

Water Resistant Cylinder (Pneumatic/Hydraulic)

Pneumatic: Series CM2/CG1/MB/MB1/CQ2/CA2/MGP/MGG

Hydraulic: Series CHDKB/CH2F

Compatible with an operating environment with coolants.



Anti-coolant performance has been improved compared to the standard cylinders.

Applicable for an operating environment where water splashes.



CJ5
CG5

HY

C
M

D-

-X

Individual
-X

Technical
data

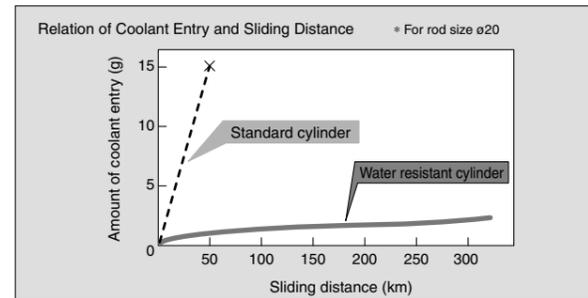
Water Resistant Air Cylinders (Pneumatic/Hydraulic)

Suitable for using under the atmosphere having coolant in the machine tools.

Also, compatible with environments where water is splashed on the food machinery, or car washing machines, etc

Special scraper

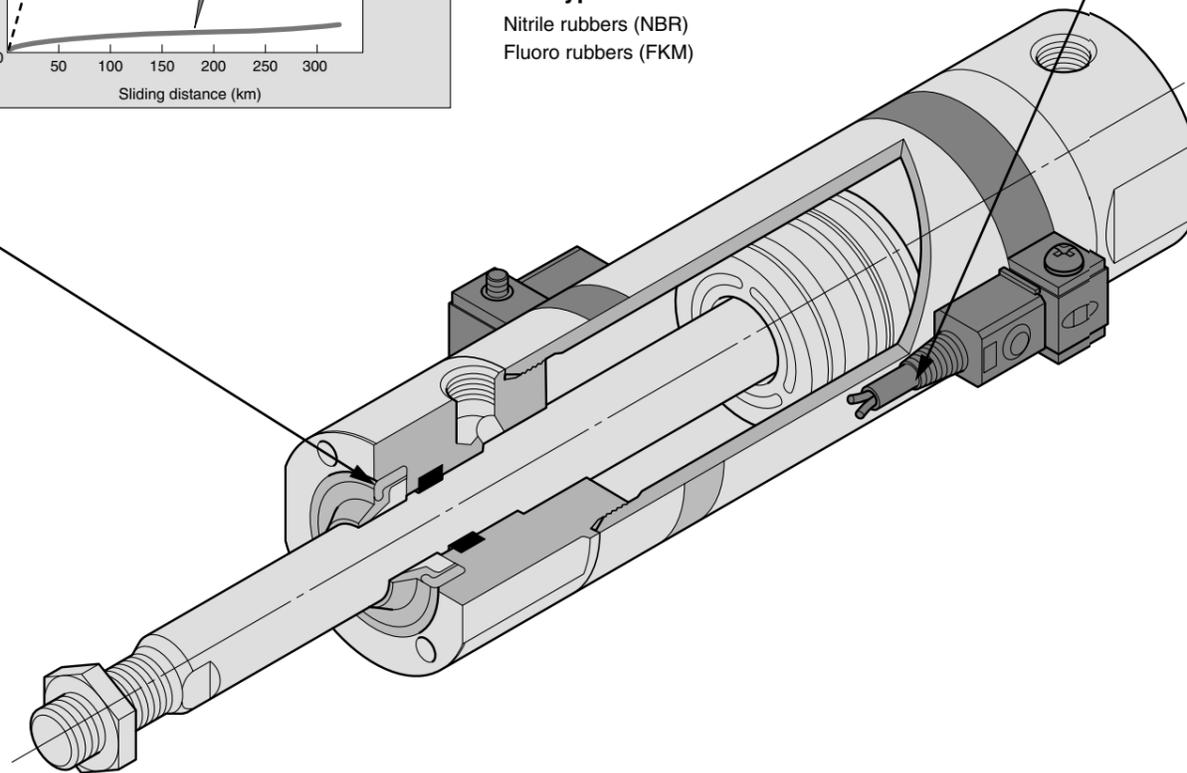
- Dramatically improved water resistance compared to standard cylinders



