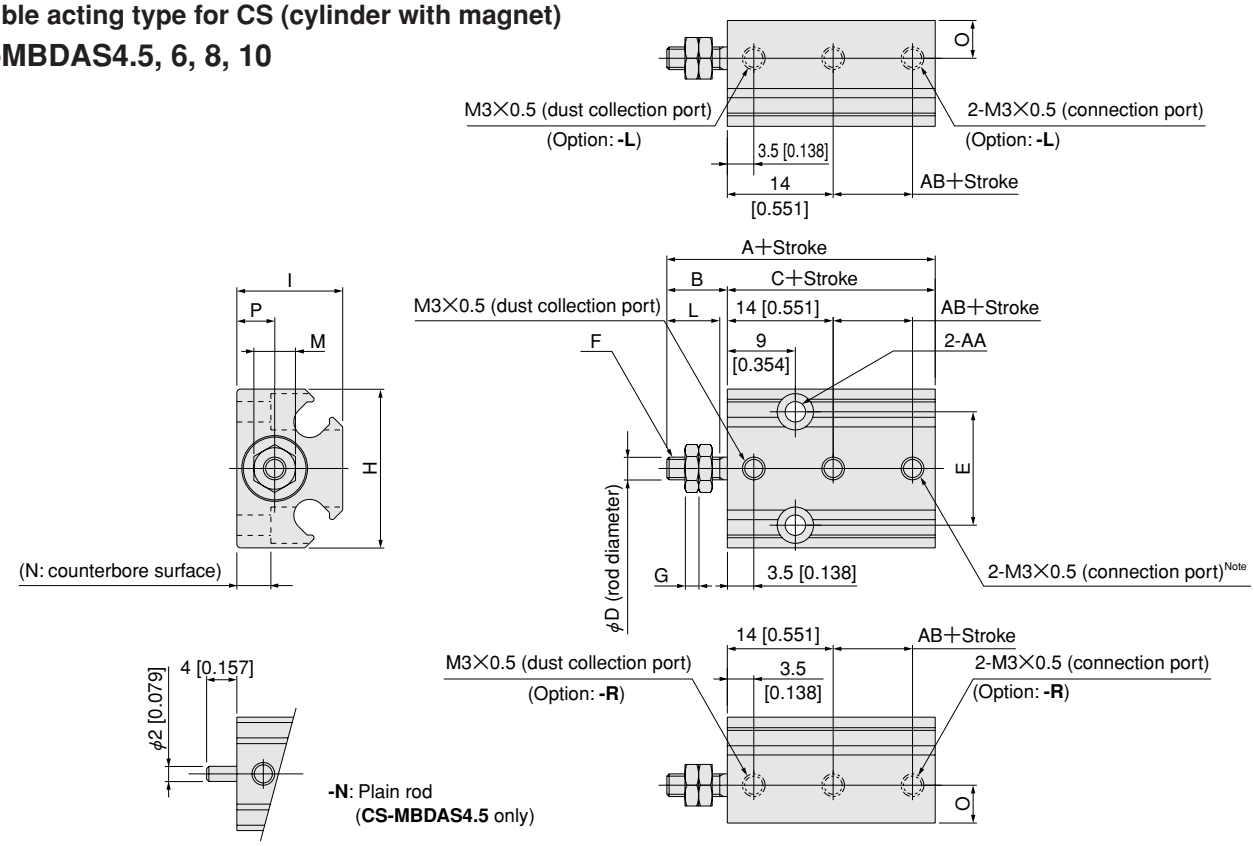


Model \ Code	A	B	C	D	E	F	G	H	I	L	M	AA	AB
CS-MBDA4.5	27 [1.063]	7 [0.276]	20 [0.787]	2 [0.079]	10 [0.394]	M2×0.4	1.6 [0.063]	15 [0.591]	6 [0.236]	6 [0.236]	4 [0.157]	φ2.2 [0.087] Counterbore φ4.1 [0.161] Depth 2.2 [0.087] (both sides)	3 [0.118]
CS-MBDA6	28.5 [1.122]	8 [0.315]	20.5 [0.807]	3 [0.315]	12 [0.472]	M3×0.5	1.8 [0.071]	17 [0.669]	8 [0.315]	7 [0.276]	5.5 [0.217]	φ2.2 [0.087] Counterbore φ4.1 [0.161] Depth 2.2 [0.087] (both sides)	3.5 [0.138]
CS-MBDA8	28.5 [1.122]	8 [0.315]	20.5 [0.807]	3 [0.315]	15 [0.591]	M3×0.5	1.8 [0.071]	21 [0.827]	10 [0.394]	7 [0.276]	5.5 [0.217]	φ2.7 [0.106] Counterbore φ4.8 [0.189] Depth 3 [0.118] (both sides)	3.5 [0.138]
CS-MBDA10	31 [1.220]	10 [0.394]	21 [0.827]	4 [0.157]	17 [0.669]	M4×0.7	2.4 [0.094]	23 [0.906]	12 [0.472]	9 [0.354]	7 [0.276]	φ2.7 [0.106] Counterbore φ4.8 [0.189] Depth 3 [0.118] (both sides)	4 [0.157]

Dimensions mm [in.]

●Double acting type for CS (cylinder with magnet)

CS-MBDAS4.5, 6, 8, 10

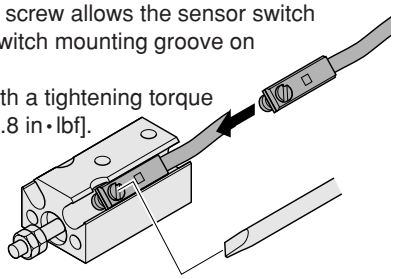


Note: When selecting the optional port location code **-R** or **-L**, the standard connection port comes with a plug.

Model \ Code	A	B	C	D	E	F	G	H	I	L	M	N	O	P	AA	AB
CS-MBDAS4.5	31 [1.220]	7 [0.276]	24 [0.945]	2 [0.079]	10 [0.394]	M2×0.4	1.6 [0.063]	15 [0.591]	11 [0.433]	6 [0.236]	4 [0.157]	2.5 [0.098]	2.8 [0.110]	3 [0.118]	φ2.2 [0.087] Counterbore φ4.1 [0.161] Depth 8.5 [0.335]	7 [0.276]
CS-MBDAS6	32 [1.260]	8 [0.315]	24 [0.945]	3 [0.118]	12 [0.472]	M3×0.5	1.8 [0.071]	17 [0.669]	12 [0.472]	7 [0.276]	5.5 [0.217]	4 [0.157]	4 [0.157]	4 [0.157]	φ2.2 [0.087] Counterbore φ4.1 [0.161] Depth 8 [0.315]	7 [0.276]
CS-MBDAS8	31.5 [1.240]	8 [0.315]	23.5 [0.925]	3 [0.118]	15 [0.591]	M3×0.5	1.8 [0.071]	21 [0.827]	14 [0.551]	7 [0.276]	5.5 [0.217]	4.5 [0.177]	5 [0.197]	5 [0.197]	φ2.7 [0.106] Counterbore φ4.8 [0.189] Depth 9.5 [0.374]	6.5 [0.256]
CS-MBDAS10	34 [1.339]	10 [0.394]	24 [0.945]	4 [0.157]	17 [0.669]	M4×0.7	2.4 [0.094]	23 [0.906]	16 [0.630]	9 [0.354]	7 [0.276]	5.5 [0.217]	6 [0.236]	6 [0.236]	φ2.7 [0.106] Counterbore φ4.8 [0.189] Depth 10.5 [0.413]	7 [0.276]

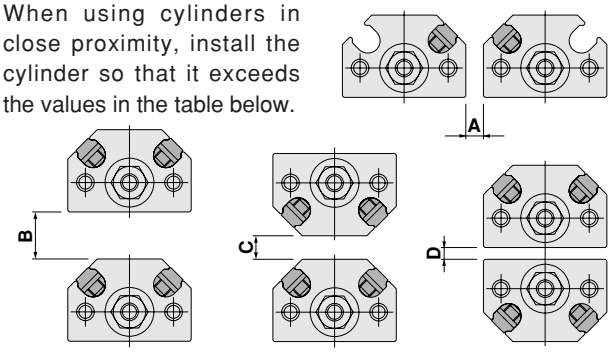
Moving Sensor Switch

- Loosening the mounting screw allows the sensor switch to be moved along the switch mounting groove on the Mini Bit Cylinder.
- Tighten the set screw with a tightening torque of 0.1～0.2N·m [0.9～1.8 in·lbf].



When Mounting Sensor Switches in Close Proximity

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



mm [in.]

Item / Bore size	A	B	C	D
4.5 [0.177]	2 [0.079]	6 [0.236]	1 [0.039]	2 [0.079]
6 [0.236]	4 [0.157]	9 [0.354]	5 [0.197]	3 [0.118]
8 [0.315]	3 [0.118]	8 [0.315]	4 [0.157]	2 [0.079]
10 [0.394]	2 [0.079]	8 [0.315]	4 [0.157]	1 [0.039]

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

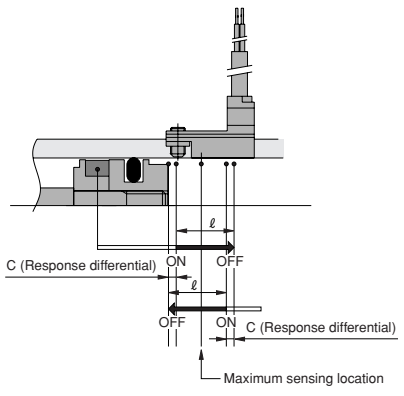
- **Operating range: ℓ**
  The distance the piston travels in one direction, while the switch is in the ON position.
- **Response differential: C**
  The distance between the point where the piston turns the switch ON and the point where the switch is turned OFF as the piston travels in the opposite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

Solid state type

mm [in.]

Item / Bore size	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]
Operating range: ℓ	1.6～2.8 [0.063～0.110]	1.8～3.0 [0.071～0.118]	1.8～3.0 [0.071～0.118]	2.0～3.2 [0.079～0.126]
Response differential: C	0.2 [0.008] or less			
Maximum sensing location Note	6 [0.236]			

Remark: The above table shows reference values.
Note: The distance from the end of the opposite side of the lead wire.



Minimum Cylinder Strokes When Mounting Sensor Switches

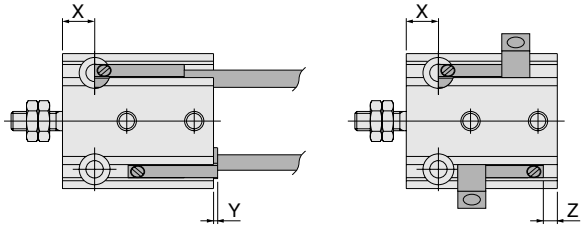
Solid state type

mm [in.]

Item / Bore size	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]
1pc. switch mounting	1.5 [0.059]			
2pcs. switch mounting	3 [0.118]			

Mounting Location of End of Stroke Detection Sensor Switch

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



Solid state type

mm [in.]

Item / Bore size		4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]
Double acting type	X	6 [0.236]	5.5 [0.217]	5 [0.197]	5 [0.197]
	Y	1.5 [0.059]	1 [0.039]	1.5 [0.059]	1 [0.039]
	Z	2 [0.079]	2 [0.079]	2 [0.079]	2.5 [0.098]
Single acting push type	X	8 [0.315]	7.5 [0.295]	7 [0.276]	7 [0.276]
	Y	1.5 [0.059]	1 [0.039]	1.5 [0.059]	1 [0.039]
	Z	2 [0.079]	2 [0.079]	2 [0.079]	2.5 [0.098]
CS specification	X	10 [0.394]	9.5 [0.374]	9 [0.354]	9 [0.354]
	Y	1.5 [0.059]	1 [0.039]	1.5 [0.059]	1 [0.039]
	Z	2 [0.079]	2 [0.079]	2 [0.079]	2.5 [0.098]

Order Codes (for Sensor Switches Only)

CS — [ ] [ ] — **MBDAS**

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

Sensor switch
ZE135 —— 2-lead wire Solid state type with indicator lamp DC10～28V horizontal lead wire
ZE155 —— 3-lead wire Solid state type with indicator lamp DC4.5～28V horizontal lead wire
ZE235 —— 2-lead wire Solid state type with indicator lamp DC10～28V vertical lead wire
ZE255 —— 3-lead wire Solid state type with indicator lamp DC4.5～28V vertical lead wire

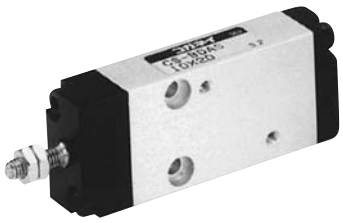
● For details of sensor switches, see p.111～121.

Clean system product

KOGANEI CLEAN SYSTEM

MULTI MOUNT CYLINDERS

Double Acting Type



Symbol

Specifications

Item \ Bore size mm [in.]	6 [0.236]	10 [0.394]	16 [0.630]
Operating type	Double acting type		
Media	Air		
Operating pressure range MPa [psi.]	0.15～0.7 [22～102]	0.1～0.7 [15～102]	0.08～0.7 [12～102]
Proof pressure MPa [psi.]	1.03 [149]		
Operating temperature range °C [°F]	0～60 [32～140]		
Operating speed range mm/s [in./sec.]	50～300 [2.0～11.8]		
Cushion	Rubber bumper		
Lubrication	Not required		
Port size	M5×0.8		
Stroke tolerance mm [in.]	$^{+1}_{0}$ [$^{+0.039}_{0}$]		

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes
6 [0.236]	5, 10, 15, 20, 25, 30
10 [0.394]	
16 [0.630]	

Order Codes

CS – **BDA** □ **10×30** – □ □ □

Clean system product

Multi mount cylinder
Double acting type

Cylinder specification
Blank — Standard cylinder
S — Cylinder with magnet

Bore size
×
Stroke

Sensor switch
Blank — Without sensor switch
ZC130 — 2-lead wire Solid state type with indicator lamp (DC10～28V)
ZC153 — 3-lead wire Solid state type with indicator lamp (DC4.5～28V)
CS5T — 2-lead wire Reed switch type without indicator lamp (DC5～28V, AC85～115V)
CS11T — 2-lead wire Reed switch type with indicator lamp (DC10～28V)

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

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

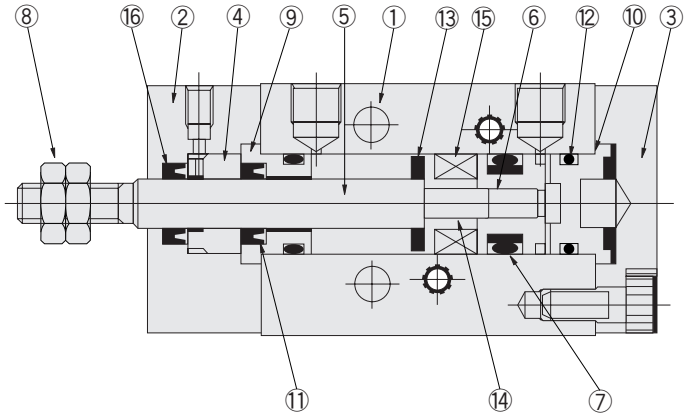
Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches

●Shield Plate Model

Bore size mm [in.]	Stroke	
	5, 10, 15	20, 25, 30
6 [0.236]	**CS-BS061**	**CS-BS062**
10 [0.394]	**CS-BS101**	**CS-BS102**
16 [0.630]	**CS-BS161**	**CS-BS162**

Inner Construction and Major Parts

●CS-BDAS



Major Parts and Materials

No.	Parts	Materials
①	Body	Aluminum alloy (anodized)
②	Rod cover	Aluminum alloy (black anodized)
③	Head cover	Aluminum alloy (black anodized)
④	Rod bushing	Oil impregnated bronze
⑤	Piston rod	Stainless steel
⑥	Piston	Brass
⑦	Piston seal	Synthetic rubber (NBR)
⑧	Rod end nut	Steel (electric nickel plated)
⑨	Seal case	Brass
⑩	Cap	Plastic
⑪	Rod seal	Synthetic rubber (NBR)
⑫	O-ring	Synthetic rubber (NBR)
⑬	Bumper	Urethane rubber
⑭	Support	Brass
⑮	Magnet	ϕ 6: Sintered alloy magnet; ϕ 10, ϕ 16: Plastic magnet
⑯	Dust leak prevention seal	Synthetic rubber (NBR)

Seals

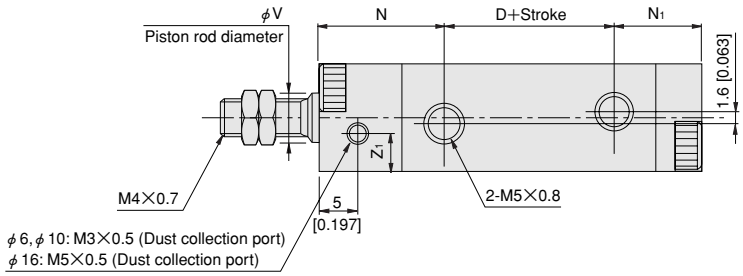
Parts / Bore size mm — Q'ty	Rod seal	Piston seal	O-ring	Dust leak prevention seal
	1	1	2	1
6	NY-6×3×2	PPH-6	8.4×6×1.2	NY-6×3×2
10	NY-8×5×2	PPH-10	10×7.6×1.2	NY-8×5×2
16	NY-9×6×2	PPH-16	16×13×1.5	NY-9×6×2

Mass

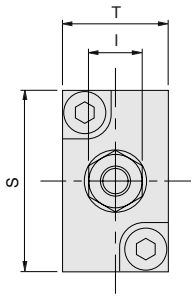
g [oz.]

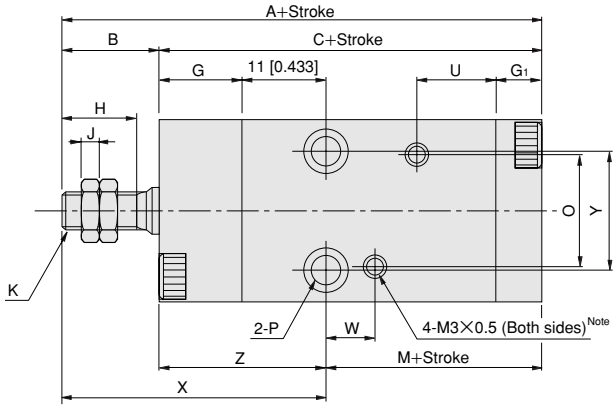
Bore size mm [in.]	Stroke mm	Mass of side mount		Additional mass			
		Standard cylinder	Cylinder with magnet	With 1 sensor switch (Only for cylinder with magnet)			
				ZC130□	**ZC153□**	**CS5T□**	**CS11T□**
6 [0.236]	5	23 [0.81]	26 [0.92]	20 [0.71]			
	10	26 [0.92]	29 [1.02]				
	15	29 [1.02]	32 [1.13]				
	20	32 [1.13]	35 [1.23]				
	25	35 [1.23]	38 [1.34]				
	30	38 [1.34]	41 [1.45]				
10 [0.394]	5	41 [1.45]	47 [1.66]	20 [0.71]			
	10	45 [1.59]	51 [1.80]				
	15	49 [1.73]	55 [1.94]				
	20	53 [1.87]	59 [2.08]				
	25	57 [2.01]	63 [2.22]				
	30	61 [2.15]	67 [2.36]				
16 [0.630]	5	84 [2.96]	97 [3.42]	20 [0.71]			
	10	91 [3.21]	104 [3.67]				
	15	98 [3.46]	111 [3.92]				
	20	105 [3.70]	118 [4.16]				
	25	112 [3.95]	125 [4.41]				
	30	119 [4.20]	132 [4.66]				

Dimensions mm [in.]

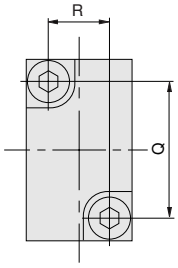


ϕ10, ϕ16

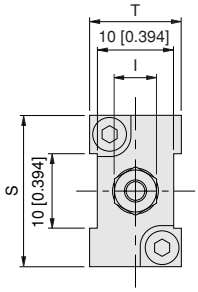




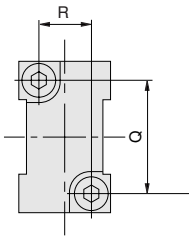
ϕ10, ϕ16



ϕ6



ϕ6



Type	Standard cylinder				Cylinder with magnet				B	G	G1	H	I	J	K
Code / Bore size	A	C	D	M	A	C	D	M							
6 [0.236]	43 [1.693]	33 [1.299]	8 [0.315]	12 [0.472]	48 [1.890]	38 [1.496]	13 [0.512]	17 [0.669]	10 [0.394]	10 [0.394]	5 [0.197]	7 [0.276]	5.5 [0.217]	1.8 [0.071]	M3×0.5
10 [0.394]	48 [1.890]	35 [1.378]	7 [0.276]	13 [0.512]	53 [2.087]	40 [1.575]	12 [0.472]	18 [0.709]	13 [0.512]	11 [0.433]	6 [0.236]	10 [0.394]	7 [0.276]	2.4 [0.094]	M4×0.7
16 [0.630]	53 [2.087]	38 [1.496]	8 [0.315]	15 [0.591]	58 [2.283]	43 [1.693]	13 [0.512]	20 [0.787]	15 [0.591]	12 [0.472]	7 [0.276]	12 [0.472]	8 [0.315]	3.2 [0.126]	M5×0.8

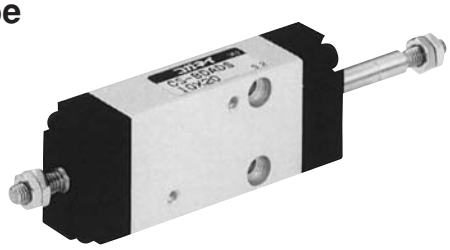
Code / Bore size	N	N1	O	P	Q	R	S	T	U	V	W	X	Y	Z	Z1
6 [0.236]	15 [0.591]	10 [0.394]	14 [0.551]	ϕ3.5 [0.138], 4−ϕ6 [0.236] Counterbore Depth 4.2 [0.165] (Both sides)	15 [0.591]	7 [0.276]	20 [0.787]	12 [0.472]	10.5 [0.413]	3 [0.118]	6.5 [0.256]	31 [1.220]	12 [0.472]	21 [0.827]	5 [0.197]
10 [0.394]	16.5 [0.650]	11.5 [0.453]	15 [0.591]	ϕ3.5 [0.138], 4−ϕ6 [0.236] Counterbore Depth 3.2 [0.126] (Both sides)	18 [0.709]	8 [0.315]	24 [0.945]	14 [0.551]		5 [0.197]		35 [1.378]	16 [0.630]	22 [0.866]	5 [0.197]
16 [0.630]	17.5 [0.689]	12.5 [0.492]	19 [0.748]	ϕ4.5 [0.177], 4−ϕ7.6 [0.299] Counterbore Depth 4.2 [0.165] (Both sides)	25 [0.984]	12 [0.472]	33 [1.299]	20 [0.787]		6 [0.236]	7.5 [0.295]	38 [1.496]	24 [0.945]	23 [0.906]	7 [0.276]

Note: The 4-M3×0.5 female thread (for sensor switch mounting) in the drawing should not be used for mounting the cylinder. Moreover, it is not available with the cylinder body of a standard 5mm [0.197in.] stroke cylinder.

KOGANEI CLEAN SYSTEM

MULTI MOUNT CYLINDERS

Double Acting Double Rod End Type



Symbol

Specifications

Item \ Bore size mm [in.]	6 [0.236]	10 [0.394]	16 [0.630]
Operating type	Double acting type		
Media	Air		
Operating pressure range MPa [psi.]	0.2～0.7 [29～102]	0.15～0.7 [22～102]	0.1～0.7 [15～102]
Proof pressure MPa [psi.]	1.03 [149]		
Operating temperature range °C [°F]	0～60 [32～140]		
Operating speed range mm/s [in./sec.]	50～300 [2.0～11.8]		
Cushion	Rubber bumper		
Lubrication	Not required		
Port size	M5×0.8		
Stroke tolerance mm [in.]	$^{+1}_{0}$ [$^{+0.039}_{0}$]		

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes
6 [0.236]	5, 10, 15, 20, 25, 30
10 [0.394]	
16 [0.630]	

Order Codes

CS – **BDAD** □ **10×30** – □ □ □

Clean system product

Multi mount cylinder
Double acting double rod end type

Cylinder specification
Blank — Standard cylinder
S — Cylinder with magnet

Bore size
×
Stroke

Sensor switch
Blank — Without sensor switch
ZC130 — 2-lead wire Solid state type with indicator lamp (DC10～28V)
ZC153 — 3-lead wire Solid state type with indicator lamp (DC4.5～28V)
CS5T — 2-lead wire Reed switch type without indicator lamp (DC5～28V, AC85～115V)
CS11T — 2-lead wire Reed switch type with indicator lamp (DC10～28V)

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

Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches

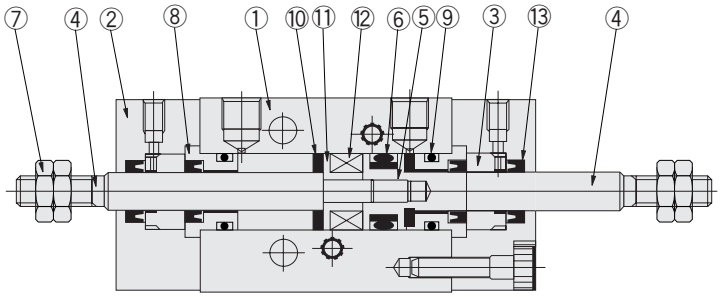
● For details of sensor switches, see p.111～121.

●Shield Plate Model

Bore size mm [in.]	Stroke	
	5, 10, 15	20, 25, 30
6 [0.236]	CS-BS061	CS-BS062
10 [0.394]	CS-BS101	CS-BS102
16 [0.630]	CS-BS161	CS-BS162

Inner Construction and Major Parts

●CS-BDADS



Major Parts and Materials

No.	Parts	Materials
①	Body	Aluminum alloy (anodized)
②	Rod cover	Aluminum alloy (black anodized)
③	Rod bushing	Oil impregnated bronze
④	Piston rod	Stainless steel
⑤	Piston	Stainless steel
⑥	Piston seal	Synthetic rubber (NBR)
⑦	Rod end nut	Steel (electric nickel plated)
⑧	Seal case	Brass
⑨	O-ring	Synthetic rubber (NBR)
⑩	Bumper	Urethane rubber
⑪	Support	Brass
⑫	Magnet	ϕ 6: Sintered alloy magnet, ϕ 10, ϕ 16: Plastic magnet
⑬	Dust leak prevention seal	Synthetic rubber (NBR)

Seals

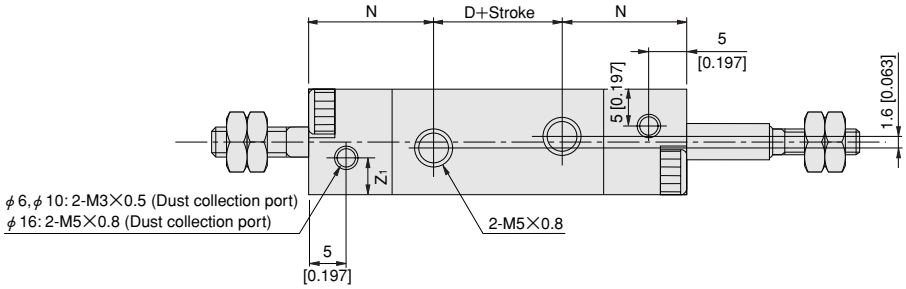
Parts / Bore size mm / Q'ty	Rod seal	Piston seal	O-ring	Dust leak prevention seal
	2	1	2	2
6	NY-6×3×2	PPH-6	8.4×6×1.2	NY-6×3×2
10	NY-8×5×2	PPH-10	10×7.6×1.2	NY-8×5×2
16	NY-9×6×2	PPH-16	16×13×1.5	NY-9×6×2

Mass

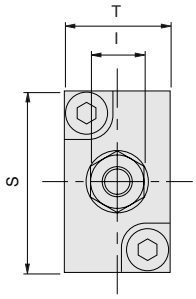
g [oz.]

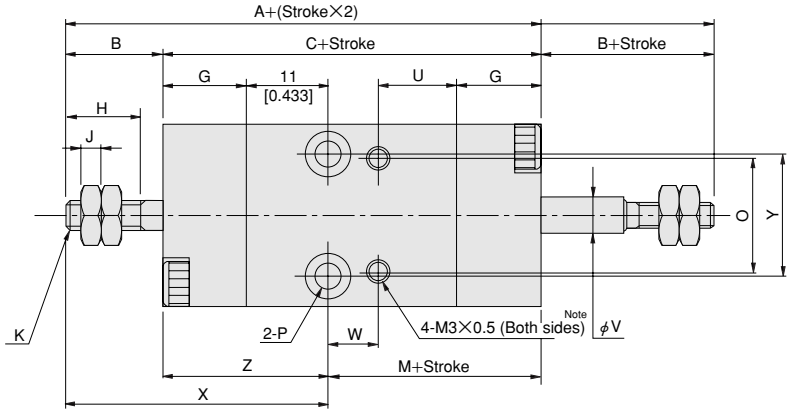
Bore size mm [in.]	Stroke mm	Mass of side mount		Additional mass			
		Standard cylinder	Cylinder with magnet	With 1 sensor switch (Only for cylinder with magnet)			
				ZC130□	**ZC153□**	**CS5T□**	**CS11T□**
6 [0.236]	5	31 [1.09]	34 [1.20]	20 [0.71]			
	10	34 [1.20]	37 [1.31]				
	15	37 [1.31]	40 [1.41]				
	20	40 [1.41]	43 [1.52]				
	25	43 [1.52]	46 [1.62]				
	30	46 [1.62]	49 [1.73]				
10 [0.394]	5	53 [1.87]	59 [2.08]	20 [0.71]			
	10	57 [2.01]	63 [2.22]				
	15	61 [2.15]	67 [2.36]				
	20	65 [2.29]	71 [2.50]				
	25	69 [2.43]	75 [2.65]				
	30	73 [2.57]	79 [2.79]				
16 [0.630]	5	105 [3.70]	118 [4.16]	20 [0.71]			
	10	112 [3.95]	125 [4.41]				
	15	119 [4.20]	132 [4.66]				
	20	126 [4.44]	139 [4.90]				
	25	133 [4.69]	146 [5.15]				
	30	140 [4.94]	153 [5.40]				

Dimensions mm [in.]

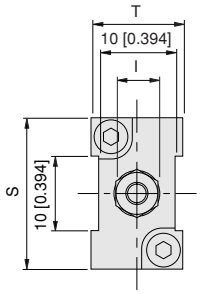


φ10, φ16





φ6



Type / Code / Bore size	Standard cylinder A	C	D	M	Cylinder with magnet A	C	D	M	B	G	H	I	J	K
6 [0.236]	58 [2.283]	38 [1.496]	8 [0.315]	17 [0.669]	63 [2.480]	43 [1.693]	13 [0.512]	22 [0.866]	10 [0.394]	10 [0.394]	7 [0.276]	5.5 [0.217]	1.8 [0.071]	M3×0.5
10 [0.394]	66 [2.598]	40 [1.575]	7 [0.276]	18 [0.709]	71 [2.795]	45 [1.772]	12 [0.472]	23 [0.906]	13 [0.512]	11 [0.433]	10 [0.394]	7 [0.276]	2.4 [0.094]	M4×0.7
16 [0.630]	73 [2.874]	43 [1.693]	8 [0.315]	20 [0.787]	78 [3.071]	48 [1.890]	13 [0.512]	25 [0.984]	15 [0.591]	12 [0.472]	12 [0.472]	8 [0.315]	3.2 [0.126]	M5×0.8

Code / Bore size	N	O	P	S	T	U	V	W	X	Y	Z	Z_1
6 [0.236]	15 [0.591]	14 [0.551]	φ3.5 [0.138] Counterbore φ6 [0.236] Depth 4.2 [0.165] (Both sides)	20 [0.787]	12 [0.472]	10.5 [0.413]	3 [0.118]	6.5 [0.256]	31 [1.220]	12 [0.472]	21 [0.827]	5 [0.197]
10 [0.394]	16.5 [0.650]	15 [0.591]	φ3.5 [0.138] Counterbore φ6 [0.236] Depth 3.2 [0.126] (Both sides)	24 [0.945]	14 [0.551]		5 [0.197]		35 [1.378]	16 [0.630]	22 [0.866]	5 [0.197]
16 [0.630]	17.5 [0.689]	19 [0.748]	φ4.5 [0.177] Counterbore φ7.6 [0.299] Depth 4.2 [0.165] (Both sides)	33 [1.299]	20 [0.787]		6 [0.236]	7.5 [0.295]	38 [1.496]	24 [0.945]	23 [0.906]	7 [0.276]

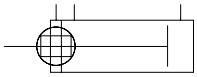
Note: The 4-M3×0.5 female thread (for sensor switch mounting) in the drawing should not be used for mounting the cylinder. Moreover, it is not available with the cylinder body of a standard 5mm [0.197in.] stroke cylinder.

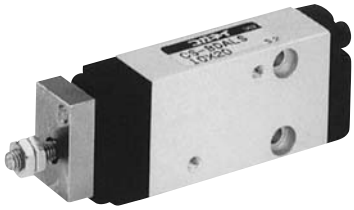
KOGANEI CLEAN SYSTEM

MULTI MOUNT CYLINDERS

Non-rotating Double Acting Type

Symbol





Specifications

Item \ Bore size mm [in.]	6 [0.236]	10 [0.394]	16 [0.630]
Operating type	Non-rotating double acting type		
Media	Air		
Operating pressure range MPa [psi.]	0.2～0.7 [29～102]	0.15～0.7 [22～102]	0.1～0.7 [15～102]
Proof pressure MPa [psi.]	1.03 [149]		
Operating temperature range °C [°F]	0～60 [32～140]		
Operating speed range mm/s [in./sec.]	50～300 [2.0～11.8]		
Cushion	Rubber bumper		
Lubrication	Not required		
Non-rotating accuracy	±2°	±1.5°	±1°
Port size	M5×0.8		
Stroke tolerance mm [in.]	$^{+1}_{0}$ [$^{+0.039}_{0}$]		

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes
6 [0.236]	5, 10, 15, 20, 25, 30
10 [0.394]	
16 [0.630]	

Order Codes

CS – BDAL □ 10×30 – □ □ □

Clean system product

Multi mount cylinder
Non-rotating double acting type

Cylinder specification
Blank — Standard cylinder
S — Cylinder with magnet

Bore size
×
Stroke

Sensor switch
Blank — Without sensor switch
ZC130 — 2-lead wire Solid state type with indicator lamp (DC10～28V)
ZC153 — 3-lead wire Solid state type with indicator lamp (DC4.5～28V)
CS5T — 2-lead wire Reed switch type without indicator lamp (DC5～28V, AC85～115V)
CS11T — 2-lead wire Reed switch type with indicator lamp (DC10～28V)

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

Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches

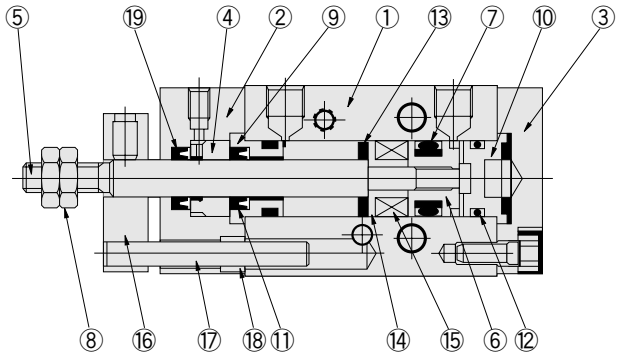
● For details of sensor switches, see p.111～121.

●Shield Plate Model

Bore size mm [in.]	Stroke	
	5, 10, 15	20, 25, 30
6 [0.236]	CS-BS061	CS-BS062
10 [0.394]	CS-BS101	CS-BS102
16 [0.630]	CS-BS161	CS-BS162

Inner Construction and Major Parts

●CS-BDALS



Major Parts and Materials

No.	Parts	Materials
①	Body	Aluminum alloy (anodized)
②	Rod cover	Aluminum alloy (black anodized)
③	Head cover	Aluminum alloy (black anodized)
④	Rod bushing	Oil impregnated bronze
⑤	Piston rod	Stainless steel
⑥	Piston	Brass
⑦	Piston seal	Synthetic rubber(NBR)
⑧	Rod end nut	Steel (electric nickel plated)
⑨	Seal case	Brass
⑩	Cap	Plastic
⑪	Rod seal	Synthetic rubber (NBR)
⑫	O-ring	Synthetic rubber (NBR)
⑬	Bumper	Urethane rubber
⑭	Support	Brass
⑮	Magnet	ϕ6: Sintered alloy magnet ϕ10, ϕ16: Plastic magnet
⑯	Plate	Brass (electric nickel plated)
⑰	Guide pin	Stainless steel
⑱	Bushing	Plastic
⑲	Dust leak prevention seal	Synthetic rubber(NBR)

Seals

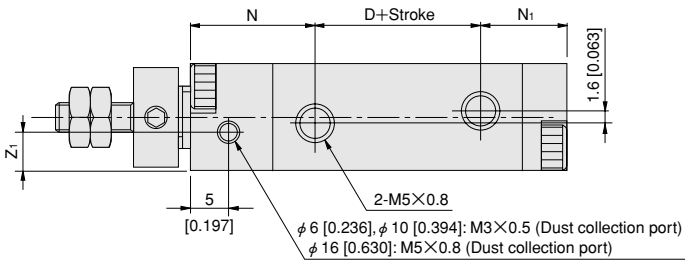
Parts / Bore size mm / Q'ty	Rod seal	Piston seal	O-ring	Dust leak prevention seal
	1	1	2	1
6	NY-6×3×2	PPH-6	8.4×6×1.2	NY-6×3×2
10	NY-8×5×2	PPH-10	10×7.6×1.2	NY-8×5×2
16	NY-9×6×2	PPH-16	16×13×1.5	NY-9×6×2

Mass

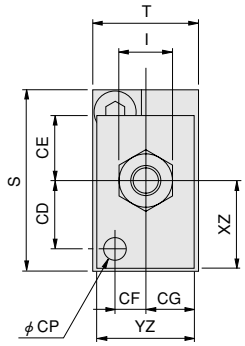
g [oz.]

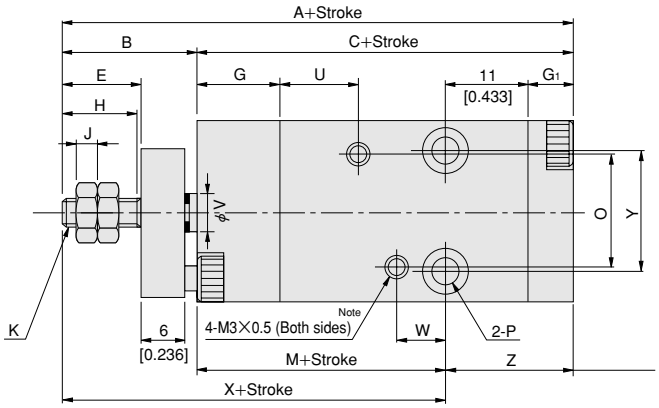
Bore size mm [in.]	Stroke mm	Mass of side mount		Additional mass			
		Standard cylinder	Cylinder with magnet	With 1 sensor switch (Only for cylinder with magnet)			
				ZC130□	**ZC153□**	**CS5T□**	**CS11T□**
6 [0.236]	5	33 [1.16]	36 [1.27]	20 [0.71]			
	10	36 [1.27]	39 [1.38]				
	15	39 [1.38]	42 [1.48]				
	20	42 [1.48]	45 [1.59]				
	25	45 [1.59]	48 [1.69]				
	30	48 [1.69]	51 [1.80]				
10 [0.394]	5	55 [1.94]	61 [2.15]	20 [0.71]			
	10	59 [2.08]	65 [2.29]				
	15	63 [2.22]	69 [2.43]				
	20	67 [2.36]	73 [2.57]				
	25	71 [2.50]	77 [2.72]				
	30	75 [2.65]	81 [2.86]				
16 [0.630]	5	109 [3.84]	122 [4.30]	20 [0.71]			
	10	116 [4.09]	129 [4.55]				
	15	123 [4.34]	136 [4.80]				
	20	130 [4.59]	143 [5.04]				
	25	137 [4.83]	150 [5.29]				
	30	144 [5.08]	157 [5.54]				

Dimensions mm [in.]

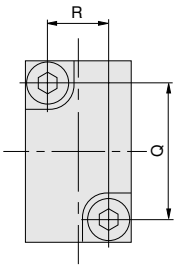


ϕ10 [0.394], ϕ16 [0.630]

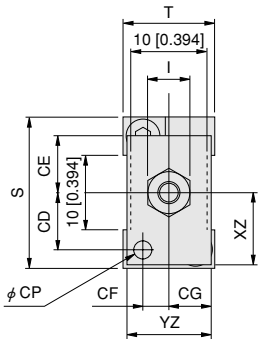




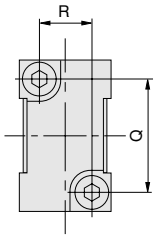
ϕ10 [0.394], ϕ16 [0.630]



ϕ 6 [0.236]



ϕ 6 [0.236]



Type	Standard cylinder					Cylinder with magnet					B	E	G	I	J	K
Code / Bore size	A	C	D	M	X	A	C	D	M	X						
6 [0.236]	48 [1.890]	33 [1.299]	8 [0.315]	17 [0.669]	32 [1.260]	53 [2.087]	38 [1.496]	13 [0.512]	22 [0.866]	37 [1.457]	15 [0.591]	7.5 [0.295]	10 [0.394]	5.5 [0.217]	1.8 [0.071]	M3×0.5
10 [0.394]	53 [2.087]	35 [1.378]	7 [0.276]	18 [0.709]	36 [1.417]	58 [2.283]	40 [1.575]	12 [0.472]	23 [0.906]	41 [1.614]	18 [0.709]	10.5 [0.413]	11 [0.433]	7 [0.276]	2.4 [0.094]	M4×0.7
16 [0.630]	58 [2.283]	38 [1.496]	8 [0.315]	20 [0.787]	40 [1.575]	63 [2.480]	43 [1.693]	13 [0.512]	25 [0.984]	45 [1.772]	20 [0.787]	12.5 [0.492]	12 [0.472]	8 [0.315]	3.2 [0.126]	M5×0.8

Code / Bore size	N	N1	O	P	Q	R	S	T	U	V	W	Y	Z	Z1
6 [0.236]	15 [0.591]	10 [0.394]	14 [0.551]	ϕ3.5 [0.138], Counterbore ϕ6 [0.236] Depth 4.2 [0.165] (Both sides)	15 [0.591]	7 [0.276]	20 [0.787]	12 [0.472]	10.5 [0.413]	3 [0.118]	6.5 [0.256]	12 [0.472]	16 [0.630]	5 [0.197]
10 [0.394]	16.5 [0.650]	11.5 [0.453]	15 [0.591]	ϕ3.5 [0.138], Counterbore ϕ6 [0.236] Depth 3.2 [0.126] (Both sides)	18 [0.709]	8 [0.315]	24 [0.945]	14 [0.551]		5 [0.197]		16 [0.630]	17 [0.669]	5 [0.197]
16 [0.630]	17.5 [0.689]	12.5 [0.492]	19 [0.748]	ϕ4.5 [0.177], Counterbore ϕ7.6 [0.299] Depth 4.2 [0.165] (Both sides)	25 [0.984]	12 [0.472]	33 [1.299]	20 [0.787]		6 [0.236]	7.5 [0.295]	24 [0.945]	18 [0.709]	7 [0.276]

Code / Bore size	CD	CE	CF	CG	CP	XZ	YZ
6 [0.236]	7.5 [0.295]	7.5 [0.295]	3.5 [0.138]	5.5 [0.217]	2.5 [0.098]	9.5 [0.374]	11 [0.433]
10 [0.394]	9 [0.354]	8.5 [0.335]	4 [0.157]	6.5 [0.256]	3 [0.118]	11.5 [0.453]	13 [0.512]
16 [0.630]	12.5 [0.492]	9 [0.354]	6 [0.236]	9.5 [0.374]	4 [0.157]	16 [0.630]	19 [0.748]

Note: The 4-M3×0.5 female thread (for sensor switch mounting) in the drawing should not be used for mounting the cylinder. Moreover, it is not available with the cylinder body of a standard 5mm [0.197in.] stroke cylinder.

Order Codes (for Sensor Switches Only)

●Sensor switches only

CS – □ □

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

Sensor switch
ZC130
ZC153
CS5T
CS11T
●For details of sensor switches, see p.111～121.

Clean system product

●Sensor switch and Mounting bracket (Sensor switch with mounting bracket)

CS – □ □ – BDAS □

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

Bore size
6 —— ϕ 6 [0.236in.]
10 —— ϕ 10 [0.394in.]
16 —— ϕ 16 [0.630in.]

Sensor switch
ZC130
ZC153
CS5T
CS11T
●For details of sensor switches, see p.111～121.

Multi mount cylinder

Clean system product

●Mounting bracket only

CS – C1 – BDAS □

Bore size
6 —— ϕ 6 [0.236in.]
10 —— ϕ 10 [0.394in.]
16 —— ϕ 16 [0.630in.]

Multi mount cylinder

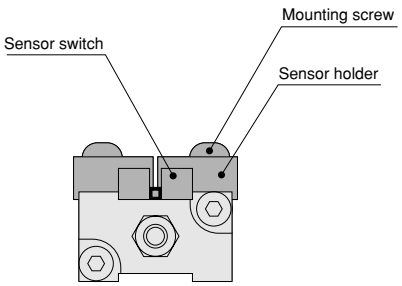
Mounting bracket type

Clean system product

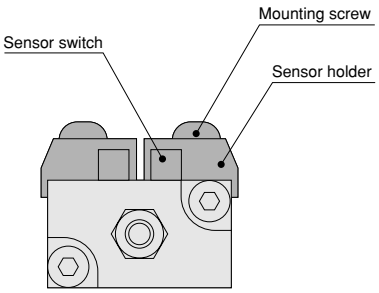
Moving Sensor Switch

- Loosening the mounting screw allows the sensor switch to be moved freely in the cylinder's axial direction.
- Tighten the mounting screw with a tightening torque of 19.6N·cm [1.73in·lbf] or less.

● ϕ 6



● ϕ 10,16



Minimum Cylinder Strokes When Mounting Sensor Switches

mm [in.]

Bore size	Solid state type sensor switch		Reed switch type sensor switch	
	2 pcs. mounting	1 pc. mounting	2 pcs. mounting	1 pc. mounting
6 [0.236]	5 [0.197]	5 [0.197]	10 [0.394]	5 [0.197]
10 [0.394]				
16 [0.630]				

Remark: Two sensor switches cannot be mounted on a cylinder with flange B mount.
Mount 1 sensor switch on the head side when the flange B mount is used on the rod side, and mount 1 sensor switch on the rod side when the flange B mount is used on the head side.

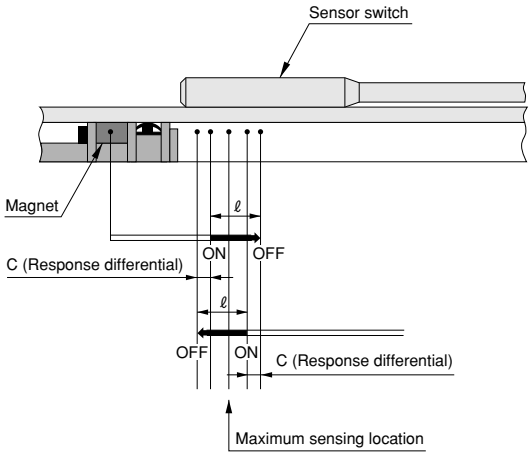
Sensor Switch Operating Range, Response Differential, and Maximum Sensing Location

● 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.

mm [in.]

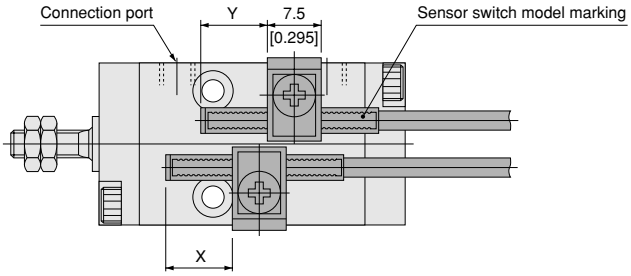
Bore size	ZC130□,ZC153□		CS5T□,CS11T□	
	Operating range	Response differential	Operating range	Response differential
6 [0.236]	2.0～3.0 [0.079～0.118]	0.3 [0.012] or less	4.8～7.2 [0.189～0.283]	1.3 [0.051] or less
10 [0.394]	2.0～3.0 [0.079～0.118]	0.3 [0.012] or less	5.8～8.3 [0.228～0.327]	2.0 [0.079] or less
16 [0.630]	2.5～4.0 [0.098～0.157]	0.3 [0.012] or less	7.5～9.4 [0.295～0.370]	2.5 [0.098] or less

Remark: The above table shows reference values.



Mounting Location of End of Stroke Detection Sensor Switch

●Cylinder with magnet
●Double rod end cylinder with magnet



■Double acting type (Including double rod end cylinders)

mm [in.]

Bore size	Mounting location	Sensor switch model		
		ZC130□,ZC153□	CS5T□	CS11T□
6 [0.236]	X	13.0 [0.512]	11.5 [0.453]	15 [0.591]
10 [0.394]	Y	8.0 [0.315]	6.5 [0.256]	10 [0.394]
16 [0.630]	X	14.0 [0.551]	12.5 [0.492]	16 [0.630]
	Y	9.0 [0.354]	7.5 [0.295]	11 [0.433]

■Single acting push type

mm [in.]

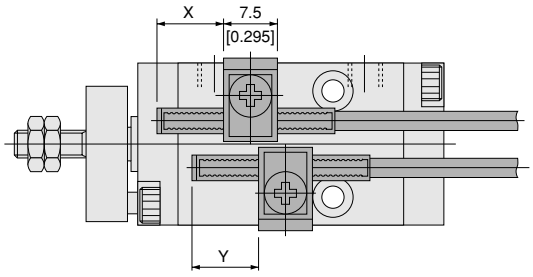
Bore size	Mounting location	Sensor switch model		
		ZC130□,ZC153□	CS5T□	CS11T□
6 [0.236]	X	8.0 [0.315]	6.5 [0.256]	10 [0.394]
10 [0.394]	Y	8.0 [0.315]	6.5 [0.256]	10 [0.394]
16 [0.630]	X	9.0 [0.354]	7.5 [0.295]	11 [0.433]
	Y	9.0 [0.354]	7.5 [0.295]	11 [0.433]

■Single acting pull type

mm [in.]

Bore size	Mounting location	Sensor switch model		
		ZC130□,ZC153□	CS5T□	CS11T□
6 [0.236]	X	13.0 [0.512]	11.5 [0.453]	15 [0.591]
10 [0.394]	Y	13.0 [0.512]	11.5 [0.453]	15 [0.591]
16 [0.630]	X	14.0 [0.551]	12.5 [0.492]	16 [0.630]
	Y	14.0 [0.551]	12.5 [0.492]	16 [0.630]

●Non-rotating cylinder with magnet
●Non-rotating double rod end cylinder



■Double acting type (Including double rod end cylinders)

mm [in.]

Bore size	Mounting location	Sensor switch model		
		ZC130□,ZC153□	CS5T□	CS11T□
6 [0.236]	X	6.0 [0.236]	4.5 [0.177]	8 [0.315]
10 [0.394]	Y	1.0 [0.039]	−0.5 [−0.020]	3 [0.118]
16 [0.630]	X	7.0 [0.276]	5.5 [0.217]	9 [0.354]
	Y	2.0 [0.079]	0.5 [0.020]	4 [0.157]

■Single acting push type

mm [in.]

Bore size	Mounting location	Sensor switch model		
		ZC130□,ZC153□	CS5T□	CS11T□
6 [0.236]	X	1.0 [0.039]	−0.5 [−0.020]	3 [0.118]
10 [0.394]	Y	1.0 [0.039]	−0.5 [−0.020]	3 [0.118]
16 [0.630]	X	2.0 [0.079]	0.5 [0.020]	4 [0.157]
	Y	2.0 [0.079]	0.5 [0.020]	4 [0.157]

■Single acting pull type

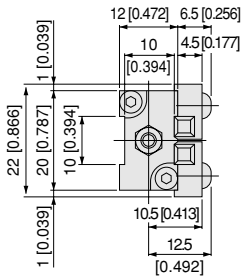
mm [in.]

Bore size	Mounting location	Sensor switch model		
		ZC130□,ZC153□	CS5T□	CS11T□
6 [0.236]	X	6.0 [0.236]	11.5 [0.453]	8 [0.315]
10 [0.394]	Y	6.0 [0.236]	11.5 [0.453]	8 [0.315]
16 [0.630]	X	7.0 [0.276]	12.5 [0.492]	9 [0.354]
	Y	7.0 [0.276]	12.5 [0.492]	9 [0.354]

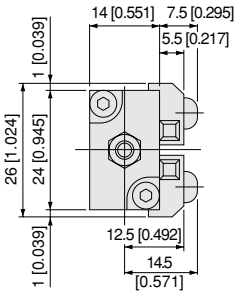
Remarks: 1. The above tables give reference values for the standard strokes. For the procedure to find-out the best sensing position, see p.23.
2. The above figures are obtained when the piping connection port turned to face upward.
3. Use the distance between the cylinder mounting hole and the rod cover to confirm the mounting location of the end of stroke detection sensor switch on the double rod end cylinder.
4. Mount the sensor switch so that the surface showing the sensor switch model marking faces up.

Dimensions of Sensor Switch Mounting mm [in.]

