Stainless Steel Cylinder
Series CJ5-S
ø10, ø16

How to Order

Bore size

10	10 mm
16	16 mm

Mounting style

B	Basic style
L	Axial foot style
F	Rod side flange style
D	Double clevis style

Cylinder stroke (mm)
Refer to "Standard Stroke" on page 835.

	CJ5	L	16	S	R	–	60		–	
With auto switch	CDJ5	L	16	S	R	–	60		– H7BAL		–	

With auto switch
(Built-in magnet)

Stainless steel cylinder

Seal material

R	NBR seals (Nitrile rubber)
V	FKM seals (Fluororubber)

Port location on head cover

Nil	Perpendicular to axis
R	In-line

∗ Only perpendicular to the axis for double clevis style.

Auto switch

B	Without auto switch
H7BAL	D-H7BAL (Water resistant)

Only band mounting auto switches are available.

Number of auto switches

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

Made to Order
Refer to page 835 for details.

Built-in Magnet Cylinder Model

If a built-in magnet cylinder without an auto switch is required, there is no need to enter the symbol for the auto switch.
(Example) CDJ5B10SV-45R

Applicable Auto Switch/Refer to page 1306 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC		Auto switch model	Lead wire length (m)∗ 3 (L)	Lead wire length (m)∗ 5 (Z)	Pre-wired connector	Applicable load
Solid state switch	Water resistant (2-color indication)	Grommet	Yes	2-wire	24 V	12 V	H7BA	●	○	○	Relay, PLC

∗ Lead wire length symbols: 3 m·····L (Example) H7BAL
5 m·····Z (Example) H7BAZ

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

• For details about auto switches with pre-wired connector, refer to pages 1328 and 1329.

Auto Switch Mounting Bracket Part No.

Mounting bracket	Bore size (mm) 10	Bore size (mm) 16	Description
Foot	CJ-L016 Stainless steel	CJK-L016 Stainless steel	Foot x 1
Flange	CJ-F016 Stainless steel	CJK-F016 Stainless steel	Flange x 1
T-bracket *	CJ-T010 Stainless steel	CJ-T016 Stainless steel	T-bracket x 1

∗ T-bracket is applicable to the double clevis style (D).

Grease pack for stainless steel cylinders/Part no.: GR-R-010 (10 g)

JIS Symbol

Double acting,
Single rod

Specifications

Bore size (mm)	10	16
Action	Double acting, Single rod	
Fluid	Air	
Proof pressure	1 MPa	
Maximum operating pressure	0.7 MPa	
Minimum operating pressure	0.1 MPa	
Ambient and fluid temperature	Without auto switch: –10 to 70°C With auto switch: –10 to 60°C	
Cushion	Rubber bumper	
Lubrication	Not required (Non-lube)	
Stroke length tolerance	$^{+1.0}_{0}$	
Piston speed	50 to 750 mm/s	
Allowable kinetic energy	0.035 J	0.090 J
Mounting style	Basic style, Axial foot style, Rod side flange style, Double clevis style	

Standard Stroke

(mm)

Bore size (mm)	Standard stroke	Maximum manufacturable stroke
10	15, 30, 45, 60, 75, 100, 125, 150	400
16	15, 30, 45, 60, 75, 100, 125, 150, 175, 200	

∗ Manufacture of intermediate strokes at 1 mm intervals is possible. (Spacers are not used.)
∗ For the one with auto switch, refer to the minimum stroke for auto switch mounting. (P. 847)

Made to Order

Made to Order Specifications

(For details, refer to page 1380.)

Symbol	Specifications
-XA□	Change of rod end shape

Mounting Style and Accessory

Mounting			Basic style	Axial foot style	Rod side flange style	Double clevis style *
Standard equipment	Mounting nut		●	●	●	—
	Rod end nut		●	●	●	●
	Clevis pin		—	—	—	●
Option	Single knuckle joint		●	●	●	●
	Double knuckle joint (With pin) *		●	●	●	●
	T-bracket		—	—	—	●
	Rod end cap	Flat type	●	●	●	●
		Round type	●	●	●	●

∗ Pin and retaining ring are shipped together with double clevis and double knuckle joint.