Conditions
 Operating conditions..... Air
 Pressure 0.5 MPa
 Coolant Water-soluble
 Piston speed 200 mm/sec
 Operating cycle 60 cpm

- Two types of standard seal material

Nitrile rubbers (NBR)
 Fluoro rubbers (FKM)



Applicable Cylinder

Air Cylinder

Series CM2
ø20 to ø40



Series CG1
ø32 to ø100



Air cylinder Series MB
ø32 to ø100



Square tube type air cylinder Series MB1
ø32 to ø100



Compact cylinder Series CQ2
ø20 to ø100



Series CA2
ø40 to ø100



Compact guide cylinder Series MGP
ø20 to ø100



Guide cylinder Series MGG
ø32 to ø100



Water resistant 2-color indication solid state auto switch

Water resistance improved 10 times by improving the waterproof effect of the switch substrate through a change of the internal structure. (SMC comparison)

| Model | Applicable cylinder | Lead wire |
|--|---|--|
| D-F7BA(V)L/ Rail mounting | CQ2(ø20 to ø100) | Oilproof vinyl cabtire cord: ø3.4 0.2 mm ² , 2 cores (Brown, Blue), 3 m (standard) |
| D-F5BAL/ Tie-rod mounting | CH2F(ø32 to ø100) CA2(ø40 to ø100) MB(ø32 to ø100) | Oilproof vinyl cabtire cord: ø4, 0.3 mm ² 2 cores (Brown, Blue), 3 m (standard) |
| D-H7BAL/ Band mounting | CM2, CG1(ø32 to ø63) MGG(ø32 to ø63) | Oilproof vinyl cabtire cord: ø3.4 0.2 mm ² , 2 cores (Brown, Blue), 3 m (standard) |
| D-G5BAL/ Band mounting | CG1(ø80, ø100) MGG(ø80, ø100) | Oilproof vinyl cabtire cord: ø4, 0.3 mm ² 2 cores (Brown, Blue), 3 m (standard) |
| D-Y7BAL/ Direct mounting <small>Note 1)</small> | CA2(ø40 to ø100) MB(ø32 to ø100) MB1(ø32 to ø100) MGP(ø20 to ø100) CHKDB(ø32 to ø100) | Oilproof vinyl cabtire cord: ø3.4 0.15mm ² , 2 cores (Brown, Blue), 3 m (standard) |
| D-M9□A(V)L/Direct mounting <small>Note 1)</small> | CQ2(ø20 to ø100) CHKDB(ø20 to ø100) CA2(ø40 to ø100) MB(ø32 to ø100) MB1(ø32 to ø100) MGP(ø20 to ø100) | Oilproof vinyl cabtire cord: 2.7 x 3.2 Elliptical shape, 0.15 mm ² , 2 cores (D-M9BA(V)), 3 cores (D-M9NA(V),D-M9PA(V)) |

Note 1) Tie-rod mounting for CA2 and MB
 Note 2) This product is not made to be used in water.
 Refer to pages 1263 to 1371 for the detailed specifications of auto switches.

