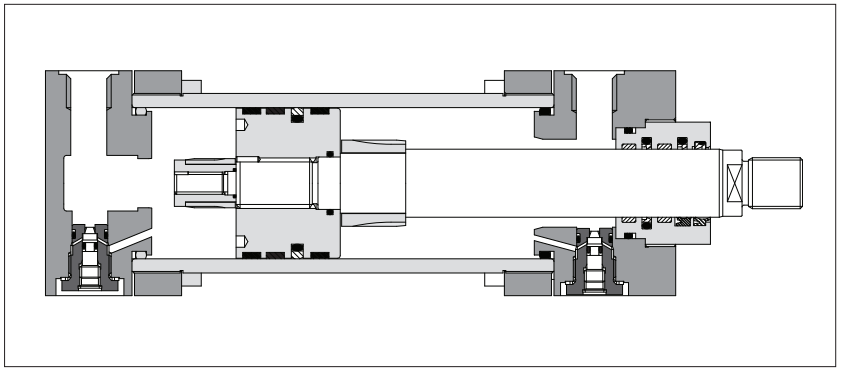
# Hydraulic cylinders type CC - round heads with counterflanges

to ISO 6022 - nominal pressure 25 MPa (250 bar) - max 32 MPa (320 bar)



CC cylinders have engineered double acting construction, designed to suit the requirements of industrial heavy duty applications: top reliability, high performances and long working life.

- Bore sizes from **50** to **320** mm
- Rods with **rolled threads**
- **6** standard mounting styles
- **3** seals options
- Adjustable cushioning
- Rod guide rings for low wear
- Optional built-in position transducer, **see tab. B310**
- Attachments for rods and mounting styles, **see tab. B500**

For cylinder's choice and sizing criteria **see tab. B015**

**SWC Cylinders Designer**

Software for assisted selection of Atos cylinders & servocylinders codes, including cylinder's sizing, full technical information, 2D & 3D drawings in several CAD formats.

Available for download at www.atos.com

**1 MODEL CODE**

| CC | P | - | 50 | / | 36 | * | 0500 | - | S | 3 | 0 | 1 | - | A | - | B1E3X1Z3 | ** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Cylinder series**
**CC** to ISO 6022

**Rod position transducer**
**-** = omit if not requested
**F** = magnetosonic
**M** = magnetosonic programmable
**N** = magnetostrictive
**P** = potentiometric
**V** = inductive
Transducer available on request, contact our technical office

**Bore size**, see section 3
from **50** to **320** mm

**Rod diameter**, see sections 7 and 9
from **36** to **220** mm

**Stroke**, see section 4
up to **5000** mm

**Mounting style**, see sections 2 and 3

| | | REF. ISO |
|---|---|---|
| **A** | =front flange | MF3 |
| **B** | =rear flange | MF4 |
| **L** | =intermediate trunnion | MT4 **(3)** |
| **S** | =fixed eye with spherical bearing | MP5 |
| **X** | =basic execution | - |
| **Z** | =front threaded holes | MX5 |

**Cushioning**, see section 10
**0** = none

**Slow adjustable**
**1** = rear only
**2** = front only
**3** = front and rear

**Spacer**, see section 5
**0** = none **2** = 50 mm **4** = 100 mm **6** = 150 mm **8** = 200 mm

**Sealing system**, see section 12
**1** = (NBR + PTFE + POLYURETHANE) high static and dynamic sealing
**2** = (FKM + PTFE) very low friction and high temperatures
**4** = (NBR + PTFE) very low friction and high speeds

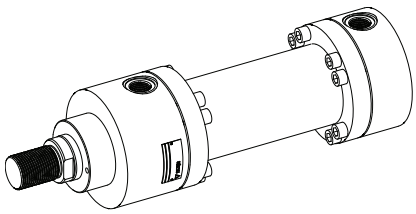
**Options (2)**:
Oversized oil ports, see section 3
**D** = front oversized oil port
**Y** = rear oversized oil port
Flange oil ports, see section 6
**M** = front and rear SAE 6000 flange oil ports
Rod treatment, see section 9
**K** = nickel and chrome plating
**T** = induction surface hardening and chrome plating
Air bleeds, see section 13
**A** = front air bleed
**W** = rear air bleed
Draining, see section 14
**L**= rod side draining

**Heads' configuration (2)**, see section 11
Oil ports positions
**B1** = front head
**X1** = rear head
Cushioning adjustments positions
**E3** = front head
**Z3** = rear head