Mass

(g)

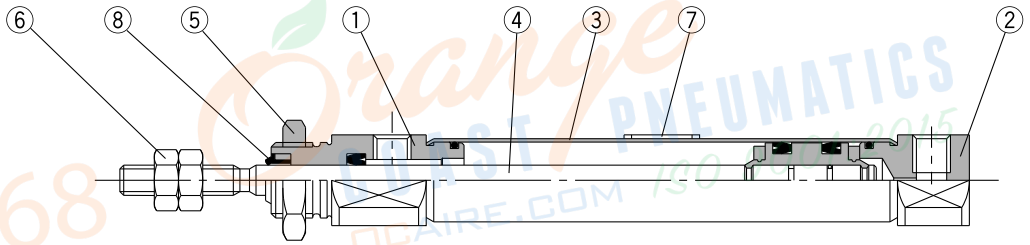
Bore size (mm)		10	16
Basic mass *		52	96
Additional mass per each 15 mm of stroke		4	6.5
Mounting bracket mass	Axial foot style	22	22
	Rod side flange style	16	16
	Double clevis style (With pin) **	6	16

∗ Mounting nut and rod end nut are included in the basic mass.
∗∗ Mounting nut is not included in double clevis style.

Calculation: (Example) **CJ5L10SR-45**
- Basic mass ····· 52 g (ø10)
- Additional mass ····· 4 g/15 stroke
- Cylinder stroke ····· 45 stroke
- Mounting bracket mass····· 22 g (Axial foot type)

52 + 4/15 x 45 + 22 = 86 g

Construction (Not able to disassemble.)



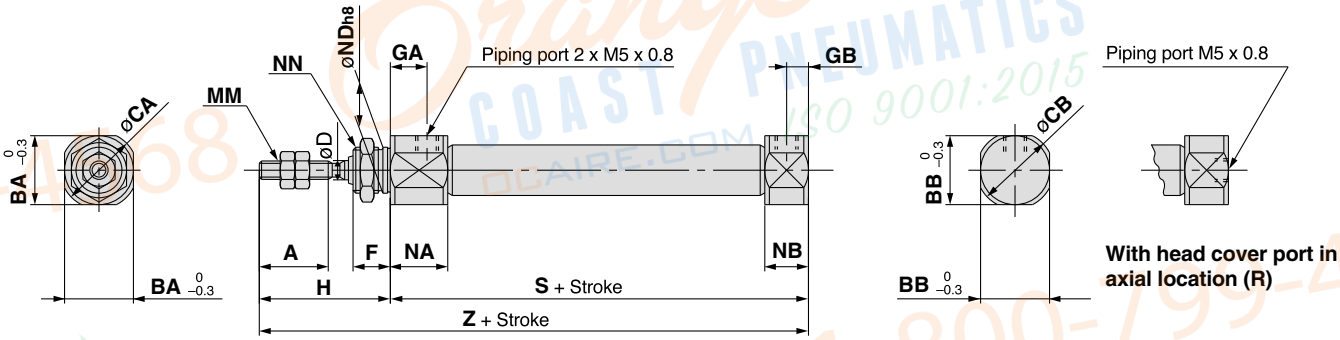
Component Parts

No.	Description	Material	
1	**Rod cover**	Stainless steel 304	
2	**Head cover**	Stainless steel 304	
3	**Cylinder tube**	Stainless steel 304	
4	**Piston rod**	Stainless steel 304	
5	**Mounting nut**	Stainless steel 304	
6	**Rod end nut**	Stainless steel 304	
7	**Label protector**	PET	
8	**Water resistant scraper**	**CJ5□□SR**	NBR
		CJ5□□SV	FKM

Note 1) Component part material and surface treatment other than listed above are the same as the standard type of Series CJ2.
Note 2) The material for seals and bumpers of CJ5□□SV is FKM.

