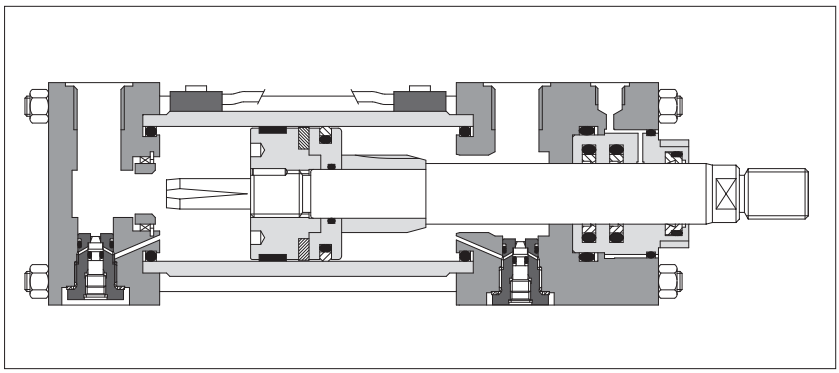
Hydraulic cylinders type CKS - with adjustable proximity sensors

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
- **15** standard mounting styles
- **2** seals options
- Adjustable or fixed cushionings
- Attachments for rods and mounting styles, **see tab. B500**

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

1 PROXIMITY SENSORS: MAIN FEATURES

Reed	Hall effect
- High switching power, up to 130 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] ON	Switching time [ms] OFF	Circuit style	Contact (2)	Output	Cable section	Cable sheath	Cable lenght [mm]	Temperature range [°C]	Protection degree
R (REED)	3 ÷130	10	300	2,7	0,5	0,1	2 wires	N.O.	-	2x0,25	PVC	3000	-20 ÷+70	IP67
S (HALL)	10 ÷30 **(1)**	6	200	0,8	0,2	0,1	3 wires	N.O.	PNP	3x0,14	PVC	3000	-20 ÷+70	IP67

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

3 MODEL CODE

CKS – 50 / 22 * 0500 – S 3 0 1 – R – B1E3X1Z3 **

CYLINDER SERIES
CKS according to ISO 6020 - 2

BORE SIZE, see section 8
from **25** to **100** mm

ROD DIAMETER, see section 8
from **12** to **70** mm

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

MOUNTING STYLE (1)

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

CUSHIONINGS (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**
4 = (NBR + PTFE) **very low friction and high speeds**

SPACER
If spacers are required, **contact our technical office**

Series number (2)

HEADS' CONFIGURATION (1) (3)
Oil ports positions
B* = front head
X* = rear head
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 (3):
Rod end (1)
F = female thread
G = light female thread
H = light male thread

Proximity sensor type, 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

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

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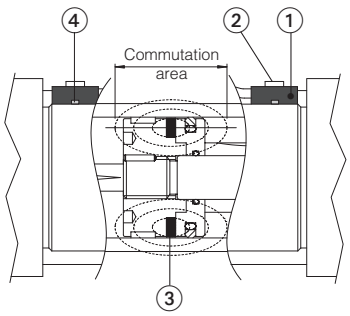
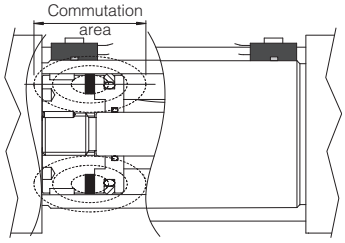
4 BASIC WORKING PRINCIPLES

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 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.



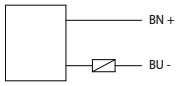
Commutation not occurred



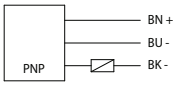
Commutation occurred

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 3 m long
Reed sensors are also available with 3 wires circuit, **contact our technical office**

6 INSTALLATION AND WORKING DATA

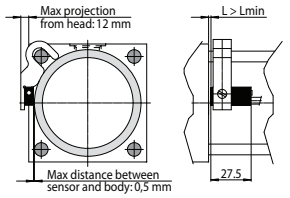
Ø Bore	Option **R (Reed sensors)**					Option **S (Hall effect sensors)**				
	Max piston speed [m/s]	**L min (1)** [mm] front	rear	**Commutation area** [mm]	**Hysteresis** [mm]	**Max piston speed** [m/s]	**L min (1)** [mm] front	rear	**Commutation area** [mm]	**Hysteresis** [mm]
25	0.4	2	2	10	2	0.15	8	6	4	1
32	0.4	2	2	10	2	0.15	8	6	4	1
40	0.5	4	2	12	2	0.15	15	7	4	1
50	0.5	6	2	12	3	0.15	13	10	4	1
63	0.5	7	2	15	5	0.2	15	8	6	1
80	0.5	7	2	12	4	0.2	18	9	5	1
100	0.5	11	2	14	5	0.3	23	11	7	1

Note: (1) minimum distance between the sensor and the cylinder's head, see figures in section 7

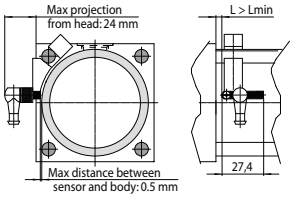
7 OPERATING LIMITS

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 minimum distance Lmin between the sensor and the cylinder's head, see section 6
- 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 20 mm.

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

9 MODEL CODE FOR SPARE PARTS OF SENSORS

SP – R – CKS – 32

Spare parts sensor type:
- **P** = REED sensor with connector
- **Q** = HALL effect sensor with connector
- **R** = REED sensor with cable output
- **S** = HALL effect sensor with cable output

Bore size [mm]

Cylinders series **CKS** dimension according to ISO 6020-2

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