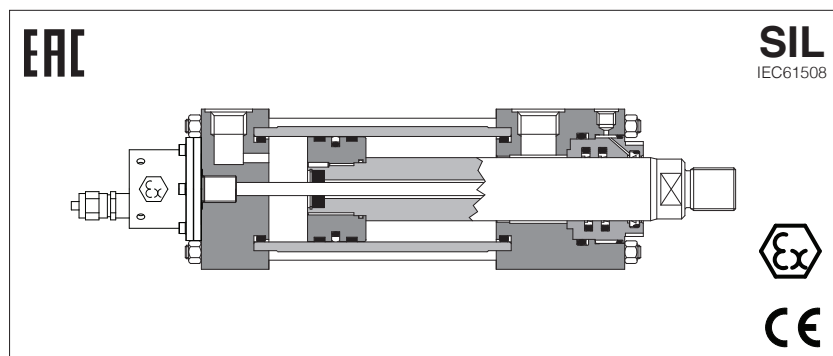


Hydraulic cylinders type **CKA** - for potentially explosive atmospheres

ATEX - 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 servo-cylinders 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
- Attachments for rods and mounting styles, **see tab. B800**
- CKA cylinders are **SIL** compliance with IEC 61508 (TÜV certified), certification on request

For cylinder's dimensions and options **see tab. B137**

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

1 ATEX CERTIFICATION

Cylinder type	Group	Equipment category	Gas/dust group	Temperature class (1)	Zone
CKA	II	2 GD	II C/III C	T85°C(T6) / T135°C(T4)	1,2,21,22
CKA + ex-proof rod position transducer (2)	II	2 G	II B	T6/T5	1,2
	II	2 D	III C	T85°C/T100°C	21,22
CKA + ex-proof proximity sensors	II	3 G	II	T4	2

(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. 2D)

2 MODEL CODE

CKA	M	/	10	-	50	/	22	/	22	*	0500	-	S	3	0	1	-	A	-	B1E3X1Z3	**
<p>Cylinder series CKA to ATEX 2014/34/EU dimensions to ISO 6020 - 2</p> <p>Ex-proof position transducer See section [5] - = omit if not requested M = Digital magnetostrictive</p> <p>Incorporated subplate (1) - = omit if subplate is not requested 10 = size 06 20 = size 10 30 = size 16 40 = size 25</p> <p>Bore size (1) from 25 to 200 mm</p> <p>Rod diameter (1) from 12 to 140 mm</p> <p>Second rod diameter for double rod (1) from 12 to 140 mm, omit for single rod</p> <p>Stroke (1) up to 5000 mm (4000 mm for CKAM)</p>																					Series number (2)
<p>Heads' configuration (1)(3) Oil ports positions B* = front head X* = rear head Cushioning adjustments positions, to be entered only if adjustable cushioning are selected E* = front head Z* = rear head * = selected position (1, 2, 3 or 4)</p> <p>Options (1)(3): Rod end F = 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 [9] 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</p>																					

Mounting style (1)

C = fixed clevis
D = fixed eye
E = feet
G = front trunnion
H = rear trunnion
L = intermediate trunnion
N = front flange
P = rear flange
S = fixed eye + spherical bearing
T = threaded hole+tie rods extended
V = rear tie rods extended
W = both end tie rods extended
X = basic execution
Y = front tie rods extended
Z = front threaded holes

REF. ISO

MP1 (4)
MP3 (4)
MS2
MT1
MT2 (4)
MT4 (5)
ME5
ME6 (4)
MP5 (4)
MX7
MX2
MX1
MX3
MX5

Sealing system, see section [8]

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

Cushioning (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

Fast fixed

7 = rear only
8 = front only
9 = front and rear

(1) For details see table **B137**

(3) To be entered in alphabetical order

(2) For spare parts request indicate the series number printed on the nameplate only for series < 30

(4) Not available for double rod

(5) XV dimension must be indicated in the model code

3 CERTIFICATION

In the following are resumed the cylinders marking according to Atex certification.
Reference norm ISO 80079-36, ISO 80079-37.