Dimensions

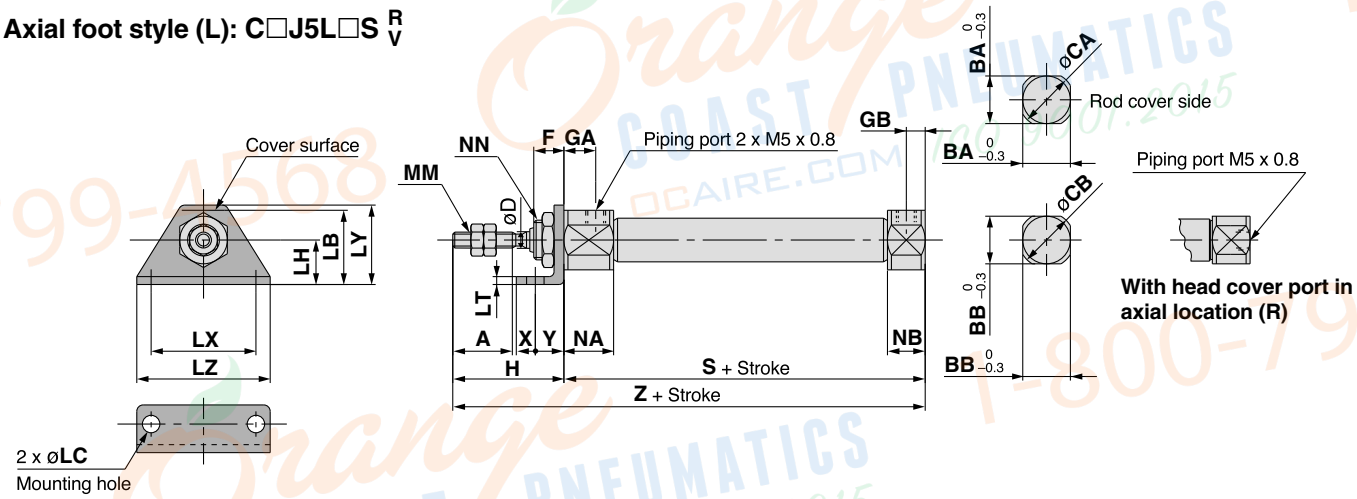
Basic style (B): C□J5B□S $^{R}_{V}$



(mm)

Bore size (mm)	A	BA	BB	CA	CB	D	F	GA	GB	H	MM	NN	NA	NB	NDh8	S	Z
10	15	15	12	17	14	4	8	8	5	28	M4 x 0.7	M10 x 1.0	12.5	9.5	10 $^{0}_{-0.022}$	46	74
16	15	18.3	18.3	20	20	5	8	8	5	28	M5 x 0.8	M12 x 1.0	12.5	9.5	12 $^{0}_{-0.027}$	47	75

Axial foot style (L): C□J5L□S $^{R}_{V}$

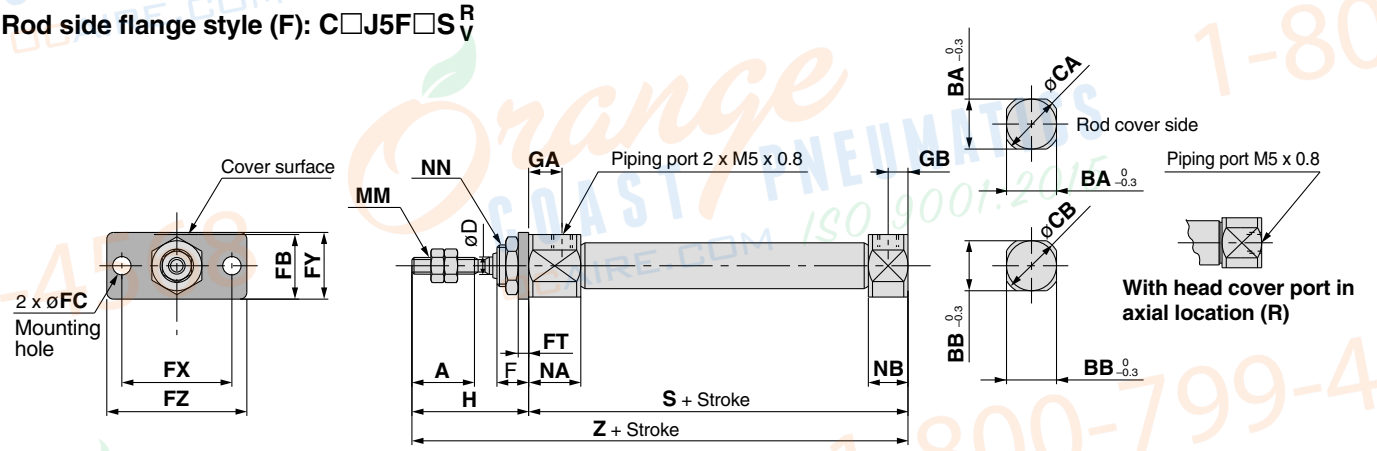


(mm)

