Operating instruction FWS-DKM

9 Specifications

<table>
<thead>
<tr>
<th>Operating Data</th>
<th>DKM-1</th>
<th>DKM-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure</td>
<td>brass</td>
<td>brass</td>
</tr>
<tr>
<td>Pressure:</td>
<td>PN 250 bar</td>
<td>PN 350 bar</td>
</tr>
<tr>
<td>Pressure: stainless steel</td>
<td>PN 300 bar</td>
<td>PN 350 bar</td>
</tr>
<tr>
<td>Pressure drop</td>
<td>0.02 - 0.4 bar</td>
<td>0.02 - 0.2 bar</td>
</tr>
<tr>
<td>Temperature max.</td>
<td>120° C (optional 160° C)</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±10% of final value</td>
<td></td>
</tr>
<tr>
<td>Viscosity range</td>
<td>30 - 600 cSt</td>
<td></td>
</tr>
</tbody>
</table>

Electrical Data:

<table>
<thead>
<tr>
<th>IP65 (plug connection DIN43650 Form A or C)</th>
<th>SPST N.O.</th>
<th>SPST N.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. 250V + 3A • 100 VA</td>
<td>max. 250V + 1.5A • 50VA (1)</td>
<td>max. 230V + 3A • 60VA</td>
</tr>
<tr>
<td>max. 250V + 1.5A • 50VA (1)</td>
<td>max. 250V + 1.5A • 50VA (1)</td>
<td></td>
</tr>
<tr>
<td>M12x1 plug</td>
<td>not available</td>
<td></td>
</tr>
<tr>
<td>Temperature max.</td>
<td>85° C</td>
<td></td>
</tr>
</tbody>
</table>

Specifications

2 Safety hints

2.1 General hints

The instructions contained in the operating instructions must be followed to ensure a safe operation of the instrument. Further, the additional Legal- and safety-regulations for the individual application must be observed. Accordingly this applies for the use of accessories as well.

2.2 Application as directed

The instruments, type DKM, serve as monitors for continuous flow of viscous liquids. Any other use counts as non-directed. If not indicated otherwise, the scaling of the instruments refers to mineral oil. Special applications, where intermittent loads (e.g. cyclic operation) could occur, should be discussed and checked with our technical Staff.

The instruments, type DKM, must not be used as single source to avoid dangerous situations on machinery and in plants. Machinery and plants must be constructed in such a way, that faulty conditions do not lead the operators into dangerous situations.

2.3 Qualified personnel

The instruments, type DKM, must only be installed by qualified personnel, which is capable of using these instruments in a professional manner. Qualified personnel are such persons, which are familiar with the erection, installation, commissioning and operation of these instruments and which hold a corresponding qualification for this function.

3 Principle of operation

The flowmonitors type DKM prove themselves through reliability and simple handling. To use the advantages of the instrument to the full extent, please take notice of the following:

Every person, in charge of commissioning and operating this instrument, must have read and understood this operating instruction and specially the safety hints!

4 Installation

4.1 Process connection

Caution! To avoid the damage of the flowmonitor or the installation the following requirements must be fulfilled under any circumstances:

- suitable process connection has to be provided
- connection size to be checked
- thread depth to be checked
- suitable sealing material to be used (liquid sealing material will damage the flowmonitor if it gets inside)
- professional sealing

4.2 Environment conditions

- The flowmonitor must not be used as a supporting pipe in a pipe construction.
- The medium must not contain any solid particles. Magnetic particles will accumulