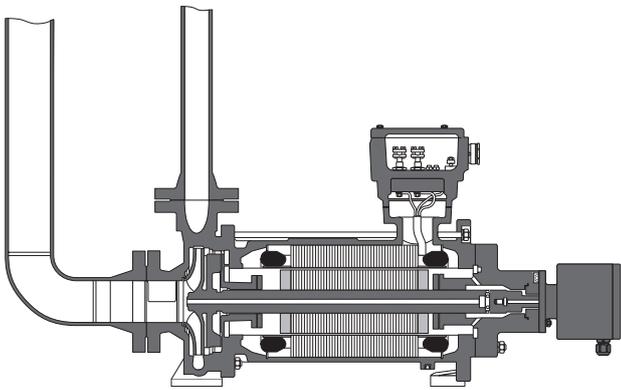


PRODUCT INFORMATION



Monitoring device AM-2000

Description

Purpose of monitoring

HERMETIC canned motor pumps are carefully tested prior to delivery.

During the test, which includes rotor thrust measurement, the pump rotor is set in the central axial position. The longevity of canned motor pumps particularly depends on this setting and their operation.

If the pump is driven outside the allowable operating range, i.e. too low or high a flow rate, the axial rotor position will change due to the resulting effect (for example cavitation). The AM-2000 unit allows continuous monitoring of the axial rotor position, and provides an early warning system to prevent failure of the pump from operating outside the specified range.

AM-2000 Axial-Monitor

The HERMETIC axial- monitor enables position detection of the rotor using a sealless and contact free method. Used with temperature and level monitoring the whole system gives an effective early warning to ensure the risk of damage to the canned motor is minimised.

The AM-2000 works using a principle similar to that of a speedometer. The monitor gives an analogue display of shaft position.

The system does not need an external power supply but generates the signal using the tacho principle.

At standstill the indicator always shows the middle position "0".

Principle of operation

An extension fitted with a multi-pole ring magnet is fitted to the drive end of the pump rotor.

The signals from this magnet are detected and processed within the AM-2000.

The position measurement is achieved by use of two coils mounted to register the axial position of the rotor. The unit will record a zero measurement when the rotor is within the per-set axial play position. Any deviation from the „zero“ position is displayed proportional to the actual displacement.

The hermetic sealing of the pump is maintained.

Application

By monitoring the axial position of the rotor several modes of both pump and process failure can be detected. These include:

- reduced motor cooling flow
- cavitation
- flow restriction, deposits and filter clogging
- axial bearing wear

Indication

The system is designed to display the rotor position directly in mm of deviation from centre position with the pump running at 3000 rpm. The display is linear for deviations of +/- 2 mm.



Operating

Recalculation of the indication at other rotational speeds

At $n = 3000$ rpm the indication instrument shows the excursion of the rotor from the middle position in "mm". When there are different rotational speeds the indication is proportional to the rotational speed.

For other speed the true deviation is calculated from the indicated deviation and the speed

$$\text{Ind-n (mm)} = \text{Pos (mm)} \cdot n / 3000$$
$$\text{Pos (mm)} = \text{Ind-n(mm)} \cdot n / 3000$$

Where:

n = is the actual speed
 Ind-n = is the indicated deviation at n rpm
 Pos. = is the actual deviation

For example

Example # 1:

- 50 Hz 2 pole motor
- Actual deviation 1mm off centre
- Indicated deviation = $1.0 \text{ mm} \times (3000/3000) = 1.0 \text{ mm}$
- i.e. at 3000 rpm the indicated deviation corresponds to
- the actual deviation.

Example # 2:

- 60 Hz 2 pole motor
- Actual deviation 1 mm off centre
- Indicated deviation = $1.0 \text{ mm} \times (3600/3000) = 1.2 \text{ mm}$
- i.e. at 3600 rpm the indicated deviation is 20% higher
- than the actual deviation.

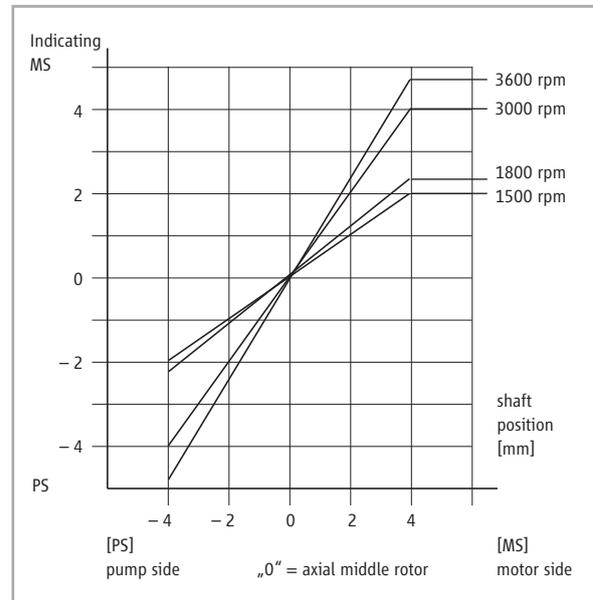
Example # 3:

- 60 Hz 4 pole motor
- Actual deviation 1mm off centre
- Indicated deviation = $1.0 \text{ mm} \times (1800/3000) = 0.6 \text{ mm}$
- i.e. at 1800 rpm the indicated deviation is 40% smaller than the actual deviation.

Calibration

The AM-2000 is factory set to "zero" indicating the middle position, irrespective of motor synchronous speed.

Indicating range



Equipment

Protection according to DIN 400500 = IP 65

motor frequency 50 / 60 Hz
material PC / PA 6
fixing to fasten with screws
dimensions $\varnothing 122$ mm
length 135 mm

Hub flange and transmitter power supply unit

temperature max. 100°C
higher temperature with cooling ribs intermediate piece
nominal pressure PN 64

Convincing service.

Important features are readiness, mobility, flexibility, availability and reliability. We are anxious to ensure a pump operation at best availability and efficiency to our customers.

Installation and commissioning

- service effected on site by own service technicians

Spare part servicing

- prompt and longstanding availability
- customized assistance in spare part stockkeeping

Repair and overhauling

- professional repairs including test run executed by the parent factory
- or executed by one of our service stations worldwide

Maintenance and service agreement

- concepts individually worked out to increase the availability of your production facilities

Training and workshops

- extra qualification of your staff to ensure the course of your manufacture

Our products comply with:

- Explosion protection acc. to ATEX / UL / CQST / CSA
- VOC directive 1999/13/EC
- TA-Luft
- IPPC directive
- CE
- RCCM, level 2
- Rosgortechnazdor

HERMETIC-Pumpen GmbH

is certified acc. to:

- ISO 9001:2000
- GOST "R"
- ATEX 94/9/EC
- AD HP 0 / TRD 201
- DIN EN 729-2
- KTA 1401, QSP 4a