Bore size (mm)	A	BA	BB	CA	CB	D	F	GA	GB	H	LB	LC	LH	LT	LX	LY	LZ	MM	NN	NA	NB	S	X	Y	Z
10	15	15	12	17	14	4	8	8	5	28	21.5	5.5	14	2.5	33	25	42	M4 x 0.7	M10 x 1.0	12.5	9.5	46	6	9	74
16	15	18.3	18.3	20	20	5	8	8	5	28	23	5.5	14	2.5	33	25	42	M5 x 0.8	M12 x 1.0	12.5	9.5	47	6	9	75

Dimensions

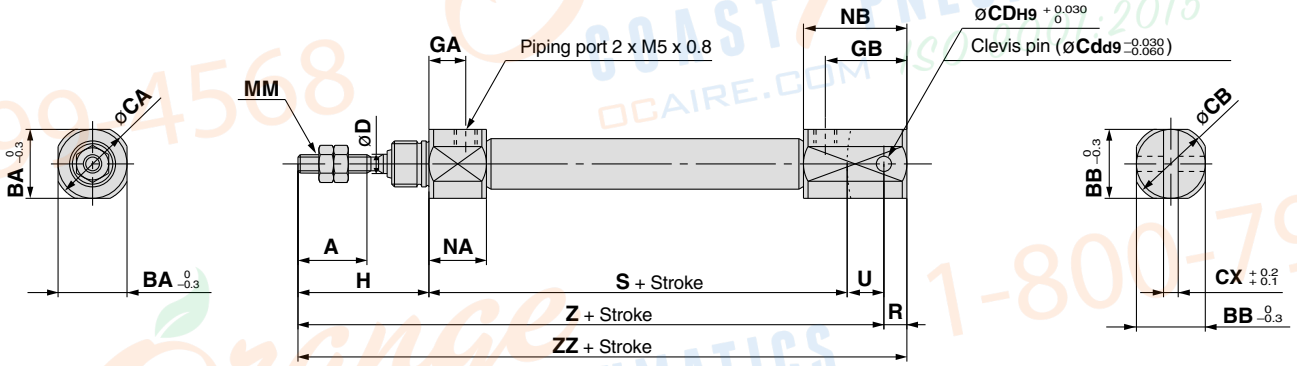
Rod side flange style (F): C□J5F□S R/V



(mm)

Bore size (mm)	A	BA	BB	CA	CB	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	H	MM	NN	NA	NB	S	Z
10	15	15	12	17	14	4	8	17.5	5.5	2.5	33	20	42	8	5	28	M4 x 0.7	M10 x 1.0	12.5	9.5	46	74
16	15	18.3	18.3	20	20	5	8	19	5.5	2.5	33	20	42	8	5	28	M5 x 0.8	M12 x 1.0	12.5	9.5	47	75

Double clevis style (D): C□J5D□S R/V



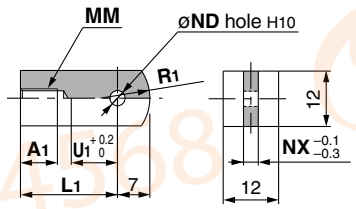
(mm)

Bore size (mm)	A	BA	BB	CA	CB	CD (Cd)	CX	D	GA	GB	H	MM	NA	NB	R	S	U	Z	ZZ
10	15	15	12	17	14	3.3	3.2	4	8	18	28	M4 x 0.7	12.5	22.5	5	46	8	82	87
16	15	18.3	18.3	20	20	5	6.5	5	8	23	28	M5 x 0.8	12.5	27.5	8	47	10	85	93

∗ Clevis pin and retaining ring are shipped together.

Accessory Dimensions

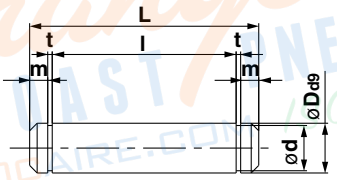
Single Knuckle Joint



Material: Stainless steel 304

Part no.	Applicable bore size (mm)	A1	L1	MM	NDH10	NX	R1	U1
I-J010SUS	10	8	21	M4 x 0.7	3.3 +0.048 0	3.1	8	9
I-J016SUS	16	8	25	M5 x 0.8	5 +0.048 0	6.4	12	14

Clevis Pin

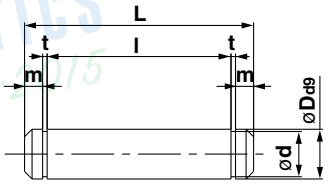


Material: Pin and retaining ring both stainless steel 304

Part no.	Applicable bore size (mm)	Dd9	d	L	ℓ	m	t	Applicable retaining ring
CD-J010	10	3.3 −0.030 −0.060	3	15.2	12.2	1.2	0.3	Type C 3.2
CD-Z015SUS	16	5 −0.030 −0.060	4.8	22.7	18.3	1.5	0.7	Type C 5

∗ Retaining rings are included.