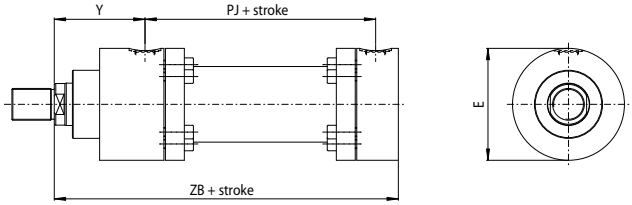
Series number **(1)**

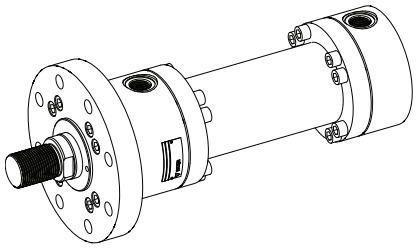
**(1)** For spare parts request indicate the series number printed on the nameplate only for series < 20
**(2)** To be entered in alphabetical order
**(3)** XV dimension must be indicated in the model code, see section 3

## 2 **MOUNTING STYLE** - for dimensions see section 3

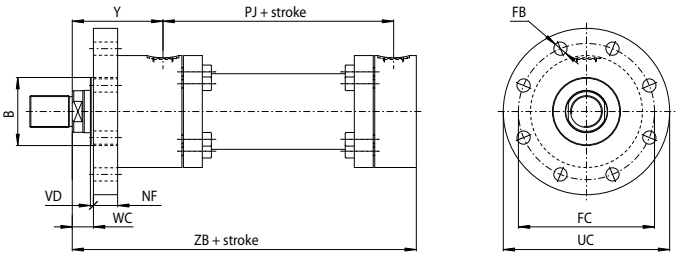


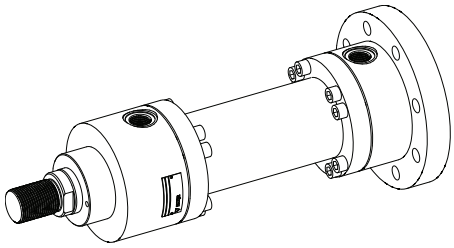
**X** = basic mounting



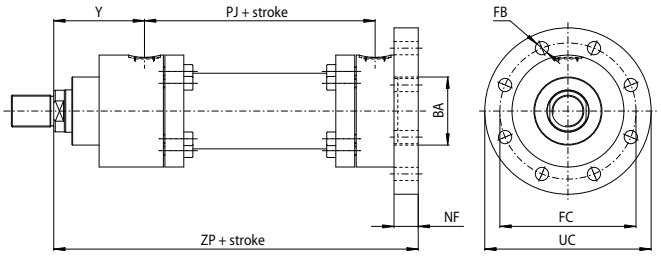



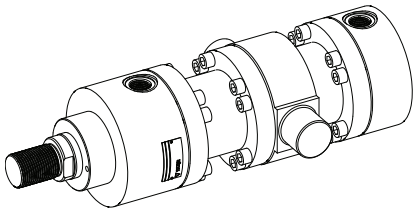
**A** (ISO MF3) = front flange mounting



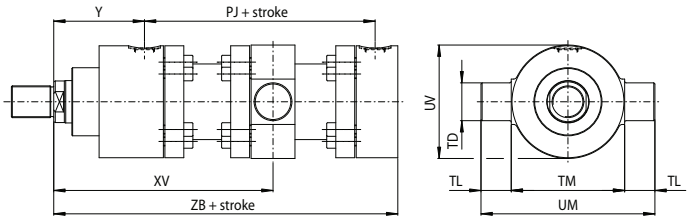



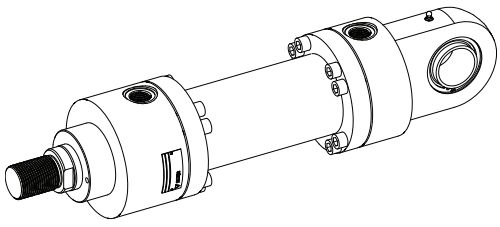
**B** (ISO MF4) = rear flange mounting



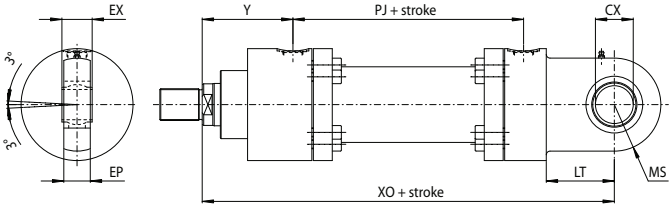



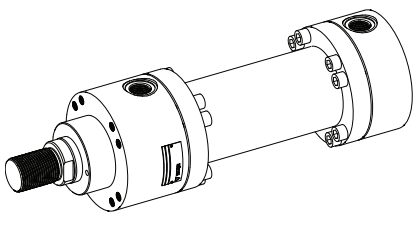
**L** (ISO MT4) = intermediate trunnion mounting