Hydraulic Cylinders

Compact hydraulic cylinder conforming to JIS/10 MPa
Series CHKDB
ø20 to ø100



Hydraulic cylinder conforming to JIS/7 MPa
Series CH2F
ø32 to ø100



CJ5
 CG5
 HY
 C
 M

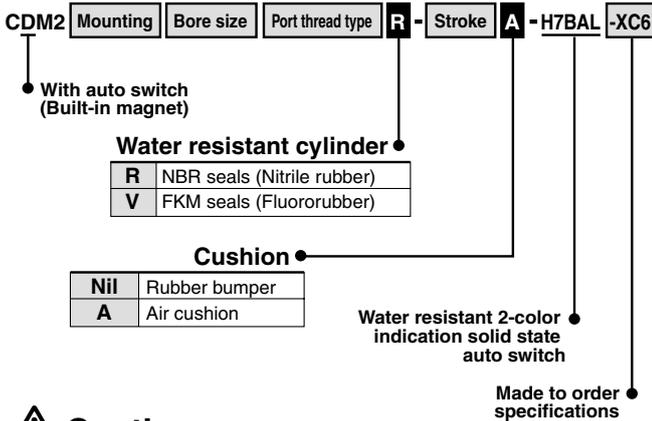
D-
 -X
 Individual
 -X
 Technical data

Air Cylinders

Series **CM2** $\varnothing 20$ to $\varnothing 40$



How to Order



Caution

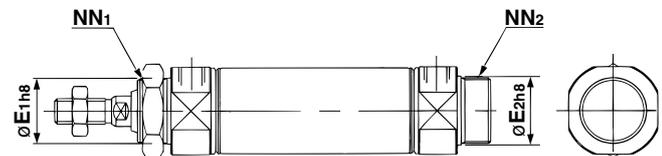
Rod seals and scrapers are not replaceable. The above parts cannot be replaced since the scraper is press-fit in the rod cover.

Specifications

| | |
|----------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40 |
| Cushion | Rubber bumper, Air cushion |
| Auto switch mounting | Band mounting |
| Made to order | Piston rod, rod end nut made of stainless steel (-XC6) |

* Specifications other than above are the same as standard, basic style.

Dimensions



| Bore size (mm) | E ₁ | E ₂ * | NN ₁ | NN ₂ * |
|----------------|-----------------------------------|-----------------------------------|-----------------|-------------------|
| 20 | 22 ⁰ _{-0.033} | 20 ⁰ _{-0.033} | M22 x 1.5 | M20 x 1.5 |

* Other specifications are the same as the double acting, single rod standard type. (An asterisk means it is the same as the standard type.)

Mounting Bracket*: Part No.

| Mounting bracket | Min. order qty. | Bore size (mm) | Description (At min. order qty.) |
|----------------------|-----------------|----------------|----------------------------------|
| Axial foot style** | 2 | CM-L020C | 2 foots, 1 mounting nut |
| Flange | 1 | CM-F020C | 1 flange |
| Trunnion (with nuts) | 1 | CM-T020C | 1 trunnion, 1 trunnion nut |

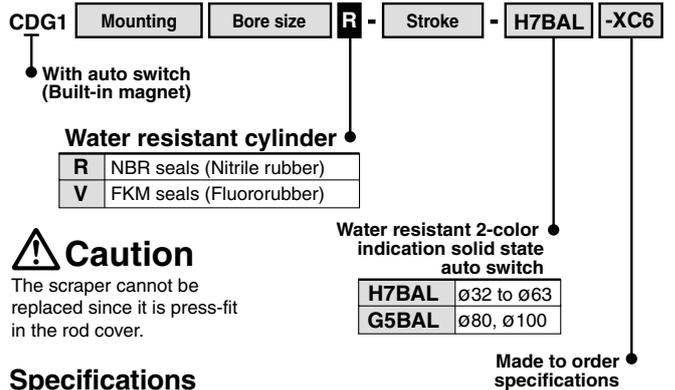
* The brackets for $\varnothing 25$ to $\varnothing 40$ are the same for the standard type.

** Order 2 foot brackets for each cylinder unit.

Series **CG1** $\varnothing 32$ to $\varnothing 100$



How to Order



Caution

The scraper cannot be replaced since it is press-fit in the rod cover.

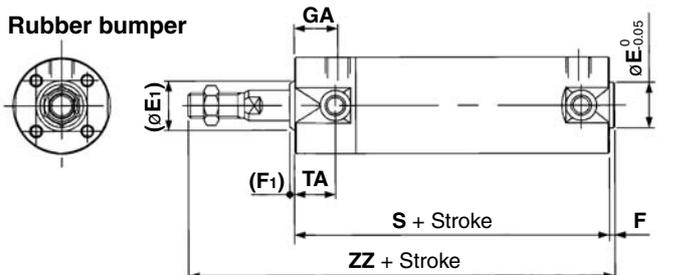
Specifications

| | |
|----------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 32, 40, 50, 63, 80, 100 |
| Cushion | Rubber bumper, Air cushion |
| Auto switch mounting | Band mounting |
| Made to order | Piston rod, rod end nut made of stainless steel (-XC6) |