Knuckle Pin

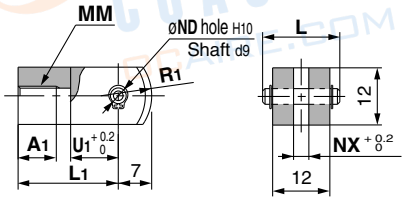


Material: Pin and retaining ring both stainless steel 304

Part no.	Applicable bore size (mm)	Dd9	d	L	ℓ	m	t	Applicable retaining ring
CD-J010	10	3.3 −0.030 −0.060	3	15.2	12.2	1.2	0.3	Type C 3.2
IY-J015SUS	16	5 −0.030 −0.060	4.8	16.6	12.2	1.5	0.7	Type C 5

∗ Clevis pin is used instead for ø10.
∗ Retaining rings are included.

Double Knuckle Joint



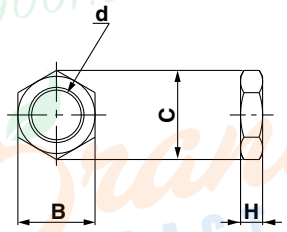
∗ Knuckle pin and retaining ring are packaged together.

Material: Stainless steel 304

Part no.	Applicable bore size (mm)	A1	L	L1	MM	NDd9
Y-J010SUS	10	8	15.2	21	M4 x 0.7	3.3 −0.030 −0.060
Y-J016SUS	16	11	16.6	21	M5 x 0.8	5 −0.030 −0.060

Part no.	NDH10	NX	R1	U1
Y-J010SUS	3.3 +0.048 0	3.2	8	10
Y-J016SUS	5 +0.048 0	6.5	12	10

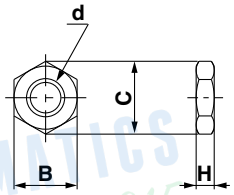
Mounting Nut



Material: Stainless steel 304

Part no.	Applicable bore size (mm)	B	C	d	H
SNJ-016SUS	10	14	16.2	M10 x 1.0	4
SNKJ-016SUS	16	17	19.6	M12 x 1.0	4

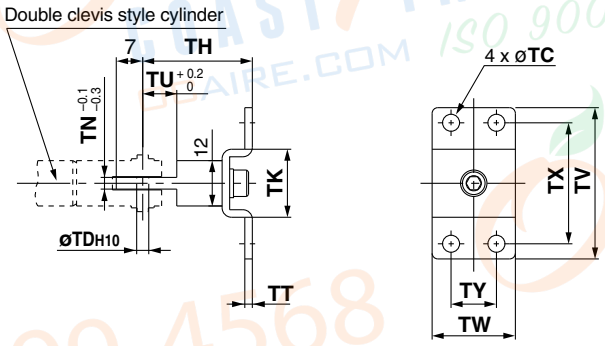
Rod End Nut



Material: Stainless steel 304

Part no.	Applicable bore size (mm)	B	C	d	H
NTJ-010SUS	10	7	8.1	M4 x 0.7	3.2
NTJ-015SUS	16	8	9.2	M5 x 0.8	4

T-bracket

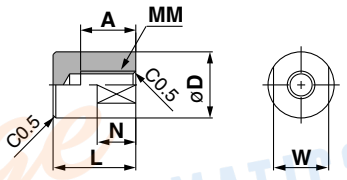


Material: Stainless steel 304

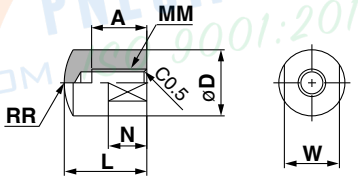
Part no.	Applicable bore size (mm)	TC	TDH10	TH	TK	TN	TT	TU	TV	TW	TX	TY
CJ-T010SUS	10	4.5	3.3 +0.048 0	29	18	3.1	2	9	40	22	32	12
CJ-T016SUS	16	5.5	5 +0.048 0	35	20	6.4	2.5	14	48	28	38	16