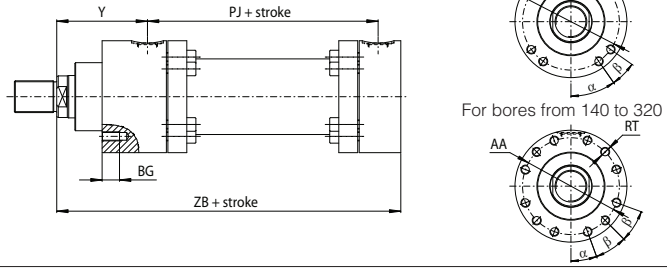



**S** (ISO MP5) = fixed eye with spherical bearing mounting



**Z** = front threaded holes mounting

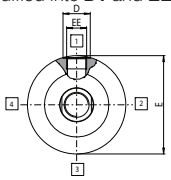


## 3 INSTALLATION DIMENSIONS [mm] - see figures in section 2

| Ø Bore | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ø Rod** | **36** | **45** | **56** | **70** | **90** | **90** | **110** | **110** | **140** | **180** | **220** |
| **α, β** | 32,5°, 25° | 32°, 26° | 35°, 20° | 35°, 20° | 35°, 20° | 27,5°, 17,5° | 25°, 20° | 25°, 20° | 25°, 20° | 27°, 18° | 25°, 20° |
| **AA** | 90 | 105 | 128 | 152 | 188 | 215 | 241 | 275 | 295 | 365 | 458 |
| **B / BA** f8/H8 **(4)** | 63 | 75 | 90 | 110 | 132 | 145 | 160 | 185 | 200 | 250 | 320 |
| **BG** min | 20 | 23 | 23 | 30 | 33 | 33 | 43 | 40 | 40 | 58 | 70 |
| **CX** H7 | 32 | 40 | 50 | 63 | 80 | 90 | 100 | 110 | 125 | 160 | 200 |
| **D (1)** | 29 | 36 | 36 | 42 | 42 | 52 | 52 | 52 | 52 | 58 | 58 |
| **D1 (1)** | 36 | 42 | 42 | 52 | 52 | 58 | 58 | 58 | 58 | 69 | 69 |
| **E** max **(2)** | 108 | 124 | 148 | 175 | 214 | 255 | 270 | 315 | 330 | 412 | 510 |
| **EE (1)** 6g | G 1/2 | G 3/4 | G 3/4 | G 1 | G 1 | G 1 1/4 | G 1 1/4 | G 1 1/4 | G 1 1/4 | G 1 1/2 | G 1 1/2 |
| **EE1 (1)** 6g | G 3/4 | G1 | G 1 | G 1 1/4 | G 1 1/4 | G 1 1/2 | G 1 1/2 | G 1 1/2 | G 1 1/2 | G 2 | G 2 |
| **EP** | 27 | 35 | 40 | 52 | 66 | 65 | 84 | 88 | 102 | 130 | 162 |
| **EX** h12 | 32 | 40 | 50 | 63 | 80 | 90 | 100 | 110 | 125 | 160 | 200 |
| **FB** H13 | 13,5 | 13,5 | 17,5 | 22 | 22 | 26 | 26 | 33 | 33 | 39 | 45 |
| **FC** js13 | 132 | 150 | 180 | 212 | 250 | 300 **(7)** | 315 | 365 **(7)** | 385 | 475 | 600 |
| **LT** min | 40 | 50 | 63 | 71 | 90 | 113 | 112 | 135 | 160 | 200 | 250 |
| **MS** max | 40 | 50 | 63 | 71 | 90 | 113 | 112 | 118 | 160 | 200 | 250 |
| **MT** [Nm] **(3)** | 30 | 50 | 85 | 152 | 255 | 255 | 304 | 370 | 490 | 950 | 1750 |
| **NF** js13 | 25 | 28 | 32 | 36 | 40 | 40 | 45 | 50 | 56 | 63 | 80 |
| **PJ (6)** | 120 | 133 | 155 | 171 | 205 | 208 | 235 | 250 | 278 | 325 | 350 |
| **RT** | n°8 holes M8 | n°8 holes M10 | n°8 holes M12 | n°8 holes M14 | n°8 holes M16 | n°12 holes M16 | n°12 holes M18 | n°12 holes M20 | n°12 holes M22 | n°12 holes M27 | n°12 holes M33 |
| **TD** f8 | 32 | 40 | 50 | 63 | 80 | 90 | 100 | 110 | 125 | 160 | 200 |
| **TL** js13 | 25 | 32 | 40 | 50 | 63 | 70 | 80 | 90 | 100 | 125 | 160 |
| **TM** h12 | 112 | 125 | 150 | 180 | 224 | 265 | 280 | 320 | 335 | 425 | 530 |
| **UC** max | 160 | 180 | 215 | 260 | 300 | 340 | 370 | 425 | 455 | 545 | 680 |
| **UM** | 162 | 189 | 230 | 280 | 350 | 405 | 440 | 500 | 535 | 675 | 850 |
| **UV** max | 108 | 124 | 150 | 180 | 219 | 260 | 280 | 315 | 333 | 412 | 510 |
| **VD** | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 8 |
| **VE** max **(4)** | 29 | 32 | 36 | 41 | 45 | 45 | 50 | 55 | 61 | 71 | 88 |
| **WC (6)** | 22 | 25 | 28 | 32 | 36 | 36 | 40 | 45 | 45 | 50 | 56 |
| **WF (4) (6)** | 47 | 53 | 60 | 68 | 76 | 76 | 85 | 95 | 101 | 113 | 136 |
| **XO (6)** | 305 | 348 | 395 | 442 | 520 | 580 | 617 | 690 | 756 | 903 | 1080 |
| **XV (5) (6)** minimum stroke for style L | 175 | 185 | 150 | 160 | 245 | 250 | 260 | 350 | 390 | 460 | 560 |
| **XV (5) (6)** min | 260 | 285 | 290 | 320 | 410 | 440 | 465 | 540 | 590 | 690 | 820 |
| **XV (5) (6)** max | 85 + stroke | 100 + stroke | 140 + stroke | 160 + stroke | 165 + stroke | 190 + stroke | 205 + stroke | 190 + stroke | 200 + stroke | 230 + stroke | 260 + stroke |
| **Y** ±2 | 98 | 112 | 120 | 134 | 153 | 181 | 185 | 205 | 220 | 260 | 310 |
| **ZB** max | 244 | 274 | 305 | 340 | 396 | 430 | 467 | 505 | 550 | 652 | 764 |
| **ZP (6)** | 265 | 298 | 332 | 371 | 430 | 465 | 505 | 550 | 596 | 703 | 830 |