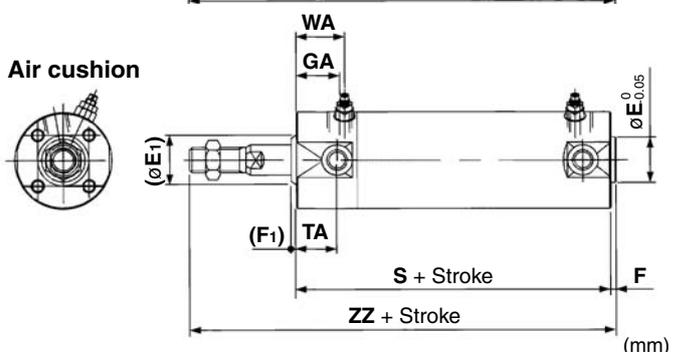
* Specifications other than above are the same as standard, basic style.

Dimensions

Rubber bumper



Air cushion



| Bore size (mm) | (E ₁) | E* | (F ₁) | F* | GA | S | TA | WA | ZZ |
|----------------|-------------------|----|-------------------|----|----|-----------|----|----|-----------|
| 32 | 17 | 18 | 2 | 2 | 18 | 77 (85) | 17 | 22 | 119 (127) |
| 40 | 21 | 25 | 2 | 2 | 19 | 84 (93) | 18 | 22 | 136 (145) |
| 50 | 26 | 30 | 2 | 2 | 21 | 97 (109) | 20 | 25 | 157 (169) |
| 63 | 26 | 32 | 2 | 2 | 21 | 97 (109) | 20 | 25 | 157 (169) |
| 80 | 32 | 40 | 3 | 3 | 28 | 116 (130) | — | 30 | 190 (204) |
| 100 | 37 | 50 | 3 | 3 | 29 | 117 (131) | — | 31 | 191 (205) |

* Other specifications are the same as the double acting, single rod standard type. (An asterisk means it is the same as the standard type.)

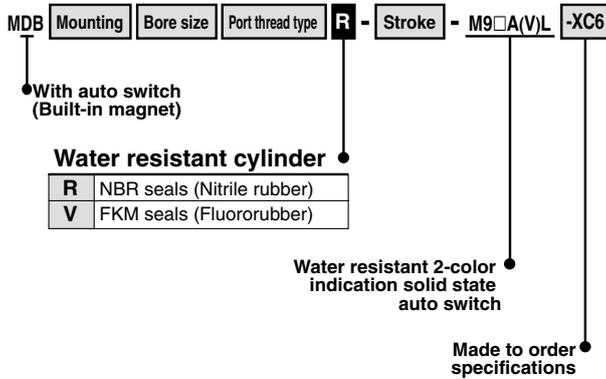
* () : For the long stroke type

Air Cylinders

Series **MB** $\varnothing 32$ to $\varnothing 100$



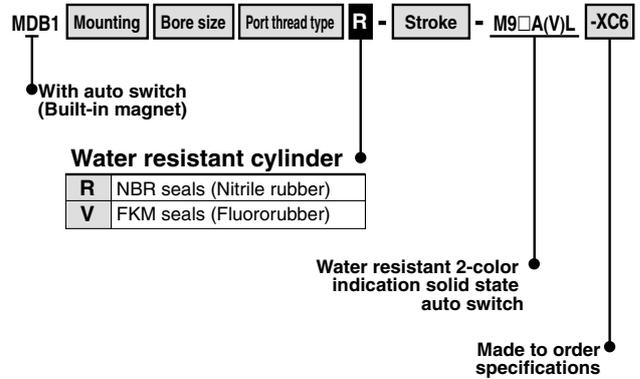
How to Order



Series **MB1** $\varnothing 32$ to $\varnothing 100$



How to Order

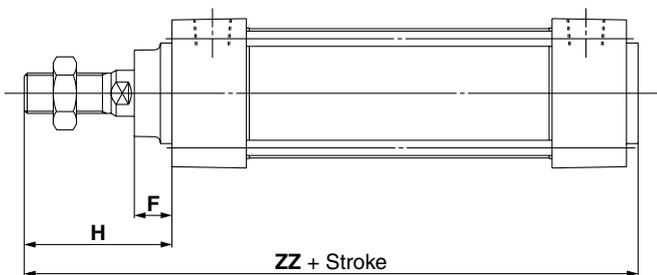


Specifications

| | |
|----------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | $\varnothing 32, 40, 50, 63, 80, 100$ |
| Cushion | Air cushion |
| Auto switch mounting | Tie rod mounting |
| Made to order | Piston rod, rod end nut made of stainless steel (-XC6) |

* Specifications other than above are the same as standard, basic style.

