

Magnetostrictive Linear Position Sensors

Model series CHM IP 68 with Analog - interface

- CHM model: Rod version
- Material : 314 / 316
- Measuring strokes from 50 to 7600 mm
- Contactless, robust system
- Infinite resolution
- Linearity < 0.01 %
- Measurement signals 0(4) ... 20 mA, 0 ... 10 V, ± 10 V or start/stop signal
- Protection class up to IP 68
- Operating temperature range - 40 °C ... + 85 °C, optionally up to 105 °C
- Pressure stability up to 350 bar



Structure and operation

The displacement transducers operate according to the principle of run time measurement between two points of a magnetostrictive waveguide. One point is determined by a moveable position magnet, whose distance from the null point corresponds to the section to be measured. The run time of an emitted impulse is directly proportionate to this section. Conversion to an analogue measuring signal takes place in the downstream electronics.

The waveguide is housed in a pressure-resistant stainless steel tube or extruded profile. To the rear of this is a die-cast

aluminium housing containing the electronics in SMD technology. Electrical connection is implemented via a circular connector.

In the rod version, the position magnet is located in a ring, which is guided over the rod without contact. In the profile version, it is located either in a slider, which is linked to the moving part of the machine via a ball joint, or it moves as a liftable position magnet, without wear, over the profile.

Standard measuring strokes:

Analogue and start/stop:

- Up to 1000 mm in 50 mm steps

Analogue output:

- Up to 7600 mm in 250 mm steps

Programming

For adaptation to measuring tasks, the measuring start and end point can be easily adjusted within the measuring range which has been ordered.

Adjustment is carried out externally via the connection cables using the analogue manual programming device PMC-01 (see data sheet 11468).

Standard designs

Output signal	Mid-point at
0 - 20 mA	10 mA
4 - 20 mA	12 mA
0 - 10 V	5 V
± 10 V	0 V
20 - 0 mA	10 mA

Diagnosis

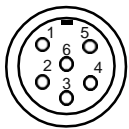
The LEDs (green/red) in the sensor head provide information on the sensor status.

Green	Red	Meaning
On	Off	Normal function
On	On	No magnet
On	Flashing	No external start signal (start/stop)

Technical data

- Supply voltage range V_S : 24 VDC (+20 / -15%)
- Supply current I_S : 100 mA typical
- Resolution: Analogue: Practically infinite
Start/stop: 0.1; 0.01; 0.005 mm depending on evaluation electronics
- Linearity: < ± 0.01 % (min. ± 50 μ m)
- Repeatability: < ± 0.001 % (min. ± 2.5 μ m)
- Hysteresis: < 4 μ m
- Measuring frequency: Analogue: > 1 kHz,
start/stop: depending on evaluation electronics and meas. length
- Temperature drift: < 40 ppm / °C
- Op. temperature range: - 40 °C to + 85 °C
- Start / stop: Optionally up to 105 °C
- Shock test: 100 g to IEC Standard 68-2-27
- Vibration test: 15 g / 10 to 2000 Hz to IEC Standard 68-2-6
- Protection type: IP 68 for cable outlet
- Rod: IP 68 for cable outlet
- **Current output:**
- Output signal : 0(4) ... 20 mA
- Apparent ohmic resistance: 0 – 500 Ω
- **Voltage output:**
- Output signal: 0...10 VDC / - 10 ... + 10 VDC
- Permissible load: ≥ 5 k Ω
- **Start/stop output:** RS422 differential signal
- **Mating connector:**
- Connection type: 6-pin connector M16
- Housing: Die-cast zinc, nickel-plated (straight or angled 90°)
- Contacts: Socket, Ag
- Wire connection: Soldering
- Connection cross-section: Max. 0.75 mm²
- Cable strain relief: M12
- Max. cable diameter: 6mm
- Protection type: IP67
- **Cable outlet:**
- Cable type: PVC cable 3 x 2 x 0.14 mm²
- Bending radius: Min. 50 mm if routed firmly

Electrical connections



Soldered connection side of mating connector

Pin	Wire	Voltage/current	Start/stop
1	Grey	(0)4 - 20 mA 0 - 10 V, ± 10 V	Stop -
2	Pink	Bridged with 6	Stop +
3	Yellow		Start +
4	Green	Bridged with 6	Start -
5	Brown	+UB (+24 VDC)	+UB (+24 VDC)
6	White	-UB (0 VDC)	-UB (0 VDC)

Order code format

■ Displacement transducer

CHM M /0500 S 2 01 P8

- Electrical and mechanical variants*
- Output signals:
1 = 0 - 20 mA
2 = 4 - 20 mA
3 = 0 - 10 VDC
4 = ± 10 VDC
I = Start/stop
- Signal curve:
S = Positively ascending on movement from the flange towards rod end
N = Descending on movement from the flange towards rod end
- Measuring stroke in mm (ex 500)
- Design**
- CHM (rod):**
M = With threaded connection M 18 x 1.5
S = With threaded connection 16 UNF $\frac{3}{4}$ "
- Model: CHM = Rod version

Cable outlet on request.

