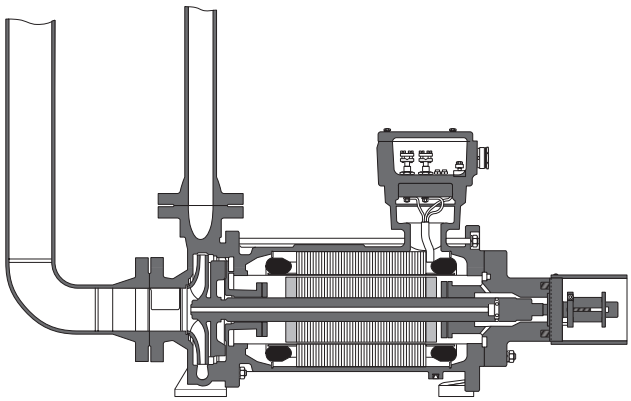
PRODUCT INFORMATION



Electronic monitoring system for axial shaft position

Monitoring device MAP

LEDERLE Hermetic

Description

Monitoring of rotor position

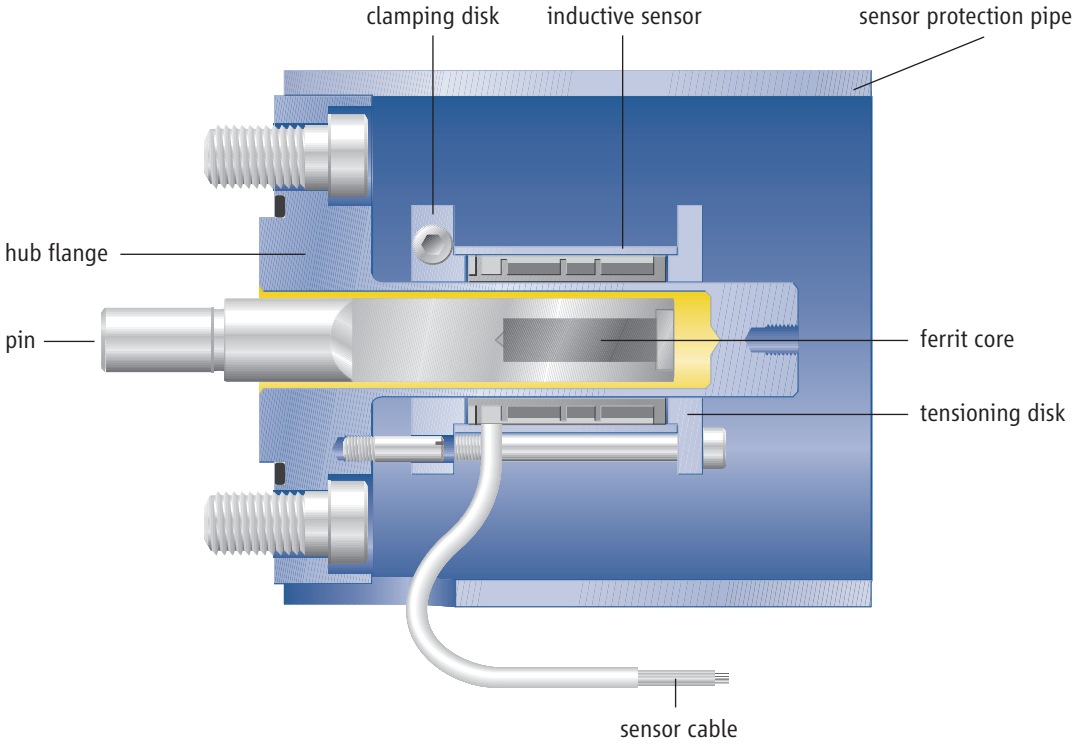
The axial thrust balance is basically influenced by the operating method of the pump, the conditions in the plant and the various physical characteristics of the fluid to be conveyed. For an early detection of error sources, it is recommended to install a monitoring system to observe the rotor position. This electronic protection device monitors the shaft position during operation in a hermetically sealed and contact-free manner. In combination with the fluid level and temperature control, it is possible to detect failures at an early stage in an effective and automatic way.

Function

The **M**onitor for **A**xial **P**osition (MAP) is a measuring device based on the LVDT principle that monitors the axial shaft position of a HERMETIC pump in a non-contacting way. The MAP consists of a sensor assembly with a permanently attached sensor cable and a separate controller unit mounted in a Fiberglas reinforced polyester casing of protection type IP65. A chemically resistant pin is mounted to the shaft end of the pump rotor. The pin contains a ferromagnetic core which is hermetically enclosed by seal welding. The installed and rotating pin extends at the back end of the pump. A modified cover (hub flange) is flanged to the pump and seals the pin from the atmosphere. The sensor is mounted to this cover. This arrangement allows the contact-free measurement of the axial displacement of the pump shaft to ensure that the unit remains hermetically sealed. The sensor signal is analyzed by a separate controller which is located up to 5 m (16 ft) away from the pump. With the ferromagnetic core of the pin located in the center of the sensor, the MAP will have an output signal of 12 mA. The signal sensitivity is typically adjusted to 2 mA for each mm of movement. The controller contains trim pots and LEDs to adjust the output signal.