Dimensions



| Bore size (mm) | F | H | ZZ |
|----------------|----|----|-----------|
| 32 | 15 | 47 | 135 (141) |
| 40 | 17 | 58 | 146 (152) |
| 50 | 19 | 67 | 165 (173) |
| 63 | 19 | 67 | 165 (173) |
| 80 | 25 | 81 | 199 (209) |
| 100 | 25 | 81 | 199 (209) |

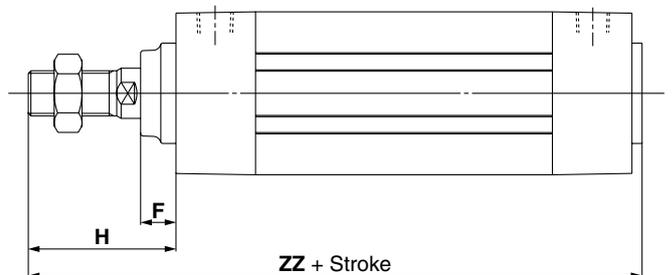
* Other specifications are the same as the double acting, single rod standard type.
 * (): For the type without an air cushion

Specifications

| | |
|----------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | $\varnothing 32, 40, 50, 63, 80, 100$ |
| Cushion | Air cushion |
| Auto switch mounting | Tie rod mounting |
| Made to order | Piston rod, rod end nut made of stainless steel (-XC6) |

* Specifications other than above are the same as standard, basic style.

Dimensions



| Bore size (mm) | F | H | ZZ |
|----------------|----|----|-----------|
| 32 | 15 | 47 | 135 (141) |
| 40 | 17 | 58 | 146 (152) |
| 50 | 19 | 67 | 165 (173) |
| 63 | 19 | 67 | 165 (173) |
| 80 | 25 | 81 | 199 (209) |
| 100 | 25 | 81 | 199 (209) |

* Other specifications are the same as the double acting, single rod standard type.
 * (): For the type without an air cushion

CJ5
CG5

HY□

C□
M□

D-□

-X□

Individual
-X□

Technical
data

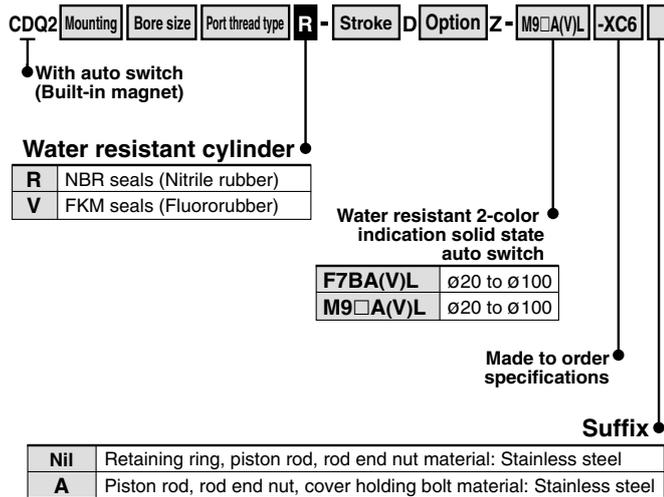
Air Cylinders

Compact Cylinder

Series **CQ2** $\varnothing 20$ to $\varnothing 100$



How to Order



Note) -XC6A: $\varnothing 20$ to $\varnothing 32$ only

Specifications

| | |
|-----------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40, 50, 63, 80, 100 |
| Mounting | $\varnothing 20$ to $\varnothing 32$ B (through-hole) only $\varnothing 40$ to $\varnothing 100$ B (through-hole), F (rod side flange) A (both ends tapped), G (head side flange) L (foot), D (double clevis) |
| Cushion | None |
| Auto switch mounting | Rail mounting (D-F7BAL/F7BAVL)/Direct mounting (D-M9□A(V)L) Use auto switch brackets for $\varnothing 20$, $\varnothing 25$ |
| Made to order | Retaining ring, piston rod, rod end nut material: Stainless steel (-XC6) |