Rod End Cap

Flat type/**CJ-CF□□□**



Round type/**CJ-CR□□□**

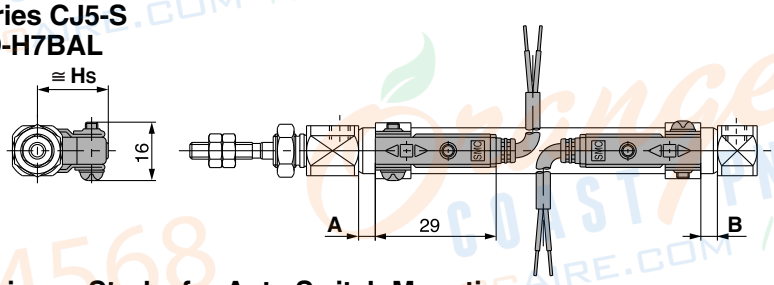


Material: Polyacetal

Part no.		Applicable bore size (mm)	A	D	L	MM	N	R	W
Flat type	Round type								
CJ-CF010	CJ-CR010	10	8	10	13	M4 x 0.7	6	10	8
CJ-CF016	CJ-CR016	16	10	12	15	M5 x 0.8	7	12	10

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

Series CJ5-S
D-H7BAL



Minimum Stroke for Auto Switch Mounting

Mounting bracket	Basic style, Foot style, Flange style, Clevis style		
Number of auto switches	1 (Rod cover side)	2 (Different sides)	2 (Same side)
Switch mounting side / Switch type	Port side	Port side	Port side
Minimum stroke (mm)	10	15	60

Operating Range

(mm)

Auto switch model	Bore size (mm)	
	10	16
D-H7BAL	5	5

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion) There may be the case to change substantially depending on an ambient environment.

Auto Switch Mounting Bracket / Part No.

Bore size (mm)	Auto switch mounting bracket part no.
10	BJ2-010S
16	BJ2-016S

* With stainless steel mounting screws.

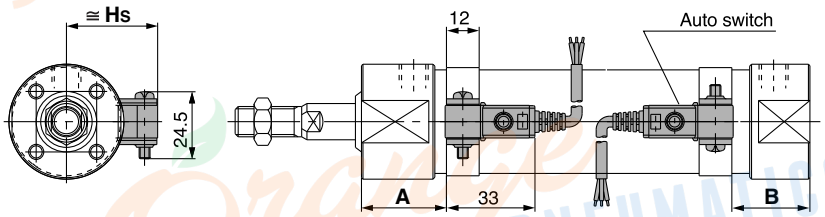
Proper Auto Switch Mounting Position and Its Mounting Height

(mm)

Applicable bore size (mm) / Auto switch model	D-H7BAL		
	A	B	Hs
10	0	0	17
16	0.5	0.5	20.5

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

Series CG5-S
D-G5BAL



Minimum Stroke for Auto Switch Mounting

Mounting bracket	Basic style, Foot style, Flange style, Clevis style		
Number of auto switches	1 (Rod cover side)	2 (Different sides)	2 (Same side)
Switch mounting side / Switch type	Port side	Port side	Port side
Minimum stroke (mm)	10	15	75

Operating Range

(mm)

Auto switch model	Bore size (mm)							
	20	25	32	40	50	63	80	100
D-G5BAL	5	5	5.5	6	7	7.5	7.5	8

* Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ±30% dispersion) There may be the case to change substantially depending on an ambient environment.

Auto Switch Mounting Bracket / Part No.

Auto switch model	Bore size (mm)							
	20	25	32	40	50	63	80	100
D-G5BAL	NBA-088S	NBA-106S	BGS1-032S	BAF-04S	BAF-05S	BAF-06S	BAF-08S	BAF-10S

* With stainless steel mounting screws.

Proper Auto Switch Mounting Position and Its Mounting Height

(mm)

Applicable bore size (mm) / Auto switch model	D-G5BAL		
	A	B	Hs
20	31.5	24	26
25	31.5	24	28.5
32	32.5	25	33
40	37	28	36.5
50	45.5	36	42
63	45.5	36	48.5
80	56	46	57.5
100	57	46	68

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

Technical Data:
Chemical Resistance Table

◎ : No influence or almost no influence
○ : Some influence, but operational depending on conditions
△ : Avoid use if possible
× : Substantial influence, not suitable for use
— : Not tested