### NOTES TO TABLE 3

**(1) D, EE** - Oil ports and drain are threaded according to GAS standard with counterbore dimension **D** according to ISO 1179-1 (see figure below).
When oversized oil ports are selected (**D** = front oversized oil ports, **Y** = rear oversized oil ports) dimensions **D** and **EE** are respectively modified into **D1** and **EE1**




**(2) E** - If not otherwise specified in the figures in section 2 this value is the front and rear round heads dimension for all the mounting styles (see figure above)

**(3) MT** - Screws tightening torque. Mounting screws must be to a minimum strength of ISO 898/2 grade 12.9

**(4) B, VE, WF** - See figure in section 7

**(5) XV** - For cylinders with mounting style **L** the stroke must always exceed the minimum values reported in the table.
The requested XV value must be included between **XV min** and **XV max** and it must be always indicated, with dimension in millimeters, together with the cylinder code. See the following example:

CC - 50 / 36 * 0500 - L308 - A -B1E3X1Z3
**XV = 300**

**(6)** The tolerance is according to the table below

| Mounting dimensions | PJ, ZP, XO | WF, WC, XV |
|---|---|---|
| stroke < 1250 | ±1,5 | ±2 |
| 1250 > stroke < 3150 | ±3 | ±4 |
| stroke > 3150 | ±5 | ±8 |

**(7)** The dimension is not according to ISO 6022

## 4 STROKE SELECTION

Stroke has to be selected a few mm longer than the working stroke, to prevent to use the cylinder heads as mechanical stroke-end. The table below shows the minimum stroke depending to the bore.

**Minimum stroke [mm]**

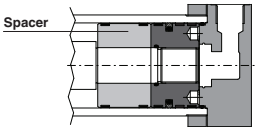
| Ø Bore | 50 | 63 | 80 | 100 | 125 | 140 |
|---|---|---|---|---|---|---|
| Minimum stroke | 70 | 70 | 20 | 25 | 50 | 50 |
| **Ø Bore** | **160** | **180** | **200** | **250** | **320** | |
| Minimum stroke | 50 | 70 | 70 | 80 | 120 | |

Maximum stroke:
- 5000 mm

Stroke tolerances:
- 0 +2 mm for strokes up to 1250 mm
- 0 +5 mm for strokes from 1250 to 3150 mm
- 0 +8 mm for strokes over 3150 mm

## 5 SPACER

For strokes longer than 1000 mm, proper spacers have to be introduced in the cylinder's construction to increase the rod and piston guide and to protect them from overloads and premature wear. Spacers can be omitted for cylinders working in traction mode. The introduction of spacers increases the overall cylinder's dimensions: spacers' lenght has to be added to all stroke dependent dimensions in section 3.