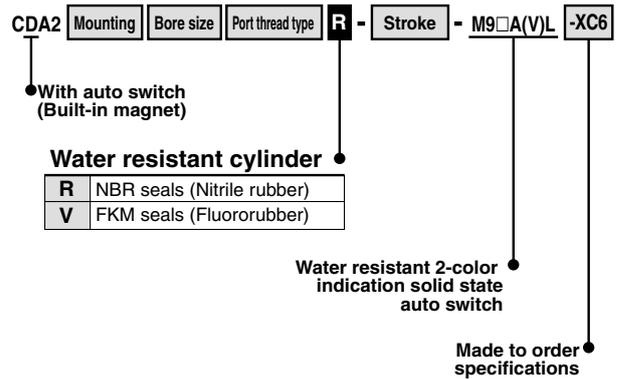
* Specifications other than above are the same as standard, basic style.

Refer to page 747 for details.

Series **CA2** $\varnothing 40$ to $\varnothing 100$



How to Order



Specifications

| | |
|-----------------------------|--|
| Action | Double acting, Single rod |
| Bore size (mm) | 40, 50, 63, 80, 100 |
| Cushion | Air cushion |
| Auto switch mounting | Tie-rod mounting style |
| Made to order | Piston rod, rod end nut material: Stainless steel (-XC6) |

* Specifications other than above are the same as standard, basic style.

Note 1) Air-hydro type, rod boot specifications of Series CA2 are excluded.

Note 2) Combination of auto switches and steel tube is not available.

Dimensions

* Other specifications are the same as the double acting, single rod standard type.

Air Cylinders

Compact guide cylinder

Series **MGP** $\varnothing 20$ to $\varnothing 100$



How to Order

MGPM Bore size Port thread type **R** - Stroke - M9□A(V)L

Slide bearing

Water resistant cylinder

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

Water resistant 2-color indication solid state auto switch

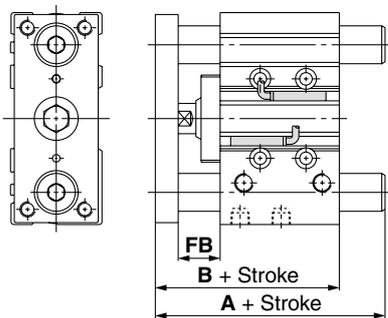
- * Piston rods and guide rods are made of stainless steel.
- * Iron parts made of stainless steel are available as made to order.
- * A scraper is installed on piston rod parts only.

Specifications

| | | |
|-----------------------------|---------------------------------|-----------------|
| Action | Double acting | |
| Bearing type | Slide bearing | |
| Bore size (mm) | 20, 25, 32, 40, 50, 63, 80, 100 | |
| Cushion | MGPM□□ R | Rubber bumper |
| | MGPM□□ V | Without cushion |
| Auto switch mounting | Direct mounting | |

* Specifications other than above are the same as standard, basic type.
Note) MGPM□□V is without cushion. Confirm the allowable kinetic energy for MGPM□□V without cushion.

Dimensions

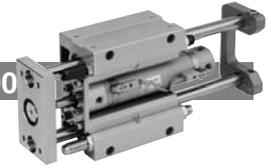


| Bore size (mm) | A | | | B | FB |
|----------------|------------------|----------------------------|------------------|-------|----|
| | Below 50 strokes | Between 50 and 200 strokes | Over 200 strokes | | |
| 20 | 66 | 97.5 | 135 | 66 | 19 |
| 25 | 67.5 | 99 | 136 | 67.5 | 20 |
| 32 | 109 | 114 | 152 | 71.5 | 22 |
| 40 | 109 | 114 | 152 | 78 | 22 |
| 50 | 117.5 | 129 | 172 | 83 | 23 |
| 63 | 117.5 | 129 | 172 | 88 | 23 |
| 80 | 121 | 148 | 199 | 102.5 | 24 |
| 100 | 141 | 166 | 207 | 120 | 29 |

* Other specifications are the same as the standard type.

