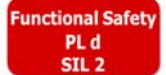




Linear Position Transmitter HLT 1300-R2

Magnetostrictive	for full integration	3 measured variables
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CANopen Safety
Combined Linear Position Pressure and
Temperature Measurement
Enhanced functional safety for the variable of linear position



Description:

The linear position transmitter HLT 1300-R2 with integrated pressure and temperature measurement has been developed specifically for the use in safety circuits / safety functions as a part of the functional safety of machinery and equipment up to SIL 2 (IEC 61508) or PL d (ISO 13849) due to the ever increasing demands in the field of linear position measurement.

The measured variables such as linear position, pressure and temperature are simultaneously digitised and made available to the CAN field bus system via the CANopen Safety protocol in a highly dynamic and safe way. The instrument parameters can be viewed and configured by the user via the CANopen Safety object directory using standard CAN software.

HYDAC offer the HLT 1300 in a pressure-resistant stainless steel housing for full integration in hydraulic cylinders. E.g. all three sensors are located inside of the cylinder, which means the measuring system is extremely robust.

Measured variable distance: functionally safe

The sensor works on the principle of magnetostriction which enables the highly precise determination of the distance / the position.

Measured variable pressure

The pressure transmitter is integrated inside of the sensor housing and measures the pressure at the sensor rod. The sensor combines excellent technical characteristics and is particularly designed for the use in linear position measurement systems. A sensor cell with a thin-film strain gauge on a stainless steel membrane is the basis for a robust, long-life pressure transmitter.

Measured variable temperature

The temperature transmitter is integrated inside of the linear position sensor rod and measures the oil temperature inside of the hydraulic cylinder. The temperature sensor is based on a semiconductor sensor.

Technical Data

Input data	
Linear Position	Measuring ranges 50 .. 4000 mm in steps of 10 mm
Pressure	Measuring ranges bar 100 450
	Overload pressures bar 200 1000
	Burst pressure bar 500 2000
Temperature	Measuring range - 40 ... 120 °C
Design	Rod Ø 10 mm for full cylinder integration Operating pressure: ≤ 450 bar Maximum pressure to DIN EN ISO 19879: 630 bar
Material	Rod: Stainless steel 1.4571; Housing: Stainless steel 1.4301
Seal	O-Ring: NBR; Support ring: PTFE
Output variables	
Output signal	CANopen Safety
Position	Resolution 0.1 mm
	Non-linearity ≤ ± 0.02 % FS
	Hysteresis ≤ ± 0.1 mm
	Repeatability ≤ ± 0.1 mm
	Temperature coefficient ≤ ± 0.003 % FS / °C
	Sampling rate 10 ms (0 .. 100 %)
Pressure	Accuracy acc. to DIN 16086 ≤ ± 0.5 % FS typ.
	Max. setting ≤ ± 1 % FS max.
	Accuracy, B.F.S.L. ≤ ± 0.25 % FS typ.
	≤ ± 0.5 % FS max.
	Temperature compensation offset ≤ ± 0.015 %/°C typ. / ≤ ± 0.025 %/°C max.
	Temperature compensation, span ≤ ± 0.015 %/°C typ. / ≤ ± 0.025 %/°C max.
	Hysteresis ≤ ± 0.15 % FS typ.
	Repeatability ≤ ± 0.1 % FS
	Rise time approx. 2 ms
	Long-term drift ≤ ± 0.2 % FS typ. / year
Temperature	Accuracy at room temperature ± 1.5 °C
	Reaction time to DIN 60751 t ₉₀ -100 s
Ambient Conditions	
Operating temperature range	- 40 .. 85 °C
Storage temperature range	- 40 .. 100 °C
Fluid temperature range	- 40 .. 120 °C
CE - Marked	EN 61000-6-1 / 2 / 3 / 4
Vibration resistance acc. to DIN EN 60068-2-6 at 5 .. 8.2 Hz at 8.2 to 150 Hz	≤ 7.5 mm ≤ 2.0 g
Shock resistance acc. to DIN EN 60068-2-27 (11 ms)	≤ 50 g
Protection class acc. to DIN EN 60529	IP 67 (Cable outlet) IP6K9K ¹⁾ (Shouldered flange connector M12x1)
Mounting position	No restrictions
Other data	
Supply voltage	9 .. 36 V DC
Residual ripple of supply voltage	≤ 250 mV _{pp}
Current consumption without output	< 100 mA
Weight	Depending on length: 100 mm (K01):-440 g 2500 mm (K01):-1160 g

Note: Reverse polarity protection of the supply voltage, excess voltage and short circuit protection are provided.
FS (Full Scale) = relative to complete measuring range
1) with mounted mating connector in corresponding protection class