**RECOMMENDED SPACERS [mm]**

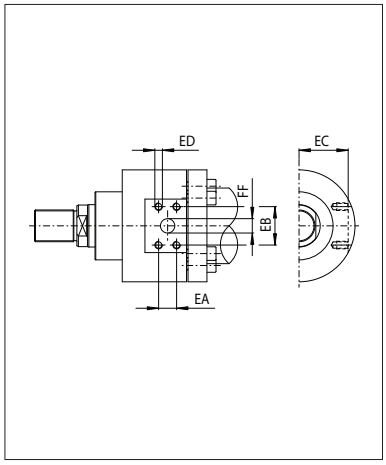
| Stroke | 1001 ÷ 1500 | 1501 ÷ 2000 | 2001 ÷ 2500 | 2501 ÷ 5000 |
|---|---|---|---|---|
| Spacer code | **2** | **4** | **6** | **8** |
| Length | 50 | 100 | 150 | 200 |

## 6 SAE 6000 FLANGE OIL PORTS - DIMENSIONS TO ISO 6162-2 [mm]

| Ø Bore | DN | EC | EA ±0,25 | EB ±0,25 | ED 6g | FF 0 / -1,5 |
|---|---|---|---|---|---|---|
| **50** (*) | 13 | 46 | 18,2 | 40,5 | M8x1,25 | 13 |
| **63** (*) | 19 | 51 | 23,8 | 50,8 | M10x1,5 | 19 |
| **80** | | 65 | | | | |
| **100** | 25 | 77 | 27,8 | 57,2 | M12x1,75 | 25 |
| **125** | | 99 | | | | |
| **140** | 32 | 118 | 31,6 | 66,6 | M14x2 (**) | 32 |
| **160** | | 126 | | | | |
| **180** | | 150 | | | | |
| **200** | | 158 | | | | |
| **250** | 38 | 195 | 36,7 | 79,3 | M16x2 | 38 |
| **320** | 51 | 245 | 44,5 | 96,8 | M20x2,5 | 51 |

(*) SAE flange not available for style B (ISO MF4)
(**) Not compliance to ISO 6162-2

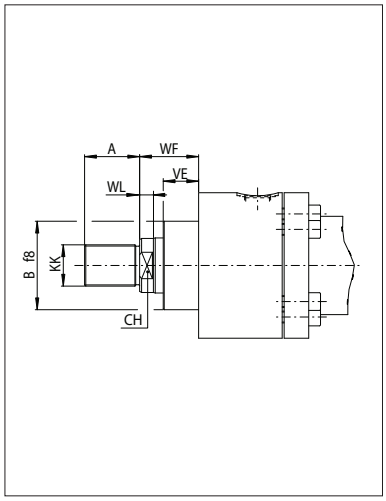
CODE: **M** = Front and rear SAE 6000 flange oil ports
Flange oil port allows an easy cylinder's connection to the piping system and it can work up to the maximum pressure 32 MPa (320 bar).




## 7 ROD END DIMENSIONS [mm]

| Ø Bore | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ø Rod** | **36** | **45** | **56** | **70** | **90** | **90** | **110** | **110** | **140** | **180** | **220** |
| **A** max | 36 | 45 | 56 | 63 | 85 | 90 | 95 | 105 | 112 | 125 | 160 |
| **CH** | 30 | 39 | 48 | 62 | 80 | 75 | 100 | 100 | 128 | 15 (*) | 20 (*) |
| **KK** 6g | M27x2 | M33x2 | M42x2 | M48x2 | M64x3 | M72x3 | M80x3 | M90x3 | M100x3 | M125x4 | M160x4 |
| **WL** min | 8 | 10 | 10 | 10 | 15 | 15 | 15 | 15 | 15 | - | - |

(*) n° 2 holes per key




## 8 CYLINDER'S HOUSING FEATURES

The cylinder's housings are made in different materials depending to the bore; the internal surfaces are lapped: diameter tolerance H8, roughness Ra ≤ 0,25 µm.

| ø Bore | Material | Rs min [N/mm²] |
|---|---|---|
| **50÷200** | Cold drawn and stressed steel | 450 |
| **250-320** | Hot rolled steel | 355 |

## 9 RODS FEATURES and options

The rods materials have high strength, which provide safety coefficients higher than 4 in static stress conditions, at maximum working pressure.
The rod surface is chrome plated: diameter tolerances f7, roughness Ra ≤ 0,25 µm. Corrosion resistance of 200h in neutral spray to ISO 9227 NSS.