Chemical Resistance Table

Parts			Body		Seal		Water resistant auto switch	
Material			Stainless steel	Aluminum*	Nitrile rubber	Fluororubber	Resin casing	Lead wire
Chemical (Concentration weight %, Temperature °C) \ Symbol			Stainless steel 304	Al	NBR (–10 to 60°C)	FKM (–40 to 150°C)	PBT (–10 to 60°C)	PVC (–10 to 60°C)
Inorganic salt	1	**Hydrochloric acid (20%, Room temperature)**	×	×	○	◎	◎	○
	2	**Chromic acid (25%, 70°C)**	○	×	×	◎	◎	○
	3	**Boric acid**	○	×	◎	◎	◎	○
	4	**Sulfuric acid (30%, Room temperature)**	×	×	◎	◎	◎	○
	5	**Phosphoric acid (50%, Room temperature)**	○	×	◎	◎	◎	○
Inorganic alkali	6	**Ammonium hydroxide (28%)**	○	○	×	◎	◎	○
	7	**Sodium hydroxide (30%, Room temperature)**	◎	×	◎	△	◎	×
	8	**Calcium hydroxide**	△	×	◎	◎	◎	◎
	9	**Magnesium hydroxide**	○	○	◎	◎	◎	◎
Organic solvent	10	**Acetylene**	◎	◎	◎	◎	◎	◎
	11	**Formic acid (25%, Room temperature)**	○	△	×	△	△	△
	12	**Citric acid**	△	×	◎	◎	△	○
	13	**Acetic acid (10%, Room temperature)**	◎	△	△	○	◎	○
	14	**Lactic acid (5%, 20°C)**	○	×	◎	◎	◎	○
Others (oil, gas, etc.)	15	**Linseed oil**	◎	○	◎	◎	△	△
	16	**Polassium chloride**	○	△	◎	◎	◎	◎
	17	**Calcium chloride**	○	◎	◎	◎	◎	◎
	18	**Mineral oil**	◎	◎	◎	◎	◎	△
	19	**Sodium hypochlorite (2%, Room temperature)**	○	×	×	◎	◎	△
	20	**Sodium chloride**	○	—	◎	◎	◎	◎
	21	**Carbon dioxide**	◎	◎	◎	◎	◎	◎
	22	**Natural gas**	◎	◎	◎	◎	◎	◎
	23	**Boric acid**	○	×	◎	◎	◎	○

∗ Unless noted otherwise, the solution concentration is in a saturated state.
∗ Chemical resistance is a guide that applies only to the stainless steel cylinder parts, and does not guarantee the performance of air cylinders (auto switches). Be sure to perform a verification test before operating.
∗ The temperature range for the protective label cover is between –40 to 110°C, and the temperature range for grease is between –20 to 150°C. (However, there is no relationship with the chemicals listed above.)

∗) Reference data

Series CJ5-S/CG5-S Stainless Steel Cylinder Specific Product Precautions 1

Be sure to read before handling. Refer to front matters 54 and 55 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Caution on Design

⚠ Warning

1. Note the mass of the stainless steel products.
Since the mass of stainless steel cylinders is approximately 1.5 to 3 times heavier than the standard products (with aluminum body), be careful when calculating mass estimates. Also, when mounting the cylinder on equipment where vibration is expected, avoid using single side brackets such as the flange style, and use double side brackets such as the foot style instead.

⚠ Caution

1. Adjust the speed control for the environment in which it will be used.
Speed adjustment may be changed depending on the environment.

2. Dust may accumulate on this product's mounting screws and brackets in some operating conditions.
Measures must be applied depending on the operating conditions when mounting.

Selection

⚠ Warning

1. Generally, use nitrile rubber (NBR) seals with liquids that do not contain chlorine and sulfur, and use fluoro rubber (FKM) seals with liquids that contain chlorine and sulfur.
However, depending on the type and the brand of liquid (such as cleaning solvent) that splashes on the cylinder, the operating life of seals may be reduced dramatically. In cases where special additives are used, or where liquid caused trouble with the conventional nitrile or fluoro rubber seals in the past, request an investigation or set up a test period for the use of the seals.

2. Even the fluoro rubber specification may not be applicable depending on the type of chemicals and the operating temperature. Therefore, be sure to verify the seal's applicability before use.

Mounting

⚠ Warning

1. Do not rotate the cover.
If a cover is rotated when installing a cylinder or screwing a fitting into the port, it is likely to damage the junction part with cover.

2. When using pins, apply grease, etc., in order to prevent them from degrading of shape and rusting.

Operating Precautions

⚠ Caution

1. If cleaning the rotating part, grease may leak out, which shortens product service life. Thus, cleaning must be as infrequent as possible.

