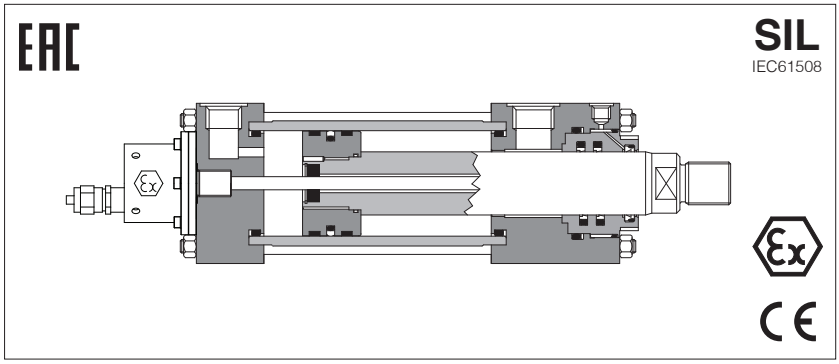
Hydraulic cylinders type CKA - for potentially explosive atmospheres

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 servocylinders 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** | ******

Cylinder series
CKA to ATEX 2014/34/EU dimensions to ISO 6020 - 2

Ex-proof position transducer
See section 5
- = omit if not requested
M = Digital magnetostrictive

Incorporated subplate (1)
- = omit if subplate is not requested
10 = size 06
20 = size 10
30 = size 16
40 = size 25

Bore size (1)
from **25** to **200** mm

Rod diameter (1)
from **12** to **140** mm

Second rod diameter for double rod **(1)**
from **12** to **140** mm, omit for single rod

Stroke (1)
up to **5000** mm (**4000** mm for **CKAM**)

Mounting style (1)

		REF. ISO
C	fixed clevis	MP1 **(4)**
D	fixed eye	MP3 **(4)**
E	feet	MS2
G	front trunnion	MT1
H	rear trunnion	MT2 **(4)**
L	intermediate trunnion	MT4 **(5)**
N	front flange	ME5
P	rear flange	ME6 **(4)**
S	fixed eye + spherical bearing	MP5 **(4)**
T	threaded hole+tie rods extended	MX7
V	rear tie rods extended	MX2
W	both end tie rods extended	MX1
X	basic execution	-
Y	front tie rods extended	MX3
Z	front threaded holes	MX5

Cushioning (1)
0 = none

Fast adjustable	Slow adjustable	Fast fixed
1 = rear only	**4** = rear only	**7** = rear only
2 = front only	**5** = front only	**8** = front only
3 = front and rear	**6** = front and rear	**9** = front and rear

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

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

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

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)

Series number **(2)**

(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

3 CERTIFICATION

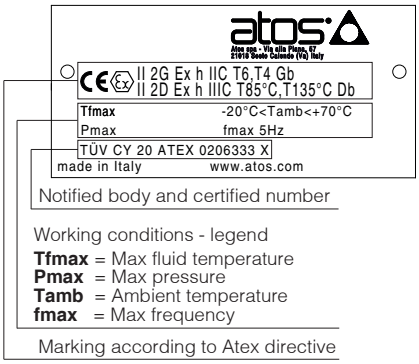
In the following are resumed the cylinders marking according to Atex certification.
Reference norm ISO 80079-36, ISO 80079-37.

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

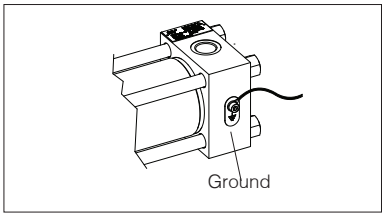
- The max surface temperature indicated in the nameplate must be lower than the following values:

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

GROUNDING



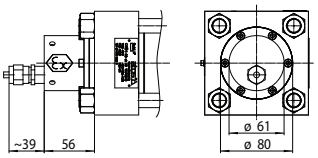
5 EX-PROOF ROD POSITION TRANSDUCER

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	**II 2D Ex tb IIIC T85°C/T100°C Db IP 67**
EN 60079-0	EN 61241-0
EN 60079-1	EN 61241-0/AA
EN 60079-26	EN 61241-1

For certification and start-up refer to the user's guide included in the supply
The transducer is available with SIL IEC61508 and CCC certifications, contact our technical office.

CKAM WITH ROD POSITION TRANSDUCER



cable connection with protection degree IP 67
Transducer housing in AISI 303

6 SIL IEC61508 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

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

8 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 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

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