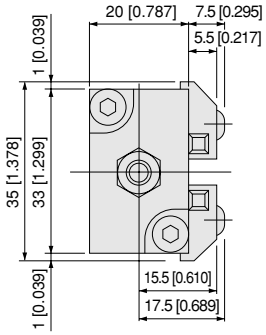
● ϕ 6 [0.236]



● ϕ 10 [0.394]

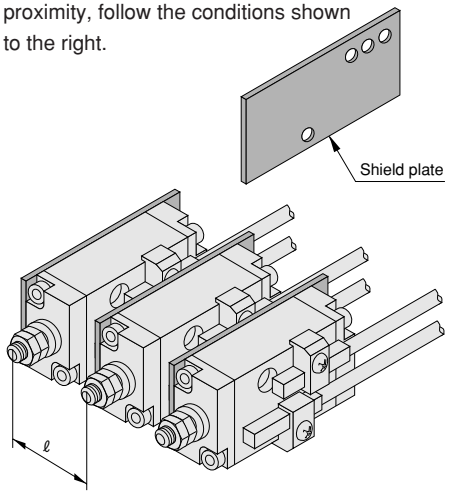


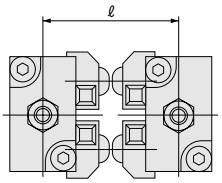
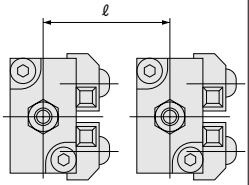
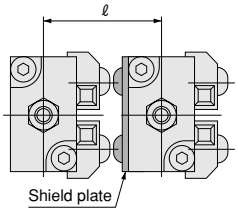
● ϕ 16 [0.630]



Precautions for Mounting Cylinders with Magnets

When mounting 2 or more Multi Mount Cylinders with sensor switches in close proximity, follow the conditions shown to the right.



Bore size mm [in.]	Without shield plate		With shield plate
			
6 [0.236]	25mm [0.984] or longer	23mm [0.906] or longer	22mm [0.866] or longer
10 [0.394]	29mm [1.142] or longer	31mm [1.220] or longer	25mm [0.984] or longer
16 [0.630]	35mm [1.378] or longer	39mm [1.535] or longer	31mm [1.220] or longer

Remark: Except the above, there are no particular limitations in mounting.

Shield Plate Model (Order Code)

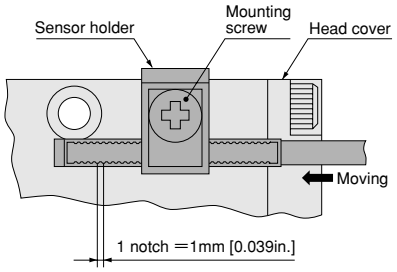
Operating type / Stroke mm / Bore size mm [in.]	Applicable shield plate model			
	Double acting type, Double acting double rod end type		Single acting push/pull type	
	5, 10, 15	20, 25, 30	5, 10	15
6 [0.236]	**CS-BS061**	**CS-BS062**	**CS-BS061**	**CS-BS062**
10 [0.394]	**CS-BS101**	**CS-BS102**	**CS-BS101**	**CS-BS102**
16 [0.630]	**CS-BS161**	**CS-BS162**	**CS-BS161**	**CS-BS162**

Remarks: 1. All shield plates come with 2 mounting screws.
2. Order shield plates separately.

Procedure for finding the best sensing position

●Setting the head side stroke end

1. Push piston rod to the fully retracted position.
2. Install a sensor switch in a holder without tightening a mounting screw all the way, move the switch from head side to rod side until it turns ON (for **ZC130**□, **ZC153**□ and **CS11T**□, when the LED lights up), then move the switch 1 notch (=1mm [0.039in.]) for **ZC130**□ and **ZC153**□, or 2 notches (=2mm [0.079in.]) for **CS5T**□ and **CS11T**□ toward the rod side, and tighten the mounting screw.

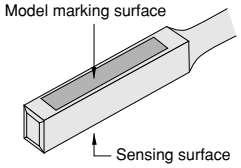


●Setting the rod side stroke end

Conduct the same procedure as the head side, but on the reversed way.

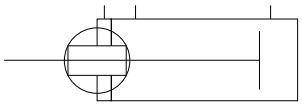
1. Pull piston rod to the fully extended position.
2. Install a sensor switch in a holder without tightening a mounting screw all the way, move the switch from rod side to head side until it turns ON, then move the switch 1 notch (=1mm [0.039in.]) for **ZC130**□ and **ZC153**□, or 2 notches (=2mm [0.079in.]) for **CS5T**□ and **CS11T**□ toward the head side, and tighten the mounting screw.

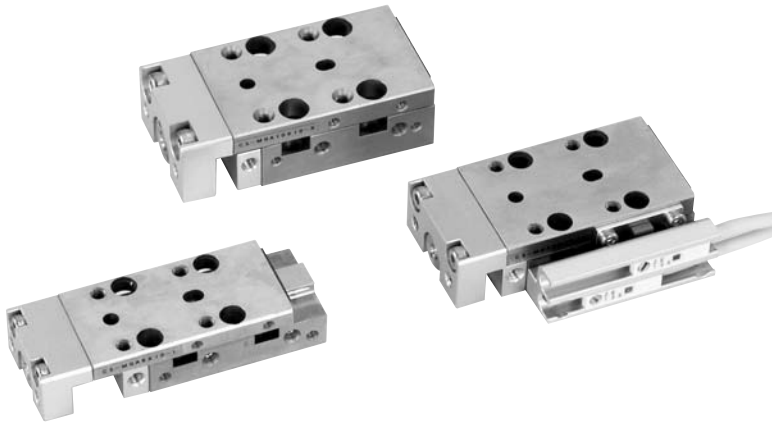
●Caution when installing sensor switches on the cylinder



In the ZC type sensor switches, the opposite side from the model marking surface is the sensing surface side. Mount it so that the cylinder magnet comes to the sensing surface side.

Symbol





Specifications

Item \ Model		CS-MGA□4.5	CS-MGA□6	CS-MGA□8	CS-MGA□10
Bore size	mm [in.]	4.5 [0.177]	6 [0.236]	8 [0.315]	10 [0.394]
Operating type		Double acting type			
Media		Air			
Operating pressure range	MPa [psi.]	0.2～0.7 [29～102]		0.15～0.7 [22～102]	
Proof pressure	MPa [psi.]	1.05 [152]			
Operating temperature range	°C [°F]	0～60 [32～140]			
Operating speed range	mm/s [in./sec.]	30～300 [1.2～11.8]			
Cushion		None	Rubber bumper		
Port size		M3×0.5			
Lubrication	Cylinder portion	Prohibited			
	Guide portion	Required[Note]			
Perpendicularity of end plate	mm [in.]	0.1 [0.004]			
Stroke tolerance	mm [in.]	$^{+1}_{0}\left[^{+0.039}_{0}\right]$			
Allowable moment N・m [in・lbf]	Mp	0.24 [2.12]	0.28 [2.48]	0.28 [2.48]	0.28 [2.48]
	My	0.29 [2.57]	0.34 [3.01]	0.34 [3.01]	0.34 [3.01]
	Mr	0.22 [1.95]	0.23 [2.04]	0.38 [3.36]	0.38 [3.36]
Number of available sensor switches (optional)		1 pc.	2 pcs.		

Note: Apply cleanroom use lithium soap-based grease on the raceway surface of the track rail in the guide portion every 6 months or 3 million operations.
Remark: Packaging is a single packaging.

Cylinder Thrust

N [lbf.]

Bore size mm [in.]	Piston rod diameter mm [in.]	Operating direction	Pressure area mm² [in.²]	Air pressure MPa [psi.] 0.2 [29]	0.3 [44]	0.4 [58]	0.5 [73]	0.6 [87]	0.7 [102]
4.5 [0.177]	2 [0.079]	Push side	15.9 [0.0246]	3.2 [0.72]	4.8 [1.08]	6.4 [1.44]	8.0 [1.80]	9.5 [2.14]	11.1 [2.50]
		Pull side	12.8 [0.0198]	2.6 [0.59]	3.8 [0.86]	5.1 [1.15]	6.4 [1.44]	7.7 [1.73]	9.0 [2.03]
6 [0.236]	3 [0.118]	Push side	28.2 [0.0437]	5.6 [1.26]	8.5 [1.91]	11.3 [2.54]	14.1 [3.17]	16.9 [3.80]	19.7 [4.43]
		Pull side	21.2 [0.0329]	4.2 [0.95]	6.4 [1.44]	8.5 [1.91]	10.6 [2.39]	12.7 [2.86]	14.8 [3.33]
8 [0.315]	3 [0.118]	Push side	50.3 [0.0780]	10.1 [2.27]	15.1 [3.40]	20.1 [4.52]	25.2 [5.67]	30.2 [6.80]	35.2 [7.92]
		Pull side	43.2 [0.0670]	8.6 [1.94]	13.0 [2.93]	17.3 [3.89]	21.6 [4.86]	25.9 [5.83]	30.2 [6.80]
10 [0.394]	4 [0.157]	Push side	78.5 [0.1217]	15.7 [3.53]	23.6 [5.31]	31.4 [7.07]	39.3 [8.84]	47.1 [10.60]	55.0 [12.38]
		Pull side	65.9 [0.1021]	13.2 [2.97]	19.8 [4.46]	26.4 [5.94]	33.0 [7.43]	39.5 [8.89]	46.1 [10.37]

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes
4.5 [0.177]	5[Note], 10
6 [0.236]	5[Note], 10, 15
8 [0.315]	5[Note], 10, 15[Note], 20
10 [0.394]	5[Note], 10, 15[Note], 20, 30

Note: The collar packed is used in these strokes.

Order Codes

CS – MGA □ × – □ – □ □ – □ □ □

Clean system product

Mini guide slider

Magnet and sensor rail Note
Blank：Without magnet and sensor rail
S　：With magnet and sensor rail

Note: For a cylinder bore size of 4.5mm [0.177in.], the sensor rail has only one groove so that only one sensor switch can be mounted.

Bore size
×
Stroke
●See the bore size and stroke on p.24.

Piping direction
R：Right side as viewed from the rod side
L：Left side as viewed from the rod side

Locating pin
Blank：Without pin
P　：With pin

Number of pins
1：With 1 pin
2：With 2 pins
3：With 3 pins
4：With 4 pins

Sensor switch type
Blank：Without sensor switch
ZE135：2-lead wire, solid state type
ZE155：3-lead wire, solid state type
ZE235：2-lead wire, solid state type
ZE255：3-lead wire, solid state type
ZE101：2-lead wire, reed switch type
ZE102：2-lead wire, reed switch type
ZE201：2-lead wire, reed switch type
ZE202：2-lead wire, reed switch type
●For details of sensor switches, see p.111～121.

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

Number of sensor switches
1：With 1 switch
2：With 2 switches

■Additional parts

●Sensor rail

S-MGA □

Applicable cylinder bore size × stroke
1：4.5×5, 10
2：6×5, 10
8×5, 10
10×5, 10
3：6×15
4：8×15, 20
10×15, 20
5：10×30

S-MGA1

S-MGA2, 3, 4, 5

●Magnet

M-MGA □

Applicable cylinder bore size
1：4.5
2：6, 8, 10

●Locating pin

P-MGA1

Remark: For details about the dimensions of additional parts, see p.32.

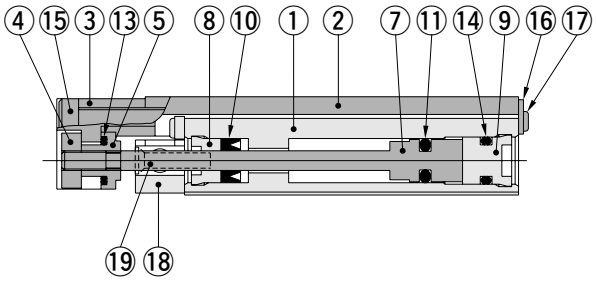
Mass

g [oz.]

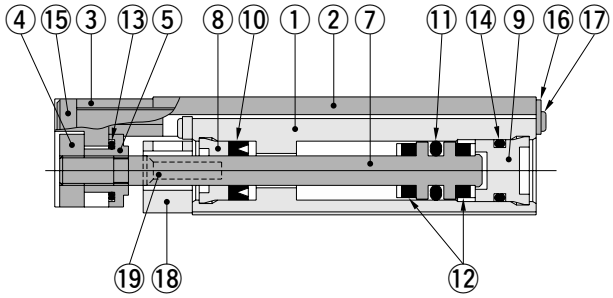
Model	Stroke mm	Without magnet and sensor rail	With magnet and sensor rail	Additional mass: Sensor switch (1 pc.) ZE□□□A	Additional mass: Sensor switch (1 pc.) ZE□□□B
CS-MGA□4.5	5	45 [1.59]	49 [1.73]	15 [0.53]	35 [1.23]
	10	45 [1.59]	49 [1.73]		
CS-MGA□6	5	61 [2.15]	66 [2.33]	15 [0.53]	35 [1.23]
	10	61 [2.15]	66 [2.33]		
	15	69 [2.43]	75 [2.65]		
CS-MGA□8	5	87 [3.07]	92 [3.25]	15 [0.53]	35 [1.23]
	10	87 [3.07]	92 [3.25]		
	15	108 [3.81]	114 [4.02]		
	20	108 [3.81]	114 [4.02]		
CS-MGA□10	5	109 [3.84]	114 [4.02]	15 [0.53]	35 [1.23]
	10	109 [3.84]	114 [4.02]		
	15	136 [4.80]	142 [5.01]		
	20	136 [4.80]	142 [5.01]		
	30	163 [5.75]	170 [6.00]		

Inner Construction

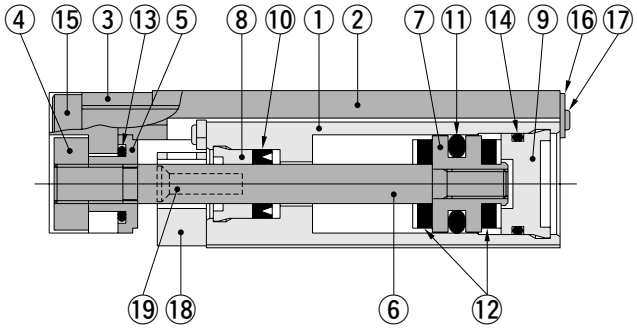
CS-MGA□4.5



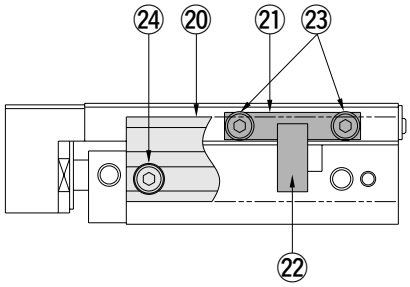
CS-MGA□6, 8



CS-MGA□10



CS-MGAS□(With magnet and sensor rail)



Locating pin

Major Parts and Materials

No.	Parts \ Model	CS-MGA□4.5	CS-MGA□6	CS-MGA□8	CS-MGA□10
①	Body	Stainless steel (heat treated)			
②	Table	Stainless steel (heat treated)			
③	Plate	Aluminum alloy (special wear-resistant treatment)			
④	Nut A	Stainless steel			
⑤	Nut B	Stainless steel			
⑥	Piston rod	—			Stainless steel
⑦	Piston[Note]	Stainless steel			Aluminum alloy (special rust prevention treatment)
⑧	Rod cap	Oil impregnated plastic bushing (polyacetal)			
⑨	Head cap	Plastic			
⑩	Rod seal	Synthetic rubber (NBR)			
⑪	Piston seal	Synthetic rubber (NBR)			
⑫	Bumper	—	Synthetic rubber (urethane)		
⑬	O-ring	Synthetic rubber (NBR)			
⑭	O-ring	Synthetic rubber (NBR)			
⑮	Bolt	Stainless steel			
⑯	Holder plate	Stainless steel			
⑰	Screw	Stainless steel			
⑱	Dust collecting block	Aluminum alloy (anodized)			
⑲	Screw	Stainless steel			
⑳	Sensor rail	Aluminum alloy (anodized)			
㉑	Magnet holder	Aluminum alloy (anodized)			
㉒	Magnet	Plastic magnet			
㉓	Bolt	Stainless steel			
㉔	Bolt	Stainless steel			
㉕	Locating pin	Steel (heat treated)			

Note: In **CS-MGA□4.5**, **CS-MGA□6** and **CS-MGA□8**, a piston and piston rod are combined as single-piece construction.

Evaluations of Cleanliness (Mini Guide Sliders)

There is currently no standard in JIS or elsewhere for methods of evaluating cleanliness for pneumatic equipment in the cleanroom specification. Koganei has therefore independently established our in-house measurement methods, to conduct the cleanliness evaluation.

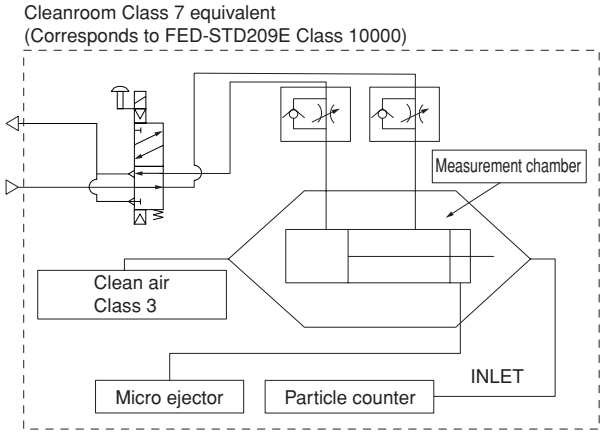
The number of particles in the Mini Guide Slider Cleanroom Specification is measured as shown in the method below.

1. Measurement sample

① CS-MGA10×10 (no load)　　② CS-MGA20×60-SS2 (load 2.5kg [5.5lbf.])

2. Measurement conditions

2-1 Test circuit: with suction from dust collection port



2-2 Operating conditions of the tested cylinder
Operating frequency: CS-MGA10/1Hz, CS-MGA20/0.5Hz
Average speed: 300mm/s [12in./sec.]
Applied pressure: 0.5MPa [73psi.]
Suction condition: Microejector ME05, Primary side 0.5MPa [73psi.] applied, Tube ϕ6 [0.236in.]
Mounting direction: CS-MGA10/Vertical, CS-MGA20/Horizontal
Chamber volume: 8.3 ℓ [0.293ft^3]

3. 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

4. Measurement method

4-1 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.

4-2 Measurement under operation
Under the conditions in the above 1 and 2, operating the measurement sample for 36 minutes, and measured the total values in the latter half of 18 minutes test.

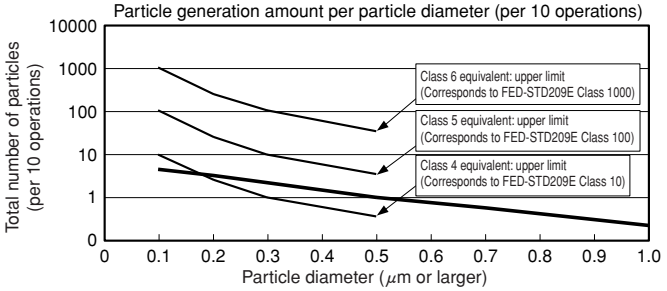
4-3 Reconfirmation
Performed the measurement in 4-1 again, to reconfirm the number of particles in the measurement system.

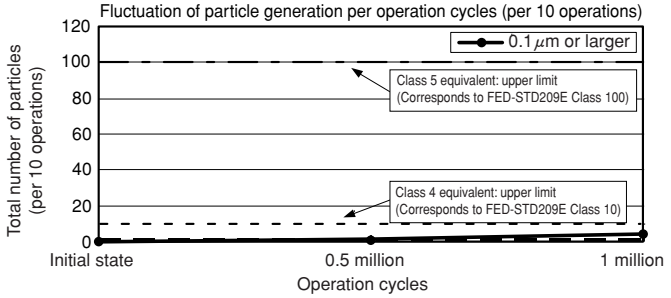
4-4 Measurement value conversion
Total value of last 18 minutes of 4-2 converted into number per 10 cylinder operations.

5. Measurement results Note

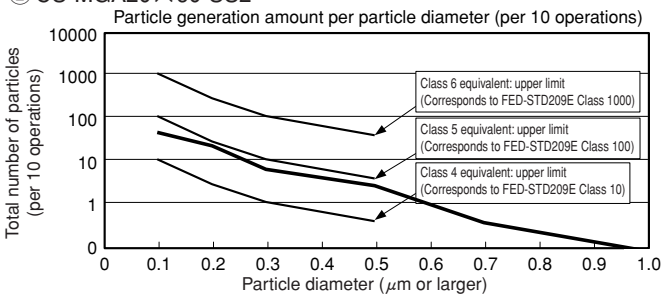
● With suction from dust collection port

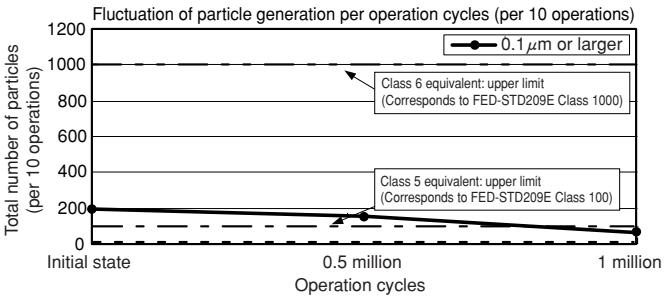
① CS-MGA10×10





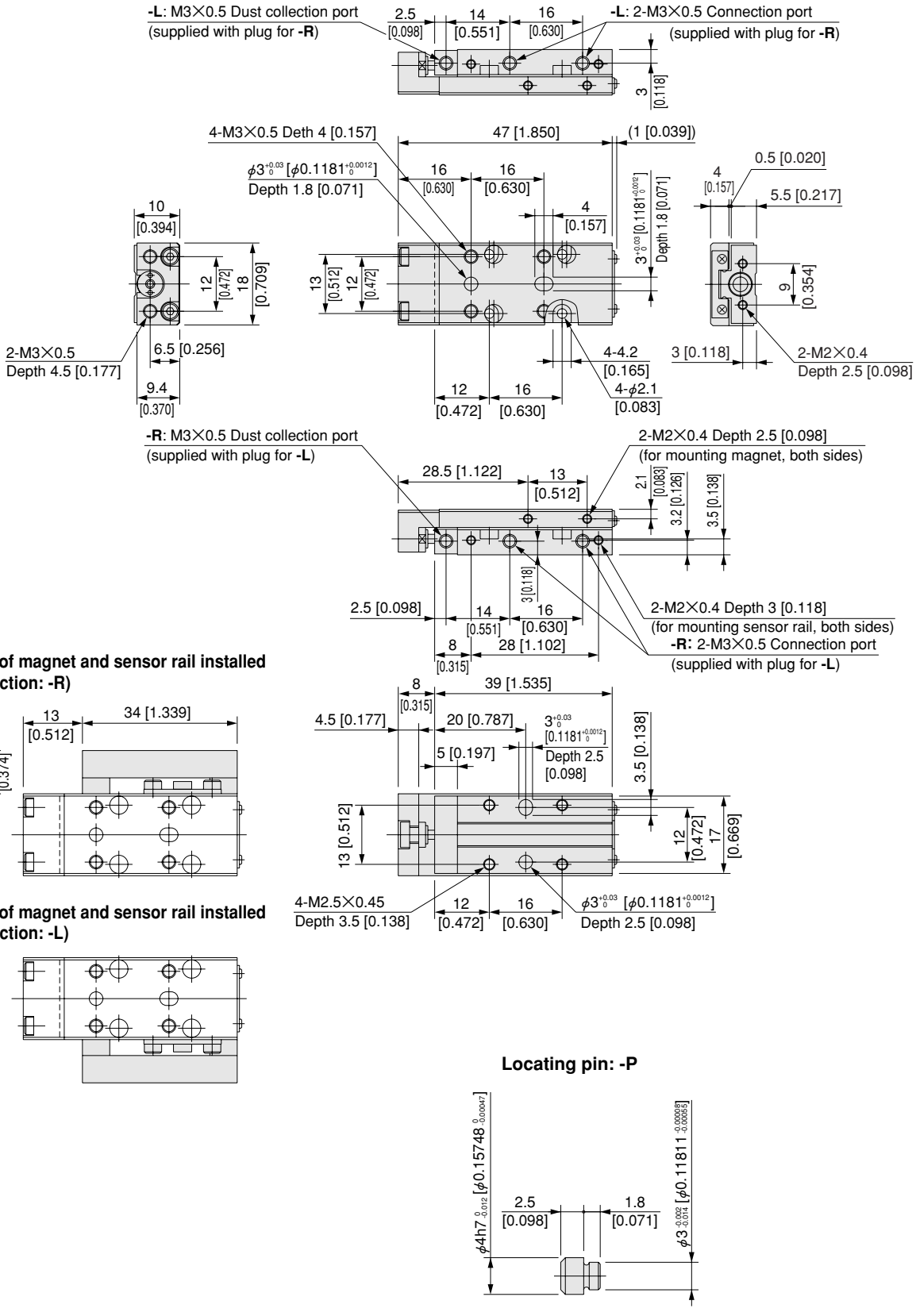
② CS-MGA20×60-SS2



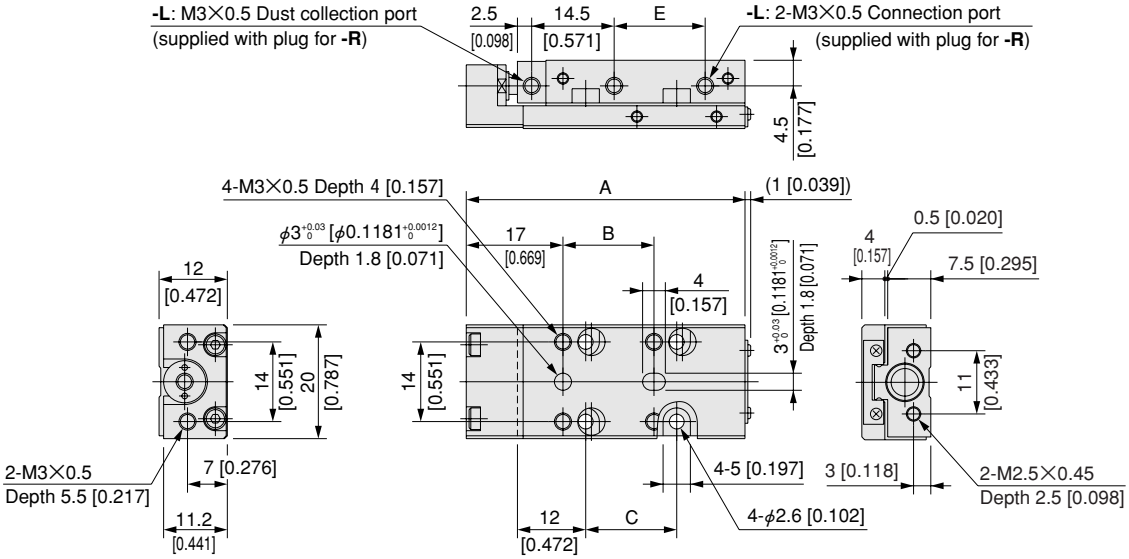


Note: The graphs by particle diameter are based on measurements after 1 million operations of products.

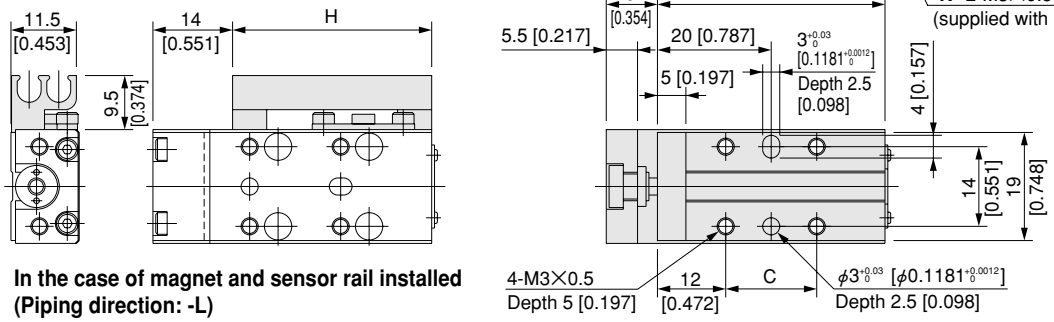
CS-MGA□4.5


-L: M3×0.5 Dust collection port
(supplied with plug for -R)
-L: 2-M3×0.5 Connection port
(supplied with plug for -R)
4-M3×0.5 Deth 4 [0.157]
Depth 1.8 [0.071]
2-M3×0.5
Depth 4.5 [0.177]
6.5 [0.256]
9.4 [0.370]
4-4.2 [0.165]
4-φ2.1 [0.083]
2-M2×0.4
Depth 2.5 [0.098]
3 [0.118]
-R: M3×0.5 Dust collection port
(supplied with plug for -L)
2-M2×0.4 Depth 2.5 [0.098]
(for mounting magnet, both sides)
2-M2×0.4 Depth 3 [0.118]
(for mounting sensor rail, both sides)
-R: 2-M3×0.5 Connection port
(supplied with plug for -L)
In the case of magnet and sensor rail installed
(Piping direction: -R)
In the case of magnet and sensor rail installed
(Piping direction: -L)
4-M2.5×0.45
Depth 3.5 [0.138]
Locating pin: -P

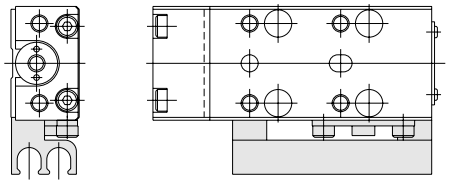
CS-MGA□6



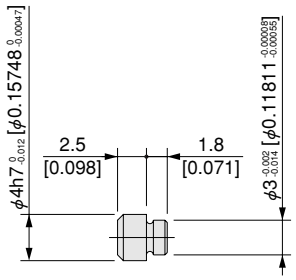
In the case of magnet and sensor rail installed (Piping direction: -R)



In the case of magnet and sensor rail installed (Piping direction: -L)

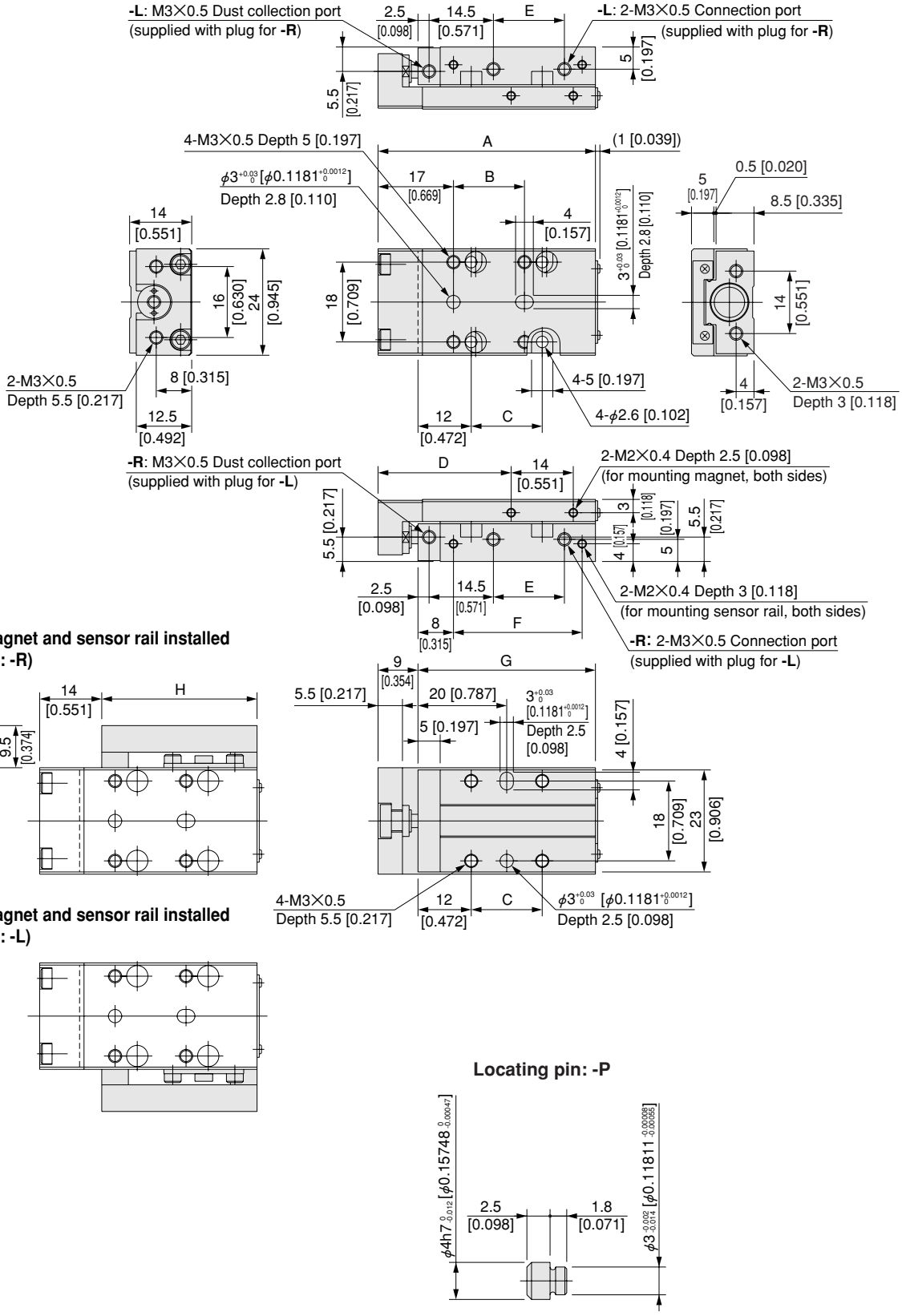


Locating pin: -P



Stroke	A	B	C	D	E	F	G	H
5	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
10	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
15	54 [2.126]	21 [0.827]	21 [0.827]	35 [1.378]	21 [0.827]	34 [1.339]	45 [1.772]	40 [1.575]

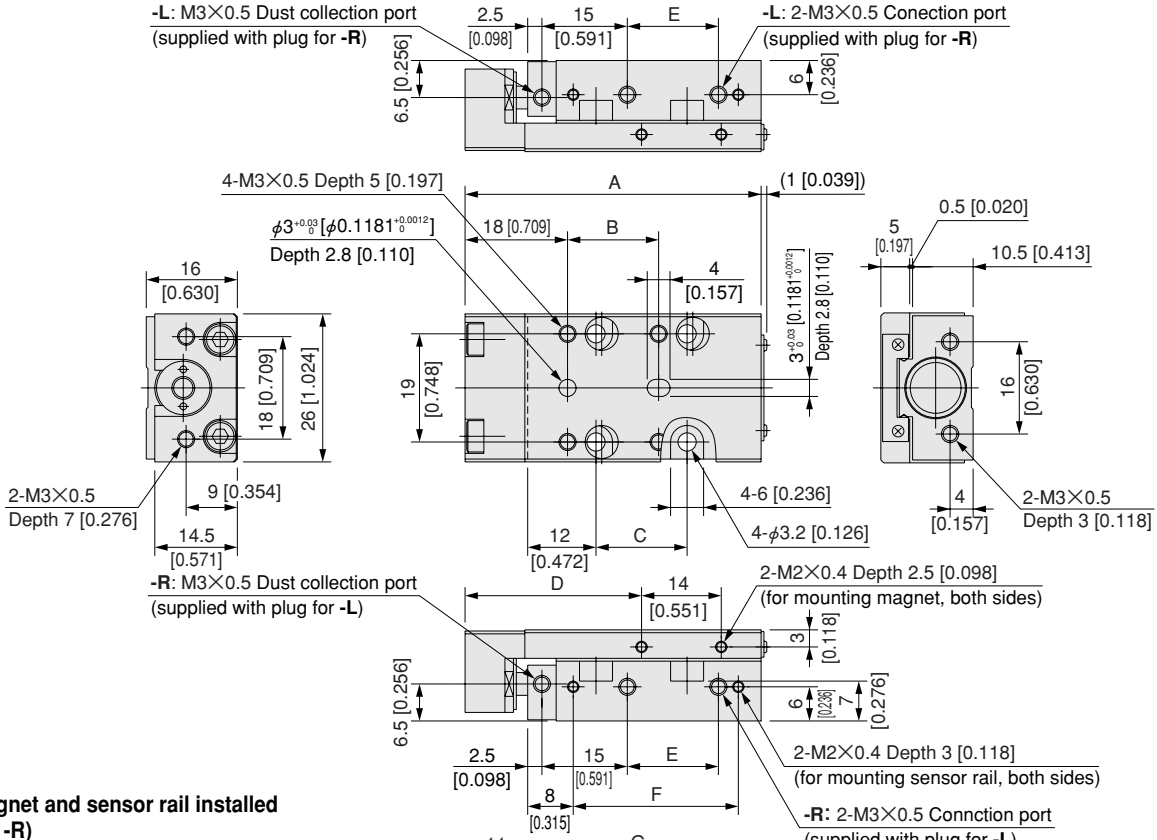
CS-MGA□8



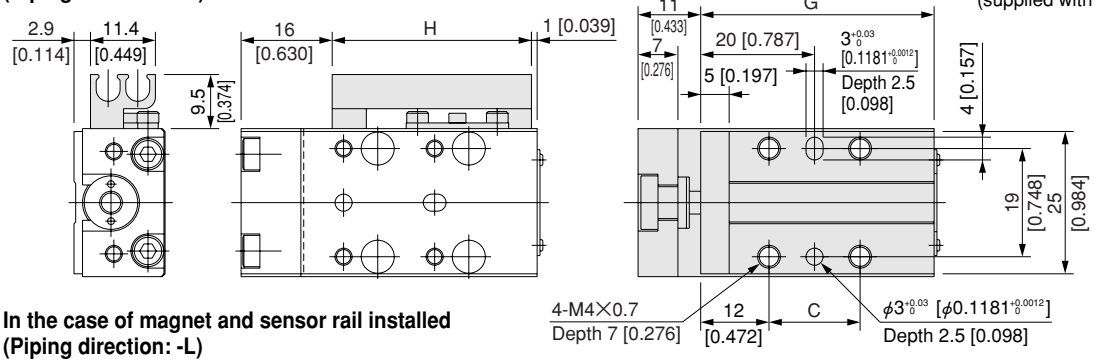
Locating pin: -P

Stroke	A	B	C	D	E	F	G	H
5	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
10	49 [1.929]	16 [0.630]	16 [0.630]	30 [1.181]	16 [0.630]	29 [1.142]	40 [1.575]	35 [1.378]
15	59 [2.323]	26 [1.024]	26 [1.024]	40 [1.575]	26 [1.024]	39 [1.535]	50 [1.969]	45 [1.772]
20	59 [2.323]	26 [1.024]	26 [1.024]	40 [1.575]	26 [1.024]	39 [1.535]	50 [1.969]	45 [1.772]

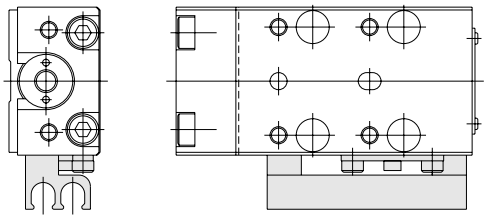
CS-MGA□10



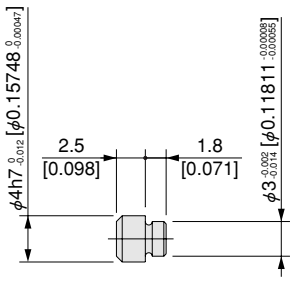
In the case of magnet and sensor rail installed (Piping direction: -R)



In the case of magnet and sensor rail installed (Piping direction: -L)



Locating pin: -P

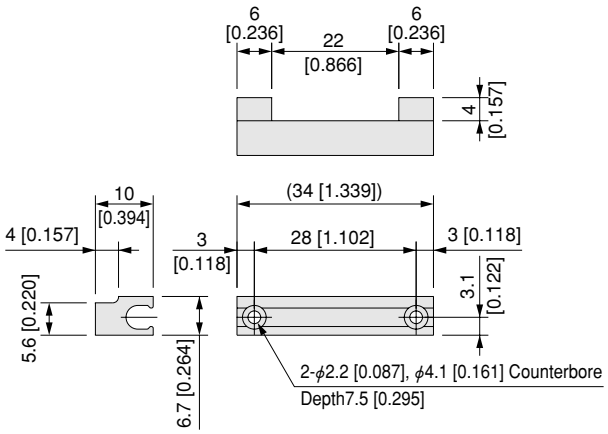


Stroke	A	B	C	D	E	F	G	H
5	52 [2.047]	16 [0.630]	16 [0.630]	31 [1.220]	16 [0.630]	29 [1.142]	41 [1.614]	35 [1.378]
10	52 [2.047]	16 [0.630]	16 [0.630]	31 [1.220]	16 [0.630]	29 [1.142]	41 [1.614]	35 [1.378]
15	62 [2.441]	26 [1.024]	26 [1.024]	41 [1.614]	26 [1.024]	39 [1.535]	51 [2.008]	45 [1.772]
20	62 [2.441]	26 [1.024]	26 [1.024]	41 [1.614]	26 [1.024]	39 [1.535]	51 [2.008]	45 [1.772]
30	72 [2.835]	36 [1.417]	36 [1.417]	51 [2.008]	36 [1.417]	49 [1.929]	61 [2.402]	55 [2.165]

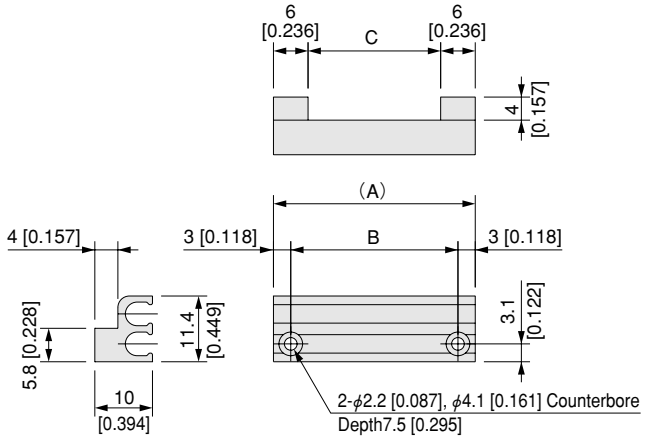
Dimensions of Additional Parts mm [in.]

●Sensor rail

S-MGA1



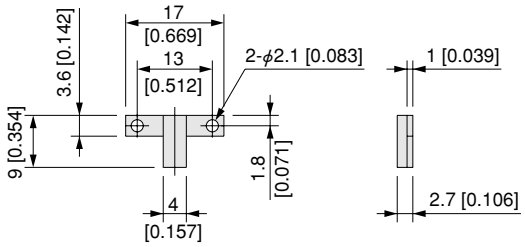
S-MGA2, 3, 4, 5



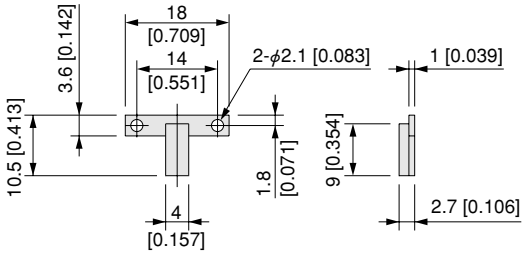
Model	A	B	C
S-MGA2	35 [1.378]	29 [1.142]	23 [0.906]
S-MGA3	40 [1.575]	34 [1.339]	28 [1.102]
S-MGA4	45 [1.772]	39 [1.535]	33 [1.299]
S-MGA5	55 [2.165]	49 [1.929]	43 [1.693]

●Magnet

M-MGA1

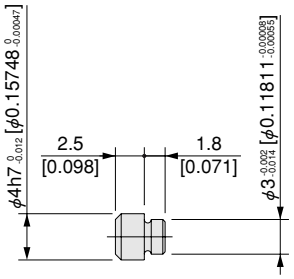


M-MGA2



●Locating pin

P-MGA1



Order Codes (for Sensor Switches Only)

CS – □ □ **– MGAS**

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

Sensor switch

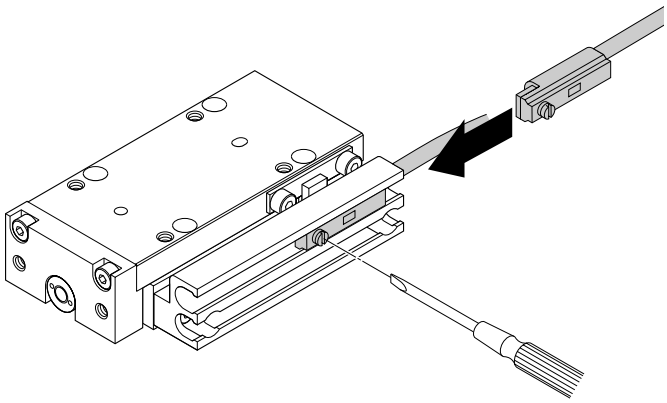
ZE135	Solid state type 2-lead wire	with indicator lamp	DC10～28V	Horizontal lead wire	**ZE155**	Solid state type 3-lead wire	with indicator lamp	DC4.5～28V	Horizontal lead wire
ZE235	Solid state type 2-lead wire	with indicator lamp	DC10～28V	Vertical lead wire	**ZE255**	Solid state type 3-lead wire	with indicator lamp	DC4.5～28V	Vertical lead wire
ZE101	Reed switch type	without indicator lamp	DC5～28V AC85～115V	Horizontal lead wire	**ZE102**	Reed switch type	with indicator lamp	DC10～28V AC85～115V	Horizontal lead wire
ZE201	Reed switch type	without indicator lamp	DC5～28V AC85～115V	Vertical lead wire	**ZE202**	Reed switch type	with indicator lamp	DC10～28V AC85～115V	Vertical lead wire

Clean system product

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

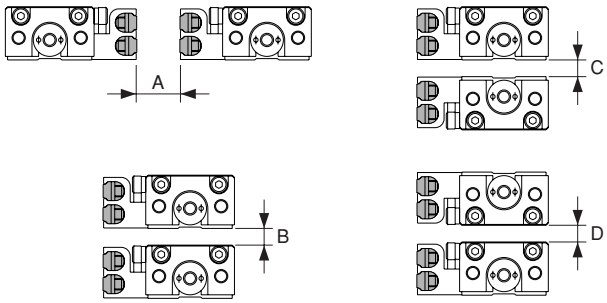
Moving Sensor Switch

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



When Mounting Sensor Switches in Close Proximity

When mounting actuators with sensor switches in close proximity, install the actuator so that it exceeds the values in the table below.



●Solid state type mm [in.]

Model	A	B	C	D
MGAS4.5	4 [0.157]	2 [0.079]	3 [0.118]	5 [0.197]
MGAS6	3 [0.118]	2 [0.079]	4 [0.157]	4 [0.157]
MGAS8	3 [0.118]	2 [0.079]	4 [0.157]	4 [0.157]
MGAS10	3 [0.118]	2 [0.079]	4 [0.157]	4 [0.157]

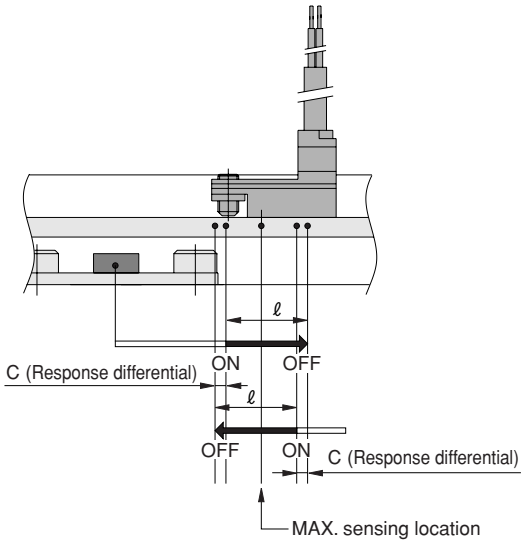
●Reed switch type mm [in.]

Model	A	B	C	D
MGAS4.5	2 [0.079]	2 [0.079]	2 [0.079]	2 [0.079]
MGAS6	2 [0.079]	2 [0.079]	4 [0.157]	2 [0.079]
MGAS8	2 [0.079]	2 [0.079]	4 [0.157]	2 [0.079]
MGAS10	2 [0.079]	2 [0.079]	4 [0.157]	2 [0.079]

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 \ Model	MGAS4.5	MGAS6	MGAS8	MGAS10
Operating range: ℓ	1.5～3.2 [0.059～0.126]			
Response differential: C	0.2 [0.008] or less			
MAX. sensing location Note	6 [0.236]			

Remark: The above table shows reference values.
Note: The distance from the end of the opposite side of the lead wire.

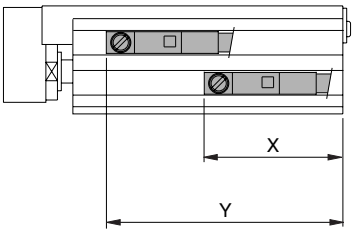
●Reed switch type

mm [in.]

Item \ Model	MGAS4.5	MGAS6	MGAS8	MGAS10
Operating range: ℓ	3.0～6.0 [0.118～0.236]			
Response differential: C	1.5 [0.059] or less			
MAX. sensing location Note	10 [0.394]			

Remark: The above table shows reference values.
Note: The distance from the end of the opposite side of the lead wire.

Mounting Location of End of Stroke Detection Sensor Switch



●Solid state type

mm [in.]

Model	MGAS4.5		MGAS6			MGAS8				MGAS10				
Stroke	5	10	5	10	15	5	10	15	20	5	10	15	20	30
X	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	18 [0.709]	19 [0.748]	19 [0.748]	19 [0.748]	19 [0.748]	19 [0.748]
Y	23 [0.906]	28 [1.102]	23 [0.906]	28 [1.102]	33 [1.299]	23 [0.906]	28 [1.102]	33 [1.299]	38 [1.496]	24 [0.945]	29 [1.142]	34 [1.339]	39 [1.535]	49 [1.929]

●Reed switch type

mm [in.]

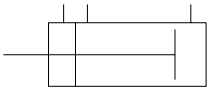
Model	MGAS4.5		MGAS6			MGAS8				MGAS10				
Stroke	5	10	5	10	15	5	10	15	20	5	10	15	20	30
X	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	23 [0.906]	23 [0.906]	23 [0.906]	23 [0.906]	23 [0.906]
Y	27 [1.063]	32 [1.260]	27 [1.063]	32 [1.260]	37 [1.457]	27 [1.063]	32 [1.260]	37 [1.457]	42 [1.654]	28 [1.102]	33 [1.299]	38 [1.496]	43 [1.693]	53 [2.087]

KOGANEI CLEAN SYSTEM

JIG CYLINDERS C SERIES

Double Acting Type

Symbol



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]
Operating type		Double acting type						
Media		Air						
Operating pressure range	MPa [psi.]	0.1～1.0 [15～145]						0.05～1.0 [7～145]
Proof pressure	MPa [psi.]	1.5 [218]						
Operating temperature range	°C [°F]	0～60 [32～140]						
Operating speed range	mm/s [in./sec.]	30～500 [1.2～19.7]						30～300 [1.2～11.8]
Cushion		Rubber bumper (Optional)						
Lubrication		Not required						
Port size		M5×0.8				Rc1/8		Rc1/4

Bore Size and Stroke

mm [in.]

Operating type	Bore size	Standard strokes	
		Standard cylinder	Cylinder with magnet
Double acting type	**12 [0.472]**	5, 10, 15, 20, 25, 30	5, 10, 15, 20, 25, 30
	16 [0.630]		
	20 [0.787]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
	25 [0.984]		
	32 [1.260]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100
	40 [1.575]		
	50 [1.969]	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100	10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100

Remarks: 1. Stroke tolerance $^{+1}_{0}$ [$^{\pm 0.039}_{0}$]

2. In most cases, body cutting is used for the non-standard strokes. However, body cutting is not used for strokes of 5mm [0.197in.] or less for ϕ 12 [0.472]～ ϕ 40 [1.575], and strokes of 10mm [0.394in.] or less for ϕ 50 [1.969]. The collar packed is used for these cases.

Order Codes

CS – CDA □ 20×30 – □ – □ – □ – □ – □ □ □

Clean system product

Jig cylinder double acting type

Cylinder specification Note1
Blank：Standard cylinder
S ：Cylinder with magnet

Bore size Note3
×
Stroke

Rod end specification
Blank：Female rod thread
R ：Male rod thread

Bumper
Blank：Without bumper
R ：With bumper

Centering location
Blank：Without centering location
G ：With centering location

Mounting type Note4
Blank：Basic type
1 ：Foot mounting type
3 ：Flange mounting type Note2

Sensor switch (For cylinder with magnet)
Blank ：Without sensor switch
ZE135 ：2-lead wire Solid state type with indicator lamp (DC10～28V) Horizontal lead wire
ZE155 ：3-lead wire Solid state type with indicator lamp (DC4.5～28V) Horizontal lead wire
ZE235 ：2-lead wire Solid state type with indicator lamp (DC10～28V) Vertical lead wire
ZE255 ：3-lead wire Solid state type with indicator lamp (DC4.5～28V) Vertical lead wire
ZE101 ：2-lead wire Reed switch type without indicator lamp (DC5～28V, AC85～115V) Horizontal lead wire
ZE102 ：2-lead wire Reed switch type with indicator lamp (DC10～28V, AC85～115V) Horizontal lead wire
ZE201 ：2-lead wire Reed switch type without indicator lamp (DC5～28V, AC85～115V) Vertical lead wire
ZE202 ：2-lead wire Reed switch type with indicator lamp (DC10～28V, AC85～115V) Vertical lead wire

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

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

Number of sensor switches
(For cylinder with magnet)
Blank：Without sensor switch
1 ：With 1 sensor switch
2 ：With 2 sensor switches

Notes: 1. In the standard cylinder, a magnet for the sensor switch is not built-in.
2. Cannot be mounted on rod side, with centering location (-G) option.
3. See table for bore size and stroke.
4. Mounting brackets are included at shipping.

