

## Absolute position sensor for oleodynamic cylinders

### General Description

In order to know continuously the absolute position of the rod in a cylinder (oleodynamic cylinders application for example), Elynx has developed a new reflective sensor, based on optical technology and a special robust code, that is imprinted on the rod. The bar code is made according to more than 15 years of experience in the field of automotive machines in industrial and agricultural market. A portion of this codification is detectable continuously, during the piston's motion in the cylinder, through suitable detecting means which are usually arranged in the cylinder of the cylinder-piston unit.

The main advantages of this innovative measuring method, compared to the traditional ones (magnetostrictive and potentiometers), are: the absence of installation workforce (the sensor can be simply plugged into the cylinder envelope, not into the rod), the contactless of the measure (optical reflection principle), the suitability for steering cylinders (passing through rods), the robustness of the rod (which can be solid and not drilled) and finally the absence of calibration/easy substitution.

In few words, a plug & play and reliable technology.

### Applications

Steering cylinders position control

Lift cylinders position control

Tilt cylinders position control

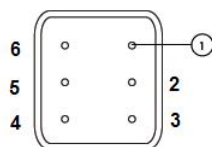
#### made for

Satellite driven machines

Agricultural machines

Rough terrain machines

Handlers, forestry machines



### Features

- Simple to install and to replace
- Works with all rods diameters, no drilling
- Non invasive, integrated and contactless
- Installable on passing through cylinders
- No calibration required
- Robust against EM noise and vibrations
- High reliability (MTTF = 180 years)
- Precise, accurate, resolute and repeatable
- Smart electronics with adaptive algorithms
- Fast sampling rate ( > 400S/s)
- Several diagnoses onboard
- Range beyond 1.5m

### Pin Functions

No.	Name	Function
1	RX	Control pin rx (do not connect, for factory use only)
2	TX	Control pin tx (do not connect, for factory use only)
3	Vcc	Power Supply
4	GND	Ground
5	OUT	Voltage Linear Output (0.5 - 4.5) V
6	D	Diagnostic pin (currently not implemented)

### Ordering Information

ELS22 -XXXX

Subcode Description:

- 0545: Analog 0.5-4.5V output

- 4505: Analog 4.5-0.5V output (reverse)

Absolute position sensor

**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Min	Max	Unit
T <sub>s</sub>	Storage Temperature	-20	85	°C
T <sub>A</sub>	Operating Temperature Range	-20	80	°C
V <sub>CC</sub>	Supply Voltage Range	8	30	V
R <sub>L</sub>	Max output load (analog version)	20	100	kΩ

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

T<sub>A</sub> = 25°C, unless otherwise noted.

**GENERAL CHARACTERISTICS**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
A <sub>T</sub>	Total Accuracy	Sensor + cylinder		0.05		mm
R <sub>S</sub>	Sensor's resolution			0.03		mm
τ	Response time (sampling time)		400			S/s
T <sub>C</sub>	Temperature coefficient	On analog output		0.00035		V/K

**ELECTRICAL CHARACTERISTICS**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>CC</sub>	Supply Voltage Range	Battery	8	12	30	V
V <sub>j</sub>	Jump start voltage allowable				36	V
I <sub>CC</sub>	Device current consumption	No load, whole voltage and temperature range		25	35	mA

**MECHANICAL CHARACTERISTICS**

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
L	linearity	% on full scale		0.02		%
R	repeatability			0.03		mm
IP	Protection grade				IP67	
L <sub>c</sub>	Length tolerance (cable version 6x0.5mm <sup>2</sup> )	0.5m cable		± 20		mm

**RELIABILITY PARAMETERS**

Symbol	Parameter	Value	Unit
MTTF	Mean Time To Failure [T <sub>a</sub> =40°C, V <sub>CC</sub> =12V, environment=mobile]	180	years

**REGULATORY COMPLIANCE TABLE (CE CONFORMITY)**

EC DIRECTIVES	Description
EMCD 2014/30/UE	EMC directive
2011/65/EU	ROHS directive
HARMONIZED STANDARDS	Description
ISO 13309:2010	Electromagnetic compatibility of machines with internal power supply
ISO 14982:2009	Agricultural and forestry machinery – Electromagnetic compatibility – Test methods and acceptance criteria

Table 1 – compliance table

MECHANICAL DIMENSIONS

Unit: mm

