Hydraulic cylinders type CKA - for potentially explosive atmospheres
to 2014/34/EU ATEX directive - ISO 6020-2 - nominal pressure 16 MPa (160 bar) - max 25 MPa (250 bar)

CKA cylinders are derived from standard CK (tab.B137) with certification according to ATEX 2014/34/EU. They are designed to limit the external surface temperature, according to the certified class, to avoid the self-ignition of the explosive mixtures potentially present in the environment. CKAM servoycylinders are equipped with ex-proof built-in digital magnetostrictive position transducer, ATEX certified.

- Optional ex-proof proximity sensors, ATEX certified
- Bore sizes from 25 to 200 mm
- Up to 3 rod diameters per bore
- Strokes up to 5000 mm
- Single or double rod
- 15 standard mounting styles
- 5 seals options
- Attachments for rods and mounting styles, see tab. B500

For cylinder’s dimensions and options see tab. B.137
For cylinder’s choice and sizing criteria see tab. B015

1 ATEX CERTIFICATION

<table>
<thead>
<tr>
<th>Cylinder type</th>
<th>Group</th>
<th>Equipment category</th>
<th>Gas group</th>
<th>Temperature class (1)</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>CKA</td>
<td>II</td>
<td>2 (D)</td>
<td>II C</td>
<td>T65°C (C16) / T135°C (C14)</td>
<td>1,2,21,22</td>
</tr>
<tr>
<td>CKA + ex-proof rod position transducer (2)</td>
<td>II</td>
<td>2 G</td>
<td>II B</td>
<td>T6</td>
<td>1,2</td>
</tr>
<tr>
<td>CKA + ex-proof proximity sensors</td>
<td>II</td>
<td>3 G</td>
<td>II</td>
<td>T85°C</td>
<td>22</td>
</tr>
</tbody>
</table>

(1) Temperature class depends to the max fluid temperature and sealing system
(2) The rod position transducer is certified to work with explosive gas (cat. 2G) and dust (cat. 3D)

2 MODEL CODE

** B1E3X1Z3 **

<table>
<thead>
<tr>
<th>Heads’ configuration (1)(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil ports positions</td>
</tr>
<tr>
<td>B* = front head</td>
</tr>
<tr>
<td>X* = rear head</td>
</tr>
</tbody>
</table>

Cushioning adjustments positions, to be entered only if adjustable cushionings are selected
| E* = front head |
| Z* = rear head |
| * = selected position (1, 2, 3 or 4)

Options (1)(3)
- Rod end
  | P = female thread |
  | G = light female thread |
  | H = light male thread |

Oversized oil ports
| D = front oversized oil port |
| Y = rear oversized oil port |

Ex-proof proximity sensors, see section [T]
- R = front sensor
- S = rear sensor

Rod treatment
| K = nickel and chrome plating |
| T = induction surface hardening and chrome plating |

Air bleeds
| A = front air bleed |
| W = rear air bleed |

Draining
| L = rod side draining |

Sealing system, see section [T]
1 = (NBR + POLYURETHANE) high static and dynamic sealing
2 = (FKM + PTFE) very low friction and high temperatures
4 = (NBR + PTFE) very low friction and high speeds
6 = (NBR + PTFE) very low friction, single acting - pushing
7 = (NBR + PTFE) very low friction, single acting - pulling

Spacer (1)
| 0 = none |
| 2 = 50 mm |
| 4 = 100 mm |
| 6 = 150 mm |
| 8 = 200 mm |

Cushionings (1)
| 0 = none |

Fast adjustable
| 1 = rear only |
| 2 = front only |
| 3 = front and rear |

Slow adjustable
| 4 = rear only |
| 5 = front only |
| 6 = front and rear |
| 7 = rear only |
| 8 = front only |
| 9 = front and rear |

(1) For details see table B137
(2) For spare parts request indicate the series number printed on the nameplate only for series < 30
(3) To be entered in alphabetical order
(4) Not available for double rod
(5) XV dimension must be indicated in the model code

For cylinder’s dimensions and options see tab. B500
For cylinder’s choice and sizing criteria see tab. B015
3 CERTIFICATION
In the following are resumed the cylinders marking according to ATEX certification.
Reference norm UNI EN 13463.
Ex II 2GD cl IIC T85°C(T6)
GROUP II, Atex
Ex = Equipment for explosive atmospheres
II = Group II for surface plants
2 = High protection (equipment category)
Ck = Protection by contructional safety and by liquid immersion
IIC = Gas group
T85/CT135°C = Surface temperature class for dust
T6/T4 = Surface temperature class for gas, see section 6
Zone 1 (gas) and 21 (dust) = Possibility of explosive atmospheres during normal functioning
Zone 2 (gas) and 22 (dust) = Low probability of explosive atmospheres

