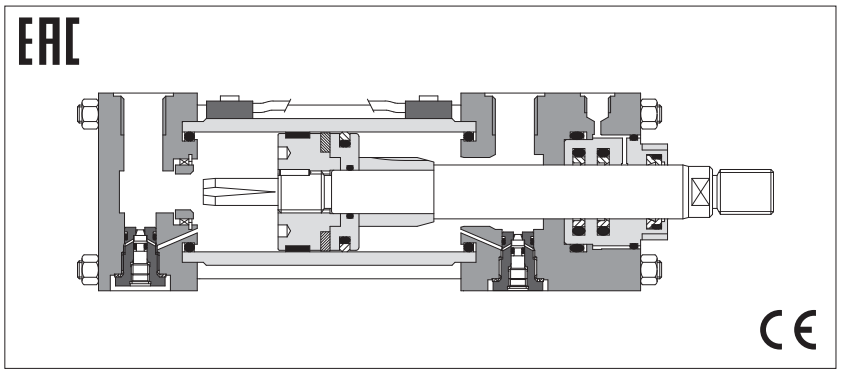
Hydraulic cylinders type CKS - with adjustable proximity sensors

to ISO 6020-2 - nominal pressure 10 MPa (100 bar) - max 15 MPa (150 bar)



CKS cylinders are derived from standard CK (tab. B137) with stainless steel piston and housing and with a special design to equip external proximity sensors for rod position detection."Reed" or "Hall effect" sensors are easily assembled on one of the four tie rods by means of proper clamps which allows to position them along the cylinder housing. The sensors switch their electric circuit when they detect the permanent magnet integrated into the piston. Thus they can be used to perform motion cycles, operating sequences, fast-slow cycles and safety functions.

- Bore sizes from **25** to **100** mm
- **2** rod diameters per bore
- Piston and housing in stainless steel
- Rods and tie rods with rolled threads
- **14** standard mounting styles
- **3** seals options
- Adjustable or fixed cushioning
- **ATEX** sensors
- Attachments for rods and mounting styles, **see tab. B800**

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

1 PROXIMITY SENSORS: MAIN FEATURES

Reed	Hall effect
- High switching power, up to 230 VDC or VAC - Suitable to directly pilot a power load - 2 wires circuit for easy connection	- Electronic sensor - Infinite electric life (no moving parts inside it) - High sensitivity and switching reliability - Not suitable to directly pilot a power load - 3 wires circuit to avoid voltage drop

2 PROXIMITY SENSORS: MAIN DATA

	Power supply [VDC/AC]	Max power [W]	Max current [mA]	Voltage drop [V]	Switching time [ms]		Circuit style	Contact (2)	Output	Cable section	Cable shealt	Cable shealt [mm]	Temperature range [°C]	Protection degree
					ON	OFF								
P / R (REED)	3 ÷230	10 VA	500	-	0,5	0,1	2 wires	N.O.	-	2x0,25	PVC	2500	-20 ÷+85	IP67
Q / S (HALL)	10 ÷30 **(1)**	6	250	0,7	0,2	0,1	3 wires	N.O.	PNP	3x0,14	PVC	2500	-20 ÷+85	IP67
ATEX (HALL)	8,2 **(1)**	6	250	-	0,2	0,1	3 wires	N.O.	-	2x0,14	PVC	6000	-20 ÷+70	IP67

Notes: **(1)** Only VDC
(2) N.O.= Normally Open

3 MODEL CODE

CKS	-	50	/	22	*	0500	-	S	6	0	1	-	R	-	B1E3X1Z3	**

Cylinder series
CKS to ISO 6020 - 2
CKSA with ATEX sensors

Bore size, see section 8
from **25** to **100** mm

Rod diameter, see sections 8
from **12** to **70** mm

Stroke, see section 8
from **20** to **3000** mm

Mounting style (1)

		REF. ISO
C	= fixed clevis	MP1
D	= fixed eye	MP3
E	= feet	MS2
G	= front trunnion	MT1
H	= rear trunnion	MT2
N	= front flange	ME5
P	= rear flange	ME6
S	= fixed eye + spherical bearing	MP5
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

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

Sealing system (1)
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

Spacer, see section 5
0 = none **1** = 25 mm **2** = 50 mm **4** = 100 mm **6** = 150 mm **8** = 200 mm

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)

Options (3):
Rod end **(1)**
F = female thread
G = light female thread
H = light male thread

Proximity sensor type for CKS, see sections 1 and 2 **(4)**
P = REED with connector
Q = HALL with connector
R = REED with cable output
S = HALL with cable output

Air bleeds **(1)**
A = front air bleed
W = rear air bleed

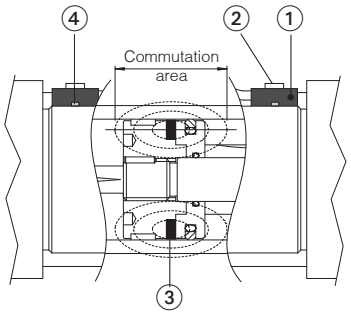
Draining **(1)**
L = rod side draining

Series number **(2)**

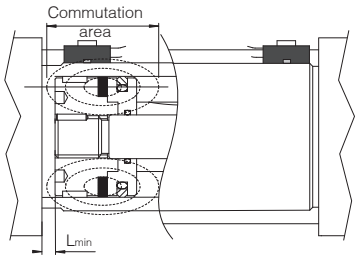
(1) For details refer to **tab. B137** **(2)** For spare parts request indicate the series number printed on the nameplate only for series < 30
(3) To be entered in alphabetical order **(4)** 2 proximity sensors are included in the supply, for spare parts see section 9