Order Codes of Additional Parts (To be ordered separately)

●Mounting Brackets Only

CS – □ – CDA □

Clean system product

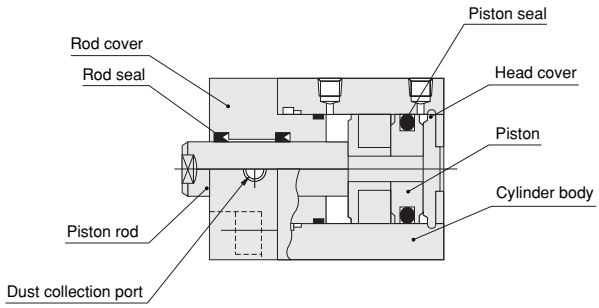
Mounting bracket
1：Foot mounting bracket (1 set: 2 pcs.)
3：Flange mounting bracket

Bore size ϕ 12～50

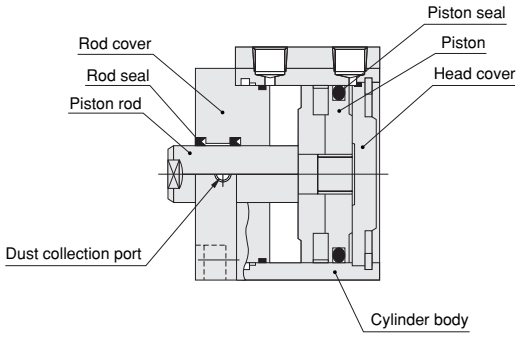
Inner Construction and Major Parts

●Double acting type

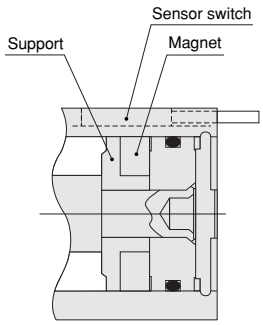
●φ12 [0.472in.]～φ25 [0.984in.]



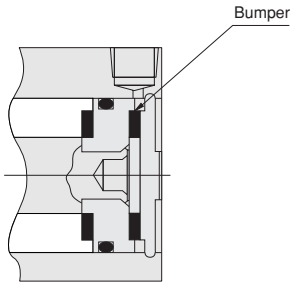
●φ32 [1.260in.]～φ50 [1.969in.]



●Cylinder with magnet



●With bumper



Major Parts and Materials

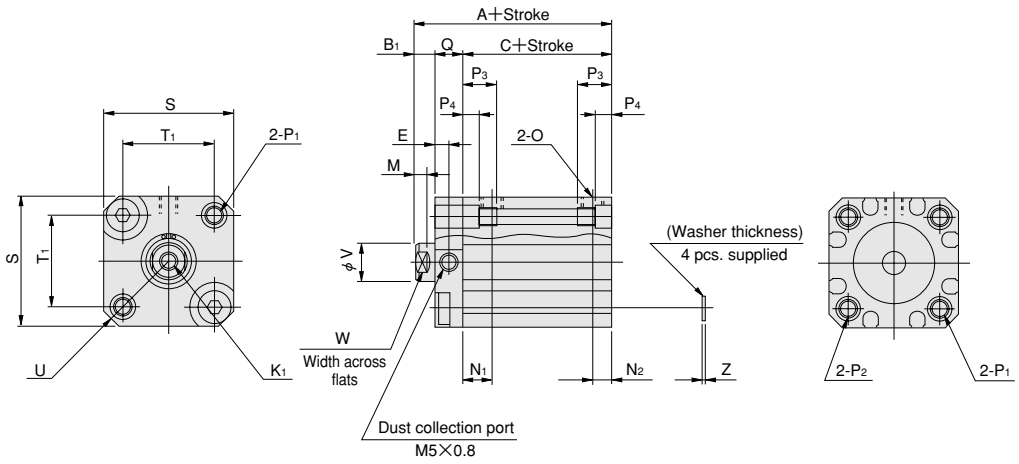
Parts	Materials
Cylinder body	Aluminum alloy (anodized)
Piston	Aluminum alloy (special rust prevention treatment)
Piston rod	Stainless steel (chrome plated)
Seal	Synthetic rubber (NBR)
Rod cover	Aluminum alloy (special wear-resistant treatment)
Head cover	Aluminum alloy (anodized)
Snap ring	Steel (nickel plated)
Spacer	Aluminum alloy (special rust prevention treatment)
Bumper	Synthetic rubber (NBR)
Magnet	Plastic magnet
Support	Aluminum alloy (special rust prevention treatment)

Seals

Parts / Bore mm	Rod seal (2 pcs.)	Piston seal	Tube gasket	
			Rod side	Head side
12	MYR-6	PSD-12	Y090260	None
16	MYR-8	PSD-16	Y090207	None
20	MYR-10	PSD-20	Y090216	None
25	MYR-12	PSD-25	Y090210	None
32	MYR-16	PSD-32	L090084	None
40	MYR-16	PSD-40	L090151	None
50	MYR-20	PSD-50	L090174	L090106

Dimensions mm [in.]

●φ12～φ25

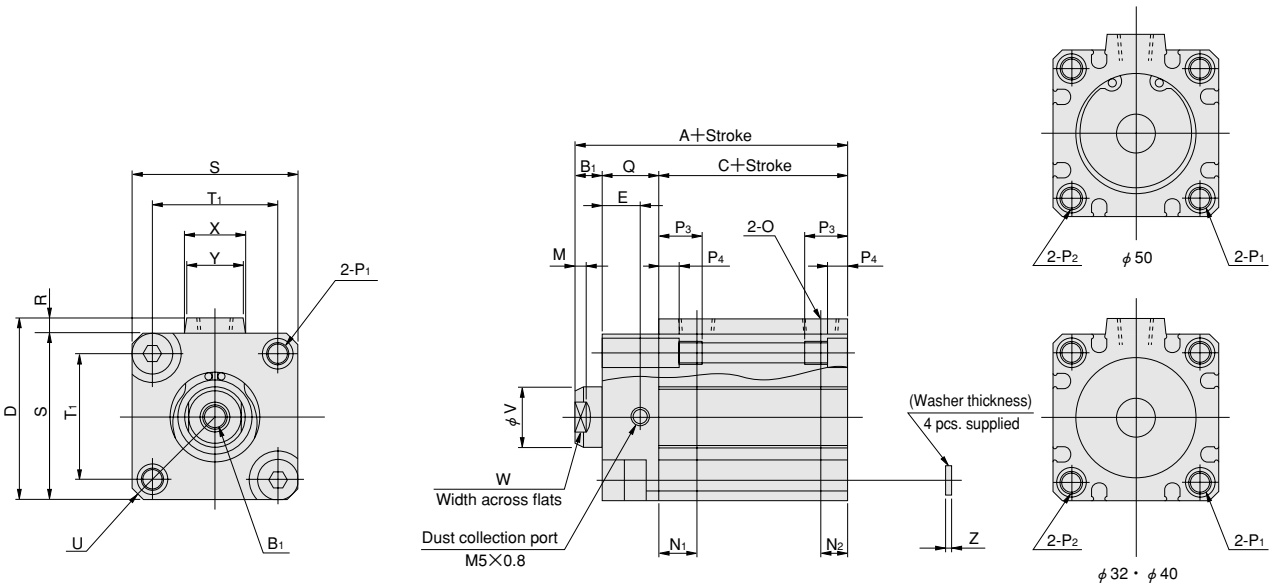


Bore size \ Type	Standard cylinder (CDA)			Cylinder with magnet (CDAS)			Standard cylinder with bumper (CDA-R)			Cylinder with magnet and bumper (CDAS-R)			E	K1	M	N1	N2	O
Code	A	B1	C	A	B1	C	A	B1	C	A	B1	C						
12 [0.472]	32 [1.260]	5 [0.197]	17 [0.669]	37 [1.457]	5 [0.197]	22 [0.866]	37 [1.457]	5 [0.197]	22 [0.866]	42 [1.654]	5 [0.197]	27 [1.063]	5 [0.197]	M3×0.5 Depth 6 [0.236]	3 [0.118]	8 [0.315]	5 [0.197]	M5×0.8
16 [0.630]	32.5 [1.280]	5.5 [0.217]	17 [0.669]	37.5 [1.476]	5.5 [0.217]	22 [0.866]	37.5 [1.476]	5.5 [0.217]	22 [0.866]	42.5 [1.673]	5.5 [0.217]	27 [1.063]	5 [0.197]	M4×0.7 Depth8 [0.315]	3 [0.118]	8 [0.315]	5 [0.197]	M5×0.8
20 [0.787]	35 [1.378]	5.5 [0.217]	19.5 [0.768]	45 [1.772]	5.5 [0.217]	29.5 [1.161]	40 [1.575]	5.5 [0.217]	24.5 [0.965]	50 [1.969]	5.5 [0.217]	34.5 [1.358]	5 [0.197]	M5×0.8 Depth10 [0.394]	3 [0.118]	10.5 [0.413]	5 [0.197]	M5×0.8
25 [0.984]	42 [1.654]	6 [0.236]	21 [0.827]	52 [2.047]	6 [0.236]	31 [1.220]	47 [1.850]	6 [0.236]	26 [1.024]	57 [2.244]	6 [0.236]	36 [1.417]	10 [0.394]	M6×1 Depth10 [0.394]	3 [0.118]	10.5 [0.413]	5 [0.197]	M5×0.8

Bore size \ Code	P1	P2	P3	P4	Q	S	T1	U	V	W	Z
12 [0.472]	φ4.3 [0.169] (Thru hole) Counterbore φ6.5 [0.256] (Both sides) and M5×0.8 (Both sides)	Counterbore φ6.5 [0.256] and M5×0.8	9.5 [0.374]	4.5 [0.177]	10 [0.394]	25 [0.984]	16.3 [0.642]	R16 [0.630]	6 [0.236]	5 [0.197]	1 [0.039]
16 [0.630]	φ4.3 [0.169] (Thru hole) Counterbore φ6.5 [0.256] (Both sides) and M5×0.8 (Both sides)	Counterbore φ6.5 [0.256] and M5×0.8	9.5 [0.374]	4.5 [0.177]	10 [0.394]	29 [1.142]	19.8 [0.780]	R19 [0.748]	8 [0.315]	6 [0.236]	1 [0.039]
20 [0.787]	φ4.3 [0.169] (Thru hole) Counterbore φ6.5 [0.256] (Both sides) and M5×0.8 (Both sides)	Counterbore φ6.5 [0.256] and M5×0.8	9.5 [0.374]	4.5 [0.177]	10 [0.394]	34 [1.339]	24 [0.945]	R22 [0.866]	10 [0.394]	8 [0.315]	1 [0.039]
25 [0.984]	φ5.1 [0.201] (Thru hole) Counterbore φ8 [0.315] (Both sides) and M6×1 (Both sides)	Counterbore φ8 [0.315] and M6×1	11.5 [0.453]	5.5 [0.217]	15 [0.591]	40 [1.575]	28 [1.102]	R25 [0.984]	12 [0.472]	10 [0.394]	1 [0.039]

Dimensions mm [in.]

●φ32～φ50



Bore size \ Type / Code	Standard cylinder (CDA)			Cylinder with magnet (CDAS)			Standard cylinder with bumper (CDA-R)			Cylinder with magnet and bumper (CDAS-R)			D	E	K1	M	N1	N2
	A	B1	C	A	B1	C	A	B1	C	A	B1	C						
32 [1.260]	45 [1.772]	7 [0.276]	23 [0.906]	55 [2.165]	7 [0.276]	33 [1.299]	50 [1.969]	7 [0.276]	28 [1.102]	55 [2.165]	7 [0.276]	33 [1.299]	48.5 [1.909]	10 [0.394]	M8×1.25 Depth12 [0.472]	3 [0.118]	10 [0.394] (9.5 [0.374])	7 [0.276] (6 [0.236])
40 [1.575]	48 [1.890]	7 [0.276]	26 [1.024]	58 [2.283]	7 [0.276]	36 [1.417]	48 [1.890]	7 [0.276]	26 [1.024]	58 [2.283]	7 [0.276]	36 [1.417]	56.5 [2.224]	10 [0.394]	M8×1.25 Depth12 [0.472]	3 [0.118]	10.5 [0.413]	7 [0.276]
50 [1.969]	52 [2.047]	9 [0.354]	28 [1.102]	62 [2.441]	9 [0.354]	38 [1.496]	52 [2.047]	9 [0.354]	28 [1.102]	62 [2.441]	9 [0.354]	38 [1.496]	70 [2.756]	10 [0.394]	M10×1.5 Depth15 [0.591]	3 [0.118]	11 [0.433]	9.5 [0.374]

Bore size \ Code	O	P1	P2	P3	P4	Q	R	S	T1	U	V
32 [1.260]	Rc1/8	φ5.1 [0.201] (Thru hole) Counterbore φ8 [0.315] (Both sides) and M6×1 (Both sides)	Counterbore φ8 [0.315] and M6×1	11.5 [0.453]	5.5 [0.217]	15 [0.591]	4.5 [0.177]	44 [1.732]	34 [1.339]	R29.5 [1.161]	16 [0.630]
40 [1.575]	Rc1/8	φ6.9 [0.272] (Thru hole) Counterbore φ9.5 [0.374] (Both sides) and M5×1.25 (Both sides)	Counterbore φ9.5 [0.374] and M5×1.25	15.5 [0.610]	7.5 [0.295]	15 [0.591]	4.5 [0.177]	52 [2.047]	40 [1.575]	R35 [1.378]	16 [0.630]
50 [1.969]	Rc1/4	φ6.9 [0.272] (Thru hole) Counterbore φ11 [0.433] (Both sides) and M5×1.25 (Both sides)	Counterbore φ11 [0.433] and M5×1.25	16.5 [0.650]	8.5 [0.335]	15 [0.591]	8 [0.315]	62 [2.441]	48 [1.890]	R41 [1.614]	20 [0.787]

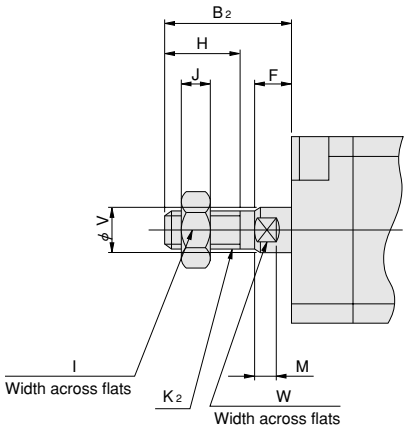
Bore size \ Code	W	X	Y	Z
32 [1.260]	14 [0.551]	15 [0.591]	13.6 [0.535]	1 [0.039]
40 [1.575]	14 [0.551]	15 [0.591]	13.6 [0.535]	1.6 [0.063]
50 [1.969]	17 [0.669]	21.6 [0.850]	19 [0.748]	1.6 [0.063]

Note: Figures in parentheses ( ) are for the cylinder with 5mm [0.197in.] stroke.

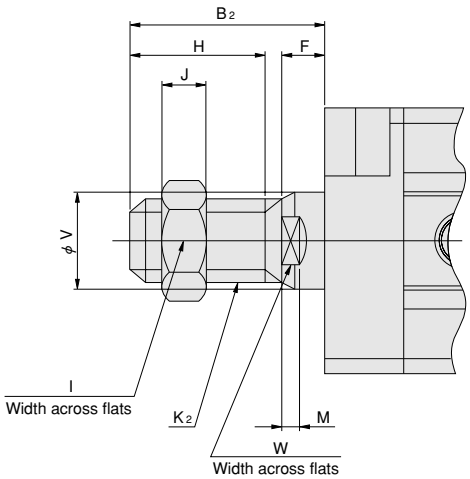
Dimensions of Male Rod End Thread Specification mm [in.]

● **Double acting type**

● **ϕ12 [0.472]～ϕ25 [0.984]**

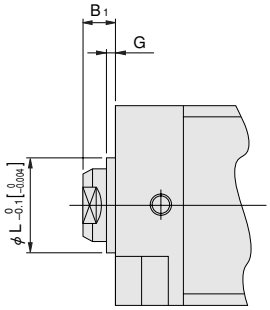


● **ϕ32 [1.260]～ϕ50 [1.969]**



Bore size \ Code	B2	F	H	I	J	K2	M	V	W
12 [0.472]	17 [0.669]	5 [0.197]	10 [0.394]	8 [0.315]	4 [0.157]	M5×0.8	3 [0.118]	6 [0.236]	5 [0.197]
16 [0.630]	20.5 [0.807]	5.5 [0.217]	13 [0.512]	10 [0.394]	5 [0.197]	M6×1	3 [0.118]	8 [0.315]	6 [0.236]
20 [0.787]	22.5 [0.886]	5.5 [0.217]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	3 [0.118]	10 [0.394]	8 [0.315]
25 [0.984]	24 [0.945]	6 [0.236]	15 [0.591]	14 [0.551]	6 [0.236]	M10×1.25	3 [0.118]	12 [0.472]	10 [0.394]
32 [1.260]	35 [1.378]	7 [0.276]	25 [0.984]	19 [0.748]	8 [0.315]	M14×1.5	3 [0.118]	16 [0.630]	14 [0.551]
40 [1.575]	35 [1.378]	7 [0.276]	25 [0.984]	19 [0.748]	8 [0.315]	M14×1.5	3 [0.118]	16 [0.630]	14 [0.551]
50 [1.969]	37 [1.457]	9 [0.354]	25 [0.984]	27 [1.063]	11 [0.433]	M18×1.5	3 [0.118]	20 [0.787]	17 [0.669]

Dimensions of Centering Location mm [in.]



● Not available for bore size ϕ 12 [0.472].

Bore size \ Code	B1	G	L
16 [0.630]	5.5 [0.217]	1.5 [0.059]	9.4 [0.370]
20 [0.787]	5.5 [0.217]	1.5 [0.059]	12 [0.472]
25 [0.984]	6 [0.236]	2 [0.079]	15 [0.591]
32 [1.260]	7 [0.276]	2 [0.079]	21 [0.827]
40 [1.575]	7 [0.276]	2 [0.079]	29 [1.142]
50 [1.969]	9 [0.354]	2 [0.079]	38 [1.496]

Order Codes (for Sensor Switches Only)

CS – □ □ – **CDAS**

Clean system product

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	2 pcs. mounting Note		1 pc. mounting
	1-surface mounting	2-surface mounting	
12 [0.472]	30 [1.181]	10 [0.394]	5 [0.197]
16～100 [0.630～3.937]	10 [0.394]		

Note: Two pieces can be mounted with 5mm [0.197in.] stroke.
Take note that overlapping may occur, however.

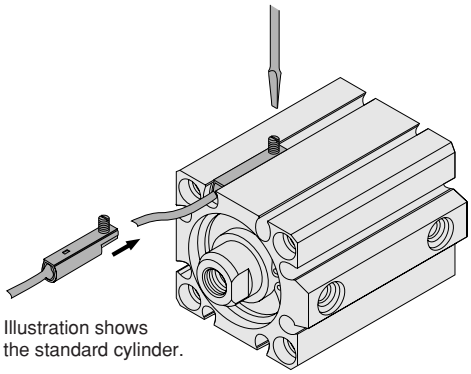
●Reed switch type

mm [in.]

Bore size	2 pcs. mounting		1 pc. mounting
	1-surface mounting	2-surface mounting	
12 [0.472]	30 [1.181]	10 [0.394]	10 [0.394]
16～100 [0.630～3.937]	10 [0.394]		

Moving Sensor Switch

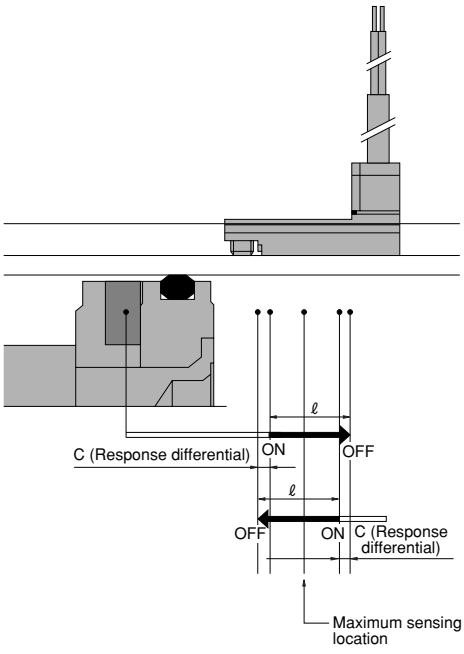
- Loosening the mounting screw allows the sensor switch to be moved along the switch mounting groove on the cylinder body.
- Tighten the mounting screw with a tightening torque of 0.1～0.2N·m [0.9～1.8in·lbf].



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	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]	80 [3.150]	100 [3.937]
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]	4.5～9.5 [0.177～0.374]	4.5～9.0 [0.177～0.354]
Response differential : C	1.0 [0.039] or less								1.5 [0.059] or less	
Maximum sensing location	6 [0.236]									

Remark: The above table shows reference values.

●Reed switch type

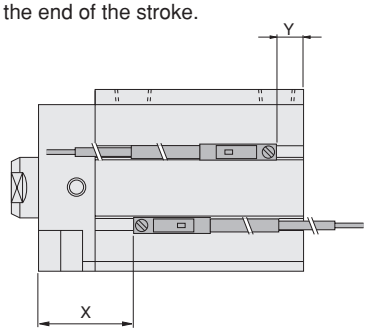
mm [in.]

Item \ Bore	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]	80 [3.150]	100 [3.937]
Operating range : ℓ	4.5～8.5 [0.177～0.335]	5.5～9.5 [0.217～0.374]	9～13.5 [0.354～0.531]	10～15.5 [0.394～0.610]	8～12 [0.315～0.472]	8.5～14 [0.335～0.551]	9～15 [0.354～0.591]	10～16 [0.394～0.630]	11～16 [0.433～0.630]	11～16.5 [0.433～0.650]
Response differential : C	1.0 [0.039] or less	2.0 [0.079] or less							3.0 [0.118] or less	2.5 [0.098] or less
Maximum sensing location	10 [0.394]									

Remark: The above table shows reference values.

Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the location 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.



■Solid state type

●Double acting type

mm [in.]

Code \ Bore		12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]
X	Standard type	17 [0.669]	17 [0.669]	21 [0.827]	26 [1.024]	28.5 [1.122]	29.5 [1.161]	27.5 [1.083]
	With bumper (-R)	20 [0.787]	20 [0.787]	25 [0.984]	31 [1.220]	30.5 [1.201]	31.5 [1.240]	30.5 [1.201]
Y	Standard type	4 [0.157]	4 [0.157]	7.5 [0.295]	9 [0.354]	8.5 [0.335]	10.5 [0.413]	14.5 [0.571]
	With bumper (-R)	6 [0.236]	6 [0.236]	8.5 [0.335]	9 [0.354]	6.5 [0.256]	8.5 [0.335]	11.5 [0.453]

■Reed switch type

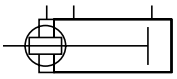
●Double acting type

mm [in.]

Code \ Bore		12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]
X	Standard type	12.5 [0.492]	12.5 [0.492]	16.5 [0.650]	21.5 [0.846]	24 [0.945]	25 [0.984]	23 [0.906]
	With bumper (-R)	15.5 [0.610]	15.5 [0.610]	20.5 [0.807]	26.5 [1.043]	26 [1.024]	27 [1.063]	26 [1.024]
Y	Standard type	–0.5 [–0.020]	–0.5 [–0.020]	3 [0.118]	4.5 [0.177]	4 [0.157]	6 [0.236]	10 [0.394]
	With bumper (-R)	1.5 [0.059]	1.5 [0.059]	4 [0.157]	4.5 [0.177]	2 [0.079]	4 [0.157]	7 [0.276]

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.]	$^{+1.5}_{0}$ [$^{+0.059}_{0}$]							

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

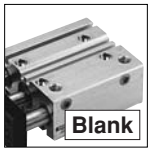
■ Operating type

DA : Double acting type

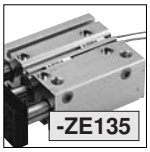
■ Clean system product

■ Sensor switch [Note]

Without sensor switch

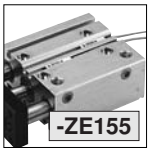


With ZE135



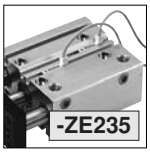
- 2-lead wire Solid state type
- With indicator lamp
- DC10～28V
- Horizontal lead wire

With ZE155



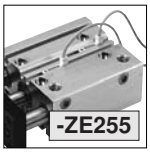
- 3-lead wire Solid state type
- With indicator lamp
- DC4.5～28V
- Horizontal lead wire

With ZE235



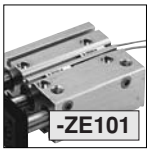
- 2-lead wire Solid state type
- With indicator lamp
- DC10～28V
- Vertical lead wire

With ZE255



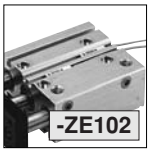
- 3-lead wire Solid state type
- With indicator lamp
- DC4.5～28V
- Vertical lead wire

With ZE101



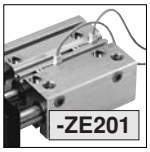
- 2-lead wire Reed switch type
- Without indicator lamp
- DC5～28V, AC85～115V
- Horizontal lead wire

With ZE102



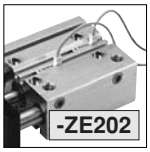
- 2-lead wire Reed switch type
- With indicator lamp
- DC10～28V, AC85～115V
- Horizontal lead wire

With ZE201



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

With ZE202



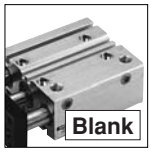
- 2-lead wire Reed switch type
- With indicator lamp
- DC10～28V, AC85～115V
- Vertical lead wire

■ Lead wire length

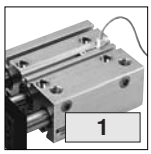
A : 1000mm [39in.]
B : 3000mm [118in.]

■ Number of sensor switches

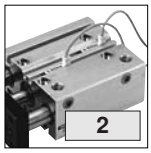
Without sensor switch



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

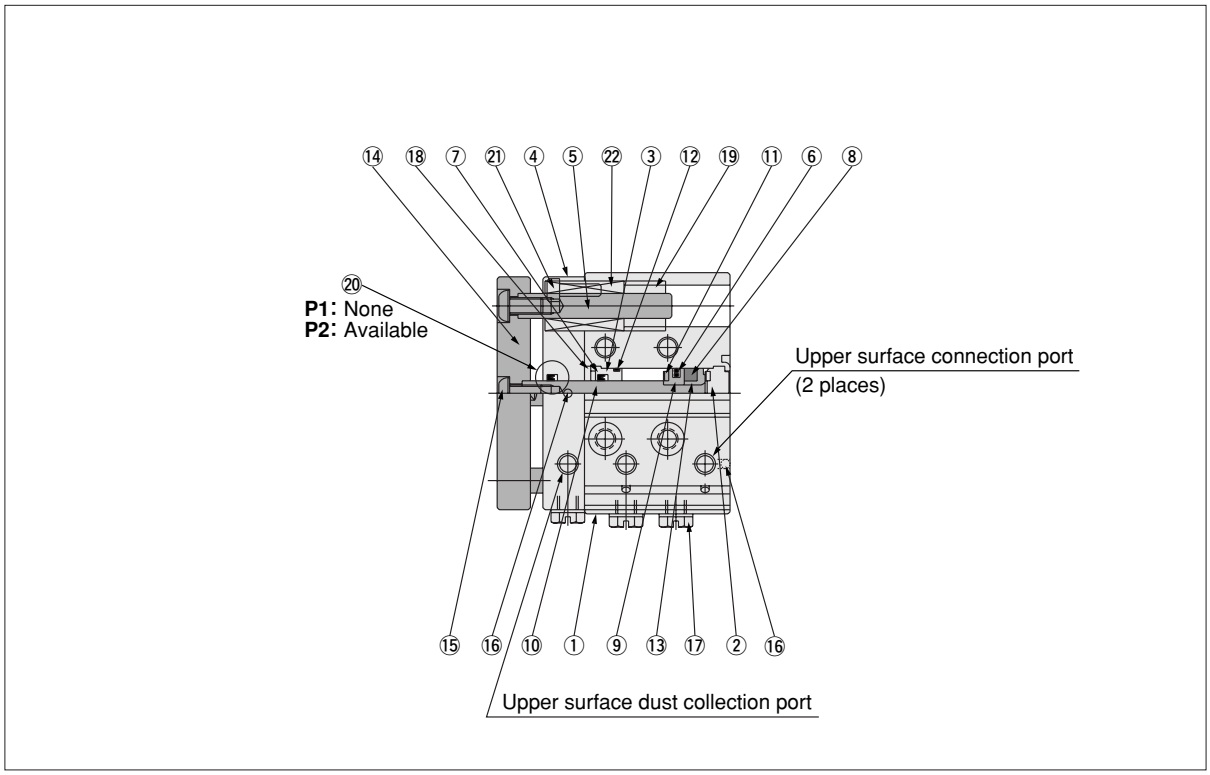
● See the bore size and stroke on p.43.

● 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 ϕ 20 [0.787]～ ϕ 63 [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

Type / Parts / Bore size mm	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

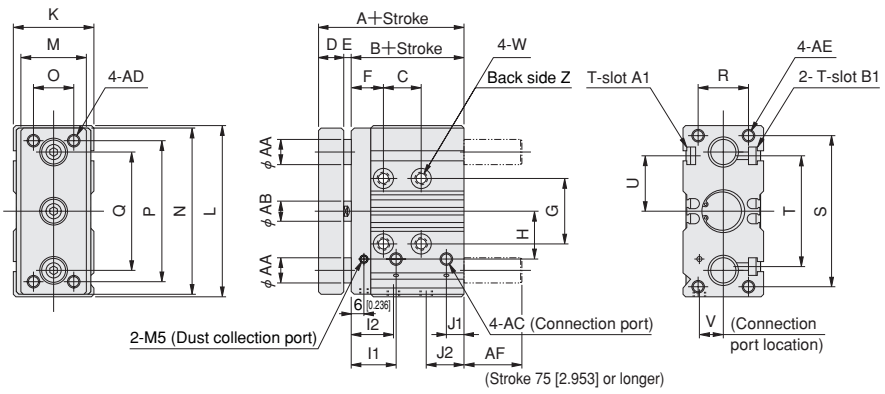
g [oz.]

Type / Mass / Bore size mm [in.]		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]		

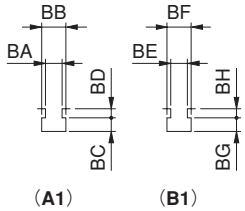
Dimensions mm [in.]

Rolling bearing type CS－SGDAQ Bore size × Stroke

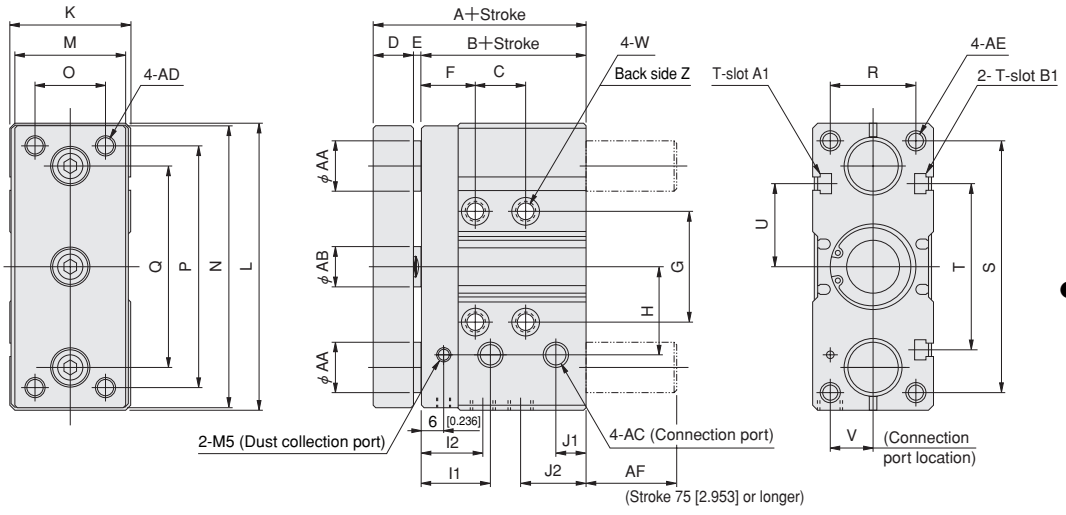
● ϕ12 [0.472], ϕ16 [0.630]



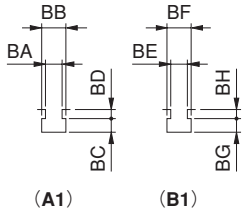
● T-slot **A1**, **B1** dimensions



● ϕ20 [0.787]～ϕ63 [2.480]



● T-slot **A1**, **B1** dimensions



mm [in.]

Code / Bore size	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.]

Code / Bore size	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.]

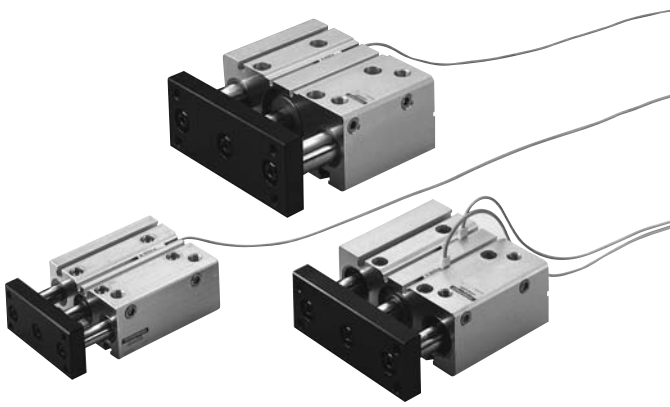
Code / Bore size	Z	AA	AB	AC	AD	AE	AF
12 [0.472]	M5×0.8 Depth 8 [0.315]	6 [0.236]	6 [0.236]	M5×0.8	M4×0.7	M4×0.7 Depth 8 [0.315]	5 [0.197]
16 [0.630]	M5×0.8 Depth 11 [0.433]	8 [0.315]	8 [0.315]	M5×0.8	M5×0.8	M5×0.8 Depth 10 [0.394]	13 [0.512]
20 [0.787]	M6×1 Depth 12 [0.472]	12 [0.472]	10 [0.394]	Rc1/8	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.]

Code / Bore size	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]

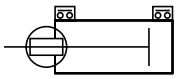
JIG CYLINDERS WITH GUIDES

Sensor Switches

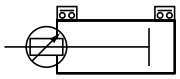


Symbols

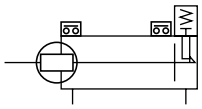
●**Standard cylinder**



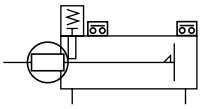
●**Stroke adjusting cylinder**



●**End keep cylinder (Head side)**



●**End keep cylinder (Rod side)**



Order Codes (for Sensor Switches Only)

CS — □ □ — **SGDA**

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

Clean system product

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.

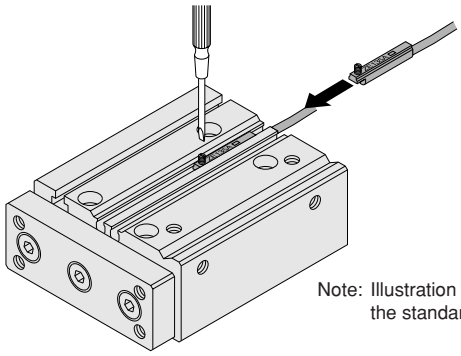
●Reed switch type

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

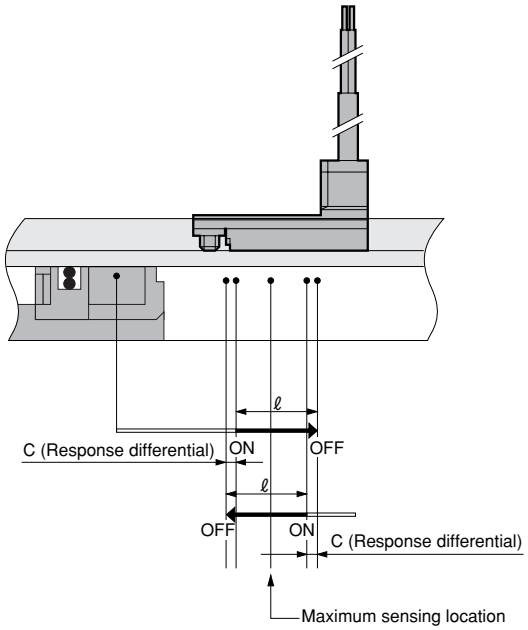
- Loosening the mounting screw allows the sensor switch to be moved along the switch mounting groove on the cylinder body.
- Tighten the mounting screw with a tightening torque of 0.1～0.2N·m [0.9～1.8in·lbf].



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.

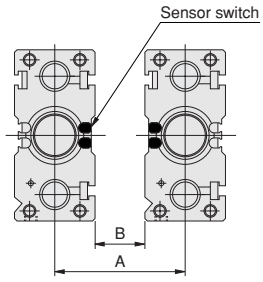
●Reed switch type

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

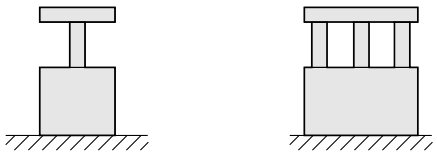
mm [in.]

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]	

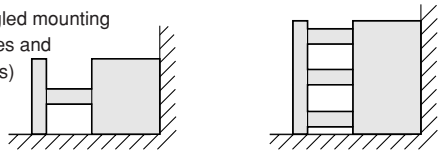
Mounting and Removing Sensor Switches

In Jig Cylinders with Guides of ϕ12～ϕ63, be aware that sensor switches cannot be mounted or removed when strokes of 10mm [0.394in.] or shorter installed in the application shown below.

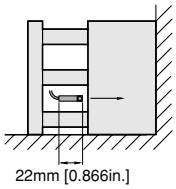
Bottom mounting



Right angled mounting (2 surfaces and 3 surfaces)



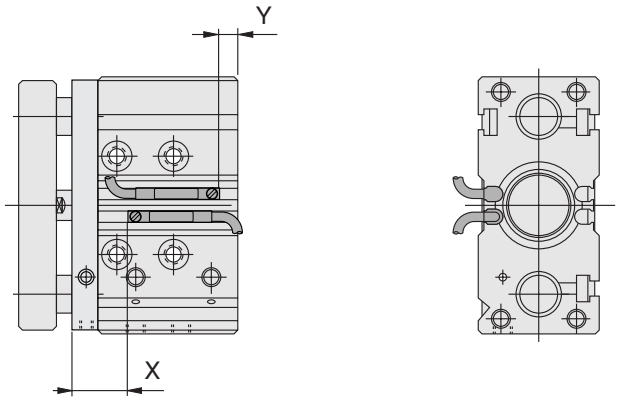
※ For strokes of 20mm [0.787in.] or longer, sensor switches can be mounted and removed when the plate (rods extend) is extended.



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.]

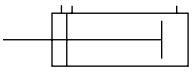
Code \ Bore size	12 [0.472]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
X	15.5 [0.610]	17 [0.669]	20 [0.787]	22 [0.866]	21 [0.827]	22.5 [0.886]	22.5 [0.886]	22.5 [0.886]
Y	0 [0]	0 [0]	6 [0.236]	6 [0.236]	9 [0.354]	11.5 [0.453]	14.5 [0.571]	14.5 [0.571]

KOGANEI CLEAN SYSTEM

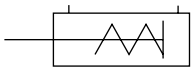
PEN CYLINDERS

Symbols

●**Double acting type**



●**Single acting push type**



Specifications

Item \ Bore mm [in.]		6 [0.236]	10 [0.394]	16 [0.630]
Operating type		Double acting type, Single acting push type		
Media		Air		
Mounting type		Basic type, Foot type, Flange type, Clevis type (clevis type of ϕ10 and ϕ16 only)		
Operating pressure range MPa [psi.]	Double acting type	0.15～0.7 [22～102]	0.1～0.7 [15～102]	
	Single acting push type	0.3～0.7 [44～102]	0.15～0.7 [22～102]	
Proof pressure MPa [psi.]		1.03 [149]		
Operating temperature range °C [°F]		0～60 [32～140]		
Operating speed range mm/s [in./sec.]		50～300 [2.0～11.8]		
Cushion		None	Rubber bumper	
Lubrication		Not required		
Port size		M5×0.8 Note		

Note: M3×0.5 can also be selected at ϕ6 only.

Bore Size and Stroke

●**Double acting type** mm [in.]

Bore size	Standard strokes Note	Maximum available stroke	Stroke tolerance
6 [0.236]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60	100	$^{+1.5}_{0}$ [$^{+0.059}_{0}$]
10 [0.394]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 75, 100, 125, 150	150	
16 [0.630]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 75, 100, 125, 150, 175, 200	200	

●**Single acting type** mm [in.]

Operating type	Bore size	Standard strokes Note	Maximum available stroke	Stroke tolerance
Single acting push type	6 [0.236]	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60	75	$^{+1.5}_{0}$ [$^{+0.059}_{0}$]
	10 [0.394]		105	
	16 [0.630]		120	

Note: The non-standard strokes:
For strokes divisible by 5, cylinder tube cutting is used.
For strokes not divisible by 5, a collar is packed to the next size up stroke of cylinder tube.

Order Codes

CS – **PB** □ □ **10×30** – □ – □ – □ – □ □ □

Clean system product

Pen cylinder series

Operating type
DA — Double acting type
SA — Single acting push type

Cylinder specification
Blank — Standard cylinder
S — Cylinder with magnet

Bore size × Stroke

Head cover piping specification
Blank — Axial direction piping
A — Lateral piping※
M — Lateral piping with mounting thread※

※ (**-A** and **-M** correspond only to ϕ10 and ϕ16 of double acting type and single acting push type. Not available for clevis mounting type.)

Connection port
Blank — M5×0.8 (ϕ6, ϕ10, ϕ16)
M3 — M3×0.5 (ϕ6 only)

Mounting type (Included at shipping other than clevis mounting type)
Blank — Basic type
1 — Double foot mounting type (mountable only on ϕ10 and ϕ16 of head cover **-M** specification double acting type and **-M** specification single acting push type)
1A — Single foot mounting type
3 — Flange mounting type
7 — Clevis mounting type (with pin for bore sizes of ϕ10 and ϕ16 only)
7-7C — Clevis mounting type with pin and clevis supporting bracket (for bore sizes of ϕ10 and ϕ16 only)

Sensor switch
Blank — Without sensor switch
ZC253 — 3-lead wire, solid state type
ZC230 — 2-lead wire, solid state type
ZC201 — 2-lead wire, reed switch type
ZC205 — 2-lead wire, reed switch type
●For details, see p.111～121.

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

Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches
3 — With 3 sensor switches

Order Codes for Mounting Brackets Only

Name \ Bore size mm [in.]	6 [0.236]	10 [0.394]	16 [0.630]
Single foot bracket	**CS-1A-PBDA6**	**CS-1A-PBDA10**	**CS-1A-PBDA16**
Double foot bracket	**CS-1-PBDA6**	**CS-1-PBDA10**	**CS-1-PBDA16**
Flange bracket	**CS-3-PBDA6**	**CS-3-PBDA10**	**CS-3-PBDA16**
Clevis supporting bracket	—	**CS-7C-PBDA10**	**CS-7C-PBDA16**

Mounting type

Mounting type	Name	Remarks
1	Double foot type	Included at shipping
1A	Single foot type Note	Included at shipping
3	Flange type	Included at shipping
7	Clevis type (with pin)	Assembled and shipped
7-7C	Clevis type with supporting bracket (with pin)	Supporting bracket included at shipping

Note: When the stroke exceeds 60mm [2.362in.], select the double foot type when using the foot bracket.

Mass

g [oz.]

Operating type	Mounting type	Bore mm	Stroke mm																		Additional mass					Additional mass of Lateral piping
																					Mounting type			Cylinder with magnet	Sensor switch (1 pc.) Note 2	
			5	10	15	20	25	30	35	40	45	50	55	60	75	100	125	150	175	200	Single foot	Flange	Clevis Note 1			
Double acting type	Basic type	**6**	18.8 [0.663]	19.4 [0.684]	20 [0.705]	20.8 [0.734]	21.4 [0.755]	22 [0.776]	22.4 [0.790]	22.8 [0.804]	23 [0.811]	23.6 [0.832]	24.2 [0.854]	25 [0.882]	—	—	—	—	—	—	7 [0.25]	5 [0.18]	—	0.5 [0.018]	A：20 [0.71] B：50 [1.76]	—
		10	27 [0.952]	28 [0.988]	29 [1.023]	30 [1.058]	31 [1.093]	32 [1.129]	33.3 [1.175]	34.6 [1.220]	36 [1.270]	37 [1.305]	38 [1.340]	39 [1.376]	42.4 [1.496]	48.1 [1.697]	53.8 [1.898]	59.5 [2.099]	—	—	7 [0.25]	5 [0.18]	—	1 [0.04]		2 [0.07]
		16	47.8 [1.686]	49.4 [1.743]	51 [1.799]	52.6 [1.855]	54.2 [1.912]	56 [1.975]	57.6 [2.032]	59.2 [2.088]	61 [2.152]	62.3 [2.198]	63.6 [2.243]	66 [2.328]	71.3 [2.515]	80.1 [2.825]	88.9 [3.136]	97.7 [3.446]	106.5 [3.757]	115.3 [4.067]	18 [0.63]	12 [0.42]	—	2 [0.07]		3 [0.11]
	Clevis mounting type (with pin)	**10**	30.8 [1.086]	31.9 [1.125]	33 [1.164]	33.8 [1.192]	34.9 [1.231]	36 [1.270]	37.8 [1.333]	38.9 [1.372]	40 [1.411]	40.8 [1.439]	41.9 [1.478]	43 [1.517]	46.3 [1.633]	51.8 [1.827]	57.3 [2.021]	62.8 [2.215]	—	—	—	—	32 [1.13]	1 [0.04]		—
		16	59.4 [2.095]	61.2 [2.159]	63 [2.222]	64.4 [2.272]	66.2 [2.335]	68 [2.399]	69.4 [2.448]	71.2 [2.511]	73 [2.575]	74.4 [2.624]	76.2 [2.688]	78 [2.751]	83.4 [2.942]	92.4 [3.259]	101.4 [3.577]	110.4 [3.894]	119.4 [4.212]	128.4 [4.529]	—	—	45 [1.59]	2 [0.07]		—
Single acting push type	Basic type	**6**	15.8 [0.557]	16.4 [0.578]	17 [0.600]	19.8 [0.698]	20.4 [0.720]	21 [0.741]	22.8 [0.804]	23.4 [0.825]	24 [0.847]	24.8 [0.875]	25.4 [0.896]	26 [0.917]	—	—	—	—	—	—	7 [0.25]	5 [0.18]	—	0.5 [0.018]		—
		10	26.8 [0.945]	27.9 [0.984]	29 [1.023]	31.8 [1.122]	32.9 [1.160]	34 [1.199]	39.8 [1.404]	40.9 [1.443]	42 [1.481]	42.8 [1.510]	43.9 [1.549]	45 [1.587]	—	—	—	—	—	—	18 [0.63]	12 [0.42]	—	1 [0.04]		2 [0.07]
		16	50.4 [1.778]	52.2 [1.841]	54 [1.905]	58.4 [2.060]	60.2 [2.123]	62 [2.187]	72.4 [2.554]	74.2 [2.617]	76 [2.681]	77.4 [2.730]	79.2 [2.794]	81 [2.857]	—	—	—	—	—	—	18 [0.63]	12 [0.42]	—	2 [0.07]		3 [0.11]
	Clevis mounting type (with pin)	**10**	29.8 [1.051]	30.9 [1.090]	32 [1.129]	34.8 [1.228]	35.9 [1.266]	37 [1.305]	42.8 [1.510]	43.9 [1.549]	45 [1.587]	45.8 [1.616]	46.9 [1.654]	48 [1.693]	—	—	—	—	—	—	—	—	32 [1.13]	1 [0.04]		—
		16	61.4 [2.166]	63.2 [2.229]	65 [2.293]	69.4 [2.448]	71.2 [2.511]	73 [2.575]	83.4 [2.942]	83.4 [2.942]	87 [3.069]	88.4 [3.118]	90.2 [3.182]	92 [3.245]	—	—	—	—	—	—	—	—	45 [1.59]	2 [0.07]		—

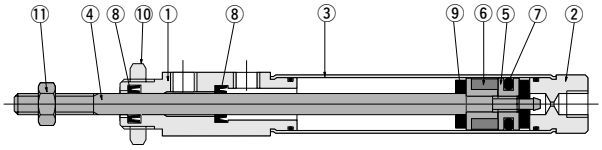
Remark : Includes mounting nut and rod end nut. The clevis mounting type does not include mounting nut.
For the mass of the double foot bracket, add double the mass of the single foot bracket listed above.

Notes: 1. With supporting bracket and pin.
2. Same for all sensor switch models (**ZC253**□, **ZC230**□, **ZC201**□, **ZC205**□).

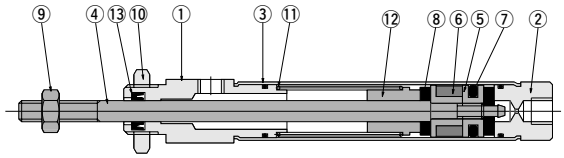
Calculation example: The mass for 2 units of ZC253A, with a double acting cylinder with magnet with single foot bracket, bore size of 10mm, and stroke of 45mm, is 36＋7＋1＋40＝84g [2.96oz.].

Inner Construction (cannot be disassembled)

●Double acting type



●Single acting push type



Major Parts and Materials

No.	Parts	Materials
①	Rod cover	Aluminum alloy (nickel plated)
②	Head cover	
③	Cylinder tube	Stainless steel
④	Piston rod	
⑤	Piston	Aluminum alloy
⑥	Magnet Note	Plastic magnet
⑦	Piston seal	Synthetic rubber (NBR)
⑧	Rod seal	
⑨	Bumper	Urethane rubber
⑩	Mounting nut	Mild steel (nickel plated)
⑪	Rod end nut	

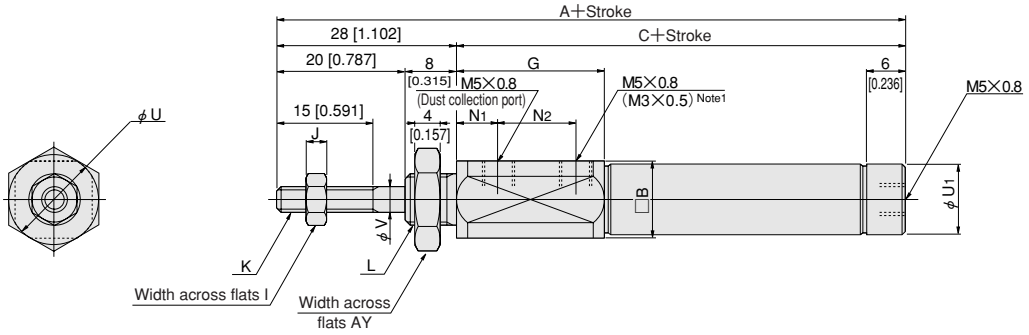
Note: For cylinders with magnets. Standard cylinders do not have a built-in magnet for the sensor switch.

No.	Parts	Materials
①	Rod cover	Aluminum alloy (nickel plated)
②	Head cover	
③	Cylinder tube	Stainless steel
④	Piston rod	
⑤	Piston	Aluminum alloy
⑥	Magnet Note1	Plastic magnet
⑦	Piston seal	Synthetic rubber (NBR)
⑧	Bumper	Urethane rubber
⑨	Rod end nut	Mild steel (nickel plated)
⑩	Mounting nut	
⑪	Spring	Steel
⑫	Collar	Aluminum alloy
⑬	Rod seal	Synthetic rubber (NBR)

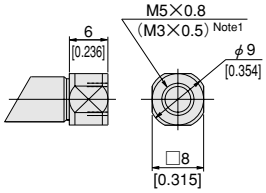
Note: For cylinders with magnets. Standard cylinders do not have a built-in magnet for the sensor switch.

Dimensions of Double Acting Cylinder mm [in.]

■Basic type CS - PBDA □ Bore size × Stroke

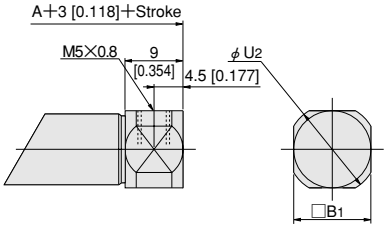


●φ6 Head cover



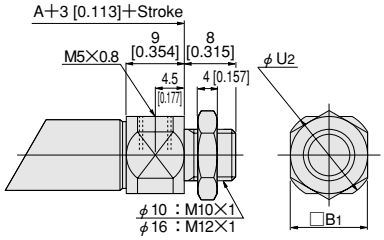
●Lateral piping (-A) Note 2

CS - PBDA □ Bore size × Stroke -A



●Lateral piping with mounting thread (-M) Note 2

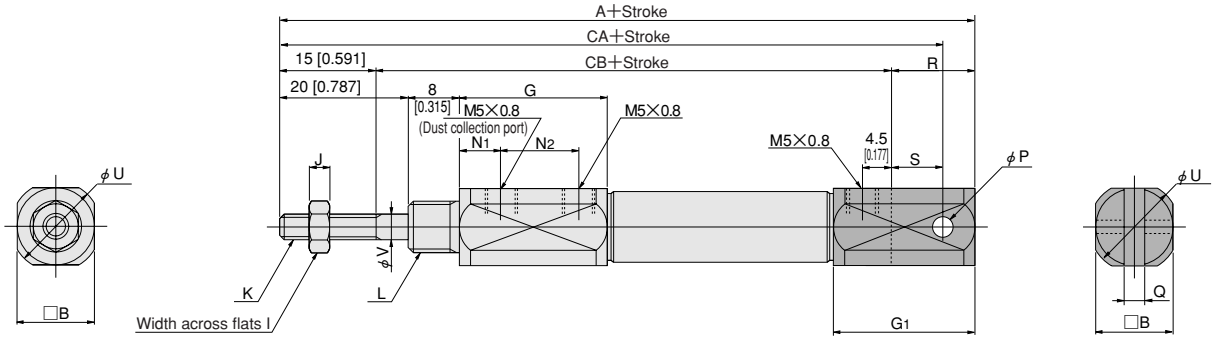
CS - PBDA □ Bore size × Stroke -M



Bore size \ Code	A	C	B	B1	G	I	J	K	L	N1	N2	U	U1	U2	V	AY
6 [0.236]	87 [3.425]	59 [2.323]	12 [0.472]	—	24.5 [0.965]	5.5 [0.217]	2.4 [0.094]	M3×0.5	M8×1	10 [0.394]	10 [0.394]	14 [0.551]	—	—	3 [0.118]	12 [0.472]
10 [0.394]	81 [3.189]	53 [2.087]	12 [0.472]	12 [0.472]	23 [0.906]	7 [0.276]	3.2 [0.126]	M4×0.7	M10×1	6.5 [0.256]	12 [0.472]	14 [0.551]	11 [0.433]	14 [0.551]	4 [0.157]	14 [0.551]
16 [0.630]	81.5 [3.209]	53.5 [2.106]	17 [0.669]	17 [0.669]	21.5 [0.846]	8 [0.315]	4 [0.157]	M5×0.8	M12×1	5 [0.197]	12 [0.472]	19 [0.748]	17 [0.669]	19 [0.748]	5 [0.197]	17 [0.669]

Notes: 1. For bore size φ6 only.
2. Not available for bore size φ6.