Guide cylinder

Series **MGG** $\varnothing 32$ to $\varnothing 100$



How to Order

MGGM Mounting Bore size Port thread type **R** - Stroke - H7BAL -XC6□

Slide bearing

Water resistant cylinder

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

Water resistant 2-color indication solid state auto switch

| | |
|--------------|--------------------------------------|
| H7BAL | $\varnothing 32$ to $\varnothing 63$ |
| G5BAL | $\varnothing 80$, $\varnothing 100$ |

* A scraper is installed on piston rod parts only.

Made to order specifications

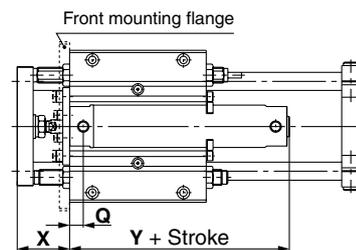
Specifications

| | | |
|-----------------------------|---|--|
| Action | Double acting | |
| Bore size (mm) | 32, 40, 50, 63, 80, 100 | |
| Bearing type | Slide bearing | |
| Cushion | Built-in rubber bumper and shock absorber | |
| Auto switch mounting | Band mounting | |
| Made to order | -XC6 | Piston rod and rod end nut made of stainless steel |
| | -XC6A | Stainless steel used on all iron parts |
| | -XC6B | Stainless steel rod end moving parts |
| | -XC6C | Stainless steel rods |

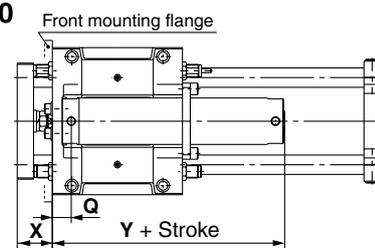
* Specifications other than above are the same as standard, basic type.
Note) RBL (anti-coolant) type is used for shock absorbers.

Dimensions (Dimensions other than the below are the same as the standard type.)

$\varnothing 32$ to $\varnothing 50$



$\varnothing 63$ to $\varnothing 100$



| Bore size (mm) | Q | X | Y |
|----------------|----|----|-----------|
| 32 | 16 | 48 | 77 (85) |
| 40 | 17 | 58 | 84 (93) |
| 50 | 19 | 69 | 97 (109) |
| 63 | 34 | 56 | 112 (124) |
| 80 | 46 | 68 | 137 (151) |
| 100 | 47 | 68 | 138 (152) |

* (): For the long stroke type.

CJ5
CG5

HY□

C□
M□

D-□

-X□

Individual
-X□

Technical
data

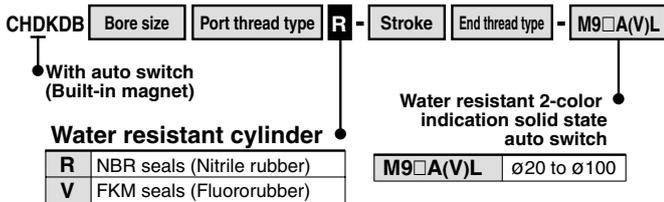
Hydraulic Cylinders

Compact hydraulic cylinder
conforming to JIS/10 MPa

Series **CH□KD** $\varnothing 20$ to $\varnothing 100$



How to Order

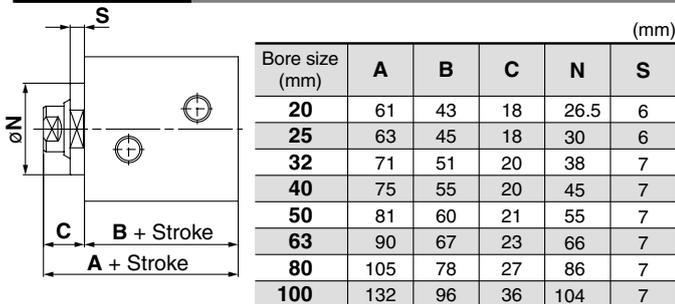


Specifications

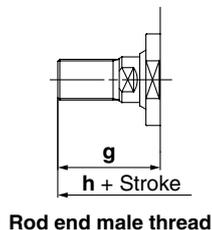
| | |
|----------------------|---------------------------------|
| Action | Double acting, Single rod |
| Bore size (mm) | 20, 25, 32, 40, 50, 63, 80, 100 |
| Cushion | None |
| Auto switch mounting | Direct mounting |

* Specifications other than above are the same as standard, basic style.