| ø Rod | Material | Rs min [N/mm²] | Chrome | |
|---|---|---|---|---|
| | | | min thickness [mm] | hardness [HV] |
| **36÷110** | Hardened and tempered alloy-steel | 700 | 0,020 | 850-1150 |
| **140** | Alloy steel | 450 | | |
| **180÷220** | Carbon steel | 360 | 0,045 | 850-1150 |

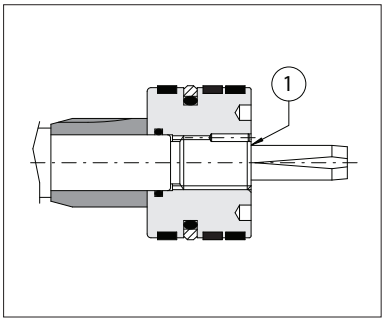
Rod diameters from 36 to 70 mm have rolled threads; in rolling process the component material is stressed beyond its yield point, being deformed plastically. This offers many technical advantages: higher profile accuracy, improved fatigue working life and high wear resistance. See **tab. B015** for the calculation of the expected rod fatigue life.
**Contact our technical office** in case of heavy duty applications.

Rod corrosion resistance and hardness can be improved selecting the options **K** and **T** (option K affects the strength of standard rod, see **tab. B015** for the calculation of the expected rod fatigue life):

**K** = Nickel and chrome-plating (for rods from 36 to 110 mm)
Corrosion resistance (rating 10 to ISO 10289):
- 500 h in acetic acid salt spray to ISO 9227 AASS
- 1000 h in neutral spray to ISO 9227 NSS

**T** = Induction surface hardening and chrome plating (for rods up to 140 mm)
- 56-60 HRC (613-697 HV) hardness

**ROD-PISTON COUPLING**

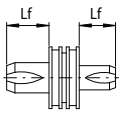



The rod and piston are mechanically coupled by a threaded connection in which the thread on the rod is at least equal to the external thread KK, indicated in the table 7. The piston is screwed to the rod by a prefixed tightening torque in order to improve the fatigue resistance. The stop pin ① avoids the piston unscrewing.

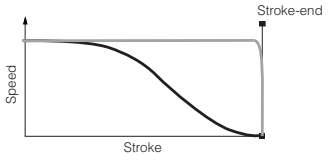
## 10 CUSHIONING

Cushioning are recommended for applications where: • the piston makes a full stroke with speed over than 0,05 m/s; • it is necessary to reduce undesirable noise and mechanical shocks; • vertical application with heavy loads. The stroke-end cushioning are hydraulic dampers specifically designed to dissipate the energy of the mass connected to the cylinder rod, by progressively increasing the pressure in the cushioning chamber and thus reducing the rod speed before the cylinder's mechanical stroke-end (see the graphics at side). See the **tab. B015** for the max damping energy.
The cylinder is provided with needle valve to optimize cushioning performances in different applications. The regulating screws are supplied fully screwed in (max cushioning effect).
In case of high masses and/or very high operating speeds it is recommended to back them off to optimize the cushioning effect. The adjustment screw has a special design to prevent unlocking and expulsion. The cushioning effect is highly ensured even in case of variation of the fluid viscosity.

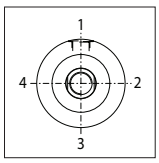
Lf is the total cushioning lenght. When the stroke-end cushioning are used as safety devices, to mechanically preserve the cylinder and the system, it is advisable to select the cylinder's stroke longer than the operating one by an amount equal to the cushioning lenght Lf; in this way the cushioning effect does not influence the movement during the operating stroke.




| Ø Bore | | 50 | 63 | 80 | 100 | 125 | 140 | 160 | 180 | 200 | 250 | 320 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ø Rod | | 36 | 45 | 56 | 70 | 90 | 90 | 110 | 110 | 140 | 180 | 220 |
| Cushioning length [mm] | Lf front | 29 | 40 | 45 | 50 | 60 | 60 | 64 | 64 | 64 | 80 | 100 |
| | Lf rear | 35 | 38 | 45 | 50 | 60 | 60 | 64 | 64 | 64 | 64 | 64 |

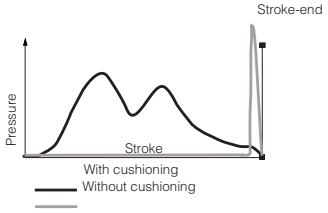



## 11 POSITION OF THE OIL PORTS AND CUSHIONING ADJUSTMENTS



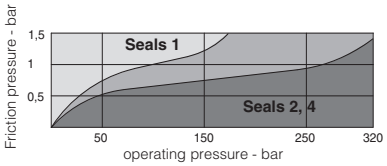

FRONT HEAD: **B1** = oil port position; **E3** = cushioning adjustment position
REAR HEAD: **X1** = oil port position; **Z3** = cushioning adjustment position.
The oil ports and cushioning adjustment positions are only available, respectively, on sides 1 and 3 (see figure at side).