■Clevis mounting type CS - PBDA □ Bore size × Stroke -7

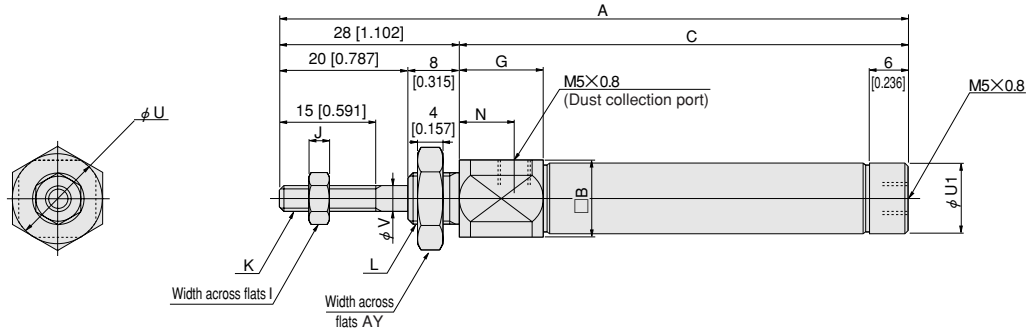


Bore size \ Code	A	B	G	G1	I	J	K	L	N1	N2
10 [0.394]	97 [3.819]	12 [0.472]	23 [0.905]	22 [0.866]	7 [0.276]	3.2 [0.126]	M4×0.7	M10×1	6.5 [0.256]	12 [0.472]
16 [0.630]	102.5 [4.035]	17 [0.669]	21.5 [0.846]	27 [1.063]	8 [0.315]	4 [0.157]	M5×0.8	M12×1	5 [0.197]	12 [0.472]

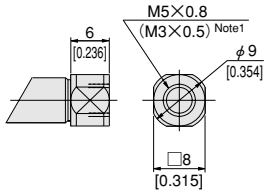
Bore size \ Code	P	Q	R	S	U	V	CA	CB
10 [0.394]	$3.2^{+0.09}_{+0.06}$ [$0.1260^{+0.0035}_{+0.0024}$]	$3.2^{+0.2}_{+0.1}$ [$0.126^{+0.008}_{+0.004}$]	13 [0.512]	8 [0.315]	14 [0.551]	4 [0.157]	92 [3.622]	69 [2.717]
16 [0.630]	5 $^{+0.09}_{+0.06}$ [$0.1969^{+0.0035}_{+0.0024}$]	$6.5^{+0.2}_{+0.1}$ [$0.256^{+0.008}_{+0.004}$]	18 [0.709]	10 [0.394]	19 [0.748]	5 [0.197]	94.5 [3.720]	69.5 [2.736]

Dimensions of Single Acting Push Type Cylinder mm [in.]

●Basic type CS - PBSA □ Bore size × Stroke

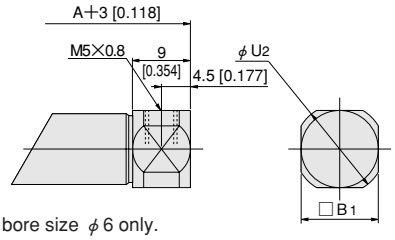


●φ6 Head cover



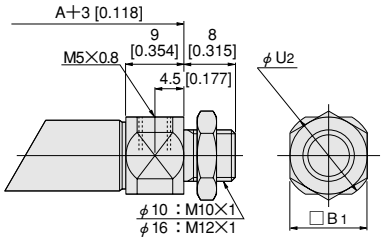
●Lateral piping (-A) Note 2

CS - PBSA □ Bore size × Stroke **-A**



●Lateral piping with mounting thread (-M) Note 2

CS - PBSA □ Bore size × Stroke **-M**



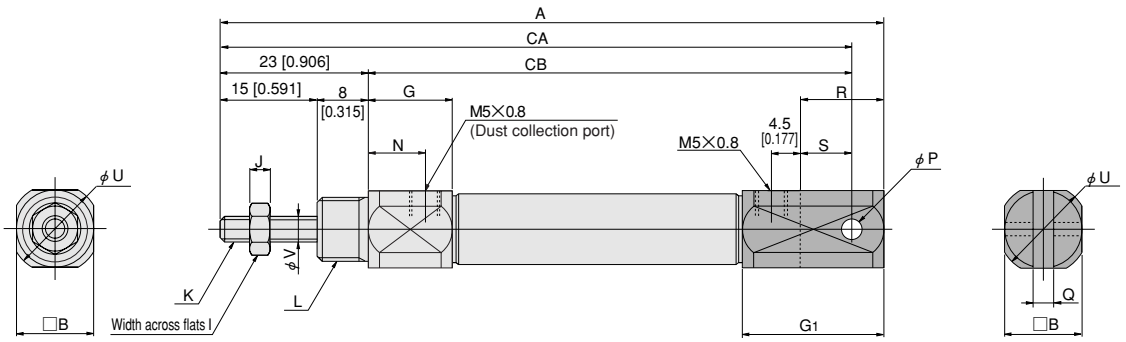
Notes: 1. For bore size φ6 only.
2. Not available for bore size φ6.

Code / Bore size \ Stroke	A												C											
	5	10	15	20	25	30	35	40	45	50	55	60	5	10	15	20	25	30	35	40	45	50	55	60
6 [0.236]	87 [3.425]	92 [3.622]	97 [3.819]	107 [4.213]	112 [4.409]	117 [4.606]	137 [5.394]	142 [5.591]	147 [5.787]	152 [5.984]	157 [6.181]	162 [6.378]	59 [2.323]	64 [2.520]	69 [2.717]	79 [3.110]	84 [3.307]	89 [3.504]	109 [4.291]	114 [4.488]	119 [4.685]	124 [4.882]	129 [5.079]	134 [5.276]
10 [0.394]	86 [3.386]	91 [3.583]	96 [3.780]	106 [4.173]	111 [4.370]	116 [4.567]	131 [5.157]	136 [5.354]	141 [5.551]	146 [5.748]	151 [5.945]	156 [6.142]	58 [2.283]	63 [2.480]	68 [2.677]	78 [3.071]	83 [3.268]	88 [3.465]	103 [4.055]	108 [4.252]	113 [4.449]	118 [4.646]	123 [4.843]	128 [5.039]
16 [0.630]	86.5 [3.406]	91.5 [3.602]	96.5 [3.799]	106.5 [4.193]	111.5 [4.390]	116.5 [4.587]	131.5 [5.177]	136.5 [5.374]	141.5 [5.571]	146.5 [5.768]	151.5 [5.965]	156.5 [6.161]	58.5 [2.303]	63.5 [2.500]	68.5 [2.697]	78.5 [3.091]	83.5 [3.287]	88.5 [3.484]	103.5 [4.075]	108.5 [4.272]	113.5 [4.469]	118.5 [4.665]	123.5 [4.862]	128.5 [5.059]

Bore size \ Code	B	B_1	G	I	J	K	L	N	U	U_1	U_2	V	AY
6 [0.236]	12 [0.472]	—	14.5 [0.571]	5.5 [0.217]	2.4 [0.094]	M3×0.5	M8×1	8 [0.315]	14 [0.551]	—	—	3 [0.118]	12 [0.472]
10 [0.394]	12 [0.472]	12 [0.472]	13 [0.512]	7 [0.276]	3.2 [0.126]	M4×0.7	M10×1	8.5 [0.335]	14 [0.551]	11 [0.433]	14 [0.551]	4 [0.157]	14 [0.551]
16 [0.630]	17 [0.669]	17 [0.669]	11.5 [0.453]	8 [0.315]	4 [0.157]	M5×0.8	M12×1	7 [0.276]	19 [0.748]	17 [0.669]	19 [0.748]	5 [0.197]	17 [0.669]

Dimensions of Single Acting Push Type Cylinder mm [in.]

●Clevis mounting type CS - PBSA □ Bore size × Stroke -7



Code / Bore size \ Stroke	A											
	5	10	15	20	25	30	35	40	45	50	55	60
10 [0.394]	97 [3.819]	102 [4.016]	107 [4.213]	117 [4.606]	122 [4.803]	127 [5.000]	142 [5.591]	147 [5.787]	152 [5.984]	157 [6.181]	162 [6.378]	167 [6.575]
16 [0.630]	102.5 [4.035]	107.5 [4.232]	112.5 [4.429]	122.5 [4.823]	127.5 [5.020]	132.5 [5.217]	147.5 [5.807]	152.5 [6.004]	157.5 [6.201]	162.5 [6.398]	167.5 [6.594]	172.5 [6.791]

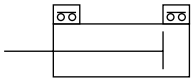
Code / Bore size \ Stroke	CA											
	5	10	15	20	25	30	35	40	45	50	55	60
10 [0.394]	92 [3.622]	97 [3.819]	102 [4.016]	112 [4.409]	117 [4.606]	122 [4.803]	137 [5.394]	142 [5.591]	147 [5.787]	152 [5.984]	157 [6.181]	162 [6.378]
16 [0.630]	94.5 [3.720]	99.5 [3.917]	104.5 [4.114]	114.5 [4.508]	119.5 [4.705]	124.5 [4.902]	139.5 [5.492]	144.5 [5.689]	149.5 [5.886]	154.5 [6.083]	159.5 [6.280]	164.5 [6.476]

Code / Bore size \ Stroke	CB											
	5	10	15	20	25	30	35	40	45	50	55	60
10 [0.394]	69 [2.717]	74 [2.913]	79 [3.110]	89 [3.504]	94 [3.701]	99 [3.898]	114 [4.488]	119 [4.685]	124 [4.882]	129 [5.079]	134 [5.276]	139 [5.472]
16 [0.630]	71.5 [2.815]	76.5 [3.012]	81.5 [3.209]	91.5 [3.602]	96.5 [3.799]	101.5 [3.996]	116.5 [4.587]	121.5 [4.783]	126.5 [4.980]	131.5 [5.177]	136.5 [5.374]	141.5 [5.571]

Bore size \ Code	B	G	G1	I	J	K	L	N	P	Q	R	S	U	V
10 [0.394]	12 [0.472]	13 [0.512]	22 [0.866]	7 [0.276]	3.2 [0.126]	M4×0.7	M10×1	8.5 [0.335]	$3.2^{+0.09}_{+0.06}$ $[0.1260^{+0.0035}_{+0.0024}]$	$3.2^{+0.2}_{+0.1}$ $[0.126^{+0.008}_{+0.004}]$	13 [0.512]	8 [0.315]	14 [0.551]	4 [0.157]
16 [0.630]	17 [0.669]	11.5 [0.453]	27 [1.063]	8 [0.315]	4 [0.157]	M5×0.8	M12×1	7 [0.276]	$5^{+0.09}_{+0.06}$ $[0.1969^{+0.0035}_{+0.0024}]$	$6.5^{+0.2}_{+0.1}$ $[0.256^{+0.008}_{+0.004}]$	18 [0.709]	10 [0.394]	19 [0.748]	5 [0.197]

Sensor Switches

Symbol



Order Codes for Sensor Switches

●Sensor switches (with mounting band)

CS – □ □ – **PBDAS** □

Bore size
6 —— ϕ 6 [0.236in.]
10 —— ϕ 10 [0.394in.]
16 —— ϕ 16 [0.630in.]

Cylinder type
PBDAS

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

Sensor switch

ZC230	Solid state type with indicator lamp	DC10～28V
ZC253	Solid state type with indicator lamp	DC4.5～28V
ZC201	Reed switch type without indicator lamp	DC5～28V AC85～115V
ZC205	Reed switch type with indicator lamp	DC10～28V

Clean system product

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

●Mounting band only

CS – **C1** – **PBDAS** □

Bore size
6 —— ϕ 6 [0.236in.]
10 —— ϕ 10 [0.394in.]
16 —— ϕ 16 [0.630in.]

Cylinder type
PBDAS

Mounting band type

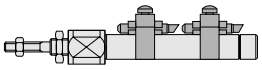
Clean system product

Minimum Cylinder Strokes When Mounting Sensor Switches

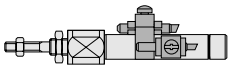
Depending on the sensor switch type and quantity, as well as on the mounting position, the minimum cylinder strokes that allow sensor switch mounting are shown below.

●Two pieces mounting

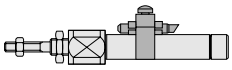
●When mounted in-line



● When mounted in staggered positions



●One piece mounting

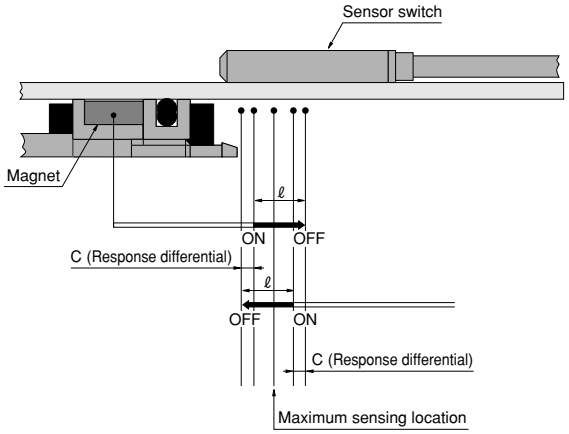


mm [in.]

Sensor switch model	2 pcs. mounting		1 pc. mounting
	In-line	In staggered positions	
ZC230□, ZC253□	30 [1.181]	5 [0.197]	5 [0.197]
ZC201□, ZC205□		10 [0.394]	

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.



mm [in.]

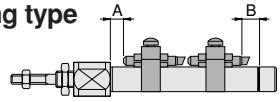
Bore size	ZC230□, ZC253□		ZC201□, ZC205□	
	Operating range	Response differential	Operating range	Response differential
6 [0.236]	1.5～2.5 [0.059～0.098]	0.3 [0.012] or less	4～6 [0.157～0.236]	1.4 [0.055] or less
10 [0.394]	2.0～3.0 [0.079～0.118]	0.3 [0.012] or less	4～6 [0.157～0.236]	1.5 [0.059] or less
16 [0.630]	2.5～3.5 [0.098～0.138]	0.3 [0.012] or less	5～7 [0.197～0.276]	1.8 [0.071] or less

Note: The operating range and response differential are to be used as reference values.

Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the location 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.

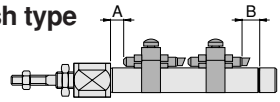
●Double acting type



mm [in.]

Sensor switch model / Code	Bore size 6 [0.236]	10 [0.394]	16 [0.630]
ZC230□ ZC253□ **A**	3.5 [0.138]	2 [0.079]	3 [0.118]
B	0 [0]	–3 [–0.118]	–2 [–0.079]
ZC201□ **A**	5 [0.197]	3.5 [0.138]	4.5 [0.177]
B	1.5 [0.059]	–1.5 [–0.059]	–0.5 [–0.020]
ZC205□ **A**	1.5 [0.059]	0 [0]	1 [0.039]
B	1 [0.039]	–2 [–0.079]	–1 [–0.039]

●Single acting push type

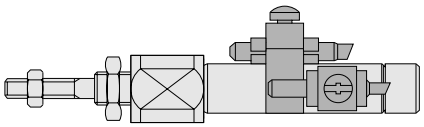


mm [in.]

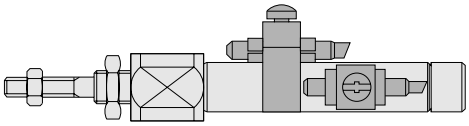
Sensor switch model	Code	Stroke	Bore size 6 [0.236]	10 [0.394]	16 [0.630]
ZC230□ ZC253□	**A**	0～15	3.5 [0.138]	7 [0.276]	8 [0.315]
		16～30	8.5 [0.335]	12 [0.472]	13 [0.512]
		31～60	23.5 [0.925]	22 [0.866]	23 [0.906]
	B	—	0 [0]	–3 [–0.118]	–2 [–0.079]
ZC201□	**A**	0～15	5 [0.197]	8.5 [0.335]	9.5 [0.374]
		16～30	10 [0.394]	13.5 [0.531]	14.5 [0.571]
		31～60	25 [0.984]	23.5 [0.925]	24.5 [0.965]
	B	—	1.5 [0.059]	–1.5 [–0.059]	–0.5 [–0.020]
ZC205□	**A**	0～15	1.5 [0.059]	5 [0.197]	6 [0.236]
		16～30	6.5 [0.256]	10 [0.394]	11 [0.433]
		31～60	21.5 [0.846]	20 [0.787]	21 [0.827]
	B	—	1 [0.039]	–2 [–0.079]	–1 [–0.039]

Mounting Sensor Switch by Strokes

●5mm stroke



●10mm stroke

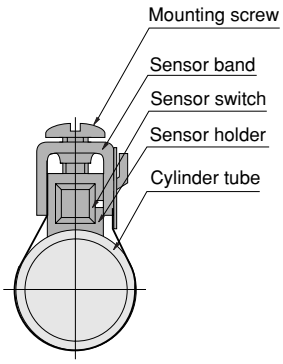


Position of sensor holder, and how to adjust it

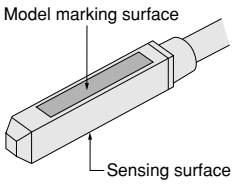
- The sensor holder cannot be installed at the center of the sensor switch in the axial direction when mounting 2 sensor switches on a 5mm [0.197in.] stroke cylinder.
- When mounting 2 sensor switches on a 5mm [0.197in.] stroke cylinder, loosen the mounting screw and move the sensor switch until the sensor holder is in the position shown in the diagram, and install it in the prescribed position.
- For 10mm [0.394in.] strokes or longer, install the sensor holder so that it is approximately at the center of the sensor switch in the axial direction, as shown in the diagram.

Moving Sensor Switch

- Loosening the mounting screw allows the sensor switch to be moved either along the axial or circumference direction of the cylinder.
- When making fine adjustments of the sensor switch along the axial direction, a very slight loosening of the mounting screw (about one-half turn) is enough to allow the sensor switch to move.
- Tighten the mounting screw with a tightening torque of 0.3N·m [2.7in·lbf] or less.

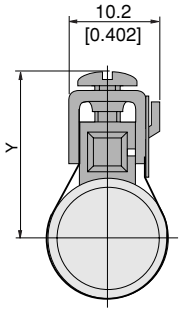


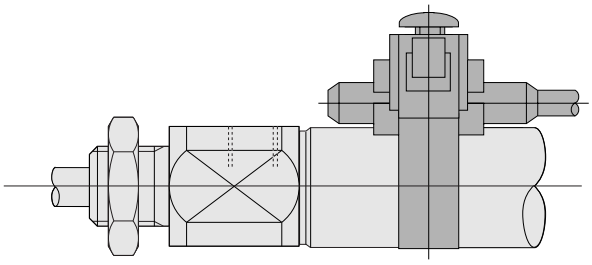
●Caution when installing sensor switches on the cylinder



In the ZC type sensor switches, the opposite side from the model marking surface is the sensing surface side. Mount it so that the cylinder magnet comes to the sensing surface side.

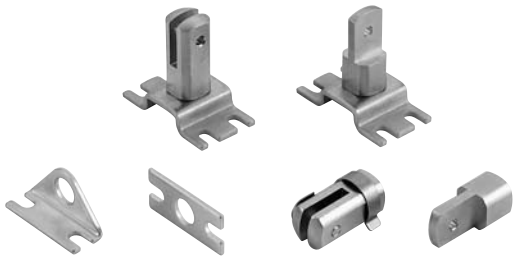
Dimensions of Sensor Switch Mounting mm [in.]





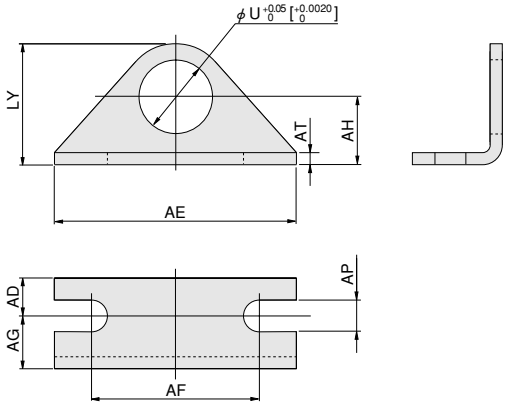
Bore size \ Code	Y
6 [0.236]	(16 [0.630])
10 [0.394]	(18 [0.709])
16 [0.630]	(21 [0.827])

Mounting Brackets, Rod End Accessories



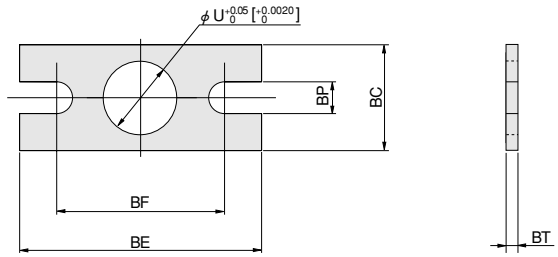
Dimensions of Mounting Bracket mm [in.]

●Single foot bracket (For the order code, see p. 62.)



Code / Bore size	U	AD	AE	AF	AG	AH	AP	AT	LY
6 [0.236]	8 [0.315]	5 [0.197]	32 [1.260]	22.2 [0.874]	7 [0.276]	9 [0.354]	4.2 [0.165]	1.6 [0.063]	16 [0.630]
10 [0.394]	10 [0.394]	6 [0.236]	42 [1.654]	29.2 [1.150]	9 [0.354]	14 [0.551]	5.2 [0.205]	2.3 [0.091]	24 [0.945]
16 [0.630]	12 [0.472]	6 [0.236]	42 [1.654]	29.2 [1.150]	9 [0.354]	14 [0.551]	5.2 [0.205]	2.3 [0.091]	24 [0.945]

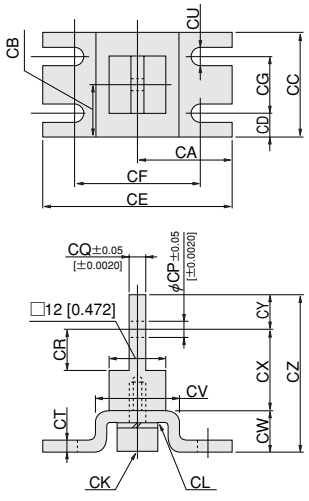
●Flange bracket (For the order code, see p. 62.)



Code / Bore size	U	BC	BE	BF	BP	BT
6 [0.236]	8 [0.315]	14 [0.551]	32 [1.260]	22.2 [0.874]	4.2 [0.165]	1.6 [0.063]
10 [0.394]	10 [0.394]	20 [0.787]	42 [1.654]	29.2 [1.150]	5.2 [0.205]	2.3 [0.091]
16 [0.630]	12 [0.472]	20 [0.787]	42 [1.654]	29.2 [1.150]	5.2 [0.205]	2.3 [0.091]

●Clevis mount supporting bracket

Order code: 7C-PBDA Bore size



Code / Bore size	CA	CB	CC	CD	CE	CF	CG	CK (Hexagon socket head bolt)
10 [0.394]	20 [0.787]	11 [0.433]	22 [0.866]	5 [0.197]	40 [1.575]	30.2 [1.189]	12 [0.472]	M4×0.7×10 [0.394]
16 [0.630]	24 [0.945]	14 [0.551]	28 [1.102]	6 [0.236]	48 [1.890]	35.2 [1.386]	16 [0.630]	M5×0.8×10 [0.394]

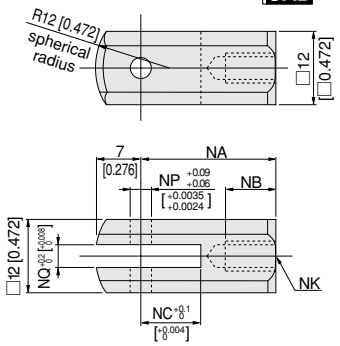
Code / Bore size	CL (Spring washer)	CP	CQ	CR	CT	CU	CV	CW	CX	CY	CZ
10 [0.394]	Nominal 4 [0.157]	3.3 [0.130]	3.1 [0.122]	9 [0.354]	2 [0.079]	4.2 [0.165]	18 [0.709]	8 [0.315]	21 [0.827]	7 [0.276]	36 [1.417]
16 [0.630]	Nominal 5 [0.197]	5.1 [0.201]	6.4 [0.252]	14 [0.551]	2.3 [0.091]	5.2 [0.205]	20 [0.787]	10 [0.394]	25 [0.984]	7 [0.276]	42 [1.654]

Dimensions of Rod End Accessories mm [in.]

Note: Rod end accessories for clean systems are not available.

● Y type knuckle

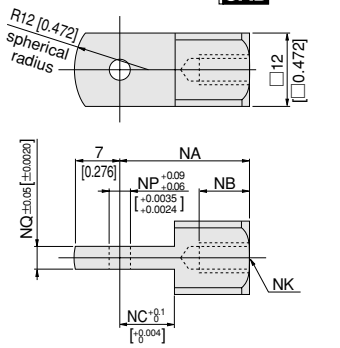
CAD PBDAY



Code / Bore size	NA	NB	NC	NK	NP	NQ	Mass g (with pin)
10 [0.394]	21 [0.827]	8 [0.315]	10 [0.394]	M4×0.7	3.2 [0.126]	3.2 [0.126]	21 [0.827]
16 [0.630]	21 [0.827]	11 [0.433]	10 [0.394]	M5×0.8	5 [0.197]	6.5 [0.256]	15 [0.591]

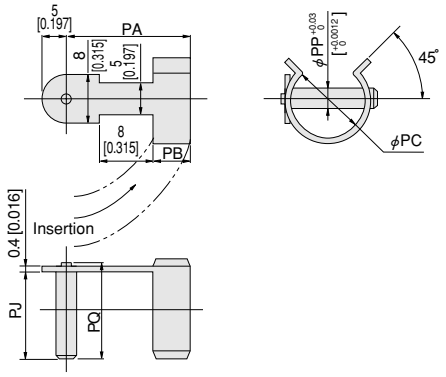
● I type knuckle

CAD PBDAI



Code / Bore size	NA	NB	NC	NK	NP	NQ	Mass g
10 [0.394]	21 [0.827]	8 [0.315]	9 [0.354]	M4×0.7	3.2 [0.126]	3.1 [0.122]	16 [0.630]
16 [0.630]	25 [0.984]	8 [0.315]	14 [0.551]	M5×0.8	5 [0.197]	6.4 [0.252]	22 [0.866]

Dimensions of Pin Bracket mm [in.]



Code / Bore size	PA	PB	PC	PJ	PP	PQ	Mass g
10 [0.394]	17 [0.669]	5 [0.197]	14 [0.551]	13.5 [0.531]	3.2 [0.126]	(15) ([0.591])	2 [0.079]
16 [0.630]	17 [0.669]	5 [0.197]	14 [0.551]	13.5 [0.531]	5 [0.197]	(15) ([0.591])	3 [0.118]
16 [0.630]※	19 [0.748]	6 [0.236]	19 [0.748]	19 [0.748]		(20.5) ([0.807])	

Note: ※shows the case for clevis mounting bracket.

Order Codes for Mounting Brackets and Rod End Accessories

Note: Rod end accessories for clean systems are not available.

(1) Single foot bracket

CS – 1A – □□

- **CS** – Clean system product
- **1A** – Single foot bracket
- □ – Applicable type: **PBDA** (Except for linear bearing, non-rotating types)
- □ – Bore size: **6** - φ 6 (**PBDA** only), **10** - φ 10, **16** - φ 16

(2) Double foot bracket (2 foot brackets in 1 set)

CS – 1 – □□

- **CS** – Clean system product
- **1** – Double foot bracket
- □ – Applicable type: **PBDA** (Except for linear bearing, non-rotating types)
- □ – Bore size: **10** - φ 10, **16** - φ 16

(3) Flange bracket

CS – 3 – □□

- **CS** – Clean system product
- **3** – Flange bracket
- □ – Applicable type: **PBDA** (Except for linear bearing type)
- □ – Bore size: **6** - φ 6 (**PBDA** only), **10** - φ 10, **16** - φ 16

(4) Clevis mount supporting bracket

CS – 7C – PBDA □

- **CS** – Clean system product
- **7C** – Clevis mount supporting bracket
- **PBDA** – Pen cylinder series
- □ – Bore size: **10** - φ 10, **16** - φ 16

(5) Y type knuckle Note

Y – PBDA □

- **Y** – Y type knuckle
- **PBDA** – Pen cylinder series
- □ – Bore size: **10** - φ 10, **16** - φ 16

(6) I type knuckle Note

I – PBDA □

- **I** – I type knuckle
- **PBDA** – Pen cylinder series
- □ – Bore size: **10** - φ 10, **16** - φ 16

(7) Pin bracket Note

PK □ – PBDA

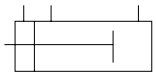
- **PK** – Pin bracket
- □ – Pin bracket type:
  - **3:** For φ **10 Y** type knuckle and φ **10** clevis mounting bracket
  - **5:** For φ **16 Y** type knuckle
  - **6:** For φ **16** clevis mounting bracket
- **PBDA** – Pen cylinder series

KOGANEI CLEAN SYSTEM

SLIM CYLINDERS

Double Acting Type

Symbol



Specifications

Item \ Bore size mm [in.]		ϕ20～ϕ40 [0.787～1.575]	ϕ50, ϕ63 [1.969, 2.480]
Operating type		Double acting type	
Media		Air	
Operating pressure range	MPa [psi.]	0.1～0.9 [15～131]	0.1～0.7 [15～102]
Proof pressure	MPa [psi.]	1.32 [191]	1.03 [149]
Operating temperature range	℃ [°F]	0～60 [32～140]	
Operating speed range	mm/s [in./sec.]	50～300 [2.0～11.8]	
Cushion		Fixed type (Rubber bumper)	Variable type (15mm [0.591in.] stroke)
Lubrication		Not required	
Port size	Supply port	Rc1/8	Rc1/4
	Dust collection port	M5×0.8	

Bore Size and Stroke

mm [in.]

Bore size	Mounting type	Standard strokes	Maximum stroke	Maximum available stroke
20 [0.787]	Foot mounting Nose mounting Flange mounting	25 50 75 100 125 150	200	1050 [41.3]
25 [0.984]	Foot mounting Nose mounting Flange mounting	25 50 75 100 125 150 200	250	
32 [1.260]	Foot mounting Nose mounting Flange mounting	25 50 75 100 125 150 200	300	
40 [1.575]	Foot mounting Nose mounting Flange mounting	25 50 75 100 125 150 200 250 300	400	
50 [1.969]	Foot mounting	25 50 75 100 150 200 250 300 350 400	500	900 [35.4]
	Nose mounting Flange mounting	25 50 75 100 150 200	300	
63 [2.480]	Foot mounting	25 50 75 100 150 200 250 300 350 400 500	600	
	Nose mounting Flange mounting	25 50 75 100 150 200	300	

Remarks: 1. Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]
2. For non-standard strokes, consult us.
3. The minimum operating pressure when the stroke is over the maximum stroke at bore sizes of ϕ20～ϕ40 is 0.2MPa [29psi.].

Order Codes

CS – **DA** **20×50** – □ – □ – □ – □ □ □

Clean system product

Slim cylinder
Double acting type

Bore size
×
Stroke

Head cover type
Blank — Standard head
A — Short head

Mounting type
Blank — Nose mounting type
1 — Foot mounting type
3 — Flange mounting type

Rod end accessory
Blank — Without rod end accessory
Y — Y type knuckle (With pin)
I — I type knuckle

Sensor switch
Blank — Without sensor switch
ZG530 — 2-lead wire Solid state type with indicator lamp DC10～28V
ZG553 — 3-lead wire Solid state type with indicator lamp DC4.5～28V
CS3M — 2-lead wire Reed switch type with indicator lamp DC10～30V, AC85～230V
CS4M — 2-lead wire Reed switch type with indicator lamp DC10～30V, AC85～115V
CS5M — 2-lead wire Reed switch type without indicator lamp DC3～30V, AC85～115V
CS2F — 2-lead wire Reed switch type with indicator lamp AC85～230V
CS3F — 2-lead wire Reed switch type with indicator lamp DC10～30V
CS4F — 2-lead wire Reed switch type with indicator lamp DC10～30V
CS5F — 2-lead wire Reed switch type without indicator lamp DC3～30V

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

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

Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches
3 — With 3 sensor switches

● For the order codes of additional parts, see p. 64.

Order Codes of Additional Parts (To be ordered separately) mm [in.]

●Mounting bracket type

CS — □ — DA □

Bore size
20 — ϕ 20 [0.787]
25 — ϕ 25 [0.984]
32 — ϕ 32 [1.260]
40 — ϕ 40 [1.575]
50 — ϕ 50 [1.969]
63 — ϕ 63 [2.480]

Slim cylinder

Mount bracket
1 — Foot bracket (2 pcs.)
3 — Flange bracket (1 pc.)

Clean system product

●Knuckle type

CS — □ — □ □

Bore size Note
16 — ϕ 16 [0.630]
20 — ϕ 20 [0.787]
25 — ϕ 25 [0.984]
32 — ϕ 32 [1.260]
40 — ϕ 40 [1.575]
50 — ϕ 50 [1.969]
63 — ϕ 63 [2.480]
Note: ϕ 50 and ϕ 63 are DA type only.

Cylinder type
DA — All sizes except ϕ 16
DAB — Only ϕ 16 size available

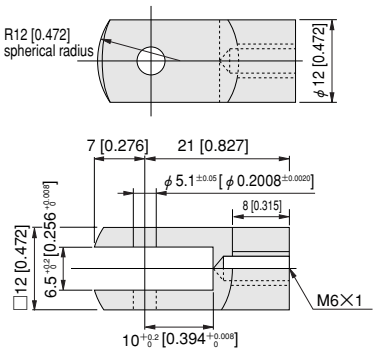
Mounting bracket
Y — Y type knuckle
I — I type knuckle

Clean system product

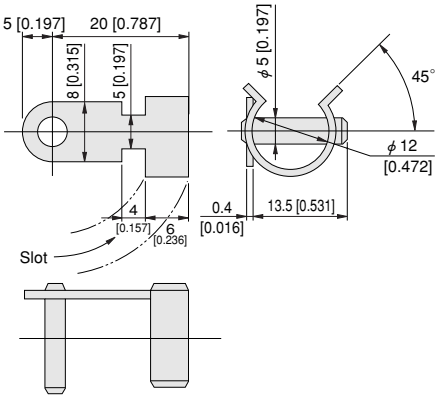
Dimensions of Additional Parts mm [in.]

● ϕ 16

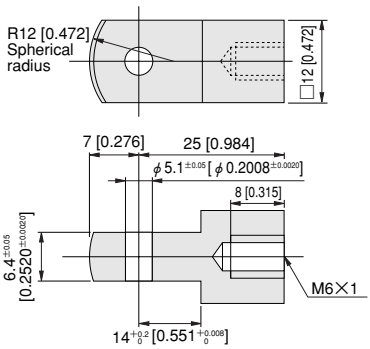
●Y type



Pin for Y type knuckle

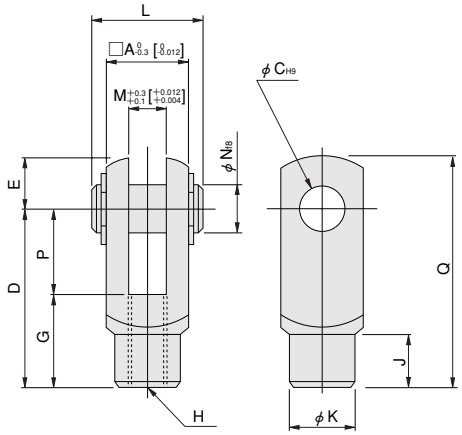


●I type

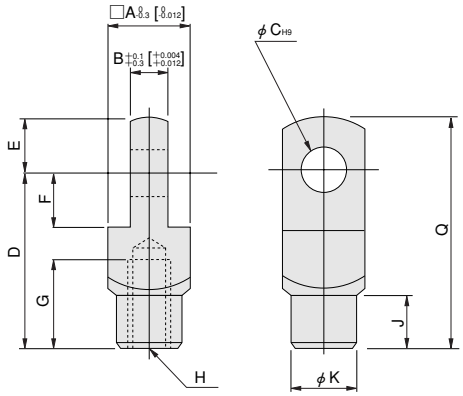


● ϕ 20～ ϕ 63

●Y type



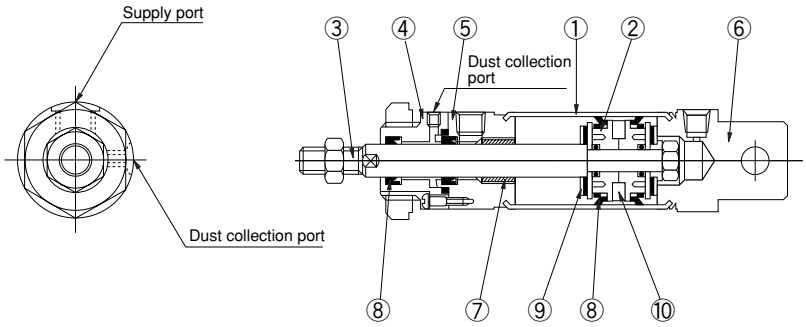
●I type



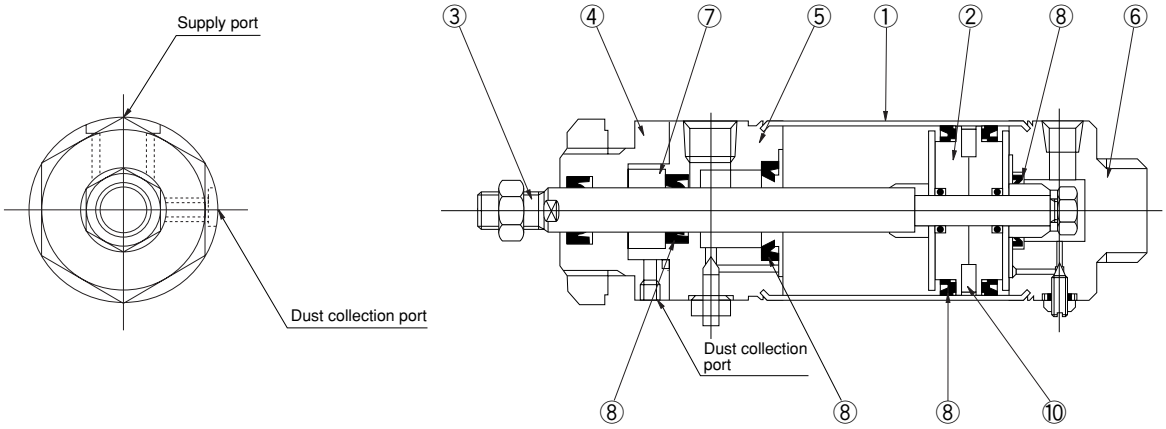
Bore \ Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
20	16 [0.630]	8 [0.315]	8 [0.315]	30 [1.181]	10 [0.394]	11 [0.433]	15 [0.591]	M8×1	10 [0.394]	14 [0.551]	21 [0.827]	8 [0.315]	8 [0.315]	15 [0.591]	40 [1.575]
25, 32	19 [0.748]	10 [0.394]	10 [0.394]	40 [1.575]	12 [0.472]	13 [0.512]	20 [0.787]	M10×1.25	12 [0.472]	16 [0.630]	25 [0.984]	10 [0.394]	10 [0.394]	20 [0.787]	52 [2.047]
40, 50, 63	24 [0.945]	14 [0.551]	10 [0.394]	45 [1.772]	12 [0.472]	13 [0.512]	25 [0.984]	M14×1.5	15 [0.591]	22 [0.866]	30 [1.181]	14 [0.551]	10 [0.394]	20 [0.787]	57 [2.244]

Inner Construction and Major Parts

●φ20～φ40



●φ50, φ63



Major Parts and Materials

No.	Parts	Materials
①	Cylinder tube	Stainless steel
②	Piston	Plastic
③	Piston rod	Stainless steel
④	Dust prevention cover	Aluminum alloy (anodized)
⑤	Rod cover	
⑥	Head cover	
⑦	Rod bushing	Plastic
⑧	Seal	Synthetic rubber (NBR)
⑨	Bumper	
⑩	Magnet	Plastic magnet
	Mounting bracket	Mild steel (nickel plated)

Seals

●φ20～φ40

Parts / Quantity / Bore mm [in.]	Dust leak prevention seal and rod seal	Piston seal
	1 each	2
20 [0.787]	NY-12×8×3.5	PPY-20
25 [0.984]	NY-14×10×3.5	PPY-25
32 [1.260]	NY-17×12×4	PPY-30
40 [1.575]	NY-22×16×5	PPY-40

●φ50, φ63

Parts / Quantity / Bore mm [in.]	Dust leak prevention seal and rod seal	Piston seal	Cushion seal
	1 each	2	2
50 [1.969]	NY-22×16×5	PGY-50	PCS-20
63 [2.480]	NY-22×16×5	PGY-63	PCS-20

Mass

●φ20～φ40

g [oz]

Bore size mm [in.]	Zero stroke mass				Additional mass for each 1mm [0.0394 in.] stroke
	Nose type	Foot type	Flange type	Clevis type	
20 [0.787]	172 [6.07]	312 [11.01]	252 [8.89]	232 [8.18]	0.8 [0.028]
25 [0.984]	235 [8.29]	415 [14.64]	335 [11.82]	295 [10.41]	1.1 [0.039]
32 [1.260]	375 [13.23]	585 [20.63]	505 [17.81]	515 [18.17]	1.5 [0.053]
40 [1.575]	540 [19.05]	870 [30.69]	710 [25.04]	680 [23.99]	2.4 [0.085]

●φ50, φ63

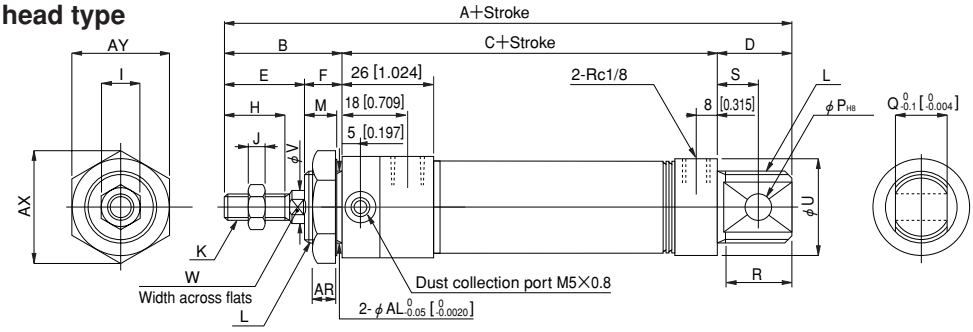
g [oz]

Bore size mm [in.]	Zero stroke mass			Additional mass for each 1mm [0.0394in.] stroke	Mass of mounting bracket	
	Standard head type	Short head type	Clevis head type		Foot bracket	Flange bracket
50 [1.969]	933 [32.91]	883 [31.15]	880 [31.04]	2.8 [0.099]	550 [19.40]	280 [9.88]
63 [2.480]	1265 [44.62]	1225 [43.21]	1195 [42.15]	3.5 [0.123]	730 [25.75]	370 [13.05]

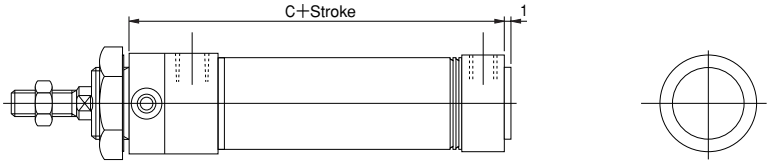
Dimensions of Basic Type mm [in.]

●φ20～φ40 CS-DA Bore size × Stroke

●Standard head type



●Short head type



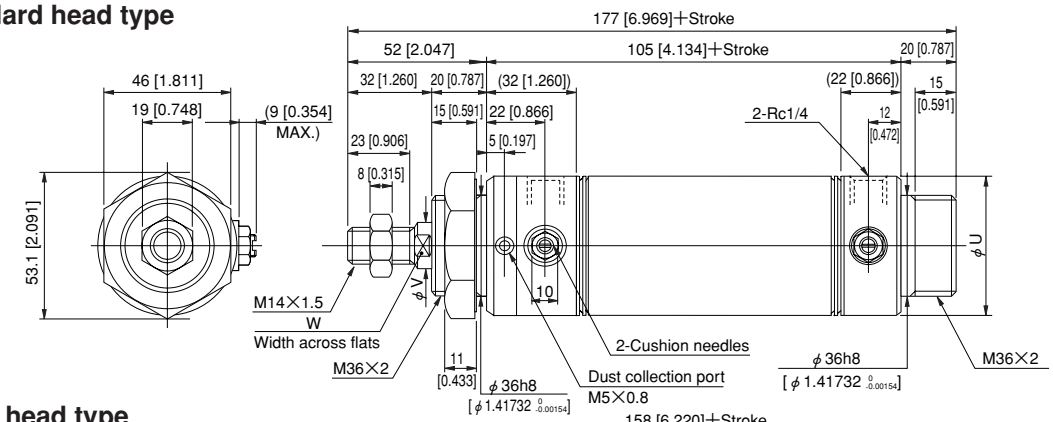
Bore \ Code	A	B	C	D	E	F	H	I	J	K	L	M	P	Q	R	S	U	V	W
20 [0.787]	142 [5.591]	35 [1.378]	86 [3.386]	21 [0.827]	23 [0.906]	12 [0.472]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	10 [0.394]	8 [0.315]	12 [0.472]	19 [0.748]	12 [0.472]	27 [1.063]	8 [0.315]	6 [0.236]
25 [0.984]	147 [5.787]	40 [1.575]	86 [3.386]	21 [0.827]	26 [1.024]	14 [0.551]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	12 [0.472]	8 [0.315]	12 [0.472]	19 [0.748]	12 [0.472]	29 [1.142]	10 [0.394]	8 [0.315]
32 [1.260]	158 [6.220]	45 [1.772]	86 [3.386]	27 [1.063]	31 [1.220]	14 [0.551]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	12 [0.472]	10 [0.394]	20 [0.787]	25 [0.984]	15 [0.591]	35 [1.378]	12 [0.472]	10 [0.394]
40 [1.575]	158 [6.220]	45 [1.772]	86 [3.386]	27 [1.063]	31 [1.220]	14 [0.551]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	12 [0.472]	10 [0.394]	20 [0.787]	25 [0.984]	15 [0.591]	41.6 [1.638]	16 [0.630]	14 [0.551]

Bore \ Code	AL	AR	AX	AY
20 [0.787]	20 [0.787]	7.5 [0.295]	31.2 [1.228]	27 [1.063]
25 [0.984]	22 [0.866]	9.5 [0.374]	34.6 [1.362]	30 [1.181]
32 [1.260]	27 [1.063]	9.5 [0.374]	41.6 [1.638]	36 [1.417]
40 [1.575]	33 [1.299]	9.5 [0.374]	47.3 [1.862]	41 [1.614]

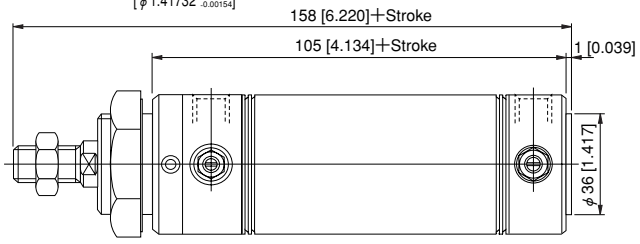
Remarks: Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]

●φ50, φ63 CS-DA Bore size × Stroke

●Standard head type



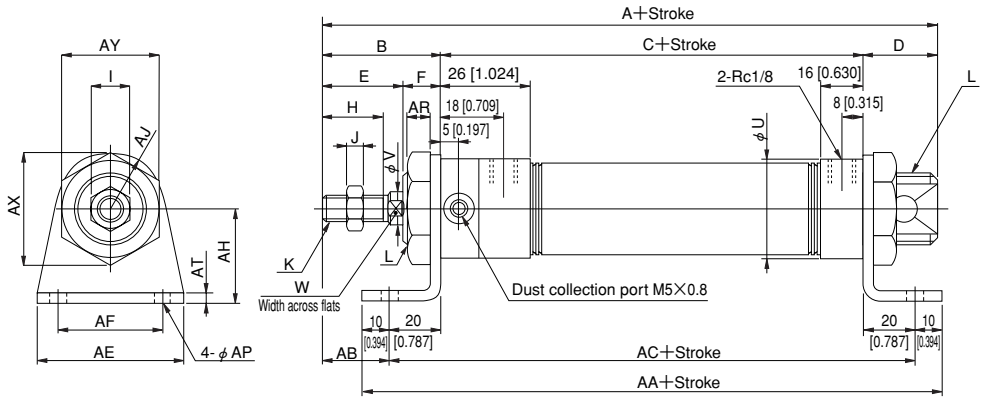
●Short head type



Bore \ Code	U	V	W	Cushion stroke	Stroke tolerance
50 [1.969]	52 [2.047]	16 [0.630]	14 [0.551]	15 [0.591]	$^{+1}_{0}$ [$^{+0.039}_{0}$]
63 [2.480]	65.4 [2.575]	16 [0.630]	14 [0.551]	15 [0.591]	$^{+1}_{0}$ [$^{+0.039}_{0}$]

Dimensions of Foot Mounting Type mm [in.]

●φ20～φ40 CS-DA Bore size × Stroke -1

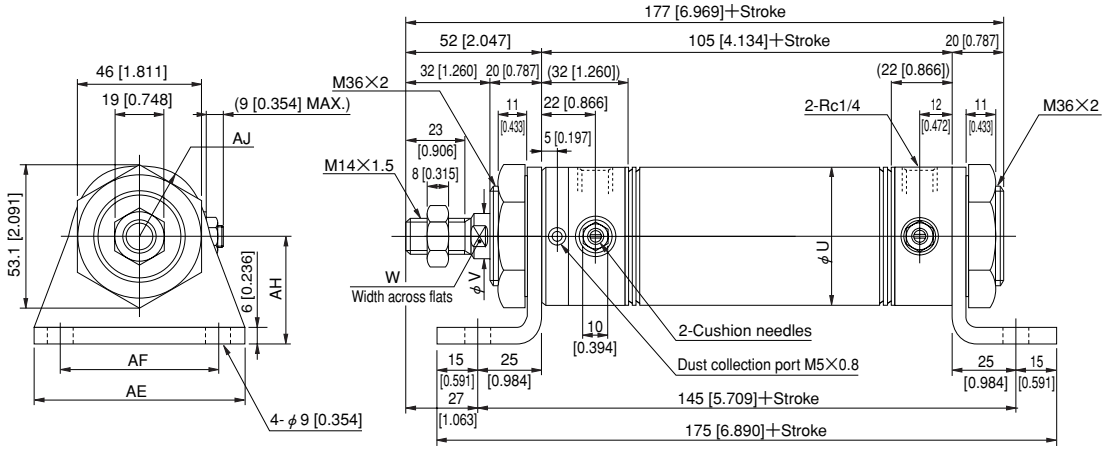


Bore \ Code	A	B	C	D	E	F	H	I	J	K	L	U	V	W
20 [0.787]	142 [5.591]	35 [1.378]	86 [3.386]	21 [0.827]	23 [0.906]	12 [0.472]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	27 [1.063]	8 [0.315]	6 [0.236]
25 [0.984]	147 [5.787]	40 [1.575]	86 [3.386]	21 [0.827]	26 [1.024]	14 [0.551]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	29 [1.142]	10 [0.394]	8 [0.315]
32 [1.260]	158 [6.220]	45 [1.772]	86 [3.386]	27 [1.063]	31 [1.220]	14 [0.551]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	35 [1.378]	12 [0.472]	10 [0.394]
40 [1.575]	158 [6.220]	45 [1.772]	86 [3.386]	27 [1.063]	31 [1.220]	14 [0.551]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	41.6 [1.638]	16 [0.630]	14 [0.551]

Bore \ Code	AA	AB	AC	AE	AF	AH	AJ	AP	AR	AT	AX	AY
20 [0.787]	146 [5.748]	15 [0.591]	126 [4.961]	55 [2.165]	40 [1.575]	25 [0.984]	15.5 [0.610]	6.8 [0.268]	7.5 [0.295]	3.2 [0.126]	31.2 [1.228]	27 [1.063]
25 [0.984]	146 [5.748]	20 [0.787]	126 [4.961]	55 [2.165]	40 [1.575]	30 [1.181]	17 [0.669]	6.8 [0.268]	9.5 [0.374]	3.2 [0.126]	34.6 [1.362]	30 [1.181]
32 [1.260]	146 [5.748]	25 [0.984]	126 [4.961]	55 [2.165]	40 [1.575]	35 [1.378]	20 [0.787]	6.8 [0.268]	9.5 [0.374]	3.2 [0.126]	41.6 [1.638]	36 [1.417]
40 [1.575]	146 [5.748]	25 [0.984]	126 [4.961]	75 [2.953]	55 [2.165]	40 [1.575]	23.5 [0.925]	9 [0.354]	9.5 [0.374]	4 [0.157]	47.3 [1.862]	41 [1.614]

Remarks: Stroke tolerance $^{+1}_{0}$ [$^{+0.039in.}_{0}$]

●φ50, φ63 CS-DA Bore size × Stroke -1

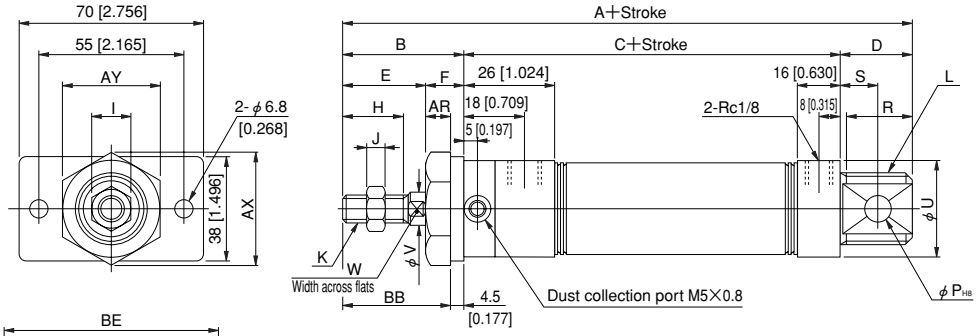


Bore \ Code	U	V	W	AE	AF	AJ	AH	Cushion stroke	Stroke tolerance
50 [1.969]	52 [2.047]	16 [0.630]	14 [0.551]	80 [3.150]	60 [2.362]	26 [1.024]	40 [1.575]	15 [0.591]	$^{+1}_{0}$[$^{+0.039}_{0}$]
63 [2.480]	65.4 [2.575]	16 [0.630]	14 [0.551]	95 [3.740]	74 [2.913]	32 [1.260]	45 [1.772]	15 [0.591]	$^{+1}_{0}$[$^{+0.039}_{0}$]

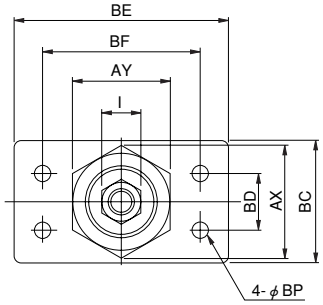
Dimensions of Flange Mounting Type mm [in.]

