# Electronic Position Switch

## HLS 100

## for Applications with Increased Functional Safety

(Minimum order quantity 100 units)

Functional Safety
PL d
SIL 2

TÜV NORD Safety Approved
DIN EN 61508
DIN EN 13849-1
SIL 2
PL d



## Description:

The position switch series HLS 100 has been specifically developed to detect the end position of safety-related devices on mobile machinery.

The position switches are designed for continuous use in safety circuits/ safety functions as part of the functional safety of machines up to SIL 2 (IEC 61508) or PL d (ISO 13849).

The HLS 100 consists of two parts, the encoder magnet and the sensor unit.

Using two Hall sensors integrated into the sensor unit, the sensor detects the defined position (end position) of the magnet and transmits the switching condition "ON" if this position is detected, or otherwise the switching condition "OFF".

Switching conditions are output as permanent PWM signals.

During stable normal operation, the position switch cyclically performs internal diagnostic steps, which identify systematic and random errors.

Errors which occur are therefore detected immediately. The output signal is then deactivated completely and the sensor is restarted.

## Special features:

- Compact design
- Robust housing suitable for mobile applications
- High operating temperature range
- PWM output
- IP 67 male connector
- SIL 2 / PL d certification

## Technical data:

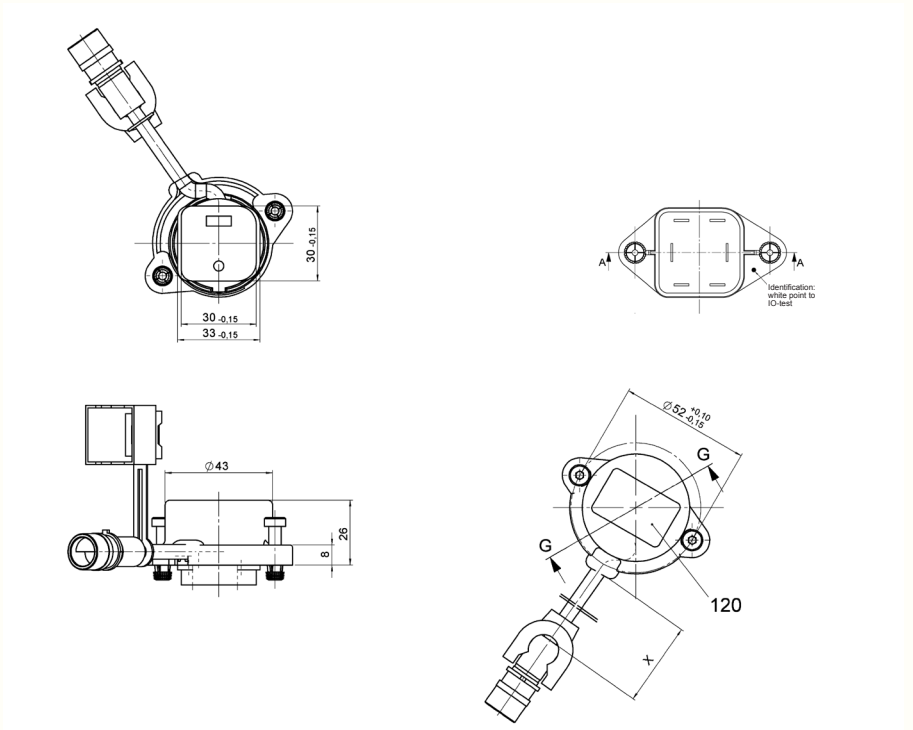
| | |
|---|---|
| **Input data** | |
| Switching range [1] | ± 3 .. ± 9 mm |
| Switching distance magnet – sensor [1] | 0 .. 11 mm |
| Lateral offset magnet – sensor [1] | ± 6 mm |
| Steel plate thickness | Magnet: min. 5 mm<br>Sensor: 6 .. 8 mm |
| **Output data** | |
| Type | PWM 50 Hz ± 3 % (Push-Pull) |
| Duty cycle of the output signal OFF (magnet outside the switching range) | 26 ± 1 % |
| Duty cycle of the output signal ON (magnet within the switching range) | 74 ± 1 % |
| Output current consumption<br>High level<br>Low level | <br>60 mA min. / 150 mA max.<br>30 mA min. / 110 mA max. |
| Output voltage<br>High level<br>Low level | <br>> +$U_B$ – 1.2 V at I = 10 mA<br>< GND + 0.2 V at I = 10 mA |
| Response times after activation | 0.5 .. 1.5 s |
| Output signal response time | < 100 ms |
| Internal diagnostic interval | ≤ 500 ms typ. (hardware)<br>≤ 1 s (memory modules) |
| **Environmental conditions** | |
| Nominal temperature range (function) | -30 .. +85 °C |
| Operating temperature range (failsafe) | -40 .. +100 °C |
| Storage temperature range | -60 .. +110°C |
| CE mark | EN 61000-6-1 / 2 / 3 / 4 |
| Functional safety | SIL 2 to EN 61508<br>PL d to ISO 13849 |
| Vibration resistance to DIN EN 60068-2-6 at 10 .. 500 Hz | 25 g |
| Shock resistance to DIN EN 60068-2-29 (6 ms) | 50 g (half sine) |
| Protection class to IEC 60529 | IP 67 |
| **Other data** | |
| Electrical connection [2] | Male ITT Canon Sure Seal, 3 pole |
| Supply voltage | 8 .. 32 V DC |
| Current consumption | < 10 mA (inactive output) |
| Residual ripple of supply voltage | ≤ 5 % |
| Life expectancy | 10 years |
| Weight | Sensor ~ 75 g<br>Magnet ~ 25 g |
| **Safety-related data** | |
| **Performance level** | |
| Based on | DIN EN ISO 13849-1: 2008 |
| PL | d |
| Architecture | Category 2 |
| **Safety Integrity Level** | |
| Based on | DIN EN 61508: 2001 1oo1 - B |
| SIL | 2 |

