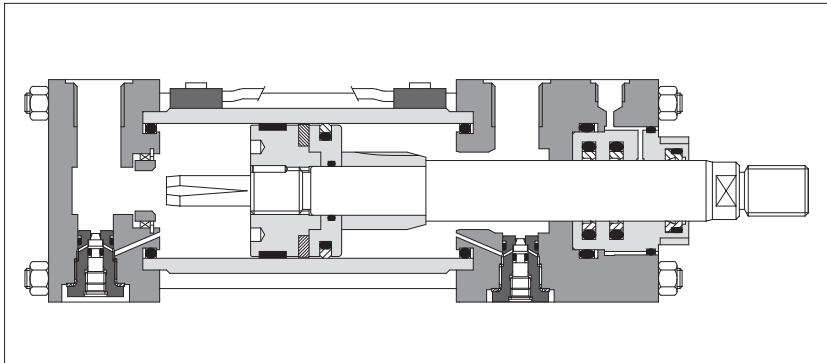


# Hydraulic cylinders type **CKS** - with adjustable proximity sensors

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 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 length [mm]	Temperature range [°C]	Protection degree
					ON	OFF								
<b>R (REED)</b>	3 ÷ 230	10VA	500	-	0,5	0,1	2 wires	N.O.	-	2x0,25	PVC	2500	-20 ÷ +85	IP67
<b>S (HALL)</b>	10 ÷ 30 (1)	6	250	0,7	0,2	0,1	3 wires	N.O.	PNP	3x0,14	PVC	2500	-20 ÷ +85	IP67

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

## 3 MODEL CODE

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

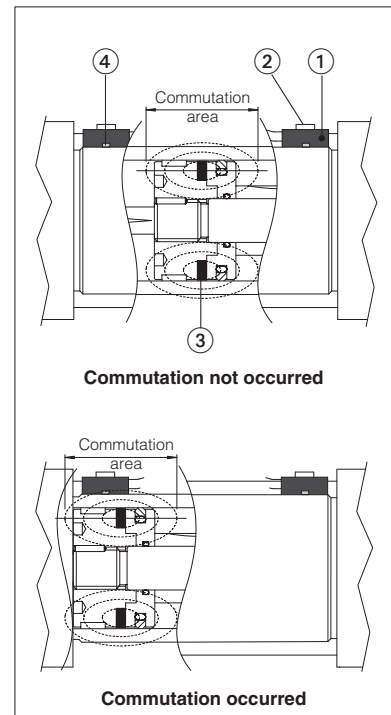
<p>CYLINDER SERIES <b>CKS</b> according to ISO 6020 - 2</p> <p>BORE SIZE, see section 8 from <b>25</b> to <b>100</b> mm</p> <p>ROD DIAMETER, see section 8 from <b>12</b> to <b>70</b> mm</p> <p>STROKE, see section 8 from <b>20</b> to <b>3000</b> mm</p> <p>MOUNTING STYLE (1)</p> <table style="width: 100%;"> <tr> <td style="width: 33%;"><b>REF. ISO</b></td> <td style="width: 33%;"></td> <td style="width: 33%;"><b>REF. ISO</b></td> </tr> <tr> <td><b>C</b> = fixed clevis</td> <td>MP1</td> <td><b>S</b> = fixed eye + spherical bearing</td> </tr> <tr> <td><b>D</b> = fixed eye</td> <td>MP3</td> <td><b>T</b> = threaded hole+tie rods extended</td> </tr> <tr> <td><b>E</b> = feet</td> <td>MS2</td> <td><b>V</b> = rear tie rods extended</td> </tr> <tr> <td><b>G</b> = front trunnion</td> <td>MT1</td> <td><b>W</b> = both end tie rods extended</td> </tr> <tr> <td><b>H</b> = rear trunnion</td> <td>MT2</td> <td><b>X</b> = basic execution</td> </tr> <tr> <td><b>N</b> = front flange</td> <td>ME5</td> <td><b>Y</b> = front tie rods extended</td> </tr> <tr> <td><b>P</b> = rear flange</td> <td>ME6</td> <td><b>Z</b> = front threaded holes</td> </tr> <tr> <td></td> <td></td> <td>MP5</td> </tr> <tr> <td></td> <td></td> <td>MX7</td> </tr> <tr> <td></td> <td></td> <td>MX2</td> </tr> <tr> <td></td> <td></td> <td>MX1</td> </tr> <tr> <td></td> <td></td> <td>MX3</td> </tr> <tr> <td></td> <td></td> <td>MX5</td> </tr> </table> <p>CUSHIONINGS (1) <b>0</b> = none <b>Slow adjustable</b> <b>4</b> = rear only <b>5</b> = front only <b>6</b> = front and rear</p> <p><b>Fast fixed</b> <b>7</b> = rear only <b>8</b> = front only <b>9</b> = front and rear</p>	<b>REF. ISO</b>		<b>REF. ISO</b>	<b>C</b> = fixed clevis	MP1	<b>S</b> = fixed eye + spherical bearing	<b>D</b> = fixed eye	MP3	<b>T</b> = threaded hole+tie rods extended	<b>E</b> = feet	MS2	<b>V</b> = rear tie rods extended	<b>G</b> = front trunnion	MT1	<b>W</b> = both end tie rods extended	<b>H</b> = rear trunnion	MT2	<b>X</b> = basic execution	<b>N</b> = front flange	ME5	<b>Y</b> = front tie rods extended	<b>P</b> = rear flange	ME6	<b>Z</b> = front threaded holes			MP5			MX7			MX2			MX1			MX3			MX5	<p style="text-align: right;">Series number (2)</p> <p>HEADS' CONFIGURATION (1) (3) Oil ports positions <b>B*</b> = front head <b>X*</b> = rear head Cushioning adjustments positions, to be entered only if adjustable cushionings are selected <b>E*</b> = front head <b>Z*</b> = rear head <b>*</b> = selected position (1, 2, 3 or 4)</p> <p>OPTIONS (3): Rod end (1) <b>F</b> = female thread <b>G</b> = light female thread <b>H</b> = light male thread Proximity sensor type, see sections 1 and 2 (4) <b>P</b> = REED with connector <b>Q</b> = HALL with connector <b>R</b> = REED with cable output <b>S</b> = HALL with cable output Air bleeds (1) <b>A</b> = front air bleed <b>W</b> = rear air bleed Draining (1) <b>L</b> = rod side draining</p> <p>SEALING SYSTEM (1) <b>1</b> = (NBR + POLYURETHANE) <b>high static and dynamic sealing</b> <b>4</b> = (NBR + PTFE) <b>very low friction and high speeds</b></p> <p>SPACER, see section 8 <b>0</b> = none <b>1</b> = 25 mm <b>2</b> = 50 mm <b>4</b> = 100 mm <b>6</b> = 150 mm <b>8</b> = 200 mm</p>	<p style="text-align: right;">**</p>
<b>REF. ISO</b>		<b>REF. ISO</b>																																										
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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