● **φ20～φ40** **CS-DA** Bore size × Stroke **-3**

● **φ20, φ25**



● **φ32, φ40**

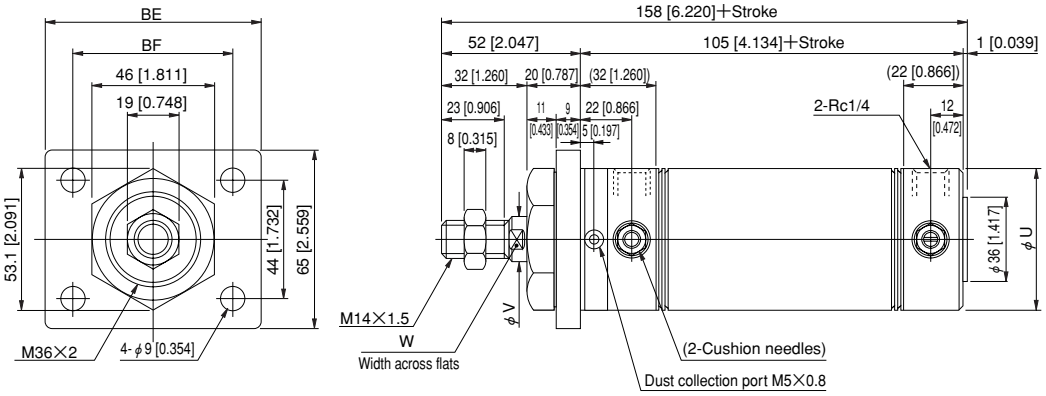


Bore \ Code	A	B	C	D	E	F	H	I	J	K	L	P	R	S	U	V	W
20 [0.787]	142 [5.591]	35 [1.378]	86 [3.386]	21 [0.827]	23 [0.906]	12 [0.472]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	8 [0.315]	19 [0.748]	12 [0.472]	27 [1.063]	8 [0.315]	6 [0.236]
25 [0.984]	147 [5.787]	40 [1.575]	86 [3.386]	21 [0.827]	26 [1.024]	14 [0.551]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	8 [0.315]	19 [0.748]	12 [0.472]	29 [1.142]	10 [0.394]	8 [0.315]
32 [1.260]	158 [6.220]	45 [1.772]	86 [3.386]	27 [1.063]	31 [1.220]	14 [0.551]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	10 [0.394]	25 [0.984]	15 [0.591]	35 [1.378]	12 [0.472]	10 [0.394]
40 [1.575]	158 [6.220]	45 [1.772]	86 [3.386]	27 [1.063]	31 [1.220]	14 [0.551]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	10 [0.394]	25 [0.984]	15 [0.591]	41.5 [1.634]	16 [0.630]	14 [0.551]

Bore \ Code	AR	AX	AY	BB	BC	BD	BE	BF	BP
20 [0.787]	7.5 [0.295]	31.2 [1.228]	27 [1.063]	30.5 [1.201]	—	—	—	—	—
25 [0.984]	9.5 [0.374]	34.6 [1.362]	30 [1.181]	35.5 [1.398]	—	—	—	—	—
32 [1.260]	9.5 [0.374]	41.6 [1.638]	36 [1.417]	40.5 [1.594]	45 [1.772]	20 [0.787]	80 [3.150]	60 [2.362]	6.8 [0.268]
40 [1.575]	9.5 [0.374]	47.3 [1.862]	41 [1.614]	40.5 [1.594]	50 [1.969]	30 [1.181]	100 [3.937]	80 [3.150]	9 [0.354]

Remarks: Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]

● **φ50, φ63** **CS-DA** Bore size × Stroke **-3**



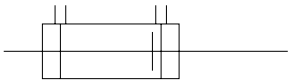
Bore \ Code	U	V	W	BE	BF	Cushion stroke	Stroke tolerance
50 [1.969]	52 [2.047]	16 [0.630]	14 [0.551]	80 [3.150]	60 [2.362]	15 [0.591]	$^{+1}_{0}$ [$^{+0.039}_{0}$]
63 [2.480]	65.4 [2.575]	16 [0.630]	14 [0.551]	100 [3.937]	80 [3.150]	15 [0.591]	$^{+1}_{0}$ [$^{+0.039}_{0}$]

KOGANEI CLEAN SYSTEM

SLIM DOUBLE ROD END CYLINDERS

Double Rod End Double Acting Type

Symbol



Specifications

Item \ Bore size mm [in.]	20～40 [0.787～1.575]
Operating type	Double acting type
Media	Air
Mounting type	Basic type, Foot type, Flange type
Operating pressure range MPa [psi.]	0.15～0.9 [22～131]
Proof pressure MPa [psi.]	1.32 [191]
Operating temperature range °C [°F]	0～60 [32～140]
Operating speed range mm/s [in./sec.]	50～300 [2.0～11.8]
Cushion	Fixed type (Rubber bumper)
Lubrication	Not required
Port size Rc	1/8

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum stroke	Maximum available stroke
20 [0.787]	25 50 75 100 125 150	200	400
25 [0.984]	25 50 75 100 125 150 200	250	
32 [1.260]	25 50 75 100 125 150 200	300	500
40 [1.575]	25 50 75 100 125 150 200 250 300	400	

Remarks: 1. Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]
2. For non-standard strokes, consult us.
3. The minimum operating pressure when the stroke is over the maximum stroke at bore size of ϕ 20[0.787]～ϕ 40[1.575] is 0.2MPa [29psi.].

Order Codes

CS – **DAD** **20×50** – □ – □ – □ □ □

Clean system product

Slim cylinder
Double rod end double acting type

Bore size
×
Stroke

Mounting type
Blank — Nose mounting type
1 ——— Foot mounting type
3 ——— Flange mounting type
(Mounting brackets are included at shipping.)

Rod end accessory
Blank — Without rod end accessory
Y ——— Y type knuckle (With pin)
I ——— I type knuckle (Rod end accessories mounted to one side only.)

Sensor switch

Blank	Without sensor switch		
ZG530	2-lead wire Solid state type	with indicator lamp	DC10～28V
ZG553	3-lead wire Solid state type	with indicator lamp	DC4.5～28V
CS3M	2-lead wire Reed switch type	with indicator lamp	DC10～30V, AC85～230V
CS4M	2-lead wire Reed switch type	with indicator lamp	DC10～30V, AC85～115V
CS5M	2-lead wire Reed switch type	without indicator lamp	DC3～30V, AC85～115V
CS2F	2-lead wire Reed switch type	with indicator lamp	AC85～230V
CS3F	2-lead wire Reed switch type	with indicator lamp	DC10～30V
CS4F	2-lead wire Reed switch type	with indicator lamp	DC10～30V
CS5F	2-lead wire Reed switch type	without indicator lamp	DC3～30V

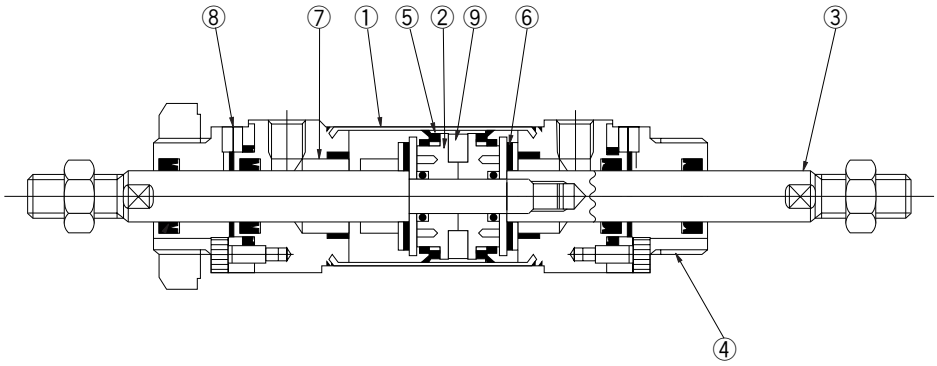
● For details of sensor switches, see p.111～121.

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

Number of sensor switches
1 ——— With 1 sensor switch
2 ——— With 2 sensor switches
3 ——— With 3 sensor switches

●For the order codes of additional parts, see p. 64.

Inner Construction and Major Parts



Major Parts and Materials

Parts / Bore size mm		20～40
①	Cylinder tube	Stainless steel
②	Piston	Plastic
③	Piston rod	Steel
④	Rod cover	Aluminum alloy (anodized)
⑤	Seal	Synthetic rubber (NBR)
⑥	Bumper	Synthetic rubber (NBR)
⑦	Rod bushing	Plastic
⑧	Dust prevention cover	Aluminum (anodized)
⑨	Magnet	Plastic magnet
	Mounting bracket	Mild steel (nickel plated)

Seals

Parts	Rod seal	Piston seal	Dust leak prevention seal
Bore mm / Quantity	2	2	2
20	NY-12×8×3.5	PPY-20	NY-12×8×3.5
25	NY-14×10×3.5	PPY-25	NY-14×10×3.5
32	NY-17×12×4	PPY-32	NY-17×12×4
40	NY-22×16×5	PPY-40	NY-22×16×5

Mass

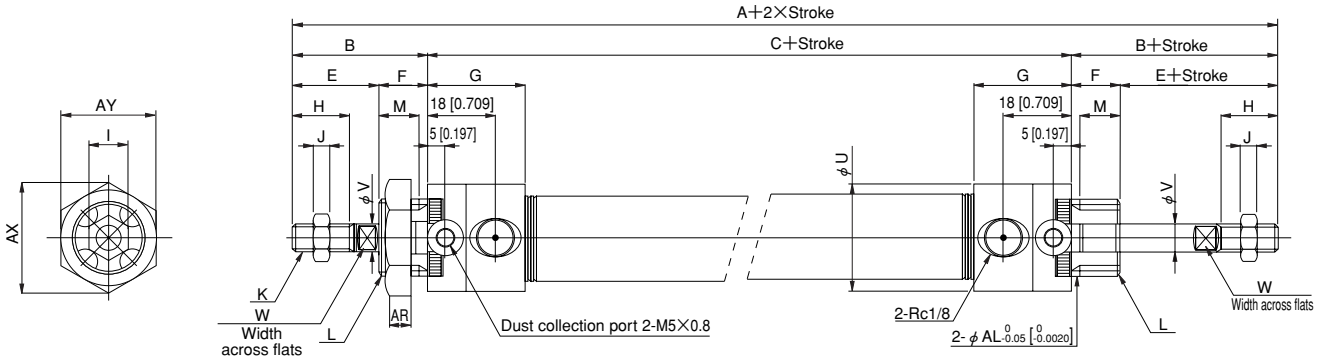
g [oz.]

Bore size mm [in.]	Zero stroke mass			Additional mass for each 1mm [0.0394in.] stroke	Mass of knuckle	
	Basic type	Foot mounting type	Flange mounting type		Y type knuckle	I type knuckle
20 [0.787]	190 [6.70]	330 [11.64]	270 [9.52]	1.2 [0.042]	41 [1.45]	36 [1.27]
25 [0.984]	290 [10.23]	450 [15.87]	370 [13.05]	1.6 [0.056]	75 [2.65]	70 [2.47]
32 [1.260]	430 [15.17]	620 [21.87]	530 [18.69]	2.5 [0.088]	75 [2.65]	70 [2.47]
40 [1.575]	630 [22.22]	920 [32.45]	760 [26.81]	3.9 [0.138]	120 [4.23]	132 [4.66]

Calculation example: For basic type of 40mm bore size and 100mm stroke
630＋(3.9×100)＝1020g [35.98 oz.]

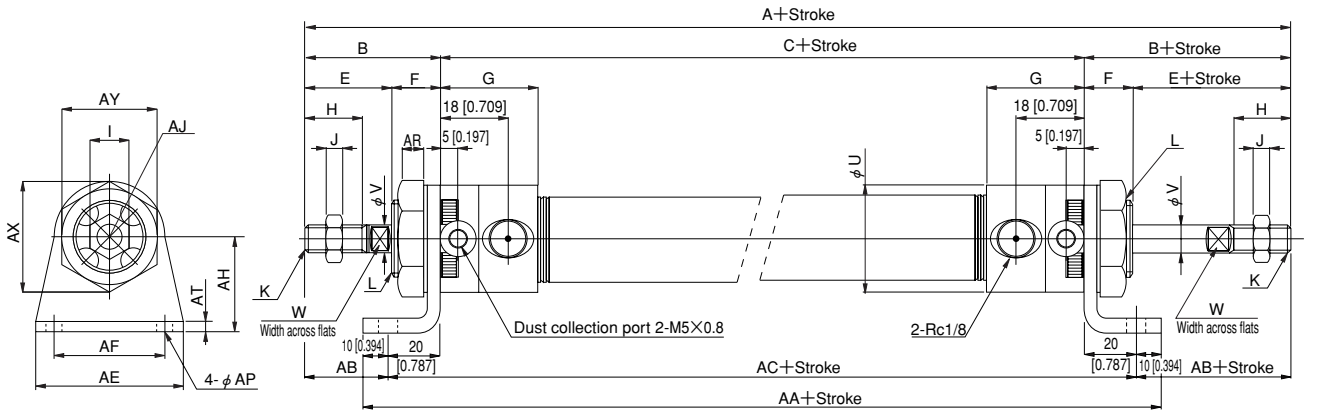
Dimensions mm [in.]

●Basic type
●φ20～φ40 CS-DAD Bore size × Stroke



Bore \ Code	A	B	C	E	F	G	H	I	J	K	L	M	U	V	W	AR	AX	AY	AL
20 [0.787]	166 [6.535]	35 [1.378]	96 [3.780]	23 [0.906]	12 [0.472]	26 [1.024]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	10 [0.394]	27 [1.063]	8 [0.315]	6 [0.236]	7.5 [0.295]	31.2 [1.228]	27 [1.063]	20 [0.787]
25 [0.984]	176 [6.929]	40 [1.575]	96 [3.780]	26 [1.024]	14 [0.551]	26 [1.024]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	12 [0.472]	29 [1.142]	10 [0.394]	8 [0.315]	9.5 [0.374]	34.6 [1.362]	30 [1.181]	22 [0.866]
32 [1.260]	186 [7.323]	45 [1.772]	96 [3.780]	31 [1.220]	14 [0.551]	26 [1.024]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	12 [0.472]	35 [1.378]	12 [0.472]	10 [0.394]	9.5 [0.374]	41.6 [1.638]	36 [1.417]	27 [1.063]
40 [1.575]	186 [7.323]	45 [1.772]	96 [3.780]	31 [1.220]	14 [0.551]	(25 [0.984])	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	12 [0.472]	41.6 [1.638]	16 [0.630]	14 [0.551]	9.5 [0.374]	47.3 [1.862]	41 [1.614]	33 [1.299]

●Foot mounting type
●φ20～φ40 CS-DAD Bore size × Stroke -1

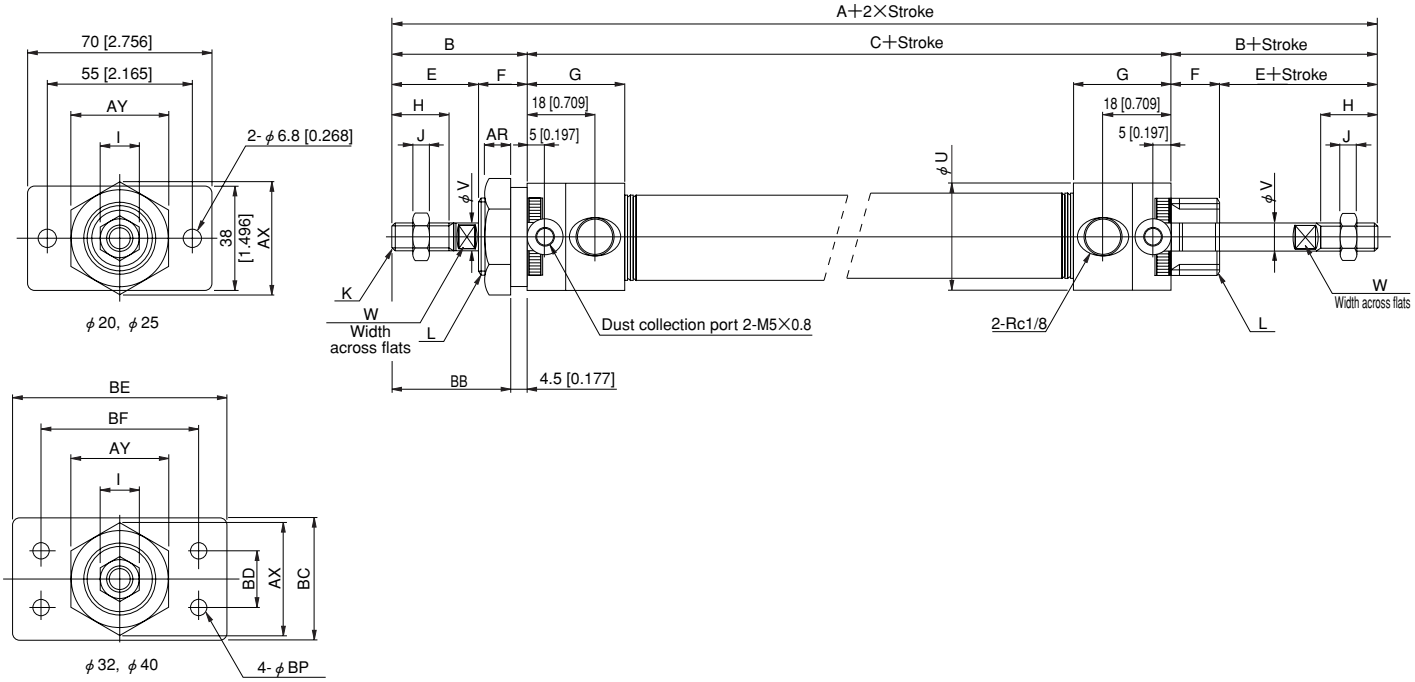


Bore \ Code	A	B	C	E	F	G	H	I	J	K	L	U	V	W
20 [0.787]	166 [6.535]	35 [1.378]	96 [3.780]	23 [0.906]	12 [0.472]	26 [1.024]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	27 [1.063]	8 [0.315]	6 [0.236]
25 [0.984]	176 [6.929]	40 [1.575]	96 [3.780]	26 [1.024]	14 [0.551]	26 [1.024]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	29 [1.142]	10 [0.394]	8 [0.315]
32 [1.260]	186 [7.323]	45 [1.772]	96 [3.780]	31 [1.220]	14 [0.551]	26 [1.024]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	35 [1.378]	12 [0.472]	10 [0.394]
40 [1.575]	186 [7.323]	45 [1.772]	96 [3.780]	31 [1.220]	14 [0.551]	(25 [0.984])	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	41.6 [1.638]	16 [0.630]	14 [0.551]

Bore \ Code	AA	AB	AC	AE	AF	AH	AJ	AP	AR	AT	AX	AY
20 [0.787]	156 [6.142]	15 [0.591]	136 [5.354]	55 [2.165]	40 [1.575]	25 [0.984]	15.5 [0.610]	6.8 [0.268]	7.5 [0.295]	3.2 [0.126]	31.2 [1.228]	27 [1.063]
25 [0.984]	156 [6.142]	20 [0.787]	136 [5.354]	55 [2.165]	40 [1.575]	30 [1.181]	17 [0.669]	6.8 [0.268]	9.5 [0.374]	3.2 [0.126]	34.6 [1.362]	30 [1.181]
32 [1.260]	156 [6.142]	25 [0.984]	136 [5.354]	55 [2.165]	40 [1.575]	35 [1.378]	20 [0.787]	6.8 [0.268]	9.5 [0.374]	3.2 [0.126]	41.6 [1.638]	36 [1.417]
40 [1.575]	156 [6.142]	25 [0.984]	136 [5.354]	75 [2.953]	55 [2.165]	40 [1.575]	23.5 [0.925]	9 [0.354]	9.5 [0.374]	4 [0.157]	47.3 [1.862]	41 [1.614]

Dimensions of Flange Mounting Type mm [in.]

● ϕ20～ϕ40 **CS-DAD** Bore size × Stroke **-3**



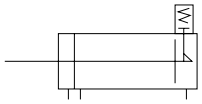
Bore \ Code	A	B	C	E	F	G	H	I	J	K	L	U	V	W	AR	AX	AY	BB	BC	BD	BE	BF	BP
20 [0.787]	166 [6.535]	35 [1.378]	96 [3.780]	23 [0.906]	12 [0.472]	26 [1.024]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	27 [1.063]	8 [0.315]	6 [0.236]	7.5 [0.295]	31.2 [1.228]	27 [1.063]	30.5 [1.201]	—	—	—	—	—
25 [0.984]	176 [6.929]	40 [1.575]	96 [3.780]	26 [1.024]	14 [0.551]	26 [1.024]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	29 [1.142]	10 [0.394]	8 [0.315]	9.5 [0.374]	34.6 [1.362]	30 [1.181]	35.5 [1.398]	—	—	—	—	—
32 [1.260]	186 [7.323]	45 [1.772]	96 [3.780]	31 [1.220]	14 [0.551]	26 [1.024]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	35 [1.378]	12 [0.472]	10 [0.394]	9.5 [0.374]	41.6 [1.638]	36 [1.417]	40.5 [1.594]	45 [1.772]	20 [0.787]	80 [3.150]	60 [2.362]	6.8 [0.268]
40 [1.575]	186 [7.323]	45 [1.772]	96 [3.780]	31 [1.220]	14 [0.551]	25 [0.984]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	41.6 [1.638]	16 [0.630]	14 [0.551]	9.5 [0.374]	47.3 [1.862]	41 [1.614]	40.5 [1.594]	50 [1.969]	30 [1.181]	100 [3.937]	80 [3.150]	9 [0.354]

KOGANEI CLEAN SYSTEM

SLIM END KEEP CYLINDERS

Head Side End Keep Double Acting Type

Symbol



Specifications

Item \ Bore size mm [in.]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
Operating type	Double acting type, with head side end keep mechanism			
Media	Air			
Mounting type	Basic type, Foot type, Flange type			
Operating pressure range MPa [psi.]	0.1～0.9 [15～131]			
Proof pressure MPa [psi.]	1.32 [191]			
Operating temperature range °C [°F]	0～60 [32～140]			
Operating speed range mm/s [in./sec.]	50～300 [2.0～11.8]			
Cushion	Fixed type (Rubber bumper)			
Lubrication	Not required			
Maximum holding force (at end keep) N [lbf.]	194.2 [43.66]	303 [68.11]	496.2 [111.5]	775.7 [174.4]
Backlash (at end keep) mm [in.]	1.4 [0.055] MAX.		1.6 [0.063] MAX.	
Port size Rc	1/8			

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum stroke	Maximum available stroke
20 [0.787]	25 50 75 100 125 150	200	1050
25 [0.984]	25 50 75 100 125 150 200	250	
32 [1.260]	25 50 75 100 125 150 200	300	
40 [1.575]	25 50 75 100 125 150 200 250 300	400	

Remarks: 1. Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]
2. For non-standard strokes, consult us.
3. The minimum operating pressure when the stroke is over the maximum stroke at bore size of φ20 [0.787]～φ40 [1.575] is 0.2MPa [29psi.].

Order Codes

CS – **DAK** **20×50** □ – □ – □ – □ – □ □ □

Clean system product

Slim cylinder
End keep
double acting cylinder

Bore size
×
Stroke

Head cover type
Blank — Standard head
A —— Short head

End keep position
HL —— Head side end keep

Mounting type
Blank — Basic type
1 —— Double foot mounting type
3 —— Flange mounting type
(Mounting brackets are included at shipping.)

Rod end accessory
Blank — Without rod end accessory
Y —— Y type knuckle (With pin)
I —— I type knuckle

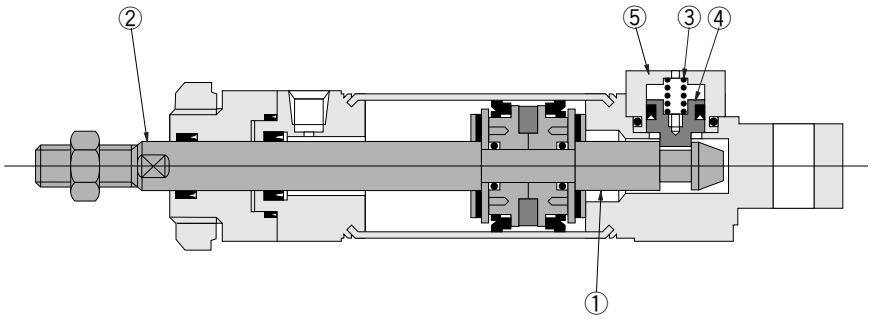
Sensor switch
Blank — Without sensor switch
ZG530 — 2-lead wire Solid state type with indicator lamp DC10～28V
ZG553 — 3-lead wire Solid state type with indicator lamp DC4.5～28V
CS3M — 2-lead wire Reed switch type with indicator lamp DC10～30V, AC85～230V
CS4M — 2-lead wire Reed switch type with indicator lamp DC10～30V, AC85～115V
CS5M — 2-lead wire Reed switch type without indicator lamp DC3～30V, AC85～115V
CS2F — 2-lead wire Reed switch type with indicator lamp AC85～230V
CS3F — 2-lead wire Reed switch type with indicator lamp DC10～30V
CS4F — 2-lead wire Reed switch type with indicator lamp DC10～30V
CS5F — 2-lead wire Reed switch type without indicator lamp DC3～30V
● For details of sensor switches, see p.111～121.

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

Number of sensor switches
1 ——With 1 sensor switch
2 ——With 2 sensor switches
3 ——With 3 sensor switches

●For the order codes of additional parts, see p. 64.

Inner Construction and Major Parts



Major Parts and Materials

Parts / Bore size mm		20, 25	32, 40
①	Piston rod A	Steel (chrome plated)	
②	Piston rod B	Stainless steel	
③	Spring	Stainless steel	Piano wire
④	Lock piston	Stainless steel	
⑤	Lock cover	Aluminum alloy (anodized)	
	Y type knuckle, I type knuckle	Mild steel (nickel plated)	

Other than the items listed above, they are the same as for the standard Slim Cylinder.

Seals

Parts / Quantity / Bore mm	Rod seal	Lock piston seal	Lock cover gasket
	1	1	1
20	GYH-9	MYN-5	—
25	GYH-11	MYN-5	—
32	—	MYN-10A	S18
40	—	MYN10-A	S18

Other than the items listed above, they are the same as for the standard Slim Cylinder.

Mass

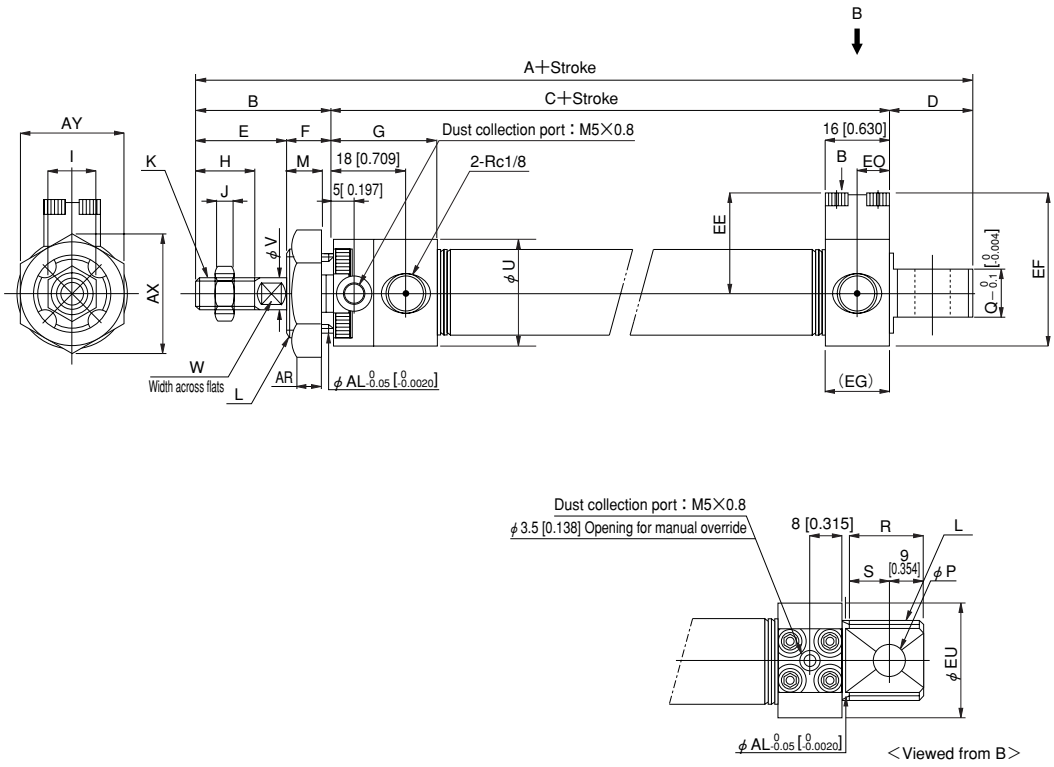
g [oz.]

Bore size mm [in.]	Zero stroke mass		Additional mass for each 1mm [0.0394in.] stroke	Mass of mounting bracket				
	-HL: Head side end keep			Foot bracket	Flange bracket	Pivot bracket	Y type knuckle	I type knuckle
	Basic type	Short head type						
20 [0.787]	170 [6.00]	160 [5.64]	0.8 [0.028]	140 [4.94]	80 [2.82]	60 [2.12]	41 [1.45]	36 [1.27]
25 [0.984]	240 [8.47]	230 [8.11]	1.1 [0.039]	160 [5.64]	80 [2.82]	60 [2.12]	75 [2.65]	70 [2.47]
32 [1.260]	410 [14.46]	390 [13.76]	1.5 [0.053]	190 [6.70]	100 [3.53]	140 [4.94]		
40 [1.575]	580 [20.46]	560 [19.75]	2.4 [0.085]	290 [10.23]	130 [4.59]	140 [4.94]	120 [4.23]	132 [4.66]

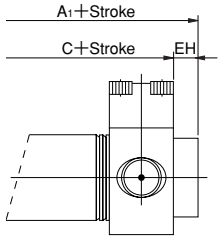
Calculation example: For head side end keep foot mounting type of 32mm bore size and 100mm stroke
410＋190＋(1.5×100)＝750g [26.46 oz.]

-HL Dimensions of Head Side End Keep Basic Type mm [in.]

●φ20～φ40 CS-DAK Bore size × Stroke -HL



●Short head



Bore \ Code	A	A1	B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R	S	U	V	W
20 [0.787]	142 [5.591]	127 [5.000]	35 [1.378]	86 [3.386]	21 [0.827]	23 [0.906]	12 [0.472]	26 [1.024]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	M20×1.5	10 [0.394]	8 [0.315]	12 [0.472]	19 [0.748]	10 [0.394]	27 [1.063]	8 [0.315]	6 [0.236]
25 [0.984]	147 [5.787]	132 [5.197]	40 [1.575]	86 [3.386]	21 [0.827]	26 [1.024]	14 [0.551]	26 [1.024]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	M22×1.5	12 [0.472]	8 [0.315]	12 [0.472]	19 [0.748]	10 [0.394]	29 [1.142]	10 [0.394]	8 [0.315]
32 [1.260]	170 [6.693]	144 [5.669]	45 [1.772]	98 [3.858]	27 [1.063]	31 [1.220]	14 [0.551]	26 [1.024]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	M27×2	12 [0.472]	10 [0.394]	20 [0.787]	25 [0.984]	15 [0.591]	35 [1.378]	12 [0.472]	10 [0.394]
40 [1.575]	175 [6.890]	149 [5.866]	45 [1.772]	103 [4.055]	27 [1.063]	31 [1.220]	14 [0.551]	25 [0.984]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	M33×2	12 [0.472]	10 [0.394]	20 [0.787]	25 [0.984]	15 [0.591]	41.6 [1.638]	16 [0.630]	14 [0.551]

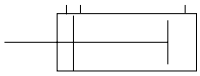
Bore \ Code	AR	AX	AY	AL	EE	EF	EG	EH	EO
20 [0.787]	7.5 [0.295]	31.2 [1.228]	27 [1.063]	20 [0.787]	24 [0.945]	38.5 [1.516]	16 [0.630]	6 [0.236]	8 [0.315]
25 [0.984]	9.5 [0.374]	34.6 [1.362]	30 [1.181]	22 [0.866]	25 [0.984]	42.5 [1.673]	16 [0.630]	6 [0.236]	8 [0.315]
32 [1.260]	9.5 [0.374]	41.6 [1.638]	36 [1.417]	27 [1.063]	30 [1.181]	47.5 [1.870]	26 [1.024]	1 [0.039]	14 [0.551]
40 [1.575]	9.5 [0.374]	47.3 [1.862]	41 [1.614]	33 [1.299]	32.2 [1.268]	53 [2.087]	31 [1.220]	1 [0.039]	16 [0.630]

KOGANEI CLEAN SYSTEM

SLIM BLOCK CYLINDERS

Double Acting Type

Symbol



Specifications

Item \ Bore size mm [in.]	16～40 [0.630～1.575]
Operating type	Double acting type
Media	Air
Mounting type	Side mount, Front mount
Operating pressure range MPa [psi.]	0.1～0.9 [15～131]
Proof pressure MPa [psi.]	1.32 [191]
Operating temperature range °C [°F]	0～60 [32～140]
Operating speed range mm/s [in./sec.]	30～300 [1.2～11.8]
Cushion	Fixed type (Rubber bumper)
Lubrication	Not required
Port size Rc	1/8

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum stroke	Maximum available stroke
16 [0.630]	15 25 50 75 100	100	300
20 [0.787]	25 50 75 100 125 150	150	500
25 [0.984]	25 50 75 100 125 150 200	200	
32 [1.260]	25 50 75 100 125 150 200	200	
40 [1.575]	25 50 75 100 125 150 200 250 300	300	

Remarks: 1. Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]
2. For non-standard strokes, consult us.

Order Codes

CS – DAB 20×50 – □ – □ – □□ □ □

Clean system product

Slim cylinder
Block double acting type

Bore size
×
Stroke

Mounting type
2 —— Side mount
4 —— Front mount

Rod end accessory
Blank — Without rod end accessory
Y —— Y type knuckle (With pin)
I —— I type knuckle

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

Number of sensor switches
1 —— With 1 sensor switch
2 —— With 2 sensor switches
3 —— With 3 sensor switches

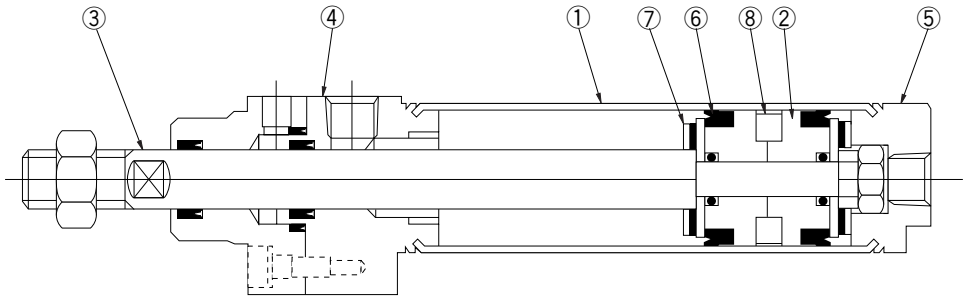
Sensor switch

Blank	Without sensor switch		
ZG530	2-lead wire Solid state type	with indicator lamp	DC10～28V
ZG553	3-lead wire Solid state type	with indicator lamp	DC4.5～28V
CS3M	2-lead wire Reed switch type	with indicator lamp	DC10～30V, AC85～230V
CS4M	2-lead wire Reed switch type	with indicator lamp	DC10～30V, AC85～115V
CS5M	2-lead wire Reed switch type	without indicator lamp	DC3～30V, AC85～115V
CS2F	2-lead wire Reed switch type	with indicator lamp	AC85～230V
CS3F	2-lead wire Reed switch type	with indicator lamp	DC10～30V
CS4F	2-lead wire Reed switch type	with indicator lamp	DC10～30V
CS5F	2-lead wire Reed switch type	without indicator lamp	DC3～30V

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

●For the order codes of additional parts, see p. 64.

Inner Construction and Major Parts



Major Parts and Materials

Parts / Bore size mm		16～40
①	Cylinder tube	Stainless steel
②	Piston	Plastic
③	Piston rod	Stainless steel
④	Rod cover	Aluminum (anodized)
⑤	Head cover	
⑥	Seal	Synthetic rubber (NBR)
⑦	Bumper	
⑧	Magnet	Plastic magnet
	I type knuckle, Y type knuckle	Mild steel (nickel plated)

Seals

Parts	Rod seal	Piston seal	Dust leak prevention seal
Bore mm / Quantity	1	2	1
16	NY-3-6	PPY-16	NY-3-6
20	NY-12×8×3.5	PPY-20	NY-12×8×3.5
25	NY-14×10×3.5	PPY-25	NY-14×10×3.5
32	NY-17×12×4	PPY-32	NY-17×12×4
40	NY-22×16×5	PPY-40	NY-22×16×5

Other than the items listed above, they are the same as for the standard Slim Cylinder.

Mass

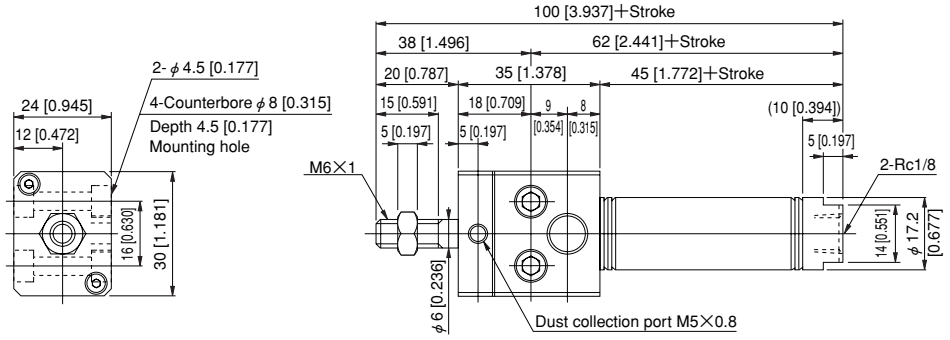
g [oz.]

Bore size mm [in.]	Zero stroke mass		Additional mass for each 1mm [0.0394in.] stroke	Mass of knuckle	
	Side mount	Front mount		Y type knuckle	I type knuckle
16 [0.630]	90 [3.17]	80 [2.82]	0.5 [0.018]	17 [0.60]	20 [0.71]
20 [0.787]	160 [5.64]	130 [4.59]	0.8 [0.028]	41 [1.45]	36 [1.27]
25 [0.984]	220 [7.76]	190 [6.70]	1.1 [0.039]	75 [2.65]	70 [2.47]
32 [1.260]	340 [11.99]	270 [9.52]	1.5 [0.053]	75 [2.65]	70 [2.47]
40 [1.575]	560 [19.75]	390 [13.76]	2.4 [0.085]	120 [4.23]	132 [4.66]

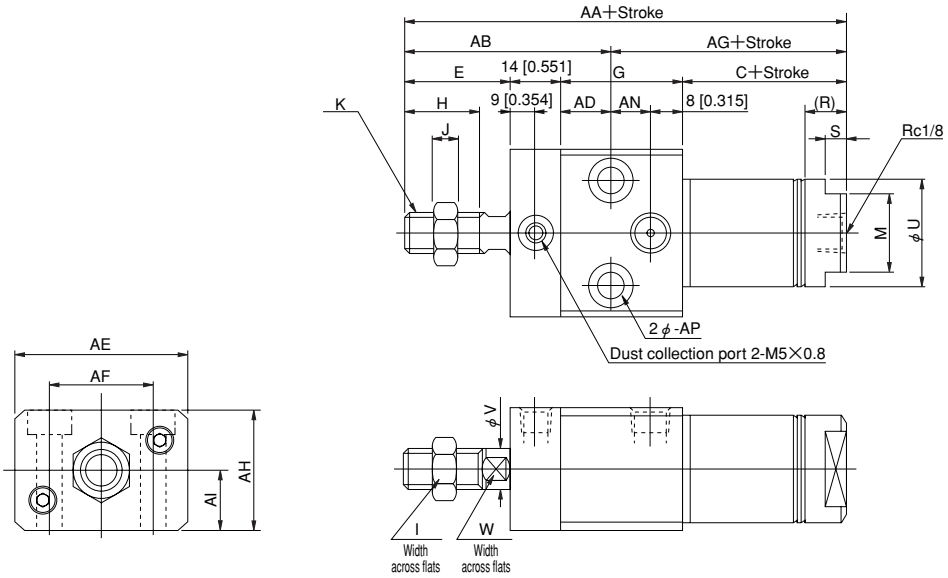
Calculation example: For the mass of side mount type of 32mm bore size and 100mm stroke
340＋(1.5×100)＝490g [17.28 oz.]

Dimensions of Block Cylinder Side Mounting Type mm [in.]

●φ16 CS-DAB16×[Stroke]-2



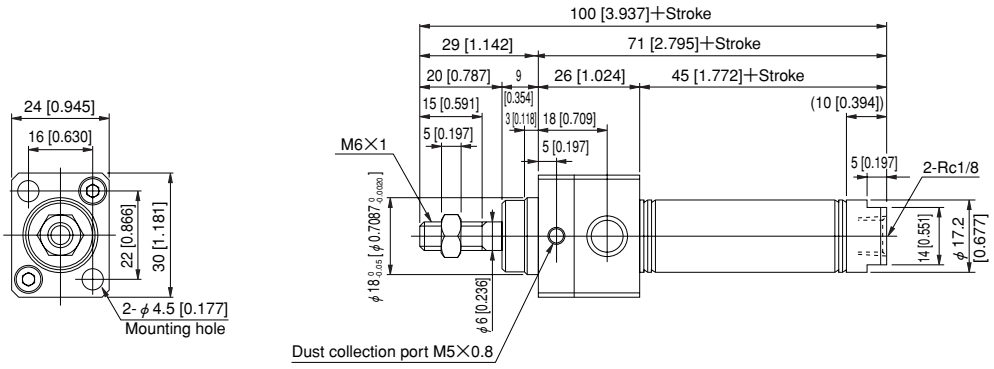
●φ20～φ40 CS-DAB×[Bore size]×[Stroke]-2



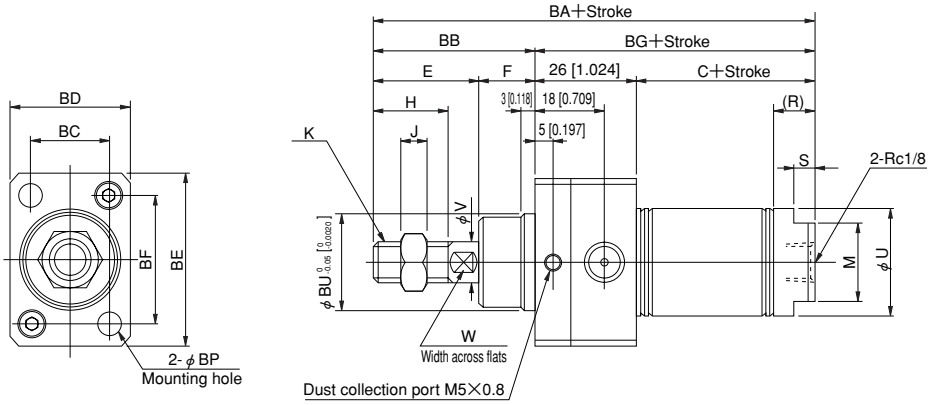
Bore \ Code	C	E	G	H	I	J	K	M	R	S	U	V	W	AA	AB	AD	AE	AF	AG	AH	AI	AN	AP
20 [0.787]	53 [2.087]	23 [0.906]	28 [1.102]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	17 [0.669]	9 [0.354]	5 [0.197]	21.4 [0.843]	8 [0.315]	6 [0.236]	118 [4.646]	48 [1.890]	11 [0.433]	38 [1.496]	22 [0.866]	70 [2.756]	28 [1.102]	14 [0.551]	9 [0.354]	φ6.6 [0.260] Counterbore φ11 [0.433] Depth 6.5 [0.256]
25 [0.984]	53 [2.087]	26 [1.024]	30 [1.181]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	19 [0.748]	9 [0.354]	5 [0.197]	26.4 [1.039]	10 [0.394]	8 [0.315]	123 [4.843]	52 [2.047]	12 [0.472]	42 [1.654]	26 [1.024]	71 [2.795]	30 [1.181]	15 [0.591]	10 [0.394]	φ6.6 [0.260] Counterbore φ11 [0.433] Depth 6.5 [0.256]
32 [1.260]	54 [2.126]	31 [1.220]	36 [1.417]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	22 [0.866]	10 [0.394]	6 [0.236]	33.6 [1.323]	12 [0.472]	10 [0.394]	135 [5.315]	59 [2.323]	14 [0.551]	54 [2.126]	34 [1.339]	76 [2.992]	36 [1.417]	18 [0.709]	14 [0.551]	φ9 [0.354] Counterbore φ14 [0.551] Depth 8.6 [0.339]
40 [1.575]	60 [2.362]	31 [1.220]	44 [1.732]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	22 [0.866]	12 [0.472]	6 [0.236]	41.6 [1.638]	16 [0.630]	14 [0.551]	149 [5.866]	62 [2.441]	17 [0.669]	68 [2.677]	46 [1.811]	87 [3.425]	44 [1.732]	22 [0.866]	19 [0.748]	φ11 [0.433] Counterbore φ17.5 [0.689] Depth 10.8 [0.425]

Dimensions of Front Mounting Type mm [in.]

●φ16 CS-DAB16×[Stroke]-4



●φ20～φ40 CS-DAB[Bore size]×[Stroke]-4



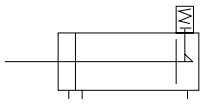
Bore \ Code	C	E	F	H	I	J	K	M	R	S	U	V	W	BA	BB	BC	BD	BE	BF	BG	BP	BU
20 [0.787]	53 [2.087]	23 [0.906]	12 [0.472]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	17 [0.669]	10 [0.394]	5 [0.197]	21.4 [0.843]	8 [0.315]	6 [0.236]	114 [4.488]	35 [1.378]	28 [1.102]	18 [0.709]	38 [1.496]	28 [1.102]	79 [3.110]	5.5 [0.217]	22 [0.866]
25 [0.984]	53 [2.087]	26 [1.024]	14 [0.551]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	19 [0.748]	10 [0.394]	5 [0.197]	26.4 [1.039]	10 [0.394]	8 [0.315]	119 [4.685]	40 [1.575]	30 [1.181]	20 [0.787]	42 [1.654]	32 [1.260]	79 [3.110]	5.5 [0.217]	24 [0.945]
32 [1.260]	54 [2.126]	31 [1.220]	14 [0.551]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	22 [0.866]	11 [0.433]	6 [0.236]	33.6 [1.323]	12 [0.472]	10 [0.394]	125 [4.921]	45 [1.772]	36 [1.417]	24 [0.945]	54 [2.126]	42 [1.654]	80 [3.150]	6.6 [0.260]	28 [1.102]
40 [1.575]	60 [2.362]	31 [1.220]	14 [0.551]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	22 [0.866]	13 [0.512]	6 [0.236]	41.6 [1.638]	16 [0.630]	14 [0.551]	131 [5.157]	45 [1.772]	44 [1.732]	28 [1.102]	68 [2.677]	52 [2.047]	86 [3.386]	9 [0.354]	34 [1.339]

KOGANEI CLEAN SYSTEM

SLIM BLOCK END KEEP CYLINDERS

Head Side End Keep Double Acting Type

Symbols



Specifications

Item \ Bore size mm [in.]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]
Operating type	Double acting type, with head side stroke end keep mechanism			
Media	Air			
Mounting type	Side mount			
Operating pressure range MPa [psi.]	0.1～0.9 [15～131]			
Proof pressure MPa [psi.]	1.32 [191]			
Operating temperature range °C [°F]	0～60 [32～140]			
Operating speed range mm/s [in./sec.]	50～300 [2.0～11.8]			
Cushion	Fixed type (Rubber bumper)			
Lubrication	Not required			
Maximum holding force (at end keep) N [lbf.]	194.2 [43.66]	303 [68.11]	496.2 [111.5]	775.7 [174.4]
Backlash (at end keep) mm [in.]	1.4 [0.055] MAX.		1.6 [0.063] MAX.	
Port size Rc	1/8			

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum stroke	Maximum available stroke
20 [0.787]	25 50 75 100 125 150	150	500
25 [0.984]	25 50 75 100 125 150 200	200	
32 [1.260]	25 50 75 100 125 150 200	200	
40 [1.575]	25 50 75 100 125 150 200 250 300	300	

Remarks: 1. Stroke tolerance $^{+1}_{0}$ [$^{+0.039}_{0}$]
2. For non-standard strokes, consult us.

Order Codes

CS – **DABK** **20×50** □ – **2** – □ – □ □ □

Clean system product

Slim block
End keep double acting cylinder

Bore size
×
Stroke

End keep position
HL — Head side end keep

Mounting type
2 — Side mount

Rod end accessory
Blank — Without rod end accessory
Y — Y type knuckle
I — I type knuckle

Sensor switch

Blank	Without sensor switch	
ZG530	2-lead wire Solid state type with indicator lamp	DC10～28V
ZG553	3-lead wire Solid state type with indicator lamp	DC4.5～28V
CS3M	2-lead wire Reed switch type with indicator lamp	DC10～30V, AC85～230V
CS4M	2-lead wire Reed switch type with indicator lamp	DC10～30V, AC85～115V
CS5M	2-lead wire Reed switch type without indicator lamp	DC3～30V, AC85～115V
CS2F	2-lead wire Reed switch type with indicator lamp	AC85～230V
CS3F	2-lead wire Reed switch type with indicator lamp	DC10～30V
CS4F	2-lead wire Reed switch type with indicator lamp	DC10～30V
CS5F	2-lead wire Reed switch type without indicator lamp	DC3～30V

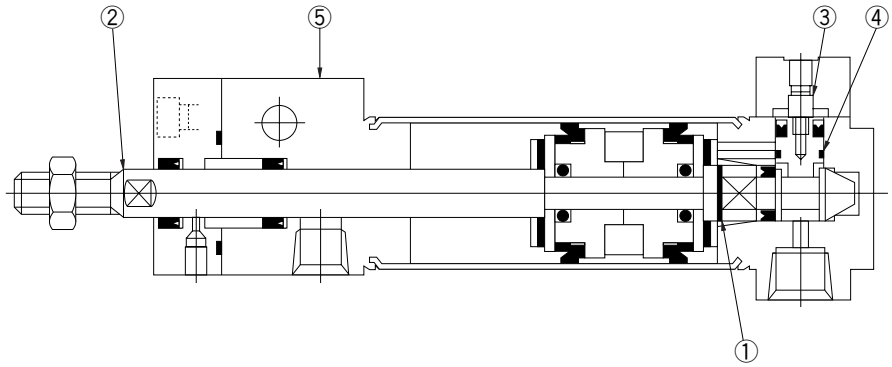
● For details of sensor switches, see p.111～121.

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

Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches
3 — With 3 sensor switches

●For the order codes of additional parts, see p. 64.

Inner Construction and Major Parts



Major Parts and Materials

Parts / Bore size mm		20, 25	32, 40
①	Piston rod A	Steel (chrome plated)	
②	Piston rod B	Stainless steel	
③	Spring	Stainless steel	Piano wire
④	Lock piston	Stainless steel	
⑤	Lock cover	Aluminum (anodized)	
	Y type knuckle, I type knuckle	Mild steel (nickel plated)	

Other than the items listed above, it is the same as for the standard Slim Cylinder.