* The basic versions according to the data sheet bear the number 01. Deviations are identified with a variant number and are documented in the factory.

Scope of delivery:

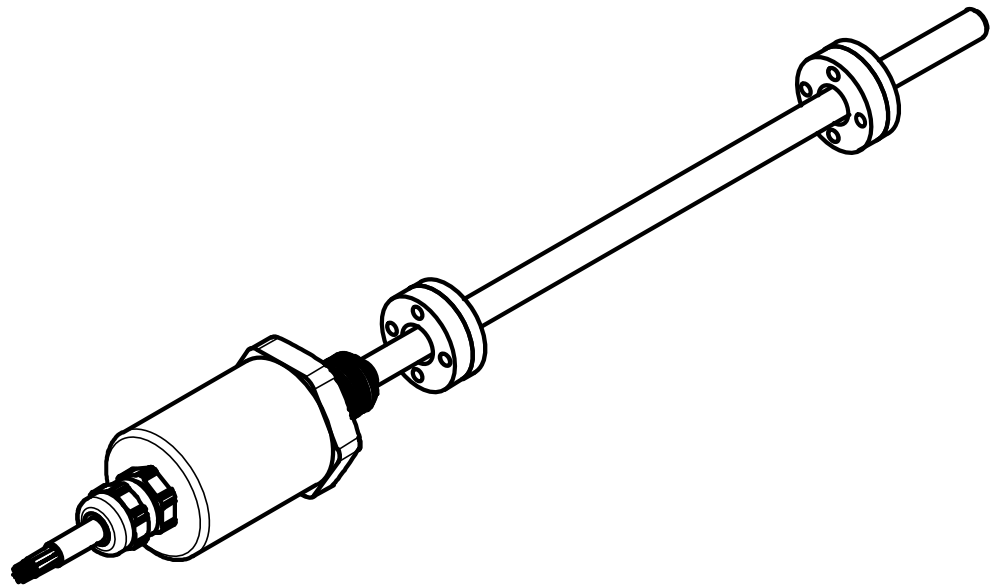
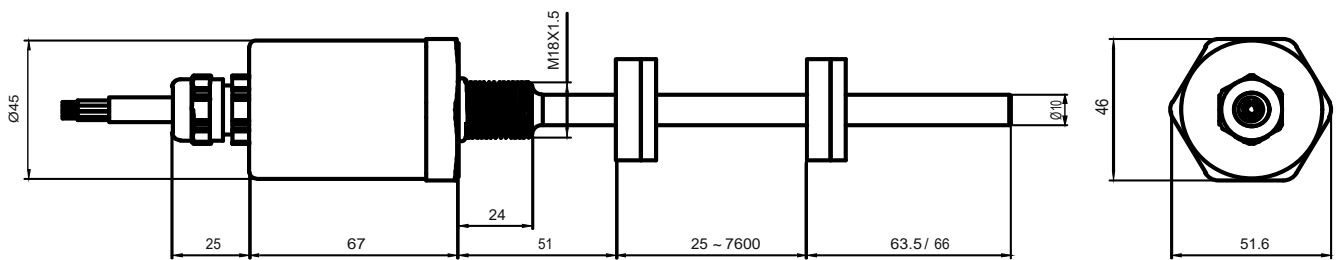
- Rod:** Sensor, nut (order position magnet separately)
- Profile:** Sensor, 1 position magnet, 2 mounting clamps up to 1250 mm + 1 clamp for each additional 500 mm.

Accessories:

- Position magnets for CHM
CPR02 Standard position ring (\varnothing 33 mm)
CPR03 Lifiable position magnet
- Additional position magnets see datasheet 11469
- Mating connector (order separately)
CSTK6GS42 Straight
CSTK6WS43 Angled 90°
- Installation material
CMB-MP-01 Mounting clamps for profile version
CNT-MP-01 M5 sliding block for profile version
- Programming devices
CPMC-01 Analogue manual programming device (data sheet 11468)

Dimensions in mm

Model: CHM (rod version)



Note: On installation of the CARLEN sensors, careful shielding from magnetic and electromagnetic fields must be ensured. The cable shield must be mounted on the connector and connected to ground at the evaluation electronics. All data sheets and manuals are also available in the Internet under www.carlen-sensors.com