The system is characterized by following features:

- Based on the reliable LVDT principle (Linear Variable Differential Transformer)
- Independent of rotor speed, i.e. the device can be adjusted on a switched-off pump
- Suitable for frequency converter
- No permanent magnet on which ferritic particles may attract
- The sensor is analyzed by a separate controller. Thus, the pump can be operated at higher temperatures
- Assembling set, power supply, output signal as well as sensitivity compatible with ARM 2000, therefore any exchange can be easily effected
- Easy to install and to calibrate
- Ex-permission
- Materials of wetted parts: Stainless steel 1.4571 or Hastelloy C-4 2.4610
- Operating range –40 °C to +130 °C



Operating and electrical data

Technical data

Sensor DTA-3D-5-CR5-G-HP

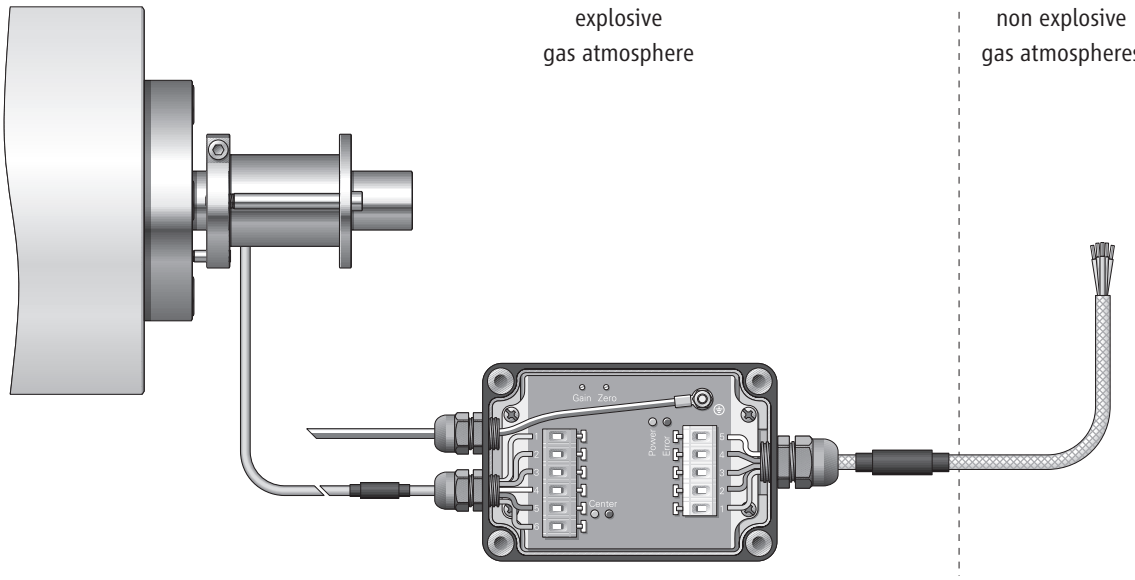
Power supply[1]:	approx. 5 m (16 ft) Teflon cable 5xAWG22/7 braided wire ends with ferrules
Operating temperature:	–40 °C to +130 °C (–40 °F to +266 °F)
Storage temperature:	–40 °C to +130 °C (–40 °F to +266 °F)
Humidity:	5-95% (non-condensing)
Ambient pressure:	atmospheric pressure
Input voltage:	up to 10 V_{eff}
Frequency:	0.2 kHz to 20 kHz
Resistance / Inductance (Pin in center position):	primary: 50 Ω / 7.8 mH secondary: 2 x 90 Ω / 21 mH
Linearity:	< 0.5% of the measuring range at 0.5 V_{eff} / 1 kHz
Degree of protection:	IP 66 (DIN 40 050 / IEC 60 529)
Explosion protection marking:	Ⓔx II 2G Ex ib IIC T6 ZELM 09 ATEX 0413 X only valid in combination with appropriate MAP controller, Mat.: 266900202

MAP controller

Measuring range:	±3,0 mm
Operating temperature:	–30 °C to +70 °C (–22 °F to +158 °F)
Storage temperature:	–40 °C to +85 °C (–40 °F to +185 °F)
Humidity:	5-95% (non-condensing)
Ambient pressure:	atmospheric pressure
Power supply:	DC 24 V –30%...+20% (16.8...28.8 V) < 80 mA
Output signal:	4...20 mA; load resistor max. 500 Ω
Sensor signal:	0.5...0.6 V_{eff}; 0.9...1.2 kHz
Linearity:	< 0,5% of the measuring range at 0.5 V_{eff} / 1 kHz
Sensor connection[1]:	allowed ø 3.5...6 mm; 0.08...2.5 mm^2; cage clamps
Grounding connection:	allowed ø 3.5...6 mm; 4 mm^2; cable socket
Power supply and signal output connection:	allowed ø 5...8 mm; 0.5...2.5 mm^2; cage clamps
Adjustment and signal components:	2 trim pots; 4 LEDs in enclosure
Degree of protection:	IP 65 (DIN 40 050 / IEC 60 529)
Explosion protection marking:	Ⓔx II 2G Ex e mb [ib] IIC T6 ZELM 09 ATEX 0413 X only valid in combination with appropriate sensor DTA-3D-5-CR5-G-HP, Mat.: 264000026202

1) It is not allowed to lengthen or to shorten the cable.

Pin assignment



Sensor connector (blue):

1	secondary A	white
2	secondary B	brown
3	primary A	green
4	primary B	yellow
5	secondary ground	grey
6	shielding	green/yellow

Supply and signal connector (grey):

1 $+U_V$ 24 V (–30%…+20%)
2 ground
3 signal 4…20 mA
4 signal ground
5 ground/shielding

Function and warning indicators

LEDs at sensor connector (blue)

- green — signal below 12 mA
- red — signal above 12 mA
- red/green changeover — pin in mechanical center position (hysteresis approx. 0.06 mA)

LEDs at supply connector (grey)

- green (Power) — supply voltage is OK
- red (Error) — supply voltage is too low or load resistor in signal circuit is too large

Special design

Suitable adjusting device is optionally available to calibrate the MAP.

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PRODUKTINFO
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