4 BASIC WORKING PRINCIPLES

The rod position detection system is composed by: one or more magnetic sensors ① fixed to a tie rod by proper clamps ② and a permanent magnet ③ integrated into the piston.
Both the “Reed” and “Hall effect” sensors are defined by a “commutation area” of variable dimension depending to the bore and sensor type (see section 6). The permanent magnet generates a magnetic field of suitable power and shape. When the piston gets close to the sensor and the magnetic field enters into its “sensitive area”④, the electric circuit is closed and the piston position detected, see figures at side. The electric circuit remains closed depending to the commutation area length, see section 6. The distance of the piston rod from the mechanical stroke-end at which the sensor commutation occurs depends to the sensor type and position, see Lmin dimension in section 6.The sensors can be assembled at any position of the cylinder stroke unscrewing the metallic clamp and moving the sensor to the desired position.
The sensors are equipped with a LED signal that indicates the commutation status.



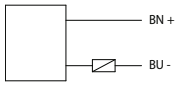
Commutation not occurred



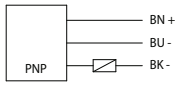
Commutation occurred

5 ELECTRIC CIRCUITS

“REED ” sensors
2 wires



“HALL effect” sensors
3 wires



BN = brown BU = blue BK = black

3 PIN female connector
for sensors **P**, **Q**

(sensor view)

PIN	WIRING	SIGNAL REED	SIGNAL HALL
1	blue	V0	V0
2	black	-	V0
3	brown	V+	V+

Notes:
The sensors **P** and **Q** are supplied with 3 pin female connector
All the sensors are supplied with an output cable 2,5 m long
Reed sensors are also available with 3 wires circuit, **contact our technical office**

6 INSTALLATION AND WORKING DATA

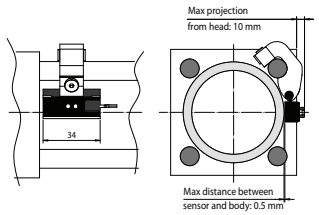
Ø Bore	Option **P / R (Reed sensors)**							Option **Q / S (Hall effect sensors)**						
	Max piston speed [m/s]	L min (1) [mm] Option P Front head	L min (1) [mm] Option P Rear head	L min (1) [mm] Option R Front head	L min (1) [mm] Option R Rear head	Commutation area [mm]	Hysteresis [mm]	Max piston speed [m/s]	L min (1) [mm] Option Q Front head	L min (1) [mm] Option Q Rear head	L min (1) [mm] Option S Front head	L min (1) [mm] Option S Rear head	Commutation area [mm]	Hysteresis [mm]
25	0.4	4	3	4	3	4	2	0.15	2.5	10	5	10	10	1
32	0.4	9	8.5	9.1	9.6	4	2	0.15	7.5	15	18	17.3	10	1
40	0.5	4	4	4	4	4	2	0.15	14	7	15	7	14	1
50	0.5	10.1	13.8	8.5	12.5	4	3	0.15	9.5	8	10	8	14	1
63	0.5	6	6	6	6	6	5	0.2	16	16	12	7	16	1
80	0.5	5	7	7	7	5	4	0.2	25	5	20	14	14	1
100	0.5	5	7	7	7	7	5	0.3	25	5	20	14	14	1

Note: (1) distance of the piston rod from the mechanical stroke-end at which the sensor commutation occurs with the sensor positioned stuck to the head, see figures in section 4

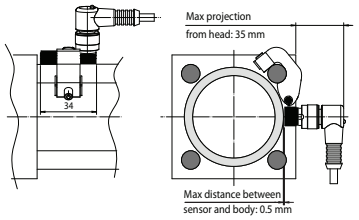
7 OPERATING LIMITS

The cylinder housing and piston are made in stainless steels to avoid dispersion and distorsion of the magnetic field generated by the permanent magnet, integrated into the piston. This limits the working pressure up to 100 bar: ensure to not exceed this pressure values.
For the proper use of the sensor and to avoid lecture faults (absence of signal or double signal) it is necessary to:
- Respect the max distance between the sensor and the body (max 0,5 mm)
- Avoid the presence of ferromagnetic objects near the sensor (minimum distance 10 mm)
- Make sure that there are no external magnetic fields around the cylinder
- Not exceed maximum piston speed shown in section 6

Proximity sensors with cable output



Proximity sensors with connector



8 BORE / ROD SIZES AND STROKE

The table shows the available bore/rod sizes, refer to **tab. B137** for installation dimensions and options.
For the proper use of proximity sensors the stroke must be selected greater than the values reported below, lower strokes can be achieved by selecting the spacer **1**.The introduction of spacers increases the overall cylinder’s dimensions.

Ø Bore		25	32	40	50	63	80	100
Ø Rod	standard	12	14	18	22	28	36	45
	differential	18	22	28	36	45	56	70
Min. stroke		20	20	25	25	30	30	40

9 ATEX SENSORS FOR CKA

CKSA cylinders are supplied with magnetic sensors with ATEX certifications:

Ex II 1G Ex ia IIC T4 Ga for gas (zone 0/1/2),
Ex II 1D Ex ia IIIC t 135°C Da for dusts (zone 20/21/22)

The sensors are supplied with an amplifier which it serves as the interface between eletrical signals from the hazardous area and the non-hazardous area (safe zone).
For certification and start up refer to the user’s guide included in the supply.

ATEX sensors with amplifier