Note: Reverse polarity protection of the supply voltage, excess voltage, override, short circuit protection are provided.
**FS** (**F**ull **S**cale) = relative to the complete measuring range

[1] All values apply to installation in magnetic steel plate of the required material thickness. If installed in thicker steel plate or other materials, the entire system must be tested thoroughly.

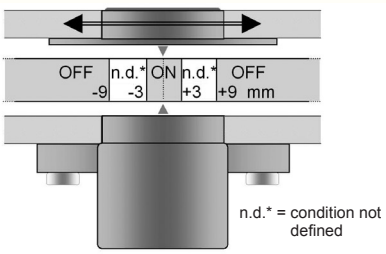
[2] Other connectors available on request

## Dimensions:

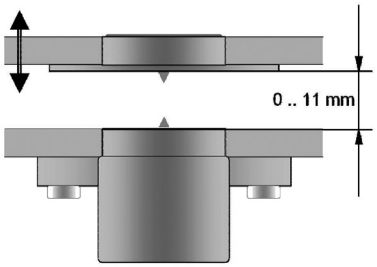



## Switching ranges:

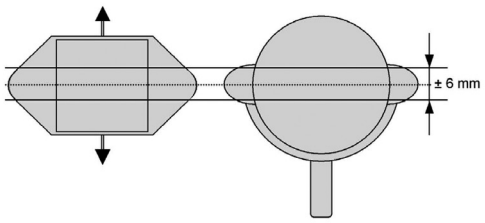
**Switching range:**




**Switching distance:**




**Lateral offset:**




## Order details:

The electronic positioning switch HLS 100 has been especially developed for OEM customers and is available for minimum order quantities of 100 units per type.

For a precise specification, please contact the Sales Department of HYDAC ELECTRONIC.

## 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.
Subject to technical modifications.

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