4 INSTALLATION NOTES
Before installation and start-up refer to tab. B600
- The max surface temperature indicated in the nameplate must be lower than the following values:
  GAS = 80% of gas ignition temperature
  DUST = max value between dust ignition temperature - 75°C and 2/3 of dust ignition temperature
- The ignition temperature of the fluid must be 50°C greater than the maximum surface temperature indicated in the nameplate
- The cylinder must be grounded using the threaded hole on the rear head, evidenced by the nameplate with ground symbol. The hydraulic cylinder must be put at the same electric potential of the machine

5 EX-PROOF ROD POSITION TRANSDUCER
CODE: M
CKA cylinders are available with “Balluff” Ex-proof rod position transducer. ATEX certified to II 1/2 G Ex d IIC T6/T5 Ga/Gb for gas and II 2D Ex tb IIC T85°C/T110°C Db Ip 67 -40°C to +85°C (T6) -40°C to +60°C (T5) for dust. Ex-proof transducers meet the requirements of the following european standard documentations:
II 1/2 G Ex d IIC T6/T5 Ga/Gb II 2D Ex tb IIC T85°C/T110°C Db Ip 67
EN 60079-0 EN 61241-0
EN 60079-1 EN 61241-0/AA
EN 60079-26 EN 61241-1
The transducer housing is made in AISI 303.
For dimensions and details, contact our technical office.
For certification and start-up refer to the user’s guide included in the supply. The transducer is available with SIL certified on request.

6 MAIN CHARACTERISTICS AND FLUID REQUIREMENTS
Ambient temperature -20°C to +70°C
Fluid temperature -20°C to +70°C (T6); -20°C to +120°C (T4) for seals type 2 (*)
Max surface temperature ≤ +85°C (T6); ≤ +135°C (T4) for seals type 2 (*)
Max working pressure 16 MPa (160 bar)
Max pressure 25 MPa (250 bar)
Max frequency 5 Hz
Max speed (see section 6) 1 m/s (seats type 2, 4, 6, 7); 0.5 m/s (seats type 1)
Recommended viscosity 15 + 100 mm²/s
Fluid contamination class according to ISO 4406: ISO 19/16 (achievable with in-line filters at 25 µm)

Note: (*) Cylinders with seals type 2 may also be certified T6 limiting the max fluid temperature to 70°C

7 SEALING SYSTEM FEATURES
The sealing system must be chosen according to the working conditions of the system: speed, operating frequencies, fluid type and temperature. Additional verifications about minimum in/out rod speed ratio, static and dynamic sealing friction are warmly suggested, see tab. B015
When single acting seals are selected (types 6 and 7), the not pressurized cylinder’s chamber must be connected to the tank. Contact our technical office for the compatibility with other fluids not mentioned below and specify type and composition.

Sealing system Material Features Max speed Fluid temperature range Fluids compatibility ISO Standards for seals Piston Rod
1 NBR + POLYURETHANE high static and dynamic sealing 0.5 -20°C to 70°C Mineral oils HH, HL, HLP, HLP-D, HM, HV ISO 7425/1 ISO 7425/7
2 FKM + PTFE very low friction and high temperatures 1 -30°C to 120°C Mineral oils HH, HL, HLP, HLP-D, HM, HV fire resistance fluids HFA, HFB, HFD-U, HFD-R ISO 7425/1 ISO 7425/7
4 NBR + PTFE very low friction and high speeds 1 -30°C to 70°C Mineral oils HH, HL, HLP, HLP-D, HM, HV fire resistance fluids HFA, HFC (water max 45%), HFD-U ISO 7425/1 ISO 7425/2
6 + 7 NBR + PTFE very low friction single acting - pushing/pulling 1 -30°C to 70°C Mineral oils HH, HL, HLP, HLP-D, HM, HV fire resistance fluids HFA, HFC (water max 45%), HFD-U ISO 7425/1 ISO 7425/2

8 EX-PROOF PROXIMITY SENSORS
CODES: R = front sensor; S = rear sensor
CKA cylinders are available with ex-proof proximity sensors, ATEX certified to Ex II 3G Ex nA II T4 Ta
They meet the requirements of the following european standard documentations: EN 60079-0, EN 60079-15.
Their functioning is based on the variation of the magnetic field, generated by the sensor itself, when the cushioning piston enters on its influence area, causing a change of state (on/off) of the sensors. The sensor housing is made in stainless steel. For dimensions and details, contact our technical office.
For certification and start-up refer to the user’s guide included in the supply.

SENSORS TECHNICAL DATA
Ambient temperature -20°C to +70°C
Nominal voltage 24 Vdc
Operating voltage 10 to 30 Vdc
Max load 200 mA
Repeatability <5%
Protection degree IP 68
Max frequency 1000 Hz
Max pressure 25 MPa