#### 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.



#### 5 ELECTRIC CIRCUITS

"REED" sensors 2 wires	"HALL effect" sensors 3 wires	3 PIN female connector for sensors P, Q	PIN	WIRING	SIGNAL REED	HALL
		 (sensor view)	1	blue	V0	V0
			2	black	-	V0
			3	brown	V+	V+

BN = brown    BU = blue    BK = black

#### 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]		Commutation area [mm]	Hysteresis [mm]	Max piston speed [m/s]	L min (1) [mm]		Commutation area [mm]	Hysteresis [mm]
		front	rear				front	rear		
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 distortion 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:

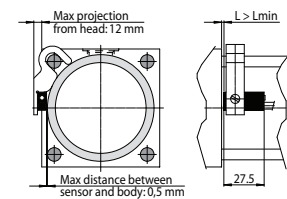
- Respect the minimum distance Lmin between the sensor and the cylinder's head, see section 6
- Avoid the presence of ferromagnetic objects near the sensor (minimum distance 10 mm)
- Make sure that there are no external magnetic fields around the cylinder
- Not exceed maximum piston speed shown in section 6

#### 8 BORE / ROD SIZES AND STROKE

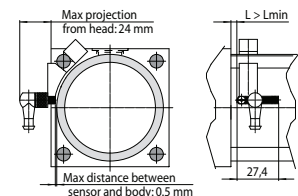
The table shows the available bore/rod sizes, refer to **tab. B137** for installation dimensions and options. For the proper use of proximity sensors the stroke must be selected greater than 20 mm, lower strokes can be achieved by selecting the spacer 1. The introduction of spacers increases the overall cylinder's dimensions.

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

#### Proximity sensors with cable output



#### Proximity sensors with connector



#### 9 MODEL CODE FOR SPARE PARTS OF SENSORS

SP	-	R	-	CKS	-	32	Bore size [mm]
Spare parts sensor type: - <b>P</b> = REED sensor with connector - <b>Q</b> = HALL effect sensor with connector - <b>R</b> = REED sensor with cable output - <b>S</b> = HALL effect sensor with cable output							
							Cylinders series <b>CKS</b> dimension according to ISO 6020-2