Dimensions



* Other specifications are the same as the double acting, single rod standard type.



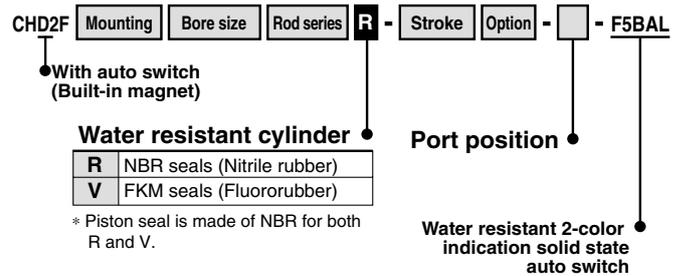
* Other specifications are the same as the double acting, single rod standard type.

Hydraulic cylinder conforming to JIS/7 MPa

Series **CH2F** $\varnothing 32$ to $\varnothing 100$



How to Order



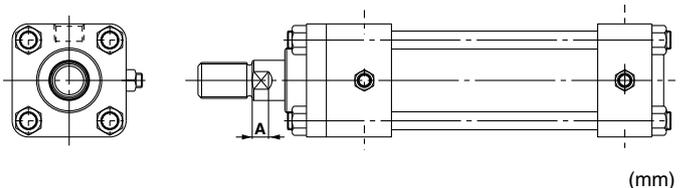
* Stainless steel piston rods are available as made to order.

Specifications

| | |
|----------------------|---------------------------|
| Action | Double acting, Single rod |
| Bore size (mm) | 32, 40, 50, 63, 80, 100 |
| Cushion | Cushion seal type |
| Auto switch mounting | Tie-rod mounting |

* Specifications other than above are the same as standard, basic style.

Dimensions



* Other specifications are the same as the double acting, single rod standard type.



Water Resistant Air Cylinder/Water Resistant Hydraulic Cylinder Specific Product Precautions

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.

Handling Precautions

1. Before installing a cylinder, thoroughly flush out the piping to prevent dust or cutting chips from entering the cylinder. For the hydraulic cylinder, use the air bleed valve to bleed the air inside the cylinder.
2. Eccentric loads applied to the piston rod dramatically shorten the service life. Use the piston rod by always applying a load in an axial direction.
3. Make sure not to scratch or gouge the sliding portion of the piston rod, as this could damage the seals and lead to leaks. Attach a cover or other protection in locations where the cylinder is exposed to grinding sludge or machining chips.
4. When the cylinder is used in a place where the liquid from the piston rod is lightly splashed, and exposed to dust or sand, use a heavy duty scraper (-XC4).
5. If there is a possibility that liquid splashes on cylinder fittings when using an air cylinder, use insert fittings, self-align fittings, piping, etc. Consider the compatibility of liquid components and piping materials before using.
6. When selecting seals, generally use NBR (nitrile rubber) seals with liquids that do not contain chlorine and sulfur, and use FKM (fluororubber) seals with liquids that contain chlorine and sulfur. However, depending on the type and the brand of liquid that splashes on the cylinder, the operating life of seals may be reduced dramatically (such as coolant liquid). In cases where special additives are used, or where liquid caused trouble with the conventional nitrile or fluororubber seals in the past, request an investigation or set up a test period for the use of the seals.

Examples of coolants

| | | |
|----------------------|---------------------------------------|-------------|
| Shimiron, PA-O-5 | (Daido Chemical Industry Co., Ltd.) | (NBR seals) |
| Noritake Cool, AFG-S | (Noritake Co., Ltd.) | (NBR seals) |
| Yushiroken, S-46S | (Yushiro Chemical Industry Co., Ltd.) | (NBR seals) |
| Yushiroken, EC-50-T3 | (Yushiro Chemical Industry Co., Ltd.) | (NBR seals) |
| Yushiron Oil, No. 23 | (Yushiro Chemical Industry Co., Ltd.) | (FKM seals) |
| Daphne Cut, Hs-1 | (Idemitsu Kosan Co., Ltd.) | (FKM seals) |

7. Please consult with SMC separately when liquid contains sulfur, which is used for cylinders with a guide (MGP, MGG).

CJ5
CG5

HY

C
M

D-

-X

Individual
-X

Technical
data