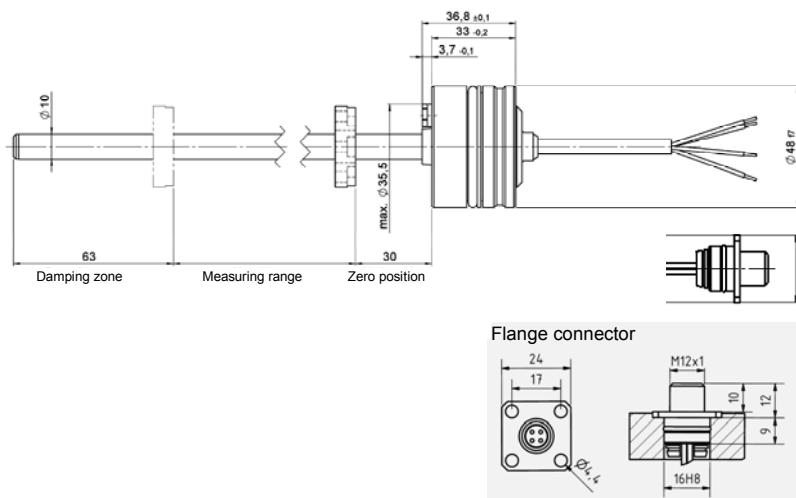
Protocol data for CANopen Safety

Communication profile	CiA DS 301 V4.2.0 / DS 304 V1.0.1
NMT-Services	CiA DSP 302 V4.1
Layer setting services and protocol	CiA DSP 305 V2.2
Encoder Device Profile	CiA DS 406 V3.2
Baud rates	10 kbit/s to 1 Mbit/s according to DS305 V2.2
Transmission services	
- PDO	measured value as 32 bit and float
- Transfer	synchronous, asynchronous, cyclical
Node ID/baud rate	adjustable via LSS

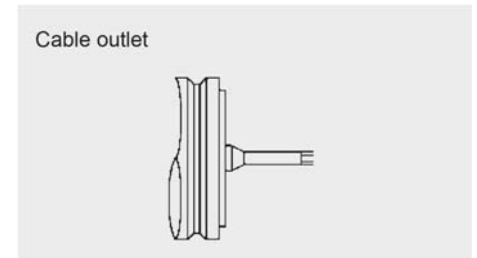
Safety-related data (linear position)

Performance Level	
Based on	DIN EN ISO 13849-1:2008
PL	d
Architecture	Category 2
Safety Integrity Level	
Based on	DIN EN 61508:2002
SIL	2

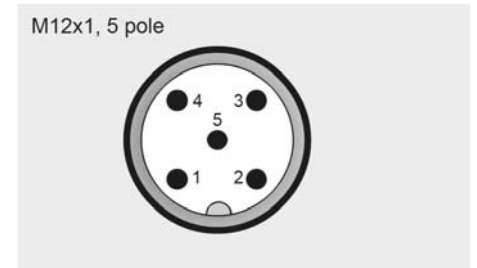
Dimensions:



Pin connections:



Core	
Brown	+U _B
White	0 V
Green	CAN_L
Yellow	CAN_H



Pin	Signal	Description
1	n.c.	
2	+U _B	Supply+
3	0V	Supply-
4	CAN_H	Bus line dominant high
5	CAN_L	Bus line dominant low

Model Code:

HLT 1 3 0 0 – R2 – XXX – F13 – XXXX – XXXX – S2PD – 000

Design/Geometry type

3 = rod, combined sensor

Design

R2 = rod Ø 10 mm
for full cylinder integration

Connection code, electrical

Cable outlet

K01 = jacketed cable, length 1 m
K02 = jacketed cable, length 2 m
K05 = jacketed cable, length 5 m
K10 = jacketed cable, length 10 m

Shouldered flange connector M12x1, 5 pole

L06 = 60 mm lead length
L18 = 180 mm lead length
L24 = 240 mm lead length

Output signal

F13 = CANopen Safety

Measuring range linear position in mm

(50 to 4000 mm in steps of 10 mm)

Example:

0150 = 150 mm

Measuring range pressure in bar

0100; 0450

Functional safety (linear position)

S2PD = SIL2 acc. IEC 61508 and PLd – Cat 2 acc. DIN EN 13849-1

Modification

000 = standard

Accessories available: (not supplied with instrument)

ZBL MR 17.4	Position magnet	Part no.: 6119372
ZBL MR22	Position magnet	Part no.: 6084453
ZBL MR25.4	Position magnet	Part no.: 6141689
ZBL MR33	Position magnet	Part no.: 6084207

More detailed information on accessories as well as on further accessories, such as female connectors, can be found in the Accessories brochure.

Status: 2019-03-06

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications and operating conditions not described, please contact the relevant technical department.

All technical details are subject to change without notice.

HYDAC ELECTRONIC GmbH

Hauptstrasse 27
D-66128 Saarbruecken
Phone: +49 (0)6897 / 509-01
Fax: +49 (0) 6897 / 509-1726
e-mail: electronic@hydac.com
Internet: www.hydac.com