Seals

Parts / Quantity / Bore mm	Rod seal	Lock piston seal	Lock cover gasket
	1	1	1
20	GYH-9	MYN-5	—
25	GYH-11	MYN-5	—
32	—	MYN-10A	S18
40	—	MYN10-A	S18

Other than the items listed above, it is the same as for the standard Slim Cylinder.

Mass

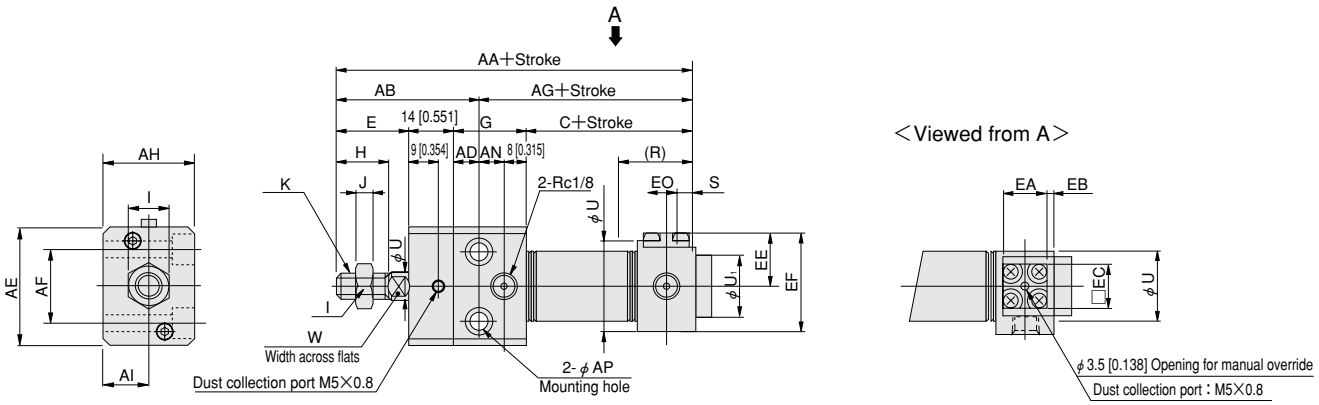
g [oz.]

Bore size mm [in.]	Zero stroke mass	Additional mass for each 1mm [0.0394in.] stroke	Mass of knuckle	
	-HL : Head side end keep Side mount		Y type knuckle	I type knuckle
20 [0.787]	210 [7.41]	0.8 [0.028]	41 [1.45]	36 [1.27]
25 [0.984]	310 [10.93]	1.1 [0.039]	75 [2.65]	70 [2.47]
32 [1.260]	500 [17.64]	1.5 [0.053]		
40 [1.575]	900 [31.75]	2.4 [0.085]	120 [4.23]	132 [4.66]

Calculation example: For head side end keep side mount type of 32mm bore size and 100mm stroke, 500＋(1.5×100)＝650g [22.93 oz.]

-HL Dimensions of Head Side End Keep, Side Mounting Type mm [in.]

●φ20～φ40



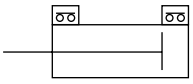
●The drawings for sizes φ32 and φ40 (The outward shape of the size φ20 and φ25 head covers is larger than the block portion.)

Bore \ Code	C	E	G	H	I	J	K	R	S	U	U_1	V	W
20 [0.787]	60 [2.362]	23 [0.906]	28 [1.102]	15 [0.591]	12 [0.472]	5 [0.197]	M8×1	16 [0.630]	6 [0.236]	29 [1.142]	20 [0.787]	8 [0.315]	6 [0.236]
25 [0.984]	60 [2.362]	26 [1.024]	30 [1.181]	18 [0.709]	14 [0.551]	6 [0.236]	M10×1.25	16 [0.630]	6 [0.236]	35 [1.378]	22 [0.866]	10 [0.394]	8 [0.315]
32 [1.260]	72 [2.835]	31 [1.220]	36 [1.417]	23 [0.906]	14 [0.551]	6 [0.236]	M10×1.25	26 [1.024]	1 [0.039]	35 [1.378]	27 [1.063]	12 [0.472]	10 [0.394]
40 [1.575]	79 [3.110]	31 [1.220]	44 [1.732]	23 [0.906]	19 [0.748]	8 [0.315]	M14×1.5	32 [1.260]	1 [0.039]	41.6 [1.638]	33 [1.299]	16 [0.630]	14 [0.551]

Bore \ Code	AA	AB	AD	AE	AF	AG	AH	AI	AN	AP	EA	EB	EC	EE	EF	EO
20 [0.787]	131 [5.157]	48 [1.890]	11 [0.433]	38 [1.496]	22 [0.866]	83 [3.268]	28 [1.102]	14 [0.551]	9 [0.354]	φ6.6 [0.260] Counterbore φ11 [0.433] Depth 6.5 [0.256]	16 [0.630]	—	16 [0.630]	24 [0.945]	38.5 [1.516]	8 [0.315]
25 [0.984]	136 [5.354]	52 [2.047]	12 [0.472]	42 [1.654]	26 [1.024]	84 [3.307]	30 [1.181]	15 [0.591]	10 [0.394]	φ6.6 [0.260] Counterbore φ11 [0.433] Depth 6.5 [0.256]	16 [0.630]	—	16 [0.630]	25 [0.984]	42.5 [1.673]	8 [0.315]
32 [1.260]	154 [6.063]	59 [2.323]	14 [0.551]	54 [2.126]	34 [1.339]	95 [3.740]	36 [1.417]	18 [0.709]	14 [0.551]	φ9 [0.354] Counterbore φ14 [0.551] Depth 8.6 [0.339]	24 [0.945]	2 [0.079]	25 [0.984]	30 [1.181]	(40.5) ([1.594])	14 [0.551]
40 [1.575]	169 [6.654]	62 [2.441]	17 [0.669]	68 [2.677]	46 [1.811]	107 [4.213]	44 [1.732]	22 [0.866]	19 [0.748]	φ11 [0.433] Counterbore φ17.5 [0.689] Depth 10.8 [0.425]	24 [0.945]	4 [0.157]	25 [0.984]	32.5 [1.280]	(46) ([1.811])	16 [0.630]

●Since a magnet comes standard in the Slim cylinders series, mounting a sensor switch will enable use in sensor switch applications.

Symbol



Order Codes

●Order codes for sensor switch with mounting strap

CS — □ □ — □ □

Sensor switch

ZG530	2-lead wire Solid state type with indicator lamp	DC10～28V
ZG553	3-lead wire Solid state type with indicator lamp	DC4.5～28V
CS3M	2-lead wire Reed switch type with indicator lamp	DC10～30V, AC85～230V
CS4M	2-lead wire Reed switch type with indicator lamp	DC10～30V, AC85～115V
CS5M	2-lead wire Reed switch type without indicator lamp	DC3～30V, AC85～115V
CS2F	2-lead wire Reed switch type with indicator lamp	AC85～230V
CS3F	2-lead wire Reed switch type with indicator lamp	DC10～30V
CS4F	2-lead wire Reed switch type with indicator lamp	DC10～30V
CS5F	2-lead wire Reed switch type without indicator lamp	DC3～30V

Lead wire length
(Applies to all except **CS□F**)
A — 1000mm [39in.]
B — 3000mm [118in.]

Cylinder basic type
DA — Excluding **DAB** ϕ16 and **DABK** ϕ16
DAB — For block cylinder ϕ16
DABK — For block type end keep cylinder ϕ16
S — For sensor switch type **CS□F**

Bore size Note
16 — ϕ16 [0.630in.]
20 — ϕ20 [0.787in.]
25 — ϕ25 [0.984in.]
32 — ϕ32 [1.260in.]
40 — ϕ40 [1.575in.]
50 — ϕ50 [1.969in.]
63 — ϕ63 [2.480in.]
Note: ϕ50 and ϕ63 are DA type only.

Clean system product

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

●Order codes for sensor switch only

CS — □ □

Sensor switch

ZG530	2-lead wire Solid state type with indicator lamp	DC10～28V
ZG553	3-lead wire Solid state type with indicator lamp	DC4.5～28V
CS3M	2-lead wire Reed switch type with indicator lamp	DC10～30V, AC85～230V
CS4M	2-lead wire Reed switch type with indicator lamp	DC10～30V, AC85～115V
CS5M	2-lead wire Reed switch type without indicator lamp	DC3～30V, AC85～115V
CS2F	2-lead wire Reed switch type with indicator lamp	AC85～230V
CS3F	2-lead wire Reed switch type with indicator lamp	DC10～30V
CS4F	2-lead wire Reed switch type with indicator lamp	DC10～30V
CS5F	2-lead wire Reed switch type without indicator lamp	DC3～30V

Lead wire length
(Applies to all except **CS□F**)
A — 1000mm [39in.]
B — 3000mm [118in.]

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

Clean system product

●Order codes for mounting strap only

CS — □ — □ □

Bore size Note
16 — ϕ16 [0.630in.]
20 — ϕ20 [0.787in.]
25 — ϕ25 [0.984in.]
32 — ϕ32 [1.260in.]
40 — ϕ40 [1.575in.]
50 — ϕ50 [1.969in.]
63 — ϕ63 [2.480in.]
Note: ϕ50 and ϕ63 are DA type only.

Cylinder basic type
DA — Excluding **DAB** ϕ16 and **DABK** ϕ16
DAB — For block cylinder **DAB** ϕ16
DABK — For block end keep cylinder **DABK** ϕ16
S — For sensor switch type **CS□F**

Mounting strap type
G5 — Solid state type
For **ZG5□□**
Reed switch type
For **CS□M**
F — Reed switch type
For **CS□F**

Clean system product

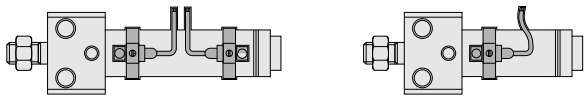
Minimum Cylinder Strokes When Using Sensor Switches

mm [in.]

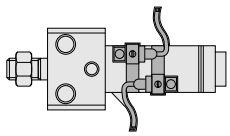
Sensor switch model	Bore size	2 pcs. mounting		1 pc. mounting
		In-line	In staggered positions	
ZG530 **ZG553**	16 [0.630]	20 [0.787]	10 [0.394]	10 [0.394]
	20~63 [0.787~2.480]	20 [0.787]	10 [0.394]	10 [0.394]
CS□M	16~63 [0.630~2.480]	20 [0.787]	15 [0.591]	15 [0.591]
CS□F	20~63 [0.787~2.480]	40 [1.575]	21 [0.827]	15 [0.591]

●Two pieces mounting ●One piece mounting

●When mounted in-line



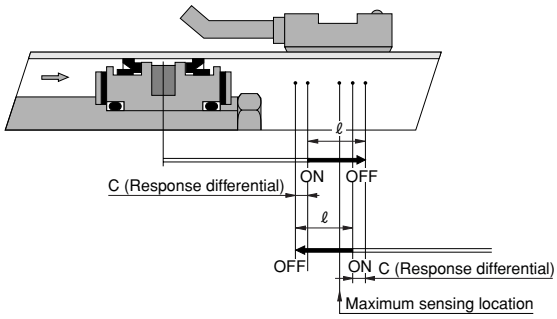
●When mounted in staggered positions



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.



mm [in.]

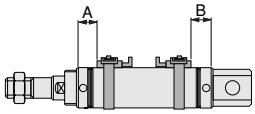
Item	Bore size	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]	40 [1.575]	50 [1.969]	63 [2.480]
Operating range : ℓ	**ZG530□**	2.5～4.1 [0.098～0.161]	2.5～4.2 [0.098～0.165]	2.6～4.3 [0.102～0.169]	3.0～4.8 [0.118～0.189]	3.1～5.0 [0.122～0.197]	3.3～5.4 [0.130～0.213]	3.5～5.7 [0.138～0.224]
	ZG533□							
	CS□M	6.7～7 [0.264～0.276]	7～8.5 [0.276～0.335]	7～8.5 [0.276～0.335]	8～9 [0.315～0.354]	9～10.5 [0.354～0.413]	7～8 [0.276～0.315]	8～9.5 [0.315～0.374]
	CS□F	—	7～8.5 [0.276～0.335]	8.5～10 [0.335～0.394]	9～10.5 [0.354～0.413]	10.5～12 [0.413～0.472]	9～10 [0.354～0.394]	9～10.5 [0.354～0.413]
Response differential : C	**ZG530**	0.7 [0.028] or less	0.7 [0.028] or less	0.8 [0.032] or less	0.7 [0.028] or less	0.8 [0.032] or less	0.8 [0.032] or less	0.8 [0.032] or less
	ZG533	0.7 [0.028] or less	0.7 [0.028] or less	0.8 [0.032] or less	0.7 [0.028] or less	0.8 [0.032] or less	0.8 [0.032] or less	0.8 [0.032] or less
	CS□M	1 [0.039] or less	1 [0.039] or less	1 [0.039] or less	1 [0.039] or less	1 [0.039] or less	1.2 [0.047] or less	1.2 [0.047] or less
	CS□F	—	1.5 [0.059] or less	1.5 [0.059] or less	1.5 [0.059] or less	1.5 [0.059] or less	2 [0.079] or less	1.5 [0.059] or less
Maximum sensing location	**ZG530, ZG553** Note 1	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]
	CS□M Note 1	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]
	CS□F Note 2	—	16 [0.630]	16 [0.630]	16 [0.630]	16 [0.630]	16 [0.630]	16 [0.630]

Remark : Figures in the table above are reference values.
Notes: 1. Figures are from the end surface that is opposite to the lead wires.
2. Figures are from the end surface of the connector side.

Mounting Location of End of Stroke Detection Sensor Switch

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

●Double acting cylinder

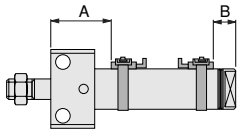


mm [in.]

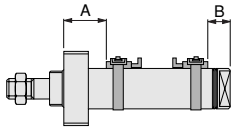
Sensor switch model	Bore size / Code	Double acting cylinder					
		20	**32**	**32**	**40**	**50**	**63**
ZG530□ ZG553□	**A**	37 [1.456]	37 [1.456]	37 [1.456]	38.5 [1.516]	45 [1.772]	45 [1.772]
	B	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	36 [1.417]	36 [1.417]
CS□M	**A**	37 [1.456]	37 [1.456]	37 [1.456]	38.5 [1.516]	45 [1.772]	45 [1.772]
	B	27 [1.063]	27 [1.063]	27 [1.063]	27 [1.063]	36 [1.417]	36 [1.417]
CS□F	**A**	32 [1.260]	32 [1.260]	32 [1.260]	32 [1.260]	41 [1.614]	41 [1.614]
	B	22 [0.866]	22 [0.866]	22 [0.866]	22 [0.866]	32 [1.260]	32 [1.260]

●Block cylinder

●Side mount



●Front mount

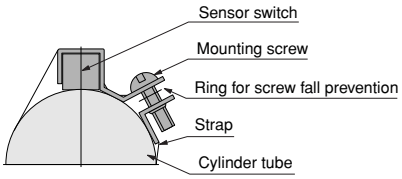


mm [in.]

Mounting type		Side mount							Front mount						
Bore size		**16**	**20**	**25**	**32**	**40**	**50**	**63**	**16**	**20**	**25**	**32**	**40**	**50**	**63**
ZG530□ ZG553□	**A** Rod side	42 [1.654]	53 [2.087]	55 [2.165]	61 [2.402]	71 [2.795]	81 [3.189]	81 [3.189]	33 [1.299]	37 [1.457]	37 [1.457]	37 [1.457]	39 [1.535]	47 [1.850]	47 [1.850]
	B Rod side	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	45 [1.772]	45 [1.772]	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	45 [1.772]	45 [1.772]
CS□M	**A** Rod side	42 [1.654]	53 [2.087]	55 [2.165]	61 [2.402]	71 [2.795]	80 [3.150]	80 [3.150]	33 [1.299]	37 [1.457]	37 [1.457]	37 [1.457]	39 [1.535]	46 [1.811]	46 [1.811]
	B Rod side	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	44 [1.732]	44 [1.732]	16 [0.630]	20 [0.787]	20 [0.787]	21 [0.827]	25 [0.984]	44 [1.732]	44 [1.732]
CS□F	**A** Rod side	—	50 [1.969]	52 [2.047]	58 [2.283]	66 [2.598]	78 [3.071]	78 [3.071]	—	34 [1.339]	34 [1.339]	34 [1.339]	34 [1.339]	44 [1.732]	44 [1.732]
	B Rod side	—	17 [0.669]	17 [0.669]	18 [0.709]	20 [0.787]	42 [1.654]	42 [1.654]	—	17 [0.669]	17 [0.669]	18 [0.709]	22 [0.866]	42 [1.654]	42 [1.654]

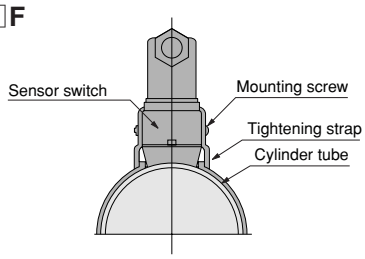
Moving Sensor Switch

●ZG530□ ZG553□ CS□M



- Loosening the mounting screw allows the sensor switch to be moved freely along with the strap in the axial and circumferential direction. The sensor switch alone cannot be moved.
- To remove the sensor switch from the strap, first detach the strap from the cylinder tube and then remove the sensor switch from the strap.
- Tighten the mounting screw with a tightening torque of 49N·cm [4.3in·lbf] or less.

●CS□F



- Loosening the mounting screw allows the sensor switch to be moved freely in the axial and circumferential direction.
- Slightly loosening the mounting screw allows fine adjustment of the lead switch only, up to 5mm [0.197in.] in the axial direction.
  Tighten the mounting screw with a tightening torque of 68.6N·cm [6.1in·lbf] or less.

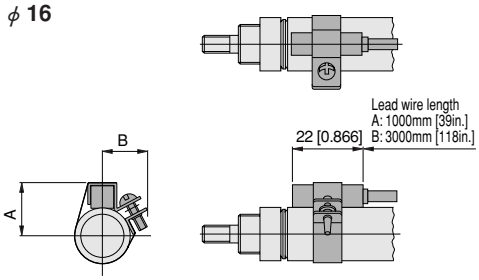
Dimensions of Sensor Switch mm [in.]

●ZG530□ ZG553□ CS□M

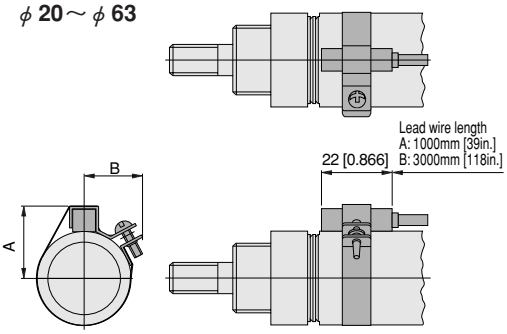
Bore \ Code	A	B
16 [0.630]	16 [0.630]	15 [0.591]
20 [0.787]	19 [0.748]	17 [0.669]
25 [0.984]	20.5 [0.807]	17.5 [0.689]
32 [1.260]	25 [0.984]	19 [0.748]
40 [1.575]	29 [1.142]	—※
50 [1.969]	34 [1.339]	—※
63 [2.480]	41 [1.614]	—※

※At φ40 [1.575in.] or more, dimension B is the radius of the cylinder tube. Therefore, the protrusion in the B direction of the mounting section disappears.

φ16

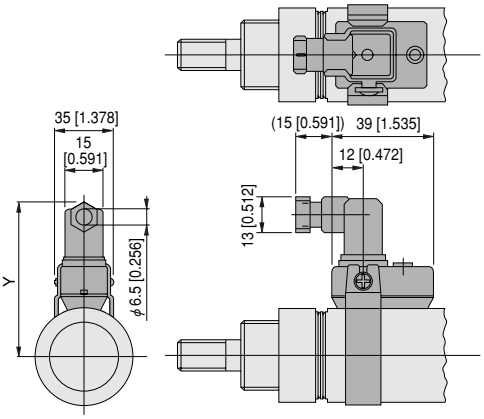


φ20～φ63



●CS□F

Bore \ Code	Y
20 [0.787]	59 [2.323]
25 [0.984]	61.5 [2.421]
32 [1.260]	65 [2.559]
40 [1.575]	69 [2.717]
50 [1.969]	76 [2.992]
63 [2.480]	83 [3.268]

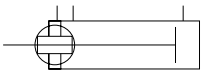


KOGANEI CLEAN SYSTEM

TWIN ROD CYLINDERS φ6

Double Acting Type

Symbol



Specifications

Item \ Bore size mm [in.]		6 [0.236]
Media		Air
Mounting type		Side mount
Operating pressure range	MPa [psi.]	0.3～0.7 [44～102]
Proof pressure	MPa [psi.]	1.03 [149]
Operating temperature range	°C [°F]	0～60 [32～140]
Operating speed range	mm/s [in./sec.]	100～300 [3.9～11.8]
Cushion		None
Lubrication		Not required
Non-rotating accuracy		±0.45°
Port size	Supply and exhaust port	M5×0.8
	Dust collection port	M5×0.8

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum available stroke
6 [0.236]	10, 20, 30, 40, 50	70

Note: Consult us for delivery of cylinders with strokes exceeding the standard.

Order Codes

CS – **TDA** **6×50** – □ □ □

Clean system product

Twin rod cylinder
Double acting type

Bore size
×
Stroke

Number of sensor switches
1：With 1 sensor switch
2：With 2 sensor switches

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

Sensor switch
Blank : Without sensor switch
CS5T : 2-lead wire Reed switch type without indicator lamp（DC5～28V, AC85～115V）
CS11T : 2-lead wire Reed switch type with indicator lamp（DC10～28V）
ZC130 : 2-lead wire Solid state type with indicator lamp（DC10～28V）
ZC153 : 2-lead wire Solid state type with indicator lamp（DC4.5～28V）
●For details of sensor switches, see p.111～121.

Remarks: 1. In the twin rod cylinder, a magnet for sensor switch is built-in.
2. Two sensor holders (one for the A surface and one for the B surface) come with 1 sensor switch.

Mass

g [oz.]

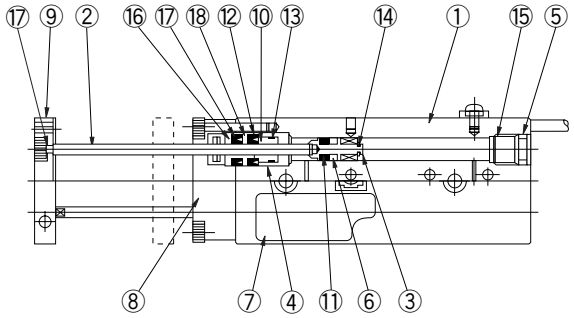
Bore size mm [in.]		Zero stroke mass Note1	Additional mass	
			Additional mass of each 10mm [0.394in.] stroke	Mass of 1 sensor switch Note2 **CS5T,CS11T,ZC130,ZC153**
6 [0.236]	Standard specification	68 [2.40]	12 [0.42]	A：20 [0.71] B：50 [1.76]

Notes: 1. The above table is for the standard strokes.
2. There are 2 types of sensor switch lead wire lengths.
A: 1000mm [39in.], B: 3000mm [118in.]

Calculation example: The mass for bore size of 20mm and stroke of 50mm with 2 sensor switches (**ZC130**),
68＋(12×5)＋(20×2)＝168g [5.93oz.]

Stroke / 10

Inner Construction and Major Parts



Major Parts and Materials

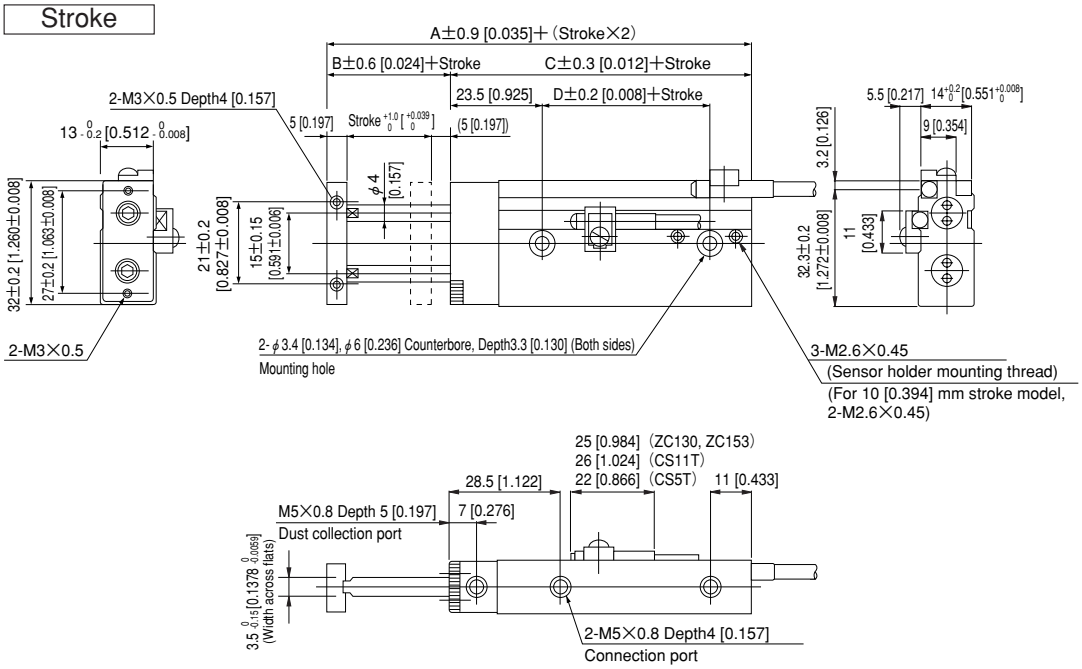
No.	Parts	Materials
①	Cylinder body	Aluminum alloy (anodized)
②	Piston	Aluminum alloy (chromic acid anodic oxide coating)
③	Cover	Aluminum alloy (anodized)
④	Wear ring	Plastic
⑤	Piston rod	Steel (chrome plated)
⑥	Housing gasket	Synthetic rubber (NBR)
⑦	Housing	Aluminum alloy (chromic acid anodic oxide coating)
⑧	Seal holder	Aluminum alloy
⑨	Rod bushing	Plastic
⑩	Piston seal	Synthetic rubber (NBR)
⑪	Plug	Aluminum alloy (anodized)
⑫	Magnet	Plastic magnet
⑬	E-ring	Stainless steel
⑭	Washer	Steel (nickel plated)
⑮	End plate	Mild steel (nickel plated)
⑯	Rod seal	Synthetic rubber
⑰	Dust leak prevention seal	
⑱	Plug gasket	

Seals

Parts / Bore mm \ Q'ty	Rod seal	Piston seal	Plug gasket	Housing gasket	Dust leak prevention seal
	2	2	2	2	2
6	MYR-4	PWP-6	1.5×1.5	1×6	MYR-4

Dimensions mm [in.]

CS-TDA6 × Stroke



Bore \ Code	A	B	C	D
6	61 [2.402]	10 [0.394]	51 [2.008]	13 [0.512]

Note: The counterbore depth is measured from the upper surface of the body.

Order Codes

CS – □ □ – **TDA6**

With holder for twin rod cylinder ϕ6 [0.236in.] Note1

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

Sensor switch

Clean system product

ZC130	Solid state type	with indicator lamp	DC10～28V
ZC153	Solid state type	with indicator lamp	DC4.5～28V
CS5T	Reed switch type	without indicator lamp	DC5～28V AC85～115V
CS11T	Reed switch type	with indicator lamp	DC10～28V

●Order code of sensor holder only

C1-TDA6 Note2

Notes: 1. Two sensor holders (one for the A, C surface and one for the B surface) come with 1 sensor switch.
2. One set consists of 2 sensor holders (one each for the A, C surface and for the B surface).

Remark : For the mounting surfaces, see p.90.

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

Minimum Cylinder Strokes When Using Sensor Switches

mm [in.]

Type of sensor switch	2 pcs. mounting			1 pc. mounting
	1-surface mounting		2-surface mounting	
	One groove on each A surface and B surface	Two grooves on B surface		
CS□T□	40 [1.575]	10 [0.394]	10 [0.394]	10 [0.394]
ZC□□	40 [1.575]	10 [0.394]	10 [0.394]	10 [0.394]

Remark : For the mounting surfaces, see p.90.

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

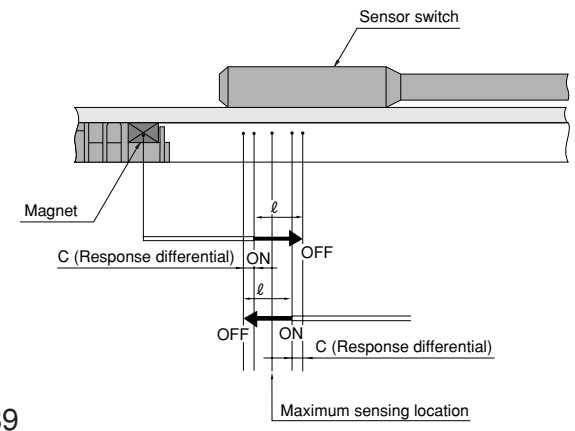
●Operating range: ℓ
The distance the piston travels in one direction, while the switch is in the ON position.

●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.

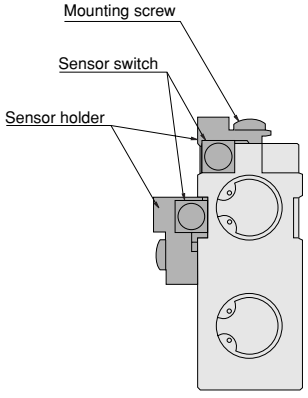
mm [in.]

CS5T□			**CS11T□**			**ZC130□, ZC153□**		
Operating range	Response differential	Maximum sensing location	Operating range	Response differential	Maximum sensing location	Operating range	Response differential	Maximum sensing location
5～7 [0.197～0.276]	1.3 [0.051] or less	7 [0.276]	5～7 [0.197～0.276]	1.3 [0.051] or less	10.5 [0.413]	2～3 [0.079～0.118]	0.3 [0.012] or less	8.5 [0.335]

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



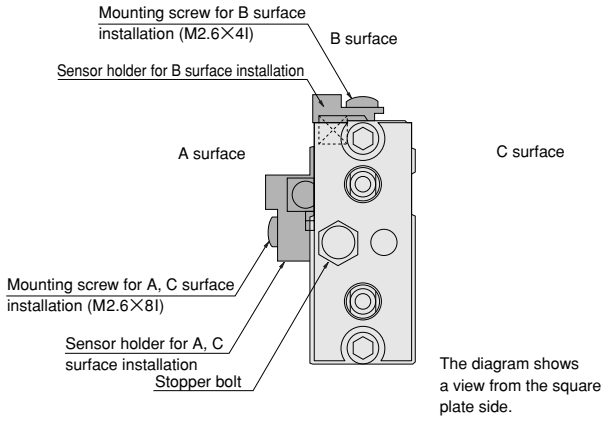
Moving Sensor Switch



The diagram shows a view from the end plate side.

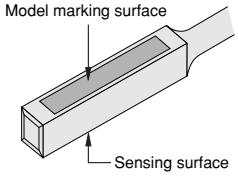
● Loosening mounting screw allows the sensor switch to be moved freely in the cylinder's axial direction.
● Tighten the mounting screw with a tightening torque of 0.3N·m [2.7in·lbf] or less.

Sensor Switch Mounting Surface



- Mounting on either 1 or 2 surfaces of the A, B, or C surfaces allows detection of the rod side and head side stroke end.
- Since 2 sensor holders and 2 mounting screws (one for the A, C surface and one for the B surface) are provided for each sensor switch, use them in accordance with the required mounting surface.

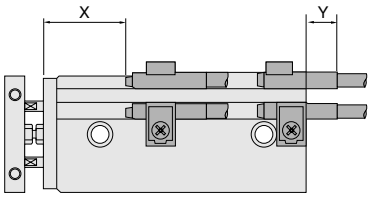
●Caution when mounting



In the ZC type sensor switches, the opposite side from the model marking surface is the sensing surface side. Mount it so that the cylinder magnet comes to the sensing surface side.

Mounting Location of End of Stroke Detection Sensor Switch

- When the sensor switch is mounted in the locations shown below (the 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.

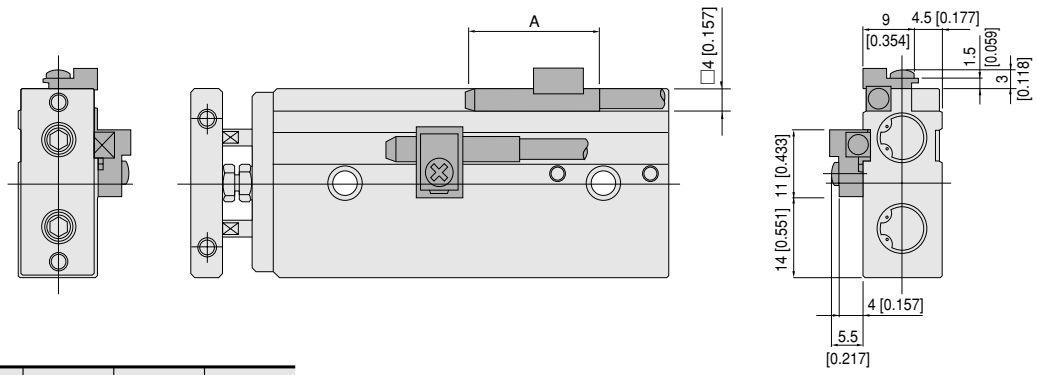


mm [in.]

Mounting location	Sensor switch type		
	CS5T□	**CS11T□**	**ZC130□, ZC153□**
X	23 [0.906]	19.5 [0.768]	22 [0.866]
Y	6 [0.236]	6.5 [0.256]	8 [0.315]

Remark: Mount the sensor switch so that the surface showing the model marking faces up.

Dimensions of Sensor Switch mm [in.]



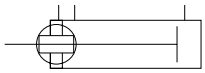
Code \ Sensor switch	**CS5T□**	**CS11T□**	**ZC130□**	**ZC153□**
A	22 [0.866]	26 [1.024]	25 [0.984]	

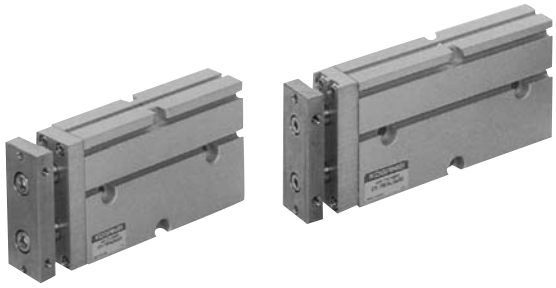
KOGANEI CLEAN SYSTEM

TWIN ROD CYLINDERS B SERIES

Double Acting Type

Symbol





Specifications

Item \ Bore size mm [in.]		10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
Operating type		Air				
Media		Side mount				
Operating pressure range	MPa [psi.]	0.15～0.7 [22～102]	0.1～0.7 [15～102]			
Proof pressure	MPa [psi.]	1.03 [149]				
Operating temperature range	°C [°F]	0～60 [32～140]				
Operating speed range	mm/s [in./sec.]	100～300 [3.9～11.8]				
Cushion		None	Rubber bumper			
Lubrication		Not required				
Non-rotating accuracy		±0.4°	±0.3°			
Port size	Supply port	M5×0.8				Rc1/8
	Dust collection port	M5×0.8				

Bore Size and Stroke

mm [in.]

Bore size	Standard strokes	Maximum available stroke
10 [0.394]	10, 20, 30, 40, 50, 60, 70	140
16 [0.630]	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	200
20 [0.787]	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	200
25 [0.984]	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	200
32 [1.260]	10, 20, 30, 40, 50, 60, 70, 80, 90, 100	200

Remark: Consult us for delivery of cylinders with strokes exceeding the standard.

Order Codes

CS – TBDA 10×50 – □ □ □

Clean system product

Twin rod cylinder
B series
double acting type

Bore size
×
Stroke

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

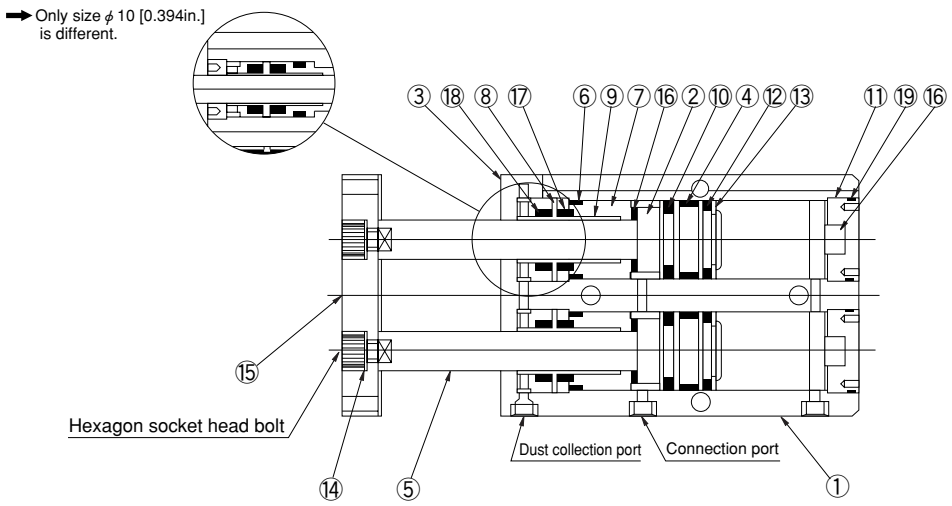
Number of sensor switches
1：With 1 sensor switch
2：With 2 sensor switches

Sensor switch
Blank：Without sensor switch
ZE135：2-lead wire, Solid state type with indicator lamp DC10～28V Horizontal lead wire
ZE235：2-lead wire, Solid state type with indicator lamp DC10～28V Vertical lead wire
ZE155：3-lead wire, Solid state type with indicator lamp DC4.5～28V Horizontal lead wire
ZE255：3-lead wire, Solid state type with indicator lamp DC4.5～28V Vertical lead wire
ZE101：2-lead wire, Reed switch type without indicator lamp DC5～28V, AC85～115 Horizontal lead wire
ZE201：2-lead wire, Reed switch type without indicator lamp DC5～28V, AC85～115 Vertical lead wire
ZE102：2-lead wire, Reed switch type with indicator lamp DC10～28V, AC85～115V Horizontal lead wire
ZE202：2-lead wire, Reed switch type with indicator lamp DC10～28V, AC85～115V Vertical lead wire

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

Remark: In the standard cylinder, the magnet for sensor switch is built-in.

Inner Construction and Major Parts



Major Parts and Materials

No.	Parts	Materials
①	Cylinder body	Aluminum alloy (anodized)
②	Piston	Aluminum alloy (chromic acid anodic oxide coating)
③	Cover	Aluminum alloy (anodized)
④	Wear ring	Plastic
⑤	Piston rod	Steel (chrome plated)
⑥	Housing gasket	Synthetic rubber (NBR)
⑦	Housing	Aluminum alloy (chromic acid anodic oxide coating)
⑧	Seal holder	Mild steel (nickel plated)
⑨	Rod bushing	Plastic
⑩	Piston seal	Synthetic rubber (NBR)
⑪	Plug	Aluminum alloy (anodized)
⑫	Magnet	Plastic magnet
⑬	E-ring	Stainless steel
⑭	Washer	Steel (nickel plated)
⑮	End plate	Mild steel (nickel plated)
⑯	Bumper	ϕ 10, 16, 20, 25 : Synthetic rubber, ϕ 32 : Urethane
⑰	Rod seal	Synthetic rubber (NBR)
⑱	Dust leak prevention seal	
⑲	Plug gasket	

Seals

Parts	Rod seal	Piston seal	Plug gasket	Housing gasket	Dust leak prevention seal
Q'ty / Bore mm	2	2	2	2	2
10	PIU-6	PWP-10	1.5×9	1.5×9	PIU-6
16	PIU-8	PWP-16	1.5×15	1.5×13	PIU-8
20	PIU-10	PWP-20	1.5×19.5	1.5×17	PIU-10
25	PIU-12	PWP-25	1.5×23	1.5×22	PIU-12
32	PIU-16	PWP-32	2×31.5	2×28.5	PIU-16

Mass

g [oz.]

Bore size mm [in.]		Zero stroke mass Note1	Additional mass		
			Additional mass of each 10mm [0.394in.] stroke	Mass of 1 sensor switch Note2	
				ZE□□□A	**ZE□□□B**
10 [0.394]	Standard specification	124 [4.37]	18 [0.63]	15 [0.53]	35 [1.23]
16 [0.630]		235 [8.29]	27 [0.95]		
20 [0.787]		393 [13.86]	36 [1.27]		
25 [0.984]		584 [20.60]	51 [1.80]		
32 [1.260]		1329 [46.88]	93 [3.28]		

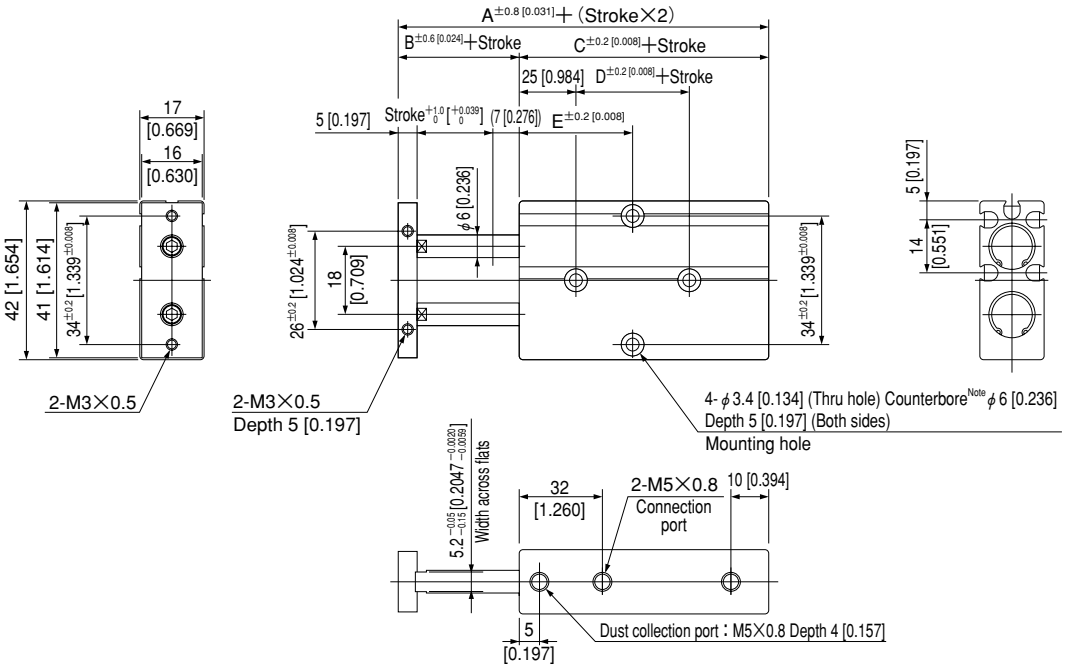
Notes: 1. The above table is for the standard strokes.
2. There are 2 types of sensor switch lead wire lengths.
A: 1000mm [39in.], B: 3000mm [118in.]

Calculation example: The mass for bore size of 20mm and stroke of 60mm with 2 sensor switches (**ZC135A**),
393+(36×6)+(15×2)=639g [22.54oz.]

$$\text{Stroke} \over 10$$

Dimensions mm [in.]

● ϕ10 CS-TBDA10 × Stroke

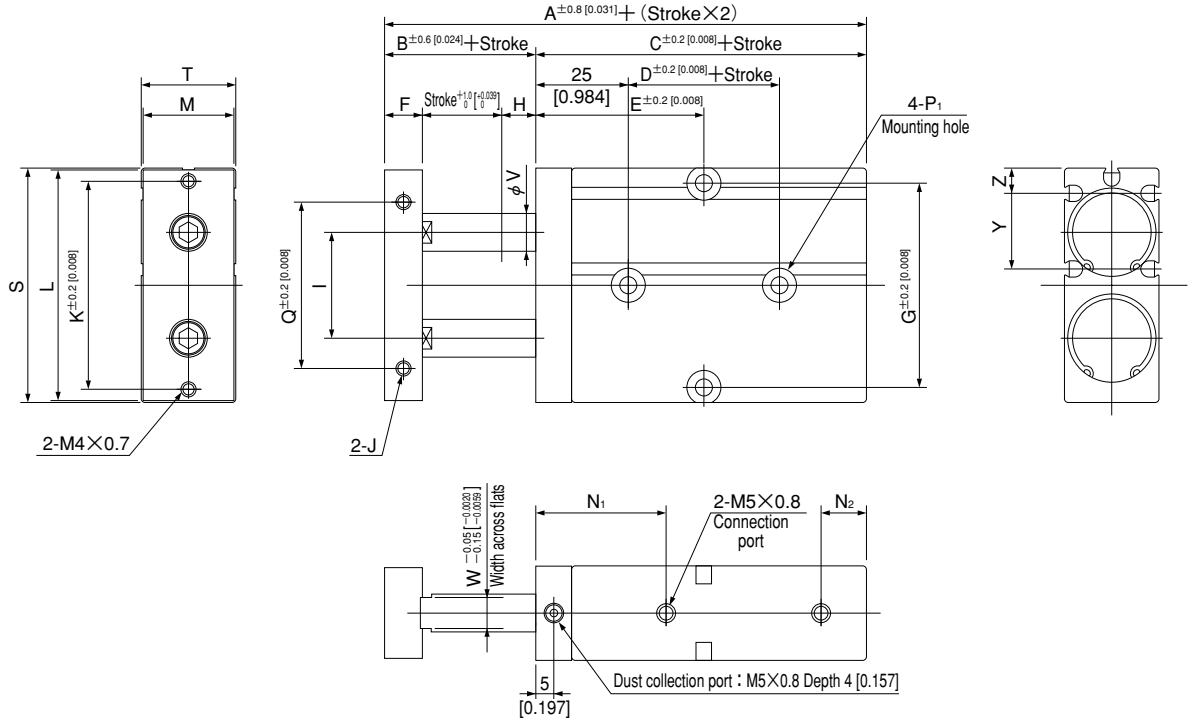


Code / Stroke / Bore	A	B	C	D	E						
					10	20	30	40	50	60	70
10 [0.394]	68 [2.677]	12 [0.472]	56 [2.205]	10 [0.394]	40 [1.575]	40 [1.575]	45 [1.772]	50 [1.969]	55 [2.165]	60 [2.362]	65 [2.559]

Note: The counterbore depth is measured from the upper surface of the body.

Dimensions mm [in.]

●φ16～φ25 CS-TBDA Bore size × Stroke



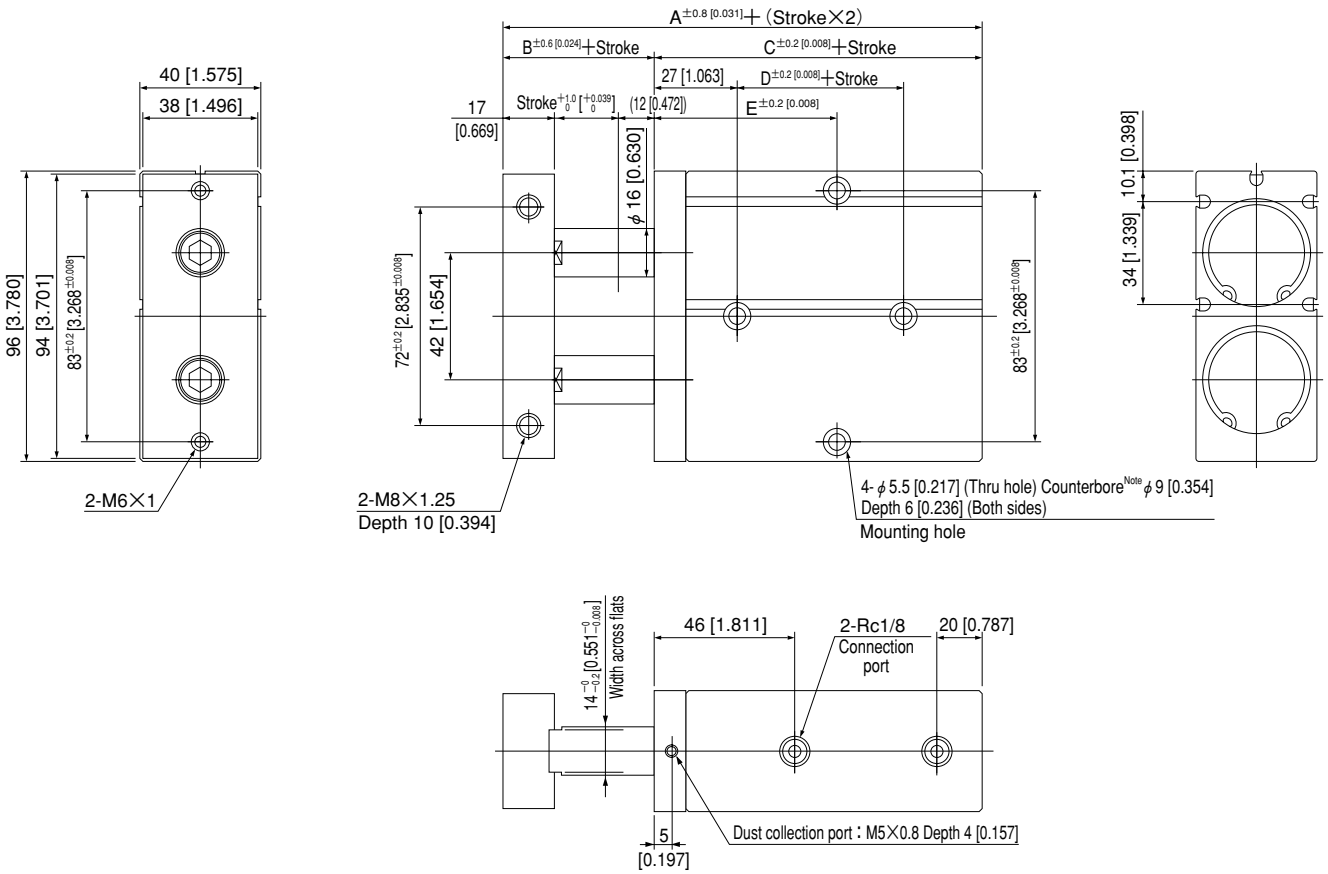
Code / Stroke / Bore	A	B	C	D	E										F	G	H	I	J	K	L	M	N1	N2
					10	20	30	40	50	60	70	80	90	100										
16 [0.630]	78 [3.071]	15 [0.591]	63 [2.480]	20 [0.787]	40 [1.575]	45 [1.772]	50 [1.969]	55 [2.165]	60 [2.362]	65 [2.559]	70 [2.756]	75 [2.953]	80 [3.150]	85 [3.346]	8 [0.315]	47 [1.850]	7 [0.276]	24 [0.945]	M4×0.7 Depth 5 [0.197]	47 [1.850]	53 [2.087]	20 [0.787]	32 [1.260]	10 [0.394]
20 [0.787]	88 [3.465]	20 [0.787]	68 [2.677]	20 [0.787]	45 [1.772]	45 [1.772]	50 [1.969]	55 [2.165]	60 [2.362]	65 [2.559]	70 [2.756]	75 [2.953]	80 [3.150]	85 [3.346]	10 [0.394]	55 [2.165]	10 [0.394]	28 [1.102]	M4×0.7 Depth 5 [0.197]	55 [2.165]	61 [2.402]	24 [0.945]	35 [1.378]	12 [0.472]
25 [0.984]	91 [3.583]	19 [0.748]	72 [2.835]	30 [1.181]	50 [1.969]	50 [1.969]	55 [2.165]	60 [2.362]	65 [2.559]	70 [2.756]	75 [2.953]	80 [3.150]	85 [3.346]	90 [3.543]	10 [0.394]	66 [2.598]	9 [0.354]	34 [1.339]	M4×0.8 Depth 6 [0.236]	66 [2.598]	72 [2.835]	29 [1.142]	40 [1.575]	12 [0.472]

Bore / Code	P1 Note	Q	S	T	V	W	Y	Z
16 [0.630]	φ4.5 [0.177] (Thru hole) Counterbore φ8 [0.315] Depth 5.5 [0.217] (Both sides)	34 [1.339]	54 [2.126]	21 [0.827]	8 [0.315]	6.2 [0.244]	18.5 [0.728]	5.7 [0.224]
20 [0.787]	φ4.5 [0.177] (Thru hole) Counterbore φ8 [0.315] Depth 5.5 [0.217] (Both sides)	44 [1.732]	62 [2.441]	25 [0.984]	10 [0.394]	8.2 [0.323]	20 [0.787]	6.8 [0.268]
25 [0.984]	φ4.5 [0.177] (Thru hole) Counterbore φ9 [0.354] Depth 6 [0.236] (Both sides)	56 [2.205]	73 [2.874]	30 [1.181]	12 [0.472]	10.2 [0.402]	22.5 [0.886]	8.3 [0.327]

Note: The counterbore depth is measured from the upper surface of the body.

Dimensions mm [in.]

● ϕ32 **CS-TBDA32 ×** Stroke



Code / Stroke / Bore	A	B	C	D	E									
					10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
32 [1.260]	118 [4.646]	30 [1.181]	88 [3.465]	35 [1.378]	55 [2.165]	60 [2.362]	65 [2.559]	70 [2.756]	75 [2.953]	80 [3.150]	85 [3.346]	90 [3.543]	95 [3.740]	100 [3.937]

Note: The counterbore depth is measured from the upper surface of the body.

Sensor Switches

Order Codes

CS — □ □ – **TBDA**

Clean system product

Sensor switch

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

Twin rod cylinder B series
with sensor switch mounting screw
for ϕ 10 [0.394in.]〜 ϕ 32 [1.260in.]