Example of model code: CC-200/140 *0100-S301 - A - **B1E3X1Z3**




## 12 SEALING SYSTEM FEATURES

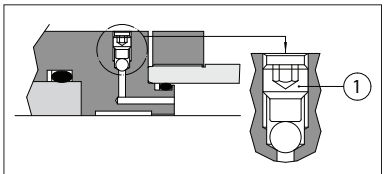
The sealing system must be choosen according to the working conditions of the system: speed, operating frequencies, fluid type and temperature. Additional verifications about minimum in/out rod speed is warmly suggested, see **tab. B015**.
Special sealing system for low temperature, high frequencies (up to 20 Hz), long working life and heavy duty are available, see **tab. TB020**. All the seals, static and dynamic, must be periodically replaced: proper spare kits are available, see section 18. Contact our technical office for the compatibility with other fluids not mentioned below and specify type and composition. See section 15 for fluid requirements.




| Sealing system | Material | Features | Max speed [m/s] | Fluid temperature range | Fluids compatibility | ISO Standards for seals | |
|---|---|---|---|---|---|---|---|
| | | | | | | Piston | Rod |
| 1 | NBR + PTFE + POLYURETHANE | high static and dynamic sealing | 0,5 | -20°C to 85°C | Mineral oils HH, HL, HLP, HLP-D, HM, HV, MIL-H-5606 | ISO 7425/1 | ISO 5597/1 |
| 2 | FKM + PTFE | very low friction and high temperatures | 4 | -20°C to 120°C | Mineral oils HH, HL, HLP, HLP-D, HM, HV, MIL-H-5606 fire resistance fluids HFA, HFB, HFC (water max 45%), HFD-U, HFD-R | ISO 7425/1 | ISO 7425/2 |
| 4 | NBR + PTFE | very low friction and high speeds | 4 | -20°C to 85°C | Mineral oils HH, HL, HLP, HLP-D, HM, HV, MIL-H-5606 fire resistance fluids HFA, HFC (water max 45%), HFD-U | ISO 7425/1 | ISO 7425/2 |

## 13 AIR BLEEDS

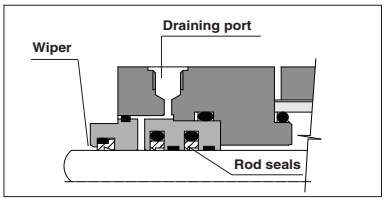
CODES: **A** = front air bleed; **W** = rear air bleed
The air in the hydraulic circuit must be removed to avoid noise, vibrations and irregular cylinder's motion: air bleed valves are recommended to realize this operation easily and safely.
Air bleeds are positioned on side 3, see section 11.
For a proper use of the air-bleed (see figure on side) unlock the grub screw ① with a wrench for hexagonal head screws, bleed-off the air and retighten as indicated in table at side.




| Ø Bore | Screwing | Tightening torque |
|---|---|---|
| 50÷200 | M8 x 10 | 20 Nm |
| 250÷320 | M12 x 20 | 30 Nm |

## 14 DRAINING

CODE: **L** = rod side draining
The rod side draining reduces the seals friction and increases their reliability; it is mandatory for cylinders with strokes longer than 2000 mm, with rod side chamber constantly pressurized and for servocylinders.
The draining is positioned on the same side of the oil port, between the wiper and the rod seals (see figure at side). It is recommended to connect the draining port to the tank without backpressure.
Draining port is G1/8.




## 15 FLUID REQUIREMENTS

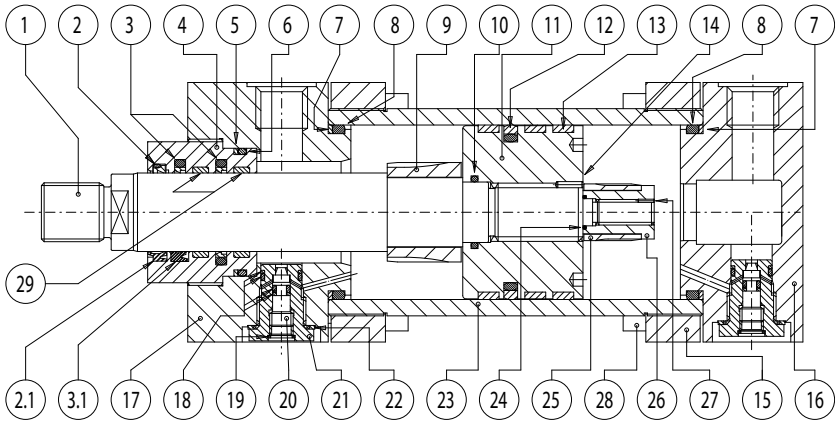
Cylinders and servocylinders are suitable for operation with mineral oils with or without additives (**HH, HL, HLP, HLP-D, HM, HV**), fire resistant fluids (**HFA** oil in water emulsion, 90-95% water and 5-10% oil; **HFB** water in oil emulsion, 40% water; **HFC** water glycol, max 45% water) and synthetic fluids (**HFD-U** organic esters, **HFD-R** phosphate esters). The fluid must have a viscosity within 15 and 100 mm²/s, a temperature within 0 and 70°C and fluid contamination class ISO 20/18/15 according to ISO 4406 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog.