II 2G Ex h IIC T6, T4 Gb (gas) II 2D Ex h IIIC T85°C, T135°C Db (dust)

GROUP II, Atex

II = Group II for surface plants
2 = High protection (equipment category)
G = For gas, vapours
D = For dust
Ex = Equipment for explosive atmospheres
IIC = Gas group
IIIC = Dust group
T85°C/T135°C = Surface temperature class for dust, see section 7
T6/T4 = Surface temperature class for gas, see section 7
Gb/Db = EPL Equipment group

Compliance RoHS Directive 2011/65/EU as last update by 2015/65/EU (only CKAM)
REACH Regulation (EC) no.1907/2006

4 INSTALLATION NOTES

Before installation and start-up refer to tab. BX900

- 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 layer ignition temperature - 75°C** and **2/3 of dust cloud 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 IIIC T85°C/T100°C Db IP 67 -40°C Ta +65°C (T6) -40°C Ta +80°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

EN 60079-0
EN 60079-1
EN 60079-26

II 2D Ex tb IIIC T85°C/T100°C Db IP 67

EN 61241-0
EN 61241-0/AA
EN 61241-1

For certification and start-up refer to the user's guide included in the supply
The transducer is available with SIL and IEC certifications, contact our technical office.

6 SIL compliance with IEC 61508: 2010

CKA meets the requirements of:

- **SC3** (systematic capability)
- max **SIL 2** (HFT = 0 if the hydraulic system does not provide the redundancy for the specific safety function where the component is applied)
- max **SIL 3** (HFT = 1 if the hydraulic system provides the redundancy for the specific safety function where the component is applied)
- for CKAM refer to transducer, SIL certified, for max SIL level

7 MAIN CHARACTERISTICS AND FLUID REQUIREMENTS

Ambient temperature	-20 ÷ +70°C; -40 ÷ +65°C for CKAM
Fluid temperature	-20 ÷ +70°C (T6); -20 ÷ +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 8)	1 m/s (seals type 2, 4, 6, 7); 0,5 m/s (seals type 1)
Recommended viscosity	15 ÷ 100 mm²/s
Max fluid contamination level	ISO4406 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog

8 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 [m/s]	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 5597/1
2	FKM + PTFE	very low friction and high temperatures	1	-20°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 7425/2
4	NBR + PTFE	very low friction and high speeds	1	-20°C to 70°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
6 - 7	NBR + PTFE	very low friction single acting - pushing/pulling	1	-20°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

9 EX-PROOF PROXIMITY SENSORS

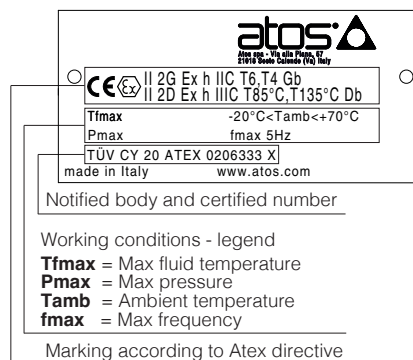
CODES: **R** = front sensor; **S** = rear sensor

CKA cylinders are available with ex-proof proximity sensors, ATEX certified to **Ex II 3G Ex nA II T4 -25≤Ta≤80°C**. They meet the requirements of the following european standard documentations: EN 60079-0, EN 60079-15.

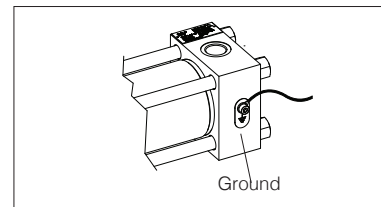
Their functioning is based on the variation of the magnetic field, generated by the sensor itself, when the cushioning piston enters on its influence area, causing a change of state (on/off) of the sensors. The sensor housing is made in stainless steel.

For dimensions and details, contact our technical office.

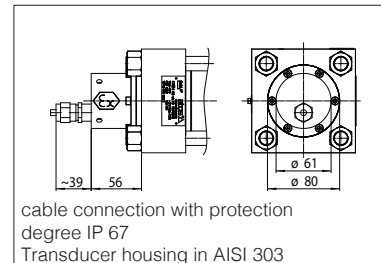
For certification and start-up refer to the user's guide included in the supply



GROUNDING



CKAM WITH ROD POSITION TRANSDUCER



CKA cylinders 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) depending to the sealing system.

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

SENSORS TECHNICAL DATA

Ambient temperature	-25 ÷ +80°C
Nominal voltage	24 Vdc
Operating voltage	10 ÷ 30 Vdc
Max load	200 mA
Repeatability	<5%
Protection degree	IP 68
Max frequency	1000 Hz
Max pressure	25 MPa