ZE135	2-lead wire, Solid state type with indicator lamp	DC10〜28V	Horizontal lead wire	**ZE155**	3-lead wire, Solid state type with indicator lamp	DC4.5〜28V	Horizontal lead wire
ZE235	2-lead wire, Solid state type with indicator lamp	DC10〜28V	Vertical lead wire	**ZE255**	3-lead wire, Solid state type with indicator lamp	DC4.5〜28V	Vertical lead wire
ZE101	2-lead wire, Reed switch type without indicator lamp	DC5〜28V AC85〜115V	Horizontal lead wire	**ZE102**	2-lead wire, Reed switch type with indicator lamp	DC10〜28V AC85〜115V	Horizontal lead wire
ZE201	2-lead wire, Reed switch type without indicator lamp	DC5〜28V AC85〜115V	Vertical lead wire	**ZE202**	2-lead wire, Reed switch type with indicator lamp	DC10〜28V AC85〜115V	Vertical lead wire

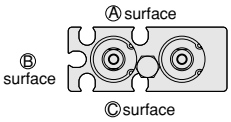
● For details of the sensor switches, see p.111〜121.

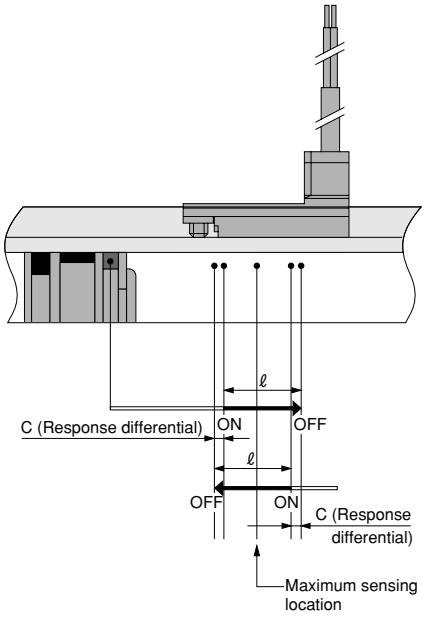
Sensor Switch Operating Range, Response Differential, and Maximum Sensing Location

●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.

●Sensor switch mounting surface





●Solid state type

mm [in.]

Item	Bore size / Mounting surface	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
Operating range : ℓ	A and C surface	2.5〜6 [0.098〜0.236]			2.5〜6.5 [0.098〜0.256]	5〜12 [0.197〜0.472]
	B surface	2.5〜4 [0.098〜0.157]	2〜4.5 [0.079〜0.177]		2.5〜5.5 [0.098〜0.217]	4〜9 [0.157〜0.354]
Response differential : C	—	1.0 [0.039] or less	1.2 [0.047] or less		1.5 [0.059] or less	2.0 [0.079] or less
Maximum sensing location Note	—	6 [0.236]				

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

●Reed switch type

mm [in.]

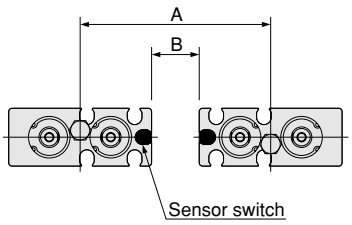
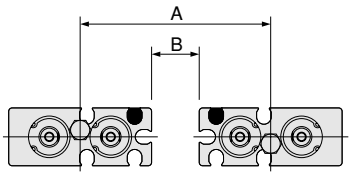
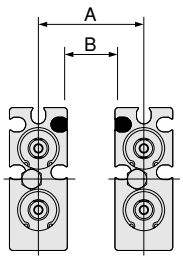
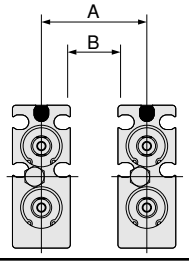
Item / Bore size	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
Operating range : ℓ	6〜8.5 [0.236〜0.335]		6〜8 [0.236〜0.315]	7〜9.5 [0.276〜0.374]	12〜16.5 [0.472〜0.650]
Response differential : C	1.5 [0.059] or less				2.5 [0.098] or less
Maximum sensing location Note	10 [0.394]				

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

When Mounting Cylinders with Sensor Switches in Close Proximity

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

mm [in.]

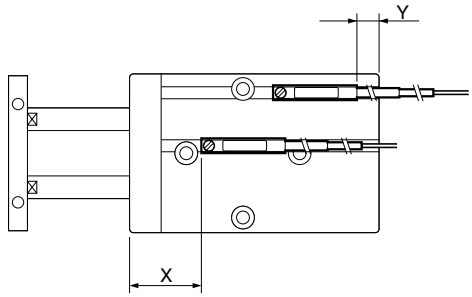
Status of mounting in close proximity	Code	Bore size / Type	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
	**A**	Solid state type	53 [2.087]	66 [2.598]	73 [2.874]	87 [3.425]	119 [4.685]
		Reed switch type	48 [1.890]	60 [2.362]	68 [2.677]	81 [3.189]	109 [4.291]
	B	Solid state type	11 [0.433]	12 [0.472]	11 [0.433]	14 [0.551]	23 [0.906]
		Reed switch type	6 [0.236]			8 [0.315]	13 [0.512]
	**A**	Solid state type	47 [1.850]	59 [2.323]	65 [2.559]	77 [3.031]	107 [4.213]
		Reed switch type	42 [1.654]	54 [2.126]	62 [2.441]	73 [2.874]	96 [3.780]
	B	Solid state type	5 [0.197]		3 [0.118]	4 [0.157]	11 [0.433]
		Reed switch type	0 [0]				
	**A**	Solid state type	28 [1.102]	33 [1.299]	36 [1.417]	44 [1.732]	65 [2.559]
		Reed switch type	22 [0.866]	27 [1.063]	30 [1.181]	37 [1.457]	53 [2.087]
	B	Solid state type	11 [0.433]	12 [0.472]	11 [0.433]	14 [0.551]	25 [0.984]
		Reed switch type	5 [0.197]	6 [0.236]	5 [0.197]	7 [0.276]	13 [0.512]
	**A**	Solid state type	21 [0.827]	24 [0.945]	25 [0.984]	30 [1.181]	44 [1.732]
		Reed switch type	17 [0.669]	21 [0.827]	25 [0.984]	30 [1.181]	40 [1.575]
	B	Solid state type	4 [0.157]	3 [0.118]	0 [0]		4 [0.157]
		Reed switch type	0 [0]				

Remark: For mounting in configurations other than the above, consult us.

Mounting Location of End of Stroke Detection Sensor Switch

When the sensor switch is mounted in the locations shown 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.

■ When the lead wire is pulled from the head side.



●Solid state type

mm [in.]

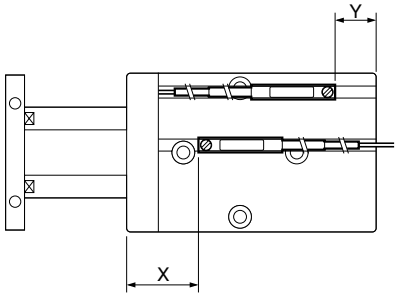
Code \ Bore	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
X	37.5 [1.476]	43.5 [1.713]	47.5 [1.870]	52.5 [2.067]	62 [2.441]
Y	−3.5 [−0.138]	−2.5 [−0.098]	−1.5 [−0.059]	−2.5 [−0.098]	4 [0.157]

●Reed switch type

mm [in.]

Code \ Bore	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
X	33.5 [1.319]	39.5 [1.555]	43.5 [1.713]	48.5 [1.909]	58 [2.283]
Y	0.5 [0.020]	1.5 [0.059]	2.5 [0.098]	1.5 [0.059]	8 [0.315]

■ When the lead wire of the head side detection sensor switch only is pulled from the rod side.



●Solid state type

mm [in.]

Code \ Bore	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
X	37.5 [1.476]	43.5 [1.713]	47.5 [1.870]	52.5 [2.067]	62 [2.441]
Y	6.5 [0.256]	7.5 [0.295]	8.5 [0.335]	7.5 [0.295]	14 [0.551]

●Reed switch type

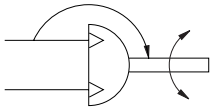
mm [in.]

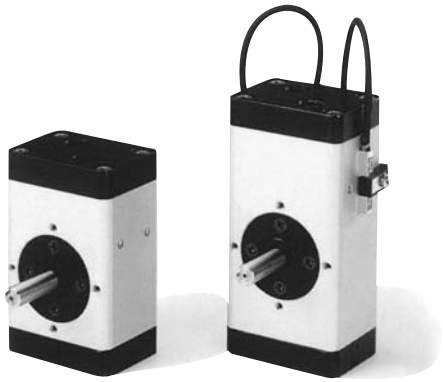
Code \ Bore	10 [0.394]	16 [0.630]	20 [0.787]	25 [0.984]	32 [1.260]
X	33.5 [1.319]	39.5 [1.555]	43.5 [1.713]	48.5 [1.909]	58 [2.283]
Y	2.5 [0.098]	3.5 [0.138]	4.5 [0.177]	3.5 [0.138]	10 [0.394]

ROTARY ACTUATORS RAP SERIES

Double Acting Type

Symbol





Specifications

Item \ Model		CS-RAP□1	CS-RAP□5	CS-RAP□10	CS-RAP□20
Operating type		Double acting piston type (Rack and pinion construction)			
Effective torque Note	N·m [ft·lbf]	0.078 [0.058]	0.373 [0.275]	0.883 [0.651]	1.863 [1.374]
Swing angle (Tolerance $^{+10^\circ}_{0}$)	**CS-RAP□-90**	90°			
	CS-RAP□-100	100°			
	CS-RAP□-180	180°			
	CS-RAP□-190	190°			
	CS-RAP□-360	360°			
Media		Air			
Port size		M5×0.8	Rc1/8		
Rod diameter	mm [in.]	4 [0.157]	6 [0.236]	8 [0.315]	10 [0.394]
Operating pressure range	MPa [psi.]	0.15～0.7 [22～102]		0.06～0.7 [9～102]	
Proof pressure	MPa [psi.]	1.03 [149]			
Operating temperature range	°C [°F]	0～50 [32～122]			
Allowable energy	J [in·lbf]	0.001 [0.009]	0.003 [0.027]	0.008 [0.071]	0.015 [0.133]
Lubrication		Not required			
Cushion		None			

Note: Values are obtained when the air pressure is 0.49MPa [71psi.].

Mass

g [oz.]

Model	Main body mass	Additional mass	
		Double rod specification	With sensor switch specification Note
CS-RAP1-90,100	101 [3.56]	2 [0.07]	With 1 sensor switch: 24 [0.85] With 2 sensor switches: 46 [1.62]
CS-RAP1-180,190	119 [4.20]		
CS-RAP1-360	166 [5.86]		
CS-RAP5-90,100	252 [8.89]	4 [0.14]	
CS-RAP5-180,190	300 [10.58]		
CS-RAP5-360	415 [14.64]		
CS-RAP10-90,100	346 [12.20]	10 [0.35]	
CS-RAP10-180,190	426 [15.03]		
CS-RAP10-360	584 [20.60]		
CS-RAP20-90,100	561 [19.79]	16 [0.56]	
CS-RAP20-180,190	675 [23.81]		
CS-RAP20-360	931 [32.84]		

Calculation example: Mass of CS-RAP1-180 with double rod and 1 sensor switch;
119＋2＋24＝145g [5.11oz.]

Note: The additional mass of the sensor switch is the mass of the sensor holder and the sensor body only, and does not include the lead wire mass.

Order Codes

CS – **RAP** □ – □ – □ □ **S** – □ □ □

Clean system product

Rotary actuator
Piston type

Blank — Standard specification
S — Sensor switch use specification

Nominal torque
1 — 9.8N·cm [0.87in·lbf]
5 — 49N·cm [4.3in·lbf]
10 — 98N·cm [8.7in·lbf]
20 — 196N·cm [17.3in·lbf]

Swing angle
90 — 90°
100 — 100°
180 — 180°
190 — 190°
360 — 360°

Rod type
Blank — Single rod type
D — Double rod type

Rod material
Stainless

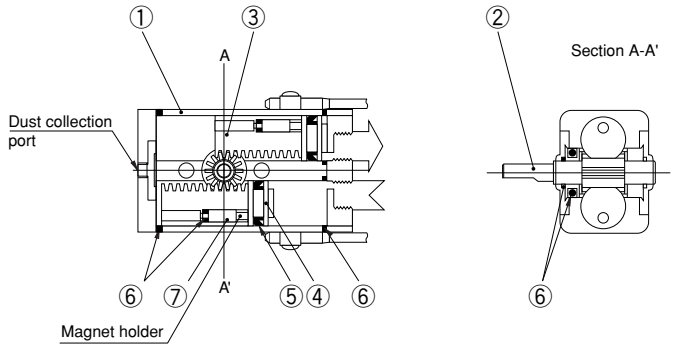
Sensor switch
Blank — Without sensor switch
CS5T — 2-lead wire Reed switch type without indicator lamp (DC5～28V、AC85～115V)
CS11T — 2-lead wire Reed switch type with indicator lamp (DC10～28V)
ZC130 — 2-lead wire Solid state type with indicator lamp (DC10～28V)
ZC153 — 3-lead wire Solid state type with indicator lamp (DC4.5～28V)
● For details of sensor switches, see p.111～121.

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

Number of sensor switches
1 — With 1 sensor switch
2 — With 2 sensor switches

Inner Construction and Major Parts

●Sensor switch use specification



Major Parts and Materials

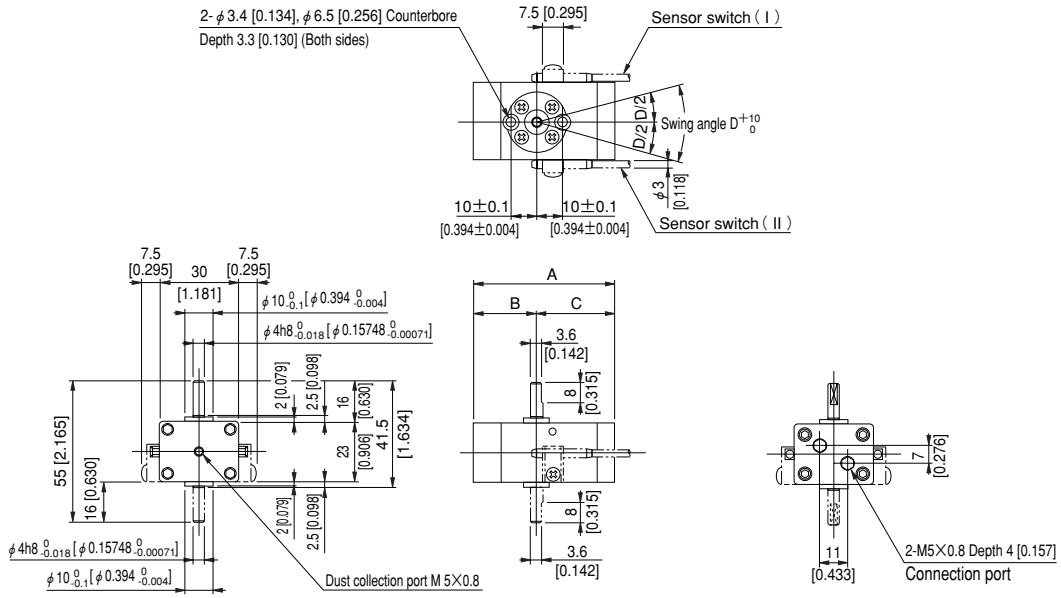
No.	Parts	Materials
①	Main body	Aluminum (anodized)
②	Rod pinion	Stainless steel (SUS304)
③	Rack	Plastic
④	Piston	
⑤	Piston seal	Synthetic rubber (NBR)
⑥	O-ring	
⑦	Magnet	Plastic magnet

Seals

Item	O-ring			Piston seal
Model / Q'ty	4	2	2	2
CS-RAP□1	IN 10	I.D φ6×φ1.2	I.D φ9×φ1.5	PPY-10
CS-RAP□5	IN 16	I.D φ9×φ1.5	I.D φ14×φ1.5	PPY-16
CS-RAP□10	IN 20	P8	I.D φ19×φ0.6	PPY-20
CS-RAP□20	I.D φ25×φ1.5	P10	I.D φ24.6×φ0.7	PPY-25

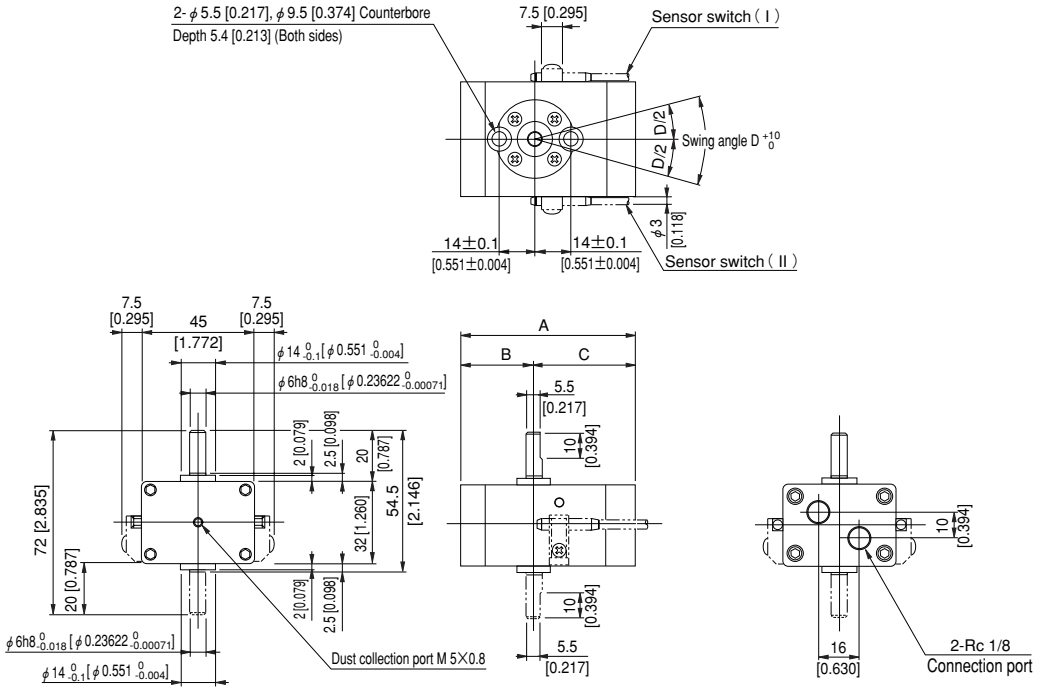
Dimensions mm [in.]

CS-RAP□1



Model \ Code	A	B	C	D
RAP□1-90	56 [2.205]	25 [0.984]	31 [1.220]	90°
RAP□1-100				100°
RAP□1-180	68 [2.677]	31[1.220]	37 [1.457]	180°
RAP□1-190				190°
RAP□1-360	96 [3.780]	45 [1.772]	51 [2.008]	360°

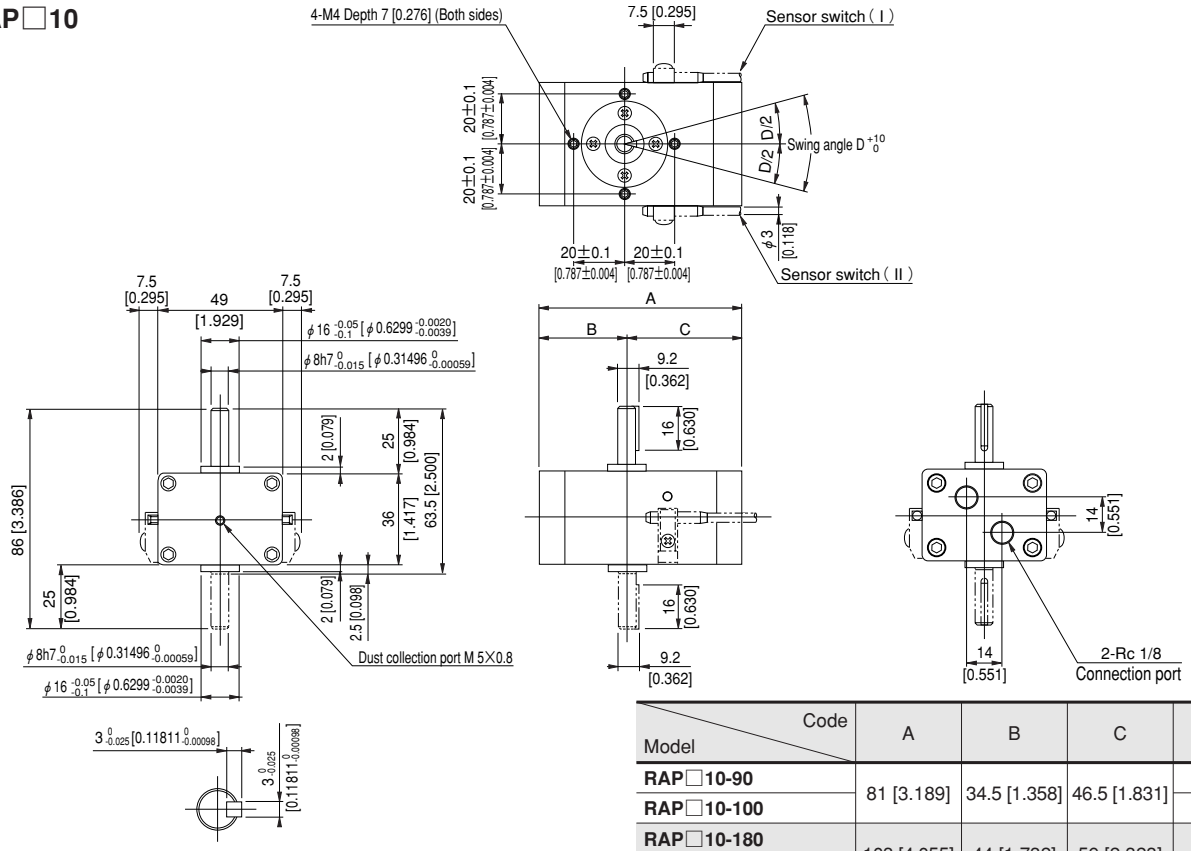
CS-RAP□5



Model \ Code	A	B	C	D
RAP□5-90	70 [2.756]	30.5 [1.201]	39.5 [1.555]	90°
RAP□5-100				100°
RAP□5-180	86 [3.386]	35.5 [1.398]	50.5 [1.988]	180°
RAP□5-190				190°
RAP□5-360	124 [4.882]	55 [2.165]	69 [2.717]	360°

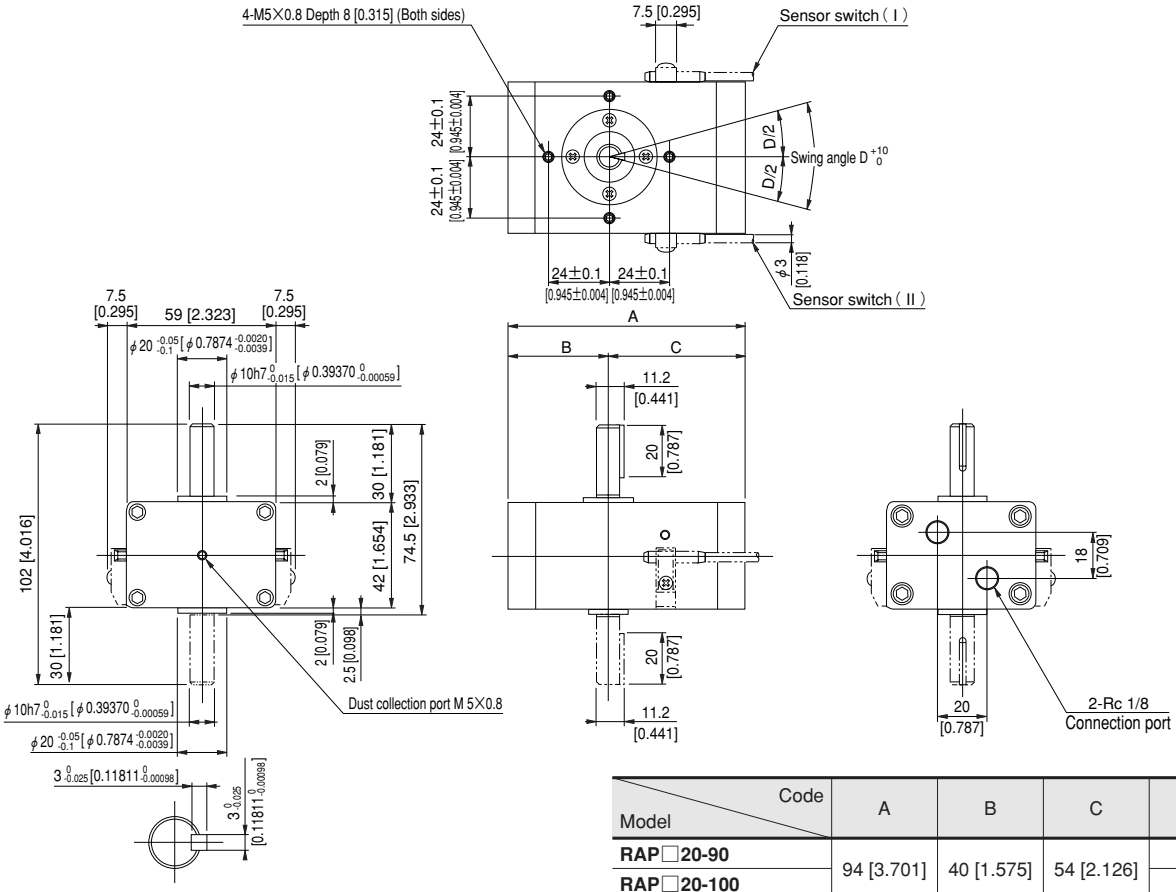
Dimensions mm [in.]

CS-RAP□10



Model \ Code	A	B	C	D
RAP□10-90	81 [3.189]	34.5 [1.358]	46.5 [1.831]	90°
RAP□10-100				100°
RAP□10-180	103 [4.055]	44 [1.732]	59 [2.323]	180°
RAP□10-190				190°
RAP□10-360	151 [5.945]	67 [2.638]	84 [3.307]	360°

CS-RAP□20



Model \ Code	A	B	C	D
RAP□20-90	94 [3.701]	40 [1.575]	54 [2.126]	90°
RAP□20-100				100°
RAP□20-180	120 [4.724]	52 [2.047]	68 [2.677]	180°
RAP□20-190				190°
RAP□20-360	179 [7.047]	80 [3.150]	99 [3.898]	360°

Sensor Switches

Order Codes

					Sensor switch model	Lead wire length	Holder / nominal torque	
Solid state type	2-lead wire	With indicator lamp	DC10～28V	CS-	ZC130	A B	-RAPS	1 5 10 20
Solid state type	3-lead wire	With indicator lamp	DC4.5～28V		ZC153			
Reed switch type	2-lead wire	Without Indicator lamp	DC5～28V AC85～115V		CS5T			
Reed switch type	2-lead wire	With indicator lamp	DC10～28V		CS11T			

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

●A：1000mm [39in.]
B：3000mm [118in.]

●**Blank**: Without holder
-RAPS: With holder

●**Blank :** Without holder
1：For **RAPS1**
5：For **RAPS5**
10：For **RAPS10**
20：For **RAPS20**
Note: When ordering with holder, enter the nominal torque.

●Order code for holder only

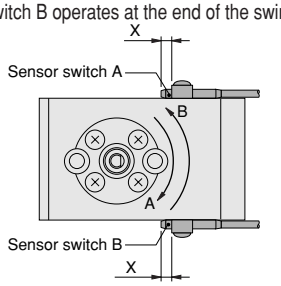
CS － C1-RAPS □

Clean system product

Nominal torque
1
5
10
20

Swing End Detection and Mounting Location of Sensor Switch

When the sensor switch is mounted in the location shown in the diagram, the magnet comes to the maximum sensing location of the sensor switch at the end of the swing. At this time, the sensor switch A operates at the end of the swing in the A direction, and sensor switch B operates at the end of the swing in the B direction.

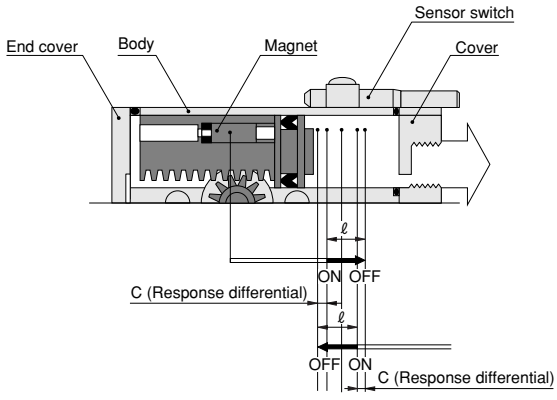


Notes: 1. Do not mount the sensor switch in the reverse direction.
2. When an external stopper, etc., limits the swing angle, note that there may be cases where the sensor switch does not operate within the above adjusting range.

mm [in.]

Model	X：Maximum sensing location		
	ZC130, ZC153	CS5T	CS11T
RAPS1	6.5 [0.256]	5.0 [0.197]	8.5 [0.335]
RAPS5	7.0 [0.276]	5.5 [0.217]	9.0 [0.354]
RAPS10	6.5 [0.256]	5.0 [0.197]	8.5 [0.335]
RAPS20			

Sensor Switch Operating Range and Response Differential



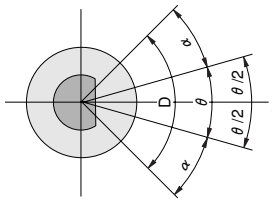
mm [in.]

CS5T□		CS11T□		ZC1□□□	
Operating range ℓ	Response differential C	Operating range ℓ	Response differential C	Operating range ℓ	Response differential C
4.7～10.8 [0.185～0.425]	1.4 [0.055] or less	6.8～9.5 [0.268～0.374]	1.4 [0.055] or less	1.5～4.7 [0.059～0.185]	0.3 [0.012] or less

Remark: The above table shows reference values.

Reference

● When use of an external stopper limits the swing angle, 2 sensor switches can be used up to the angle (α) shown below. The recommended type of the sensor switch is a solid state sensor switch for its short operating range.

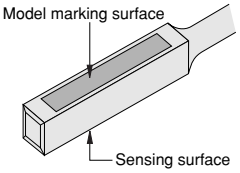


D : Swing angle
θ : Range where sensor switch cannot detect
α : Range where sensor switch can detect

Model	Swing angle	θ Note	α
RAPS1	90°	56°	17°
	100°		22°
	180°		62°
	190°		67°
	360°	100°	130°
RAPS5	90°	42°	24°
	100°		29°
	180°		69°
	190°		74°
	360°	170°	95°
RAPS10	90°	32°	29°
	100°		34°
	180°		70°
	190°	40°	75°
	360°	220°	70°
RAPS20	90°	26°	32°
	100°		37°
	180°		50°
	190°	80°	55°
	360°	250°	55°

Note: Two sensor switches may be ON at the same time when the angle adjustment is set to this value or below.
Remark: For the use of reed type sensor switches, or for swing starting points other than those listed above, consult us.

● **Caution when installing RAP with sensor switch**



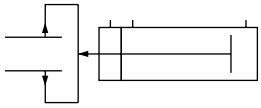
In the ZC type sensor switches, the opposite side from the model marking surface is the sensing surface side. Mount it so that the cylinder magnet comes to the sensing surface side.

KOGANEI CLEAN SYSTEM

AIR HANDS NHB SERIES PARALLEL TYPE

Linear Guide Specification Double Acting Type

Symbol



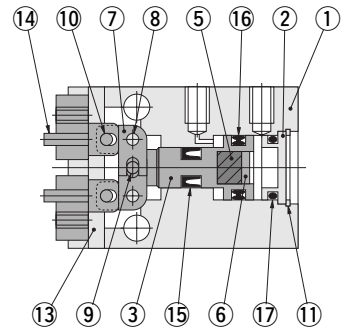
Specifications

Item \ Basic model		CS-NHBDPG-8	CS-NHBDPG-10	CS-NHBDPG-16	CS-NHBDPG-20
Cylinder bore size mm [in.]		8 [0.315]	10 [0.394]	16 [0.630]	20 [0.787]
Operating type		Double acting type			
Media		Air			
Operating pressure range MPa [psi.]		0.22～0.7 [32～102]	0.2～0.7 [29～102]	0.12～0.7 [17～102]	0.1～0.7 [15～102]
Proof pressure MPa [psi.]		1.05 [152]			
Operating temperature range °C [°F]		0～60 [32～140]			
Maximum operating frequency cycle/min		120			
Lubrication		Not required			
Effective gripping force (F)Note 1 N [lbf.]	Closed side	5.8 [1.30]	9.4 [2.11]	26.4 [5.93]	45.0 [10.12]
	Open side	9.9 [2.23]	14.7 [3.30]	39.2 [8.81]	59.8 [13.44]
Lever open/closed stroke mm [in.]		4 [0.157]	6.5 [0.256]	10 [0.394]	14 [0.551]
Repeatability mm [in.]		±0.01 [±0.0004]			
Port size		M3×0.5		M5×0.8	
MassNote 2 g [oz.]		24 [0.85] (29 [1.02])	80 [2.82] (91 [3.21])	159 [5.61] (178 [6.28])	329 [11.60] (355 [12.52])

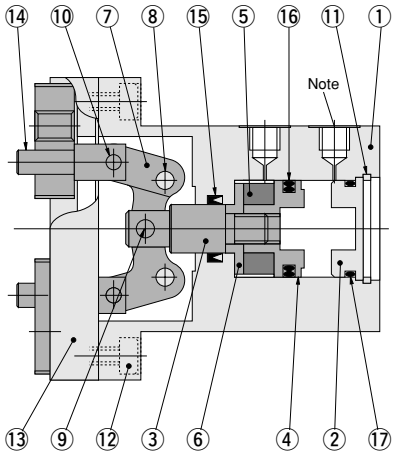
Notes: 1. Values are obtained when gripping point distance is 30mm [1.18in.] under operating pressure 0.5 MPa [73psi.]. For details of the effective gripping force, see the graphs on p.106.
2. ( ) mean the mass with the mounting bracket: **-M**.

Inner Construction

● ϕ8 [0.315]



● ϕ10 [0.394]～ϕ20 [0.787]



Note: The plug is attached to the extra connection port on the side surface.
(Except ϕ 8 [0.315in.])

Major Parts and Materials

No.	Parts	Materials	Remarks
①	Body	Aluminum alloy	
②	Head cover	Aluminum alloy	
③	Piston rod	Stainless steel	
④	Piston	Aluminum alloy	Except ϕ 8 [0.315in.]
⑤	Magnet	Plastic magnet	
⑥	Magnet holder	Aluminum alloy	
⑦	Action lever	Steel	
⑧	Fulcrum pin	Steel	
⑨	Press fit pin	Steel	
⑩	Press fit pin	Steel	
⑪	Internal snap ring	Steel	
⑫	Hexagon socket head bolt	Steel	
⑬	Bearing	Stainless steel	
⑭	Knuckle	Stainless steel	
⑮	Seal	Synthetic rubber (NBR)	
⑯	Seal	Synthetic rubber (NBR)	
⑰	O-ring	Synthetic rubber (NBR)	

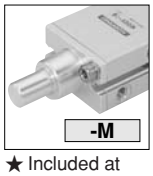
Order Codes

■Clean system product

■Mounting bracket

Without mounting bracket

With mounting bracket



★ Included at shipping

■Sensor switch

Without sensor switch

With **ZE135**

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

With **ZE155**

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

With **ZE235**

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

With **ZE255**

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

■Lead wire length

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

■Number of sensor switches
(Applied to air hands with sensor switches)

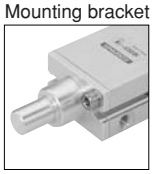
1 : With 1 sensor switch
2 : With 2 sensor switches

★Included at shipping

	Basic model		Cylinder bore size				
Double acting type	**CS**	**-NHBDPG**	**-8** **-10** **-16** **-20**	**-M**	**-ZE135** **-ZE155** **-ZE235** **-ZE255**	**A** **B**	**1** **2**

Additional Parts (To be ordered separately)

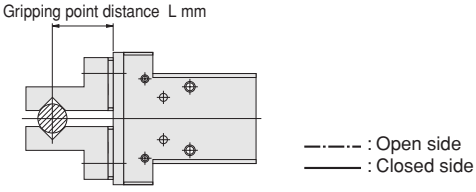
Mounting bracket



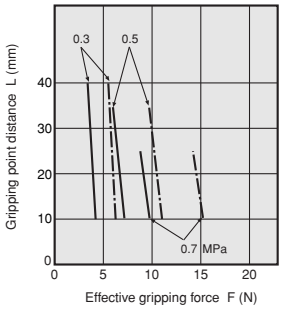
● For ϕ 8 [0.315in.] **NHB-M8**
● For ϕ 10 [0.394in.] **NHB-M10**
● For ϕ 16 [0.630in.] **NHB-M16**
● For ϕ 20 [0.787in.] **NHB-M20**

Selection

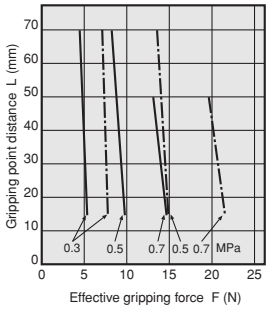
Effective gripping force



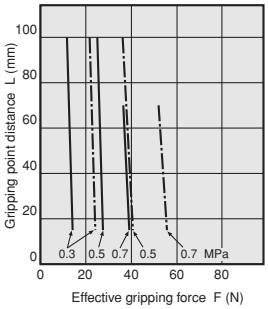
CS-NHBDPG-8



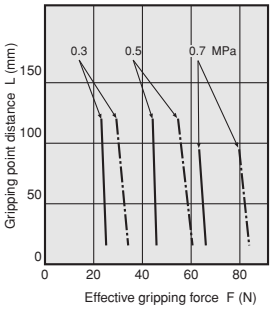
CS-NHBDPG-10



CS-NHBDPG-16

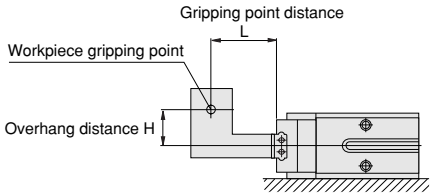


CS-NHBDPG-20

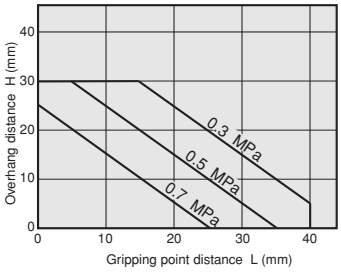


1N=0.2248 lbf. 1mm=0.039 in.
1MPa=145psi.

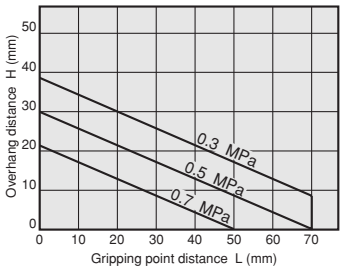
Gripping point limit range



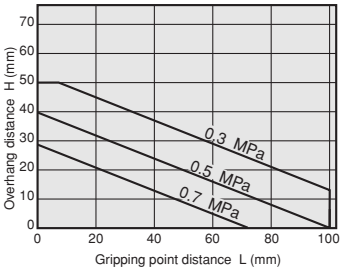
CS-NHBDPG-8



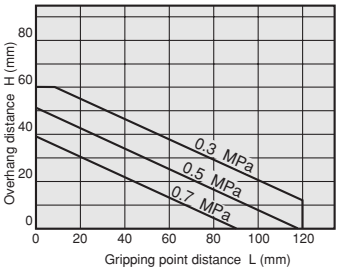
CS-NHBDPG-10



CS-NHBDPG-16



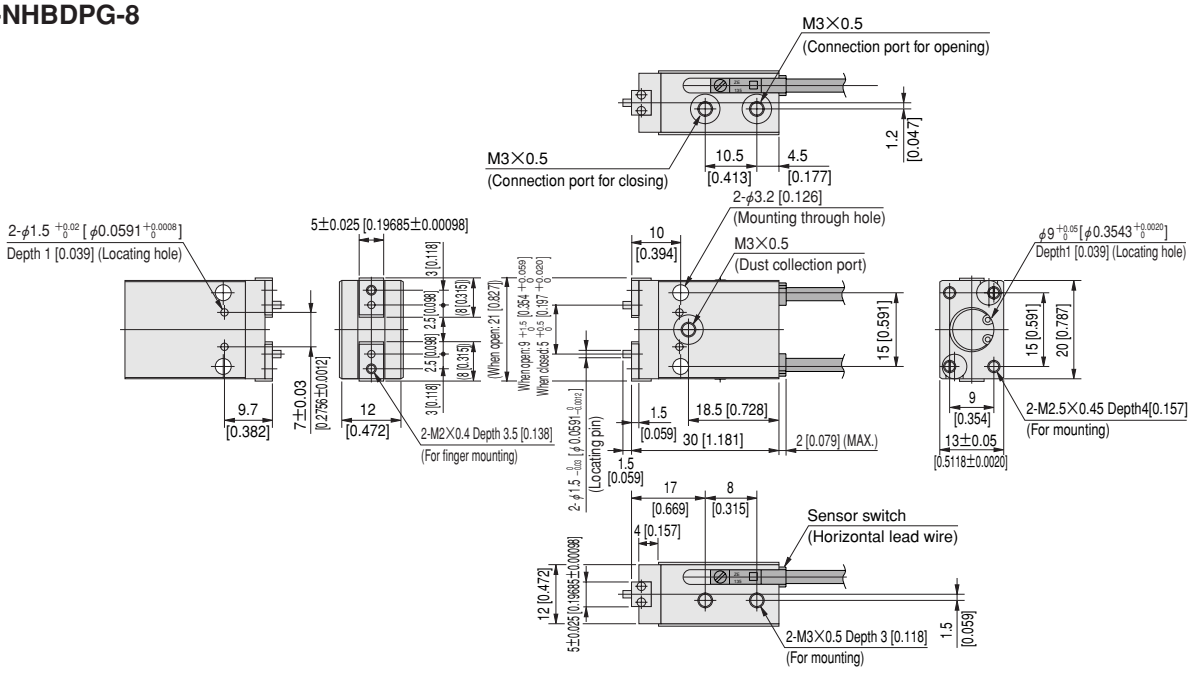
CS-NHBDPG-20



1mm=0.039 in.
1MPa=145psi.

Dimensions mm [in.]

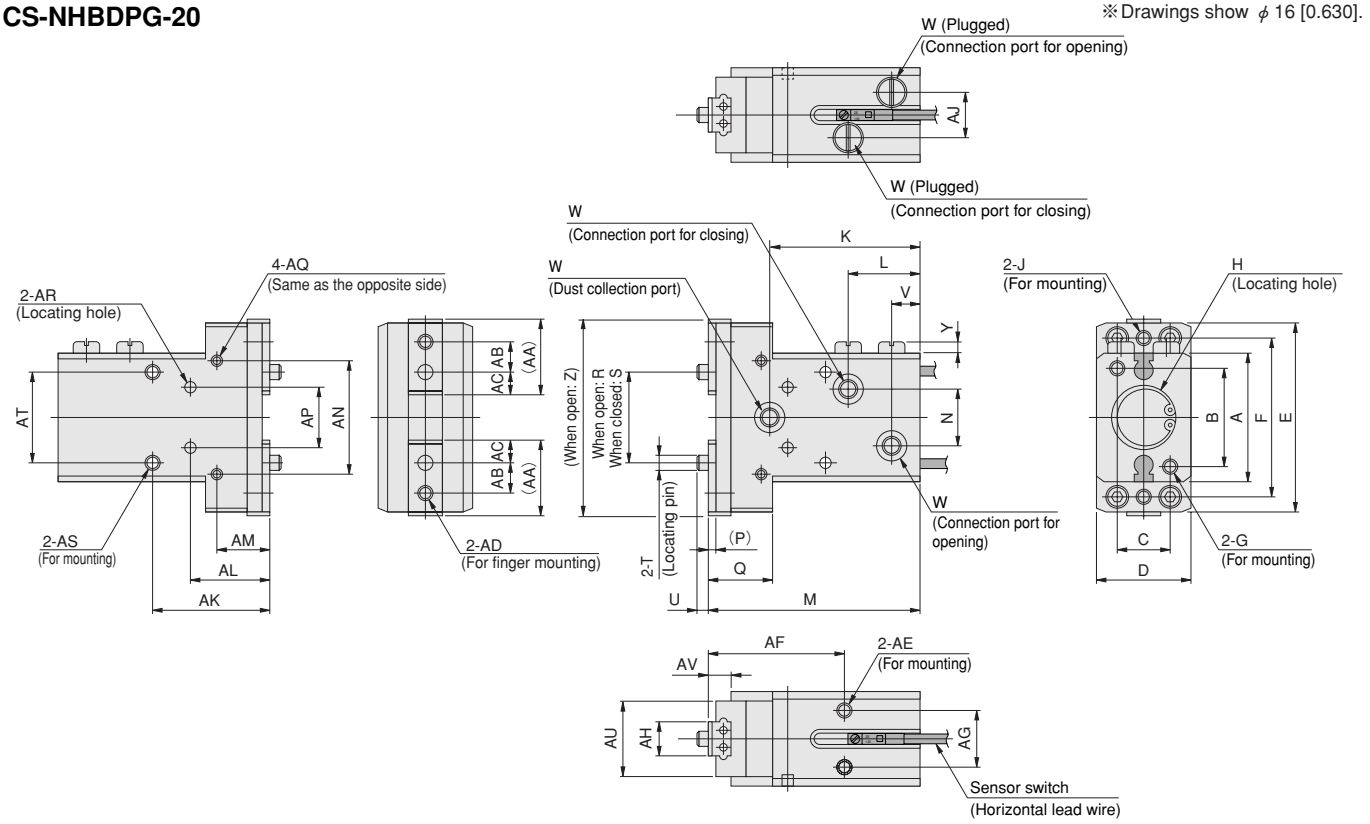
CS-NHBDPG-8



Dimensions mm [in.]

CS-NHBDPG-10
CS-NHBDPG-16
CS-NHBDPG-20

※Drawings show ϕ 16 [0.630].



Model \ Code	A	B	C	D	E	F	G	H	J	K	L	M	N	P
CS-NHBDPG-10	23 [0.906]	17 [0.669]	10 [0.394]	20±0.05 [0.7874±0.0020]	36 [1.417]	30 [1.181]	M3×0.5 Depth 6 [0.236]	$\phi 11^{+0.05}_{0}$ [$\phi 0.4331^{+0.0020}_{0}$] Depth 1.5 [0.059]	M3×0.5 Depth 4.5 [0.177]	35 [1.378]	17 [0.669]	49 [1.929]	7 [0.276]	1.5 [0.059]
CS-NHBDPG-16	34 [1.339]	26 [1.024]	14 [0.551]	25±0.05 [0.9843±0.0020]	50 [1.969]	42 [1.654]	M4×0.7 Depth 7 [0.276]	$\phi 17^{+0.05}_{0}$ [$\phi 0.6693^{+0.0020}_{0}$] Depth 1.5 [0.059]	M4×0.7 Depth 5 [0.197]	40 [1.575]	19 [0.748]	56 [2.205]	15 [0.591]	2 [0.079]
CS-NHBDPG-20	45 [1.772]	35 [1.378]	16 [0.630]	32±0.05 [1.2598±0.0020]	62 [2.441]	54 [2.126]	M5×0.8 Depth 9 [0.354]	$\phi 21^{+0.05}_{0}$ [$\phi 0.8268^{+0.0020}_{0}$] Depth 1.5 [0.059]	M4×0.7 Depth 7 [0.276]	45 [1.772]	21 [0.827]	67 [2.638]	17 [0.669]	3 [1.181]

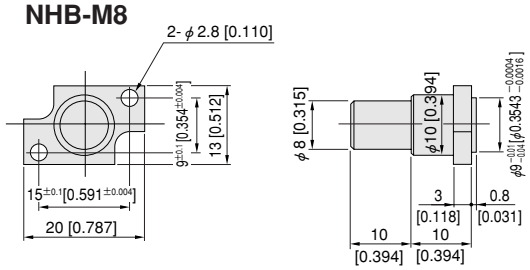
Q	R	S	T	U	V	W	Y	Z	AA	AB	AC	AD	AE	AF	AG
14	$15.5^{+0.8}_{0}$ [$0.610^{+0.031}_{0}$]	$9^{+0.5}_{0}$ [$0.354^{+0.020}_{0}$]	$\phi 3^{0}_{-0.03}$ [$\phi 0.1181^{0}_{-0.0012}$]	2 [0.079]	7.5 [0.295]	M3×0.5	2 [0.079]	37 [1.457]	14.7 [0.579]	5 [0.197]	4.5 [0.177]	M3×0.5 Depth 4 [0.157]	M3×0.5 Depth 5 [0.197]	29 [1.142]	12 [0.472]
17	$22^{+1.8}_{0}$ [$0.866^{+0.071}_{0}$]	$12^{+1.3}_{0}$ [$0.472^{+0.051}_{0}$]	$\phi 4^{0}_{-0.03}$ [$\phi 0.1575^{0}_{-0.0012}$]	3 [0.118]	7.5 [0.295]	M5×0.8	3 [0.118]	52 [2.047]	20 [0.787]	8 [0.315]	6 [0.236]	M4×0.7 Depth 5 [0.197]	M4×0.7 Depth 6 [0.236]	36 [1.417]	15 [0.591]
23	$30^{+2.9}_{0}$ [$1.181^{+0.114}_{0}$]	$16^{+1.4}_{0}$ [$0.630^{+0.055}_{0}$]	$\phi 5^{0}_{-0.03}$ [$\phi 0.1969^{0}_{-0.0012}$]	3 [0.118]	7.5 [0.295]	M5×0.8	3 [0.118]	64 [2.520]	24 [0.945]	8 [0.315]	8 [0.315]	M5×0.8 Depth 7 [0.276]	M5×0.8 Depth 8 [0.315]	43 [1.693]	18 [0.709]

AH	AJ	AK	AL	AM	AN	AP	AQ	AR	AS	AT	AU	AV
7±0.025 [0.27559±0.00098]	9 [0.354]	24 [0.945]	16 [0.630]	11 [0.433]	20 [0.787]	12±0.03 [0.4724±0.0012]	M3×0.5 Depth 5 [0.197]	$\phi 2.5^{+0.02}_{0}$ [$\phi 0.0984^{+0.0008}_{0}$] Depth 2.5 [0.098]	M4×0.7 Depth 6 [0.236], Drilled hole diameter ϕ 3.4 [0.134] thru hole	17 [0.669]	17 [0.669]	6 [0.236]
9±0.025 [0.35433±0.00098]	12 [0.472]	31 [1.220]	21 [0.827]	14 [0.551]	30 [1.181]	16±0.03 [0.6299±0.0012]	M3×0.5 Depth 5 [0.197]	$\phi 3^{+0.02}_{0}$ [$\phi 0.1181^{+0.0008}_{0}$] Depth 3 [0.118]	M4×0.7 Depth 7 [0.276], Drilled hole diameter ϕ 3.4 [0.134] thru hole	24 [0.945]	20 [0.787]	8 [0.315]
12±0.025 [0.47244±0.00098]	16 [0.630]	37 [1.457]	27.3 [1.075]	17 [0.669]	40 [1.575]	22±0.03 [0.8661±0.0012]	M4×0.7 Depth 6 [0.236]	$\phi 4^{+0.02}_{0}$ [$\phi 0.1575^{+0.0008}_{0}$] Depth 3.5 [0.1378]	M4×0.8 Depth 8 [0.315], Drilled hole diameter ϕ 4.2 [0.165] thru hole	30 [1.181]	27 [1.063]	10 [0.394]

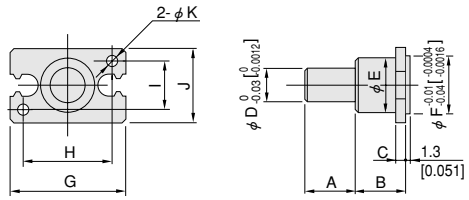
Options

● Mounting bracket: **-M**

NHB-M8



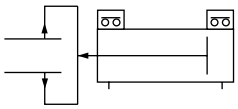
NHB-M10, M16, M20



Model \ Code	A	B	C	D	E	F	G	H	I	J	K
NHB-M10	15 [0.591]	15 [0.591]	3 [0.118]	10 [0.394]	11 [0.433]	11 [0.433]	23 [0.906]	17 [0.669]	10 [0.394]	16 [0.630]	3.4 [0.134]
NHB-M16	15 [0.591]	15 [0.591]	3 [0.118]	10 [0.394]	16 [0.630]	17 [0.669]	34 [1.339]	26 [1.024]	14 [0.551]	22 [0.866]	4.5 [0.177]
NHB-M20	15 [0.591]	15 [0.591]	3 [0.118]	10 [0.394]	18 [0.709]	21 [0.827]	45 [1.772]	35 [1.378]	16 [0.630]	26 [1.024]	5.5 [0.217]

Sensor Switches

Symbol



Order Codes

●**Sensor switch only**

CS — □ □ — **NHB**

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

Sensor switch
ZE135 — Solid state type 2-lead wire with indicator lamp DC10～28V, Horizontal lead wire
ZE235 — Solid state type 2-lead wire with indicator lamp DC10～28V, Vertical lead wire
ZE155 — Solid state type 3-lead wire with indicator lamp DC4.5～28V, Horizontal lead wire
ZE255 — Solid state type 3-lead wire with indicator lamp DC4.5～28V, Vertical lead wire
●For details of sensor switches, see p.111～121.

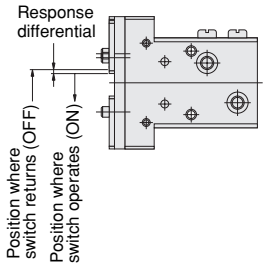
Clean system product

Sensor Switch Operating Range and Response Differential

●**Open/closed stroke differential (Open/closed angle differential)**
The stroke differential (angle differential) between the point where the lever on one side moves and turns the switch ON and the point where the switch is turned OFF as the lever travels in the opposite direction.

●**Operating position repeatability**
When the lever on one side moves in the same direction, operating position repeatability is defined as the range of the deviation of the position where the switch is turned ON or turned OFF.

Parallel type linear guide specification



●Parallel type linear guide specification

mm [in.]