## 16 CYLINDERS MASSES [kg] (tolerance ± 5%)

| | | MASS FOR STYLE X for single rod | | ADDITIONAL MASSES depending on mounting styles and options | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Ø Bore** [mm] | **Ø Rod** [mm] | for 100 mm stroke | each 100 mm more | Styles **A, B** | Style **L** | Style **S** | front cushioning | rear cushioning | each 50 mm spacer |
| **50** | **36** | 18 | 1,9 | 2,77 | 3,15 | 1 | 0,2 | 1 | 1,3 |
| **63** | **45** | 20,1 | 2,75 | 3,96 | 4,64 | 2,58 | 0,3 | 1 | 2 |
| **80** | **56** | 35,5 | 4,15 | 7,17 | 7,81 | 4,54 | 0,5 | 1 | 3,08 |
| **100** | **70** | 58 | 6,5 | 11,14 | 13,38 | 7,18 | 0,8 | 1,5 | 4,81 |
| **125** | **90** | 100 | 10,17 | 16 | 23,68 | 14,02 | 1,2 | 2 | 7,40 |
| **140** | **90** | 144 | 10,73 | 22,5 | 41,09 | 23 | 1,2 | 2 | 8,90 |
| **160** | **110** | 189 | 15,12 | 29,92 | 47,92 | 27,5 | 1,7 | 5 | 11,72 |
| **180** | **110** | 262 | 17,32 | 41,66 | 70,16 | 45,9 | 2,5 | 5 | 14,92 |
| **200** | **140** | 335 | 22,94 | 54,22 | 81,12 | 69 | 2,5 | 5 | 17,75 |
| **250** | **180** | 660 | 42,62 | 86,01 | 167 | 116 | 2,5 | 5 | 30,58 |
| **320** | **220** | 1230 | 65,35 | 166 | 304 | 250 | 2,8 | 5 | 49,32 |

**Note:** the masses related to the other options, not indicated in the table, don't have a relevant influence on the cylinder's mass

## 17 CYLINDER SECTION




| POS. | DESCRIPTION | MATERIAL | POS. | DESCRIPTION | MATERIAL | POS. | DESCRIPTION | MATERIAL |
|---|---|---|---|---|---|---|---|---|
| 1 | Rod | Chrome plated steel | 10 | O-ring | NBR / FKM | 21 | Cushioning adjustment plug | Steel |
| 2 | Wiper | NBR / FKM and PTFE | 11 | Piston | Steel | 22 | Seal | FKM |
| 2.1 | Wiper | Polyurethane | 12 | Piston seal | NBR / FKM and PTFE | 23 | Cylinder housing | Steel |
| 3 | Rod seal | NBR / FKM and PTFE | 13 | Piston guide ring | PTFE | 24 | O-ring | NBR / FKM |
| 3.1 | Rod seal | Polyurethane | 14 | Screw stop pin | Steel | 25 | Rear cushioning piston | Steel |
| 4 | Rod bearing | Bronze / Steel | 15 | Counterflange | Steel | 26 | Cushioning piston locking | Steel |
| 5 | Anti-extrusion ring | PTFE | 16 | Rear head | Steel / Cast iron | 27 | Screw stop pin | Steel |
| 6 | O-ring | NBR / FKM | 17 | Front head | Steel / Cast iron | 28 | Screw | Steel class 12.9 |
| 7 | Anti-extrusion ring | PTFE | 18 | O-ring and anti-extrusion ring | FKM and PTFE | 29 | Rod guide | PTFE |
| 8 | O-ring | NBR /FKM | 19 | Seeger | Steel | | | |
| 9 | Front cushioning piston | Steel | 20 | Cushioning adjustment screw | Steel | | | |

## 18 SPARE PARTS - SEE TABLE SP-B241

Example for seals spare parts code

| G 1 | - | C C | - | 50 | / | 36 |
|---|---|---|---|---|---|---|

Sealing system

Cylinder series

Bore size [mm]

Rod diameter [mm]