2. If excess water gets into mounting holes, unwanted bacteria may reproduce. Plug them with plug bolts or external covers to avoid this.

Operating Environment

⚠ Warning

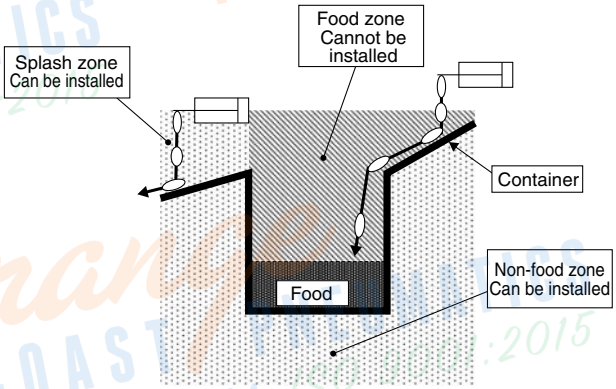
1. Fully consider the compatibility of stainless steel.
The corrosion resistance of stainless steel is not effective against all media and corrosive environments. Corrosion proceeds rapidly with strong hydrochloric acid, hydrofluoric acid, and high temperature ammonium gas, etc. Therefore its compatibility to the environment must be considered carefully.

2. Do not operate cylinders with auto switches in environments where oil and chemicals are used.
Please contact SMC when operating in environments with coolants, cleaning solvents, various oils or chemicals, as it may cause adverse effects (faulty insulation, malfunction due to swelling of the potting resin, and hardening of lead wires, etc) to auto switches even in a short period of time. Even with the fluoro rubber seal specification, the auto switch related parts (switch body, mounting bracket, and built-in magnet) are identical to the standard specifications. Therefore, consult with SMC regarding the cylinder's compatibility (such as chemical resistance) with an environment (chemicals, etc.) before operating.

3. Do not immerse the cylinder in water or chemicals.
When the cylinder is operated in a condition with water pressure, the fluid leaks into the cylinder in the early stages. In the worst case, the fluid may back flow inside the piping and damage the solenoid valve.

⚠ Caution

1. Do not use cylinders in a food-related environment.
<Cannot be installed>
Food zone.....Food may directly contact with cylinder parts, but is not treated as food products.
<Can be installed>
Splash zone.....Food may directly contact with cylinder parts, but is not treated as food products.
Non-food zone.....Cylinder parts do not directly contact food.



2. When cleaning solvent or chemicals splashes on a cylinder, the service life may be extremely shortened. Please contact SMC for details.

3. When cleaning cylinders with steam, do it as quickly as possible, keeping the cylinder's temperature range in mind.

4. When cleaning cylinders with a brush, etc., do not apply excessive force to the weaker parts, such as auto switch lead wire, etc.

Series CJ5-S/CG5-S Stainless Steel Cylinder Specific Product Precautions 2

Be sure to read before handling. Refer to front matters 54 and 55 for Safety Instructions and pages 3 to 11 for Actuator and Auto Switch Precautions.

Maintenance

⚠ Warning

1. If this cylinder is lubricated, it may cause malfunctions.

If grease other than designated is used, it may also cause malfunctions.

- Order with the following part number when only the grease for maintenance is needed.
  Grease pack part number for stainless steel cylinders
  Grease for food processing machines: GR-R-010 (10 g)

2. Do not wipe grease attached to the rotating part of the air cylinder.

If grease attached to the rotating part is forcibly wiped off, it may cause malfunctions.

If the cylinder is operated for a long period of time, the rotating part may become black. In such cases, wipe the grease attached to the rotating part and reapply fresh grease to enable the cylinder to operate for a long period of time.

(Wipe the grease with water. Using alcohol or solvents may damage seals.)

Precautions for Series CG5-S

1. Sealant* is used on the threads of the connecting sections of the cover and the cylinder tube for air-tight construction. When disassembling the cylinder, the old sealant must be completely removed, and new sealant must be applied before re-assembling.

* Loctite® 542 (medium strength) or equivalent

2. ø50 or larger bore size cylinders cannot be dis-assembled.

When disassembling cylinders with bore sizes of ø20 through ø40, grip the double flat part of either the head cover or the rod cover with a vise and loosen the other side with a wrench or a monkey wrench, etc., and then remove the cover. When re-tightening, tighten approximately 2 degrees more than the original position. (Cylinders with ø50 or larger bore sizes are tightened with a large tightening torque and cannot be disassembled. Please contact SMC when disassembly is required.)