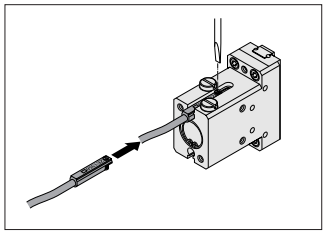
Model	Open/closed stroke differential	Operating position repeatability
(CS-)NHB□PG(L,Y)-8	0.5 [0.020]	0.2 [0.008]
(CS-)NHB□PG(L,Y)-10	0.5 [0.020]	0.2 [0.008]
(CS-)NHB□PG(L,Y)-16	0.8 [0.031]	0.2 [0.008]
(CS-)NHB□PG(L,Y)-20	0.8 [0.031]	0.2 [0.008]

Remark: The above table shows reference values.

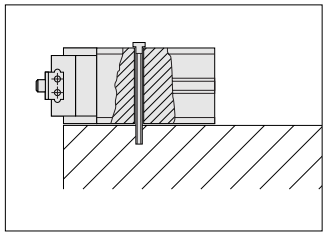
Precautions for Sensor Switch Mounting

Tighten the mounting screw after the sensor switch is inserted in the switch mounting groove in the direction of the arrow in the diagram and move to the proper location. Tightening torque of the mounting screw is 0.1～0.2N･m [0.9～1.8in･lbf].

Caution: Care must be exercised that the sensor switch cannot be inserted into the switch mounting groove from the diagram's top direction.

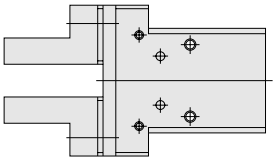


Caution: Care must be exercised that a sensor switch cannot be mounted when the body is installed by using thru holes, as shown in the diagram to the right.

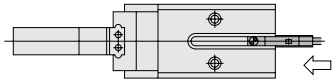


●Adjusting Sensor Switch Mounting Position (Mount the sensor switch so that the surface showing the model marking faces up.)

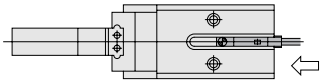
《For internal gripping》



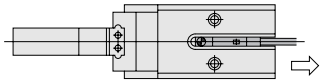
① Confirm the levers are completely open.



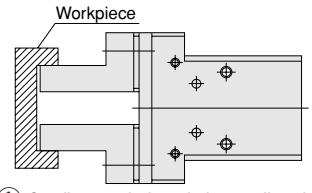
② Push the switch into the groove on the body in the direction of the arrow.



③ By moving the sensor switch in the direction of the arrow, the lamp turns ON, and by moving it further, the lamp turns OFF.

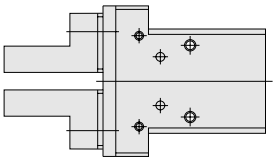


④ By moving back the sensor switch in the direction of the arrow (opposite direction), the lamp turns ON, and it should be secured by the sensor switch mounting screw after moving it about 0.3 mm [0.012in.] further.

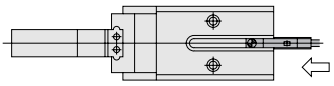


① Confirm workpiece is internally gripped.

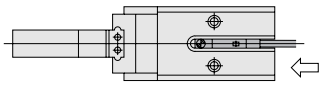
《For external gripping》



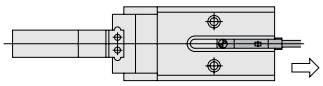
① Confirm the levers are completely closed.



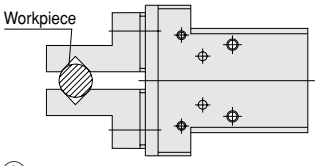
② Push the switch into the groove on the body in the direction of the arrow.



③ By moving the switch in the direction of the arrow, the lamp turns ON.



④ Secure the sensor switch by the mounting screw after moving it about 0.3 mm [0.012in.] further in the direction of the arrow from where the lamp turned ON in ③.



① Confirm workpiece is externally gripped.

Remark: ① shows the desired location for the switch to turn ON. Install and adjust it in accordance with ① ～ ④ above.

ZC130□, ZC153□

Products compliant with the EMC Directive

Solid State Type Sensor Switch

Applicable cylinders

●Multi mount cylinders ●Pen cylinders ●TDA ϕ 6

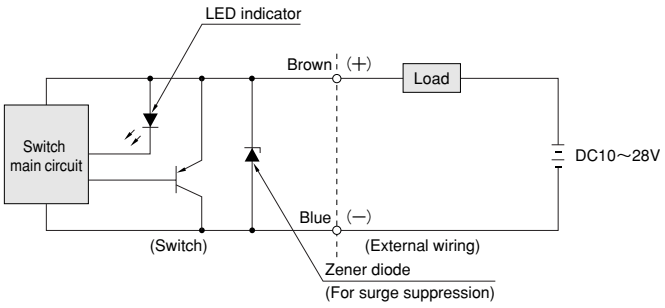
Specifications

Item \ Model	ZC130□	ZC153□
Wiring type	2-lead wire	3-lead wire
Voltage	—	DC4.5～28V
Load voltage	DC10～28V	DC4.5～28V
Load current	4～50mA	100mA MAX.
Consumption current	—	10mA MAX. (DC24V)
Internal voltage drop Note 1	3.5V MAX.	0.5V MAX. (At 50mA load current)
Leakage current	1mA MAX. (DC24V)	50μA MAX. (DC24V)
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)	
Dielectric strength	AC500V (50/60Hz) in 1 minute (Between case and lead wire terminal)	
Shock resistance Note 2	294.2m/s^2 {30G} (Non-repeated shock)	
Vibration resistance Note 2	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz)	
Environmental protection	IP67 (IEC standard), JIS C0920 (Water-proof type)	
Operating indicator	When ON: Red LED indicator lights up	
Lead wire Note 3	PVC 0.2SQ×2-lead×ℓ	PVC 0.2SQ×3-lead×ℓ
Ambient temperature	0～60°C [32～140°F]	
Storage temperature range	−10～70°C [14～158°F]	
Mass	20g [0.71oz.] (For lead wire length A: 1000mm [39in.])	

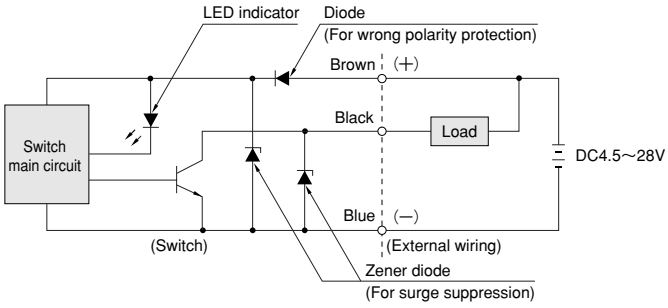
Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ : A; 1000mm [39in.], B; 3000mm [118in.]

Internal Circuit

ZC130□

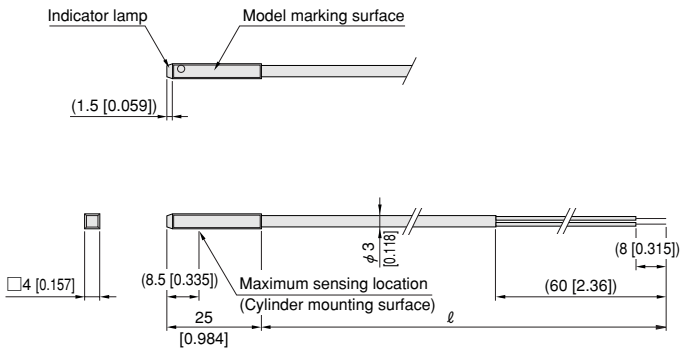


ZC153□

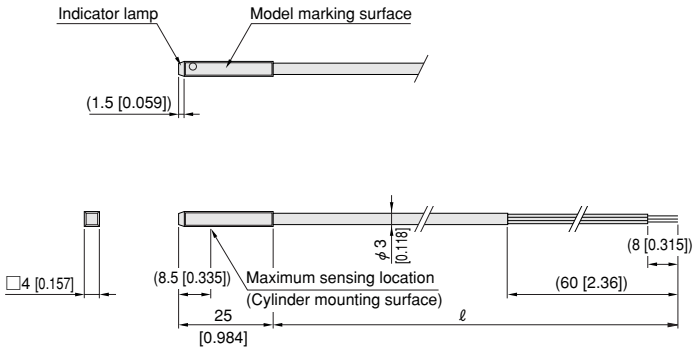


Dimensions mm [in.]

ZC130□



ZC153□



ZC230□, ZC253□

Products compliant with the EMC Directive

Solid State Type Sensor Switch

Applicable cylinders

●**Pen cylinders**

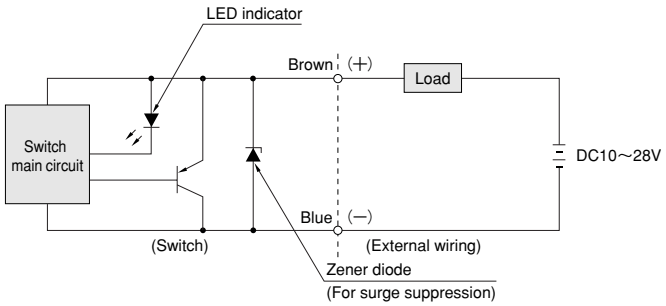
Specifications

Item \ Model	ZC230□	ZC253□
Wiring type	2-lead wire	3-lead wire
Voltage	—	DC4.5～28V
Load voltage	DC10～28V	DC4.5～28V
Load current	4～50mA	100mA MAX.
Consumption current	—	10mA MAX. (DC24V)
Internal voltage drop Note 1	3.5V MAX.	0.5V MAX. (At 50mA load current)
Leakage current	1mA MAX. (DC24V)	50μA MAX. (DC24V)
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)	
Dielectric strength	AC500V (50/60Hz) in 1 minute (Between case and lead wire terminal)	
Shock resistance Note 2	294.2m/s^2 {30G} (Non-repeated shock)	
Vibration resistance Note 2	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz)	
Environmental protection	IP67 (IEC standard), JIS C0920 (Water-proof type)	
Operating indicator	When ON: Red LED indicator lights up	
Lead wire Note 3	PVC 0.2SQ×2-lead×ℓ	PVC 0.2SQ×3-lead×ℓ
Ambient temperature	0～60°C [32～140°F]	
Storage temperature range	−10～70°C [14～158°F]	
Mass	20g [0.71oz.] (For lead wire length A: 1000mm [39in.])	

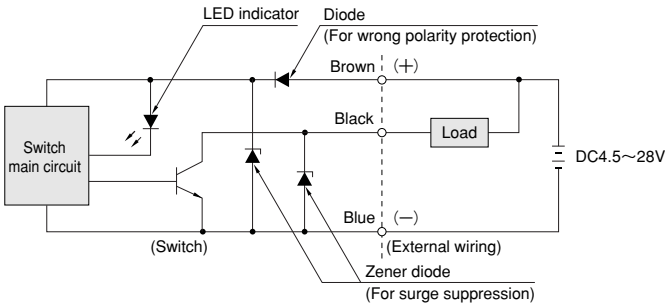
Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ : A; 1000mm [39in.], B; 3000m [118in.]

Internal Circuit

ZC230□

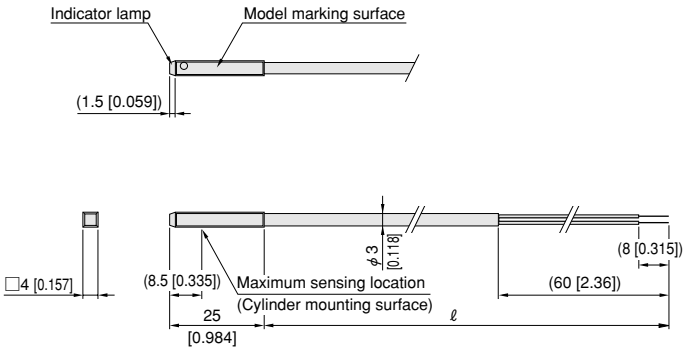


ZC253□

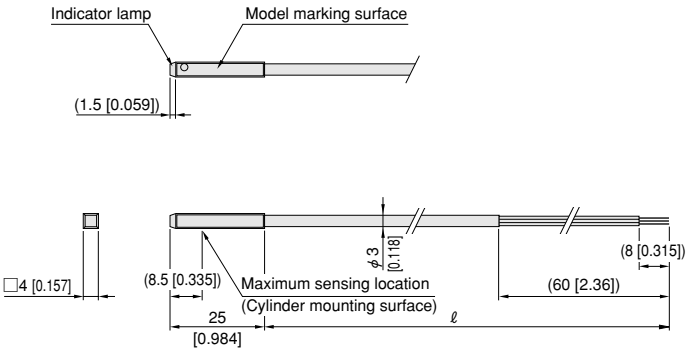


Dimensions mm [in.]

ZC230□



ZC253□



ZG530□, ZG553□

Products compliant with the EMC Directive

Solid State Type Sensor Switch

Applicable cylinders
●Slim cylinders

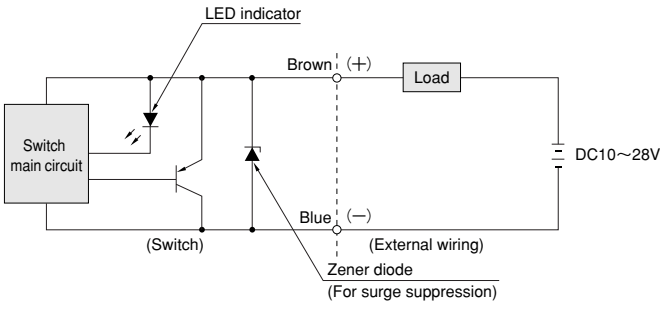
Specifications

Item \ Model	ZG530□	ZG553□
Wiring type	2-lead wire	3-lead wire
Voltage	—	DC4.5～28V
Load voltage	DC10～28V	DC4.5～28V
Load current	4～50mA	100mA MAX.
Consumption current	—	10mA MAX. (DC24V)
Internal voltage drop Note 1	4.5V MAX.	0.5V MAX. (At 50mA load current)
Leakage current	1mA MAX. (DC24V at 25°C [77°F])	50μA MAX. (DC24V)
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)	
Dielectric strength	AC500V (50/60Hz) in 1 minute (Between case and lead wire terminal)	
Shock resistance Note 2	294.2m/s^2 {30G} (Non-repeated shock)	
Vibration resistance Note 2	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz)	
Environmental protection	IP67 (IEC standard), JIS C0920 (Water-proof type)	
Operating indicator	When ON: Red LED indicator lights up	
Lead wire Note 3	PVC 0.2SQ×2-lead×ℓ	PVC 0.2SQ×3-lead×ℓ
Ambient temperature	0～60°C [32～140°F]	
Storage temperature range	−10～70°C [14～158°F]	
Mass	20g [0.71oz.] (For lead wire length A: 1000mm [39in.])	

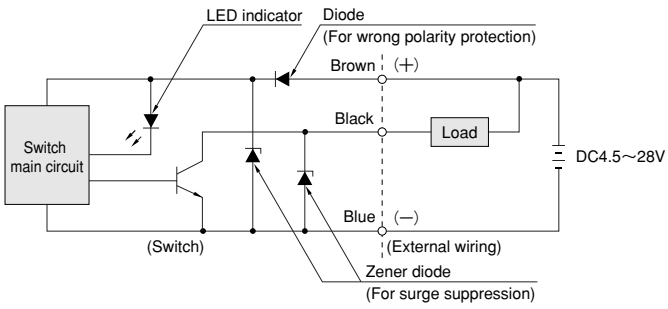
Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ : A; 1000mm [39in.], B; 3000m [118in.]

Internal Circuit

ZG530□

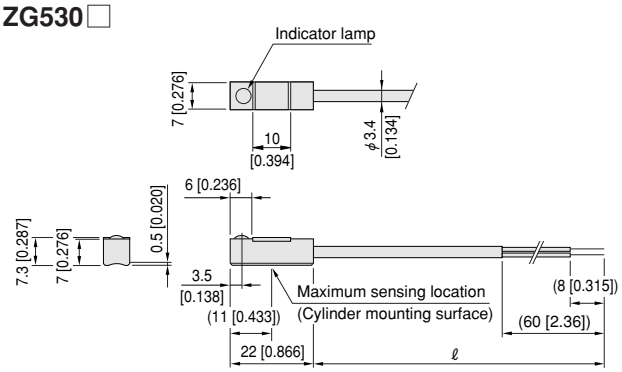


ZG553□

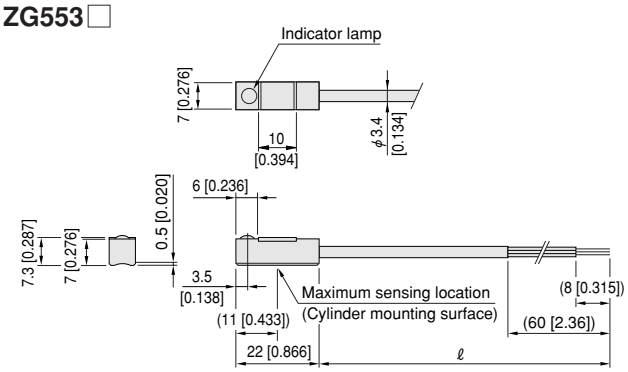


Dimensions mm [in.]

ZG530□



ZG553□



ZE135□, 155□, 235□, 255□

Products compliant with the EMC Directive

Solid State Type Sensor Switch

Applicable cylinders

●Mini bit cylinders ●Jig cylinders C series ●Mini guide sliders ●Jig cylinders with guides ●Twin rod cylinders B series ●Air Hands NHB

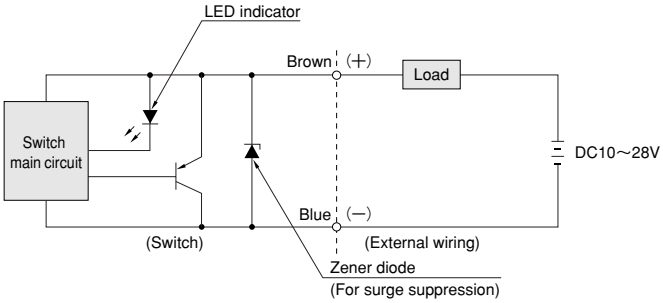
Specifications

Item \ Model	ZE135□	ZE155□	ZE235□	ZE255□
Wiring type	2-lead wire	3-lead wire	2-lead wire	3-lead wire
Lead wire direction	Horizontal		Vertical	
Voltage	—	DC4.5～28V	—	DC4.5～28V
Load voltage	DC10～28V	DC4.5～28V	DC10～28V	DC4.5～28V
Load current	4～20mA (at 25°C [77°F], and 10mA at 60°C [140°F])	50mA MAX.	4～20mA (at 25°C [77°F], and 10mA at 60°C [140°F])	50mA MAX.
Consumption current	—	8mA MAX. (DC24V)	—	8mA MAX. (DC24V)
Internal voltage drop Note 1	4V MAX.	0.5V MAX. (10V or less at 20mA)	4V MAX.	0.5V MAX. (10V or less at 20mA)
Leakage current	0.7mA MAX. (DC24V, 25°C [77°F])	50μA MAX. (DC24V)	0.7mA MAX. (DC24V, 25°C [77°F])	50μA MAX. (DC24V)
Response time	1ms MAX.			
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)			
Dielectric strength	AC500V (50/60Hz) in 1 minute (Between case and lead wire terminal)			
Shock resistance Note 2	294.2m/s^2 {30G} (Non-repeated shock)			
Vibration resistance Note 2	Total amplitude 1.5mm [0.059in.], 10～55Hz (88.3m/s^2 {9G})			
Environmental protection	IEC IP67, JIS C0920 (Water-proof type)			
Operating indicator	When ON: Red LED indicator lights up			
Lead wire Note 3	PCCV 0.2SQ×2-lead (Brown and blue) × ℓ	PCCV 0.15SQ×3-lead (Brown, blue, and black) × ℓ	PCCV 0.2SQ×2-lead (Brown and blue) × ℓ	PCCV 0.15SQ×3-lead (Brown, blue, and black) × ℓ
Ambient temperature	0～60°C [32～140°F]			
Storage temperature range	−10～70°C [14～158°F]			
Mass	15g [0.53oz.] (For lead wire length A: 1000mm [39in.]), 35g [1.23oz.] (For lead wire length B: 3000mm [118in.])			

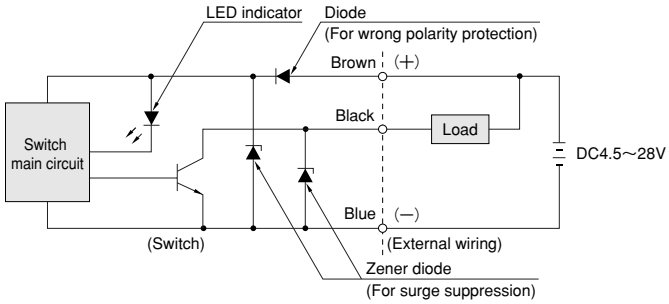
Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ : A; 1000mm [39in.], B; 3000m [118in.]

Internal Circuit

ZE135□, ZE235□

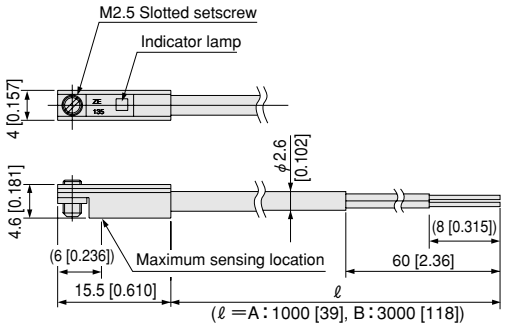


ZE155□, ZE255□

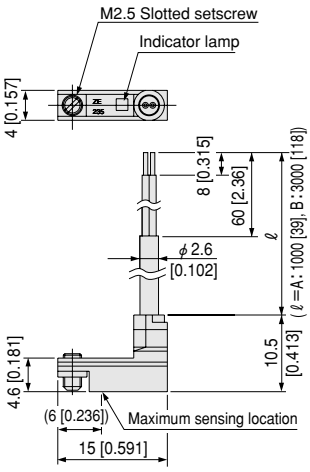


Dimensions mm [in.]

●Horizontal lead wire ZE135□, ZE155□



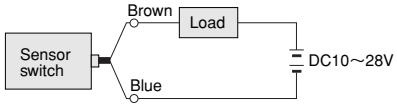
●Vertical lead wire ZE235□, ZE255□



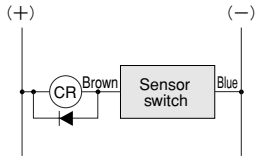
Points of Wiring Solid State Type Sensor Switches

ZC130□, ZC230□, ZC330□
ZC630□, ZE135□, ZE235□
ZG530□, ZD136C

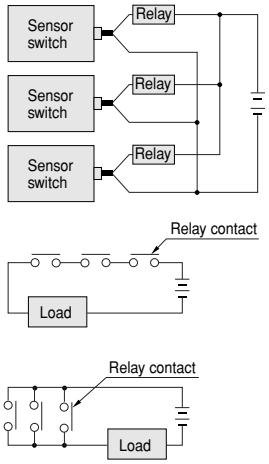
●Basic connection



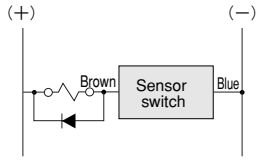
●Connection with relays



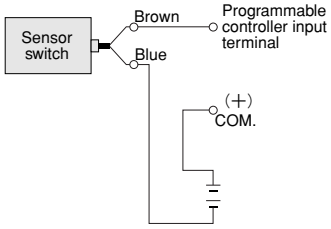
AND (series) connection and OR (parallel) connection



●Connection with solenoid valve

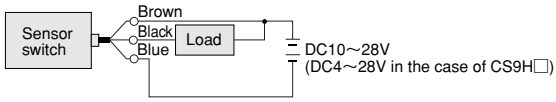


● Connection with programmable controller

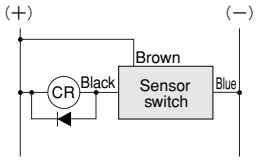


ZC153□, ZC253□, ZC353□, ZC653□
ZE155□, ZE255□, ZG553□, CS9H□

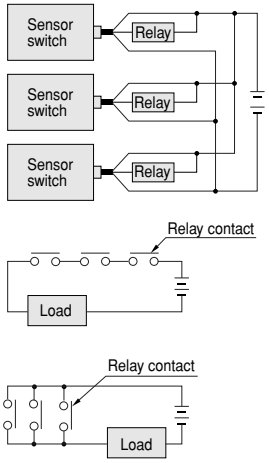
●Basic connection



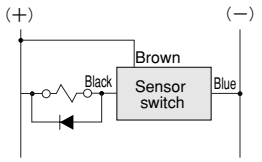
●Connection with relays



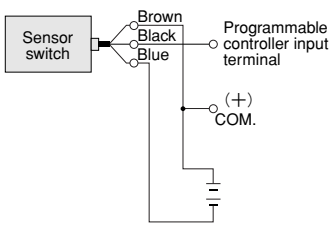
AND (series) connection and OR (parallel) connection



●Connection with solenoid valve

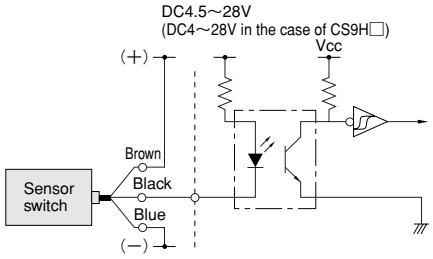


● Connection with programmable controller

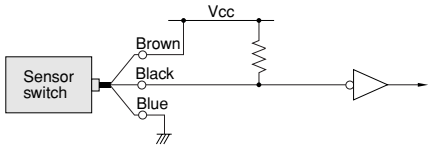


●Connection with TTL

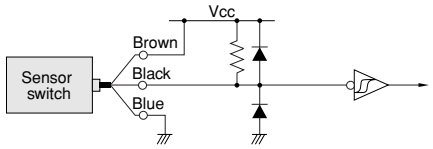
Separate connection



Direct connection



●Connection to C-MOS



Cautions: 1. Connect wires according to the colors of the lead wires. If the connection is incorrect, it could cause an erratic operation and/or damage.
2. Do not connect the 2-lead wire solid state type sensor switch to TTL or C-MOS.
3. A surge suppression protection diode is recommended for the inductive load of electromagnetic relays, etc.
4. Avoid series (AND) connection because the voltage of the circuit will drop in proportion to the number of sensor switches.
5. When using parallel (OR) connection, the same sensor output lines (e.g. the same black lead wires) can be connected together, but the current leakage will increase by the number of sensor switches. Therefore, be aware of load return abnormalities.
6. Because the sensor switches are a magnetically sensitive type, avoid using them in locations subject to strong external magnetic fields or bringing them too close to power lines or other large electric currents are present.
Do not use magnetic material for the mounting part, because it will cause erratic operations.
7. Do not pull or bend the lead wires excessively.
8. Avoid using sensor switches in strong chemical or gas environments.
9. Consult us for use in ambient atmospheres subject to water or oil.

CS5T□, CS11T□

Products compliant with the EMC Directive

Reed Switch Type Sensor Switch

Applicable cylinders

●Multi mount cylinders ●TDA ϕ6

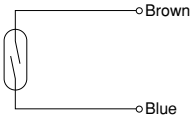
Specifications

Item \ Model	CS5T□	CS11T□
Wiring type	2-lead wire	
Load voltage	DC5～28V, AC85～115V (r.m.s.)	DC10～28V
Load current	DC0.1～40mA, AC2～25mA	DC5～40mA
Internal voltage drop Note 1	0.1V MAX. (At 40mA load current)	2.1V MAX. (At 40mA load current)
Leakage current	0mA	
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)	
Dielectric strength	AC1500V (50/60Hz) in 1 minute (Between case and lead wire terminal)	AC1000V (50/60Hz) in 1 minute (Between case and lead wire terminal)
Shock resistance Note 2	294.2m/s^2 {30G} (Non-repeated shock)	
Vibration resistance Note 2	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz), Resonance frequency 2750±250Hz	
Environmental protection	IP67 (IEC standard), JIS C0920 (Water-proof type)	
Operating indicator	—	When ON: Red LED indicator lights up
Lead wire Note 3	PVC 0.2SQ×2-lead×ℓ	
Ambient temperature	0～60°C [32～140°F]	
Storage temperature range	−10～70°C [14～158°F]	
Contact protection	Required (See contact protection on p.121.)	
Mass	20g [0.71oz.] (For lead wire length A: 1000mm [39in.])	

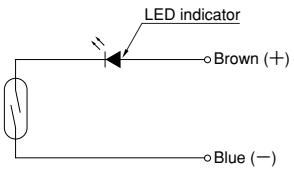
Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ: A; 1000mm [39in.], B; 3000mm [118in.]

Internal Circuit

CS5T□

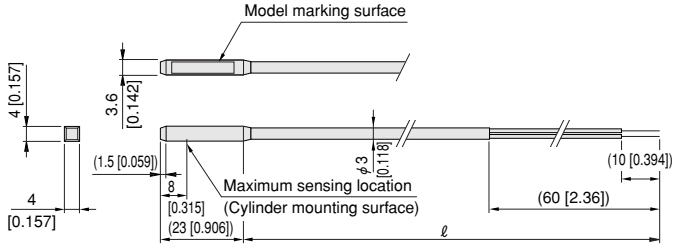


CS11T□

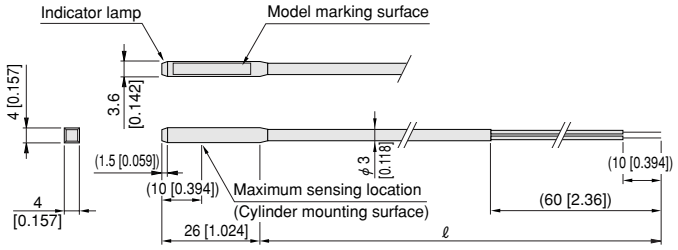


Dimensions mm [in.]

CS5T□



CS11T□



ZC201□, ZC205□

Products compliant with the EMC Directive

Reed Switch Type Sensor Switch

Applicable cylinders

●**Pen cylinders**

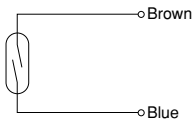
Specifications

Item \ Model	ZC201□	ZC205□
Wiring type	2-lead wire	
Load voltage	DC5～28V, AC85～115V (r.m.s.)	DC10～28V
Load current	DC0.1～40mA, AC2～25mA	DC5～40mA
Internal voltage drop[Note 1]	0.1V MAX. (At 40mA load current)	2.1V MAX. (At 40mA load current)[Note1]
Leakage current	0mA	
Response time	1ms MAX.	
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)	
Dielectric strength	AC1500V (50/60Hz) in 1 minute (Between case and lead wire terminal)	AC1000V (50/60Hz) in 1 minute (Between case and lead wire terminal)
Shock resistance[Note 2]	294.2m/s^2 {30G} (Non-repeated shock)	
Vibration resistance[Note 2]	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz), Resonance frequency 2750±250Hz	
Environmental protection	IP67 (IEC standard), JIS C0920 (Water-proof type)	
Operating indicator	—	When ON: Red LED indicator lights up
Lead wire[Note 3]	PVC 0.2SQ×2-lead×ℓ	
Ambient temperature	0～60°C [32～140°F]	
Storage temperature range	−10～70°C [14～158°F]	
Contact protection	Required (See contact protection on p.121.)	
Mass	20g [0.71oz.] (For lead wire length A: 1000mm [39in.])	

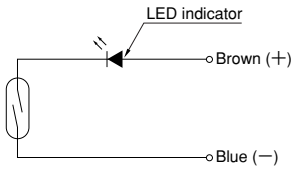
Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ : A; 1000mm [39in.], B; 3000mm [118in.]

Internal Circuit

ZC201□

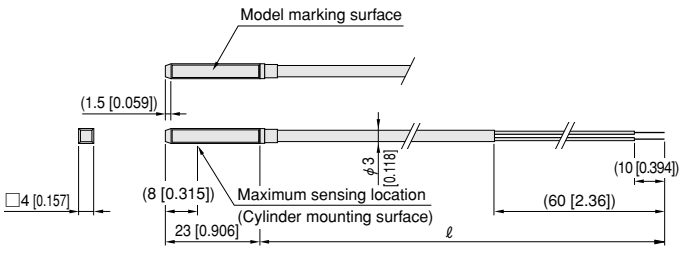


ZC205□

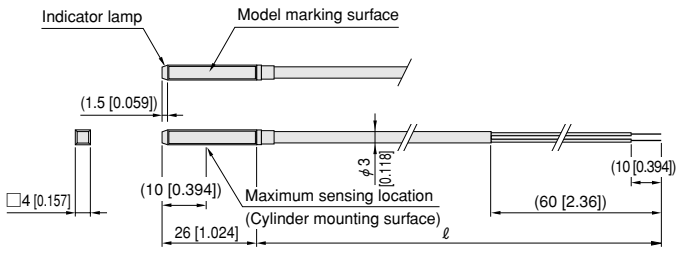


Dimensions mm [in.]

ZC201□



ZC205□



CS3M□, 4M□, 5M□

Reed Switch Type Sensor Switch

Products compliant with the EMC Directive

Applicable cylinders

●**Slim cylinders**

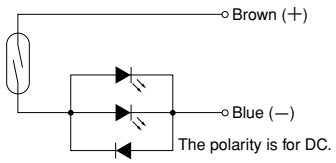
Specifications

Item \ Model	CS3M□		CS4M□		CS5M□	
Wiring type	2-lead wire					
Load voltage	DC10～30V	AC85～230V(r.m.s.)	DC10～30V	AC85～115V(r.m.s.)	DC3～30V	AC85～115V(r.m.s.)
Load current	10～50mA[Note 1]	10～50mA(AC85～115V)[Note 1] 5～15mA(AC115～230V)[Note 1]	5～25mA[Note 1]	5～20mA[Note 1]	0.1～60mA	2～25mA
Internal voltage drop[Note 2]	2.5V MAX. (At 50mA load current)		2.2V MAX. (At 25mA load current)		0.2V MAX. (At 60mA load current)	
Leakage current	0mA					
Response time	1ms MAX.					
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)					
Dielectric strength	AC2200V (50/60Hz) in 1 minute (Between case and lead wire terminal)		AC1500V (50/60Hz) in 1 minute (Between case and lead wire terminal)			
Shock resistance[Note 3]	294.2m/s^2 {30G} (Non-repeated shock)					
Vibration resistance[Note 3]	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz), Resonance frequency 5000±400Hz					
Operating indicator	When ON: Red LED indicator lights up				—	
Lead wire[Note4]	PVC 0.2SQ×2-lead×ℓ					
Ambient temperature	0～60°C [32～140°F]					
Storage temperature range	−10～70°C [14～158°F]					
Contact protection	Required (See contact protection on p.121.)					
Mass	20g [0.71oz.] (For lead wire length A: 1000mm [39in.])					

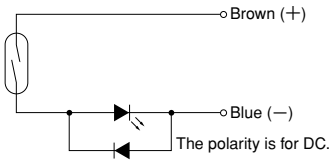
Notes: 1. Ta＝37°C [98.6°F]
2. The internal voltage drop depends on load current.
3. Measured by Koganei test standard.
4. Lead wire length ℓ : A; 1000mm [39in.], B; 3000mm [118in.]

Internal Circuit

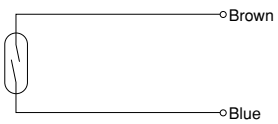
CS3M□



CS4M□

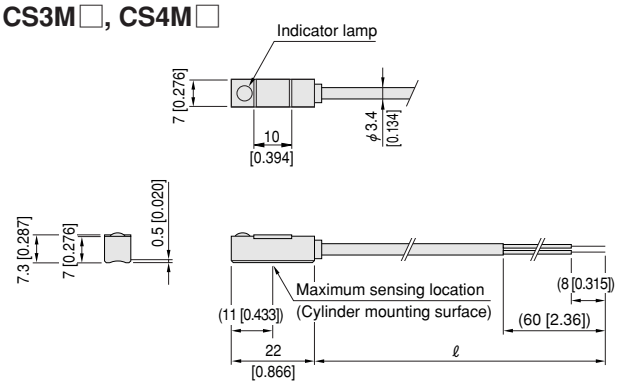


CS5M□

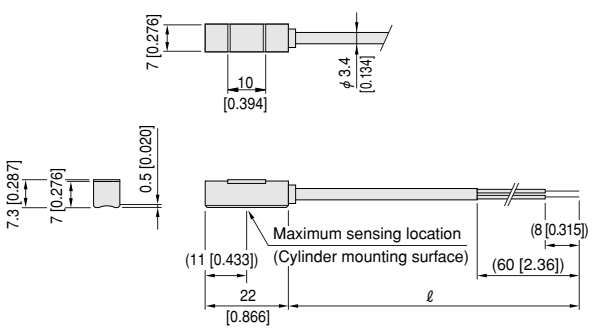


Dimensions mm [in.]

CS3M□, CS4M□



CS5M□



ZE101□, 102□, 201□, 202□

Products compliant with the EMC Directive

Reed Switch Type Sensor Switch

Applicable cylinders

●Jig cylinders C series ●Mini guide sliders ●Jig cylinders with guides ●Twin rod cylinders B series

Specifications

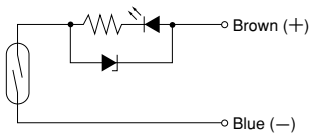
Item \ Model	ZE101□	ZE102□	ZE201□	ZE202□
Wiring type	2-lead wire			
Lead wire direction	Horizontal		Vertical	
Load voltage	DC5～28V, AC85～115V	DC10～28V, AC85～115V	DC5～28V, AC85～115V	DC10～28V, AC85～115V
Load current	DC40mA MAX., AC20mA MAX.	DC5～40mA, AC5～20mA	DC40mA MAX., AC20mA MAX.	DC5～40mA, AC5～20mA
Internal voltage drop Note 1	0.1V MAX. (At 40mA load current)	3.0V MAX.	0.1V MAX. (At 40mA load current)	3.0V MAX.
Leakage current	0mA			
Response time	1ms MAX.			
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)			
Dielectric strength	AC1500V (50/60Hz) in 1 minute (Between case and lead wire terminal)			
Shock resistance Note 2	294m/s^2 {30G} (Non-repeated shock)			
Vibration resistance Note 2	Total amplitude 1.5mm [0.059in.], 10～55Hz 88.3m/s^2 {9G}, Resonance frequency 2750±250Hz			
Environmental protection	IEC IP67, JIS C0920 (Water-proof type)			
Operating indicator	None	When ON: Red LED indicator lights up	None	When ON: Red LED indicator lights up
Lead wire Note 3	PCCV 0.2SQ×2-lead (Brown and blue)×ℓ			
Ambient temperature	0～60°C [32～140°F]			
Storage temperature range	−10～70°C [14～158°F]			
Contact protection	Required (See contact protection on p.121.)			
Mass	15g [0.53oz.] (For lead wire length A: 1000mm [39in.]), 35g [1.23oz.] (For lead wire length B: 3000mm [118in.])			

Notes: 1. The internal voltage drop depends on load current.
2. Measured by Koganei test standard.
3. Lead wire length ℓ : A; 1000mm [39in.], B; 3000mm [118in.]

Internal Circuit

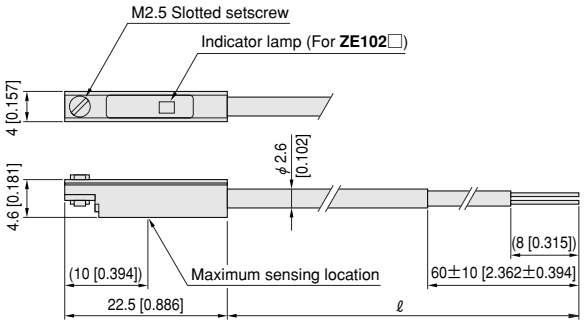
ZE101□, ZE201□

ZE102□, ZE202□

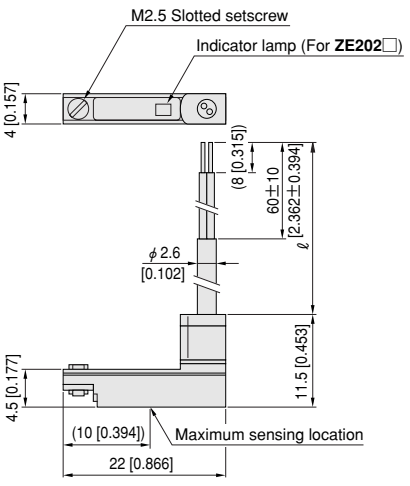


Dimensions mm [in.]

●Horizontal lead wire ZE101□, ZE102□



●Vertical lead wire ZE201□, ZE202□



CS2F, 3F, 4F, 5F

Reed Switch Type Sensor Switch

Applicable cylinders

●**Slim cylinders** Note

Note: Not including Slim block cylinder ϕ 16

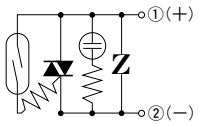
Specifications

Item \ Model	CS2F	CS3F	CS4F	CS5F
Wiring type	2-lead wire			
Load voltage	AC85～230V (r.m.s)	DC5～30V	DC5～30V	DC3～30V
Load current	2～200mA	10～46mA Note 1	5～25mA Note 1	0.1～80mA
Internal voltage drop	0.1V MAX. (At 200mA load current)	3V MAX. (At 46mA load current) Note 2	2.8V MAX. (At 25mA load current) Note 2	0.1V MAX. (At 80mA load current)
Leakage current	1mA MAX. (AC100V) 2mA MAX. (AC200V)	0mA		
Response time	2ms MAX.	1.2ms MAX.		
Insulation resistance	100MΩ MIN. (At DC500V Megger, between case and lead wire terminal)			
Dielectric strength	AC500V (50/60Hz) in 1 minute (Between case and lead wire terminal)			
Shock resistance Note 3	294.2m/s^2 {30G} (Non-repeated shock)			
Vibration resistance Note 3	88.3m/s^2 {9G} (Total amplitude 1.5mm [0.059in.], 10～55Hz), Resonance frequency 5000±400Hz			
Environmental protection	—			
Operating indicator	When ON: Red neon lamp turns off	When ON: Red LED indicator lights up		—
Method of wiring	With DIN connector (Cabtyre outer diameter ϕ 6.5 MAX.,Wire ϕ 1.25SQ MAX.)			
Ambient temperature	0～60°C [32～140°F]			
Storage temperature range	−10～70°C [14～158°F]			
Contact protection	Not required	Required (See contact protection on p.121.)		
Mass	40g [1.41oz.]			

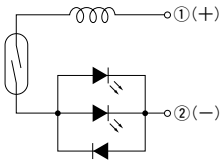
Notes: 1. Ta＝37°C [98.6°F)
2. The internal voltage drop depends on load current.
3. Measured by Koganei test standard.

Internal Circuit

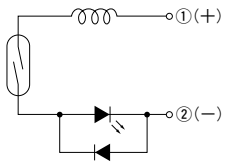
CS2F



CS3F



CS4F

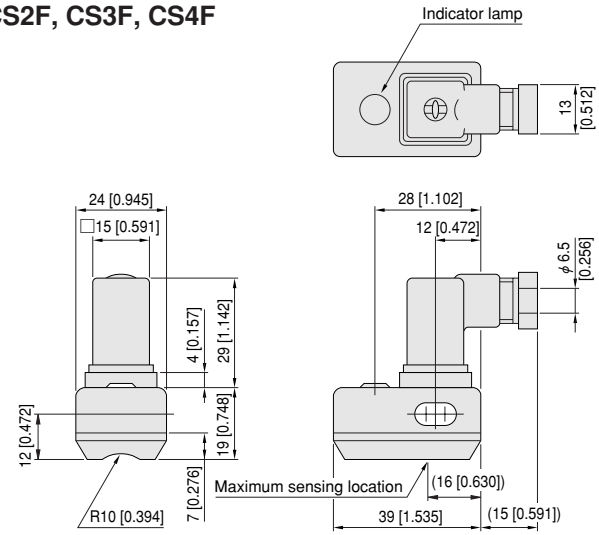


CS5F

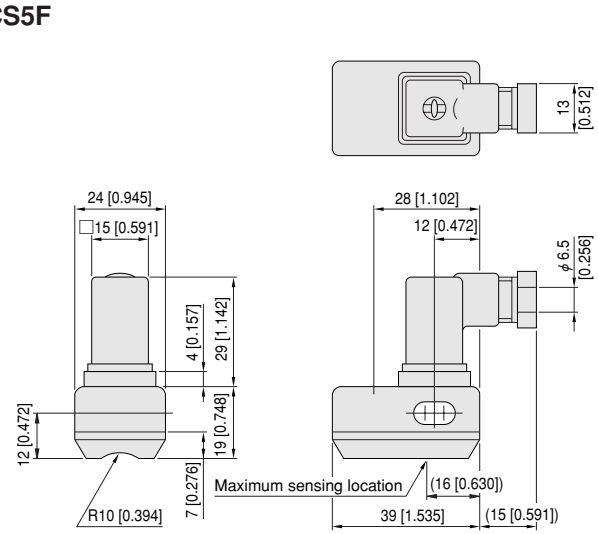
The numbers in circle show the terminal numbers of the F type connector.

Dimensions mm [in.]

CS2F, CS3F, CS4F



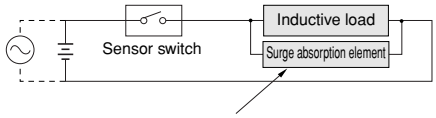
CS5F



Contact Protection for Reed Switch Type Sensor Switches

In order to use the reed switch type sensor switches in a stable condition, take the following contact protection measures.

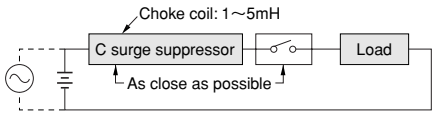
● When connecting inductive load (electromagnetic relay, etc.)



For DC··· Diode, CR, etc.
For AC··· CR, etc.
Diode: Forward current should be more than the circuit current.
Reverse direction voltage should be inverse voltage that is 10 times or more of the circuit voltage.
CR: C=0.01～0.1μF
R=1～4kΩ

●When capacity surge is generated.

(When lead wire length exceeds 10m [3.28ft.].)



EQUIPMENT WITH LOW PARTICLE GENERATION SPECIFICATION

● **Koganei takes orders for the manufacture of products that reduce particle generation to a minimum, in response to customer requests.**
Products with a proven track record are shown below.
For specifications (number of particles), delivery, prices, and other details, consult us.

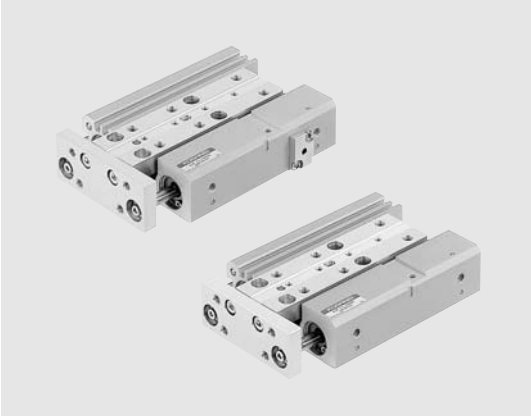
■Multi Sliders

Note: The photo shows standard equipment.

(Order Code Examples)

MS 6 × Stroke **- 2W**
MS 10 × Stroke **- 2W**
MS 16 × Stroke **- 2W**
MS 20 × Stroke **- 2W**

■Z Sliders



Note: The photo shows standard equipment.

(Order Code Examples)

ZS 6 × Stroke **- 11W**
ZS 10 × Stroke **- 11W**
ZS 16 × Stroke **- 11W**
ZS 20 × Stroke **- 11W**
ZS 25 × Stroke **- 11W**

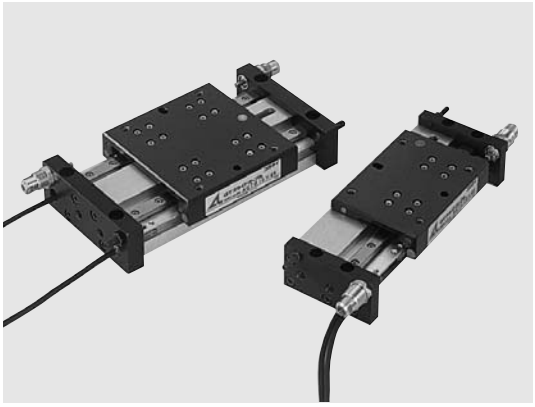
■Rod Sliders

Note: The photo shows standard equipment.

(Order Code Examples)

ARS 6 × Stroke **- 8W**
ARS 10 × Stroke **- 8W**
ARS 16 × Stroke **- 8W**
ARS 20 × Stroke **- 8W**
ARS 25 × Stroke **- 8W**

■GT Slide Tables



Note: The photo shows standard equipment.

(Order Code Examples)

AGTB 10 × Stroke **- 21W**

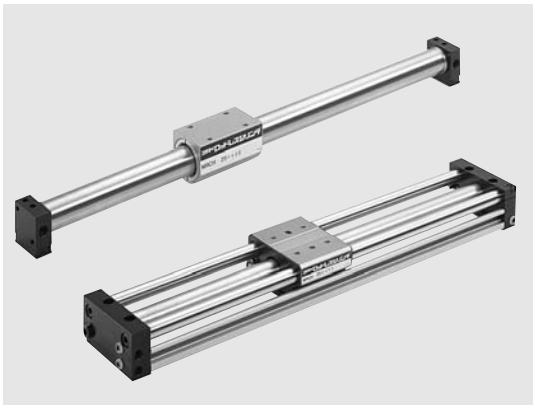
AGTB 16 × Stroke **- 21W**

AGTB 25 × Stroke **- 21W**

AGTC 10 × Stroke **- 21W**

AGTC 16 × Stroke **- 21W**

■Magnet Type Rodless Cylinders MRC, MRG Series



Note: The photo shows standard equipment.

(Order Code Examples)

MRCH (MRGH) 6 × Stroke **- 1002W**

MRCH (MRGH) 10 × Stroke **- 1002W**

MRCH (MRGH) 16 × Stroke **- 1002W**

MRCH (MRGH) 20 × Stroke **- 1002W**

MRCH (MRGH) 25 × Stroke **- 1002W**

MRCH (MRGH) 32 × Stroke **- 1002W**

MRCH (MRGH) 40 × Stroke **- 1002W**

■Magnet Type Rodless Cylinders MRS Series

Note: The photo shows standard equipment.

(Order Code Examples)

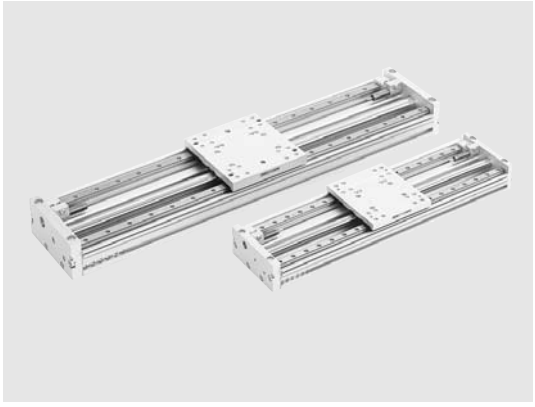
MRS 10 × Stroke **- 1014W**

MRS 16 × Stroke **- 1014W**

MRS 20 × Stroke **- 1014W**

MRS 25 × Stroke **- 1014W**

■Magnet Type Rodless Cylinders MRW Series



Note: The photo shows standard equipment.

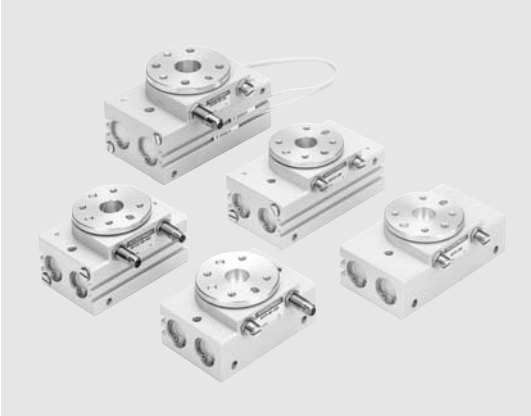
(Order Code Examples)

MRW 16 × Stroke **- 1014W**

MRW 25 × Stroke **- 1014W**

MRW 40 × Stroke **- 1014W**

■Rotary Actuators RAT Series



Note: The photo shows standard equipment.

(Order Code Examples)

RAT 5 × Swing angle - 10W

RAT 10 × Swing angle - 10W

RAT 30 × Swing angle - 10W

■Cylinder Joints

Note: The photo shows standard equipment.

(Order Code Examples)

CJ- 3 × 0.5 - 48W

CJ- 4 × 0.7 - 47W

CJ- 5 × 0.8 - 46W

CJ- 6 × 1 - 45W

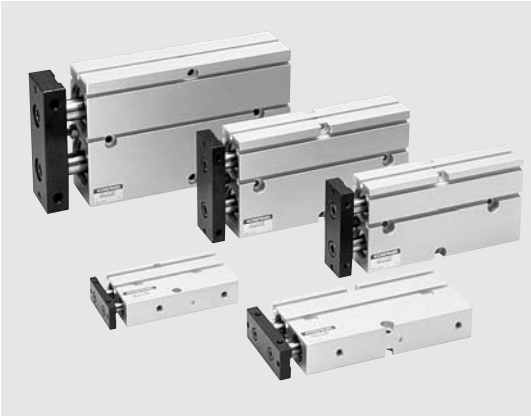
CJS (CJL) - 8 × 1 - 41W

CJS (CJL) - 10 × 1.25 - 42W

CJL - 12 × 1.25 - 116W

CJL - 14 × 1.5 - 39W

■Twin Rod Cylinders B Series



Note: The photo shows standard equipment.

(Order Code Examples)

ATBDA 10 × Stroke - 14W

ATBDA 16 × Stroke - 14W

ATBDA 20 × Stroke - 14W

ATBDA 25 × Stroke - 14W

ATBDA 32 × Stroke - 14W

Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.
- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.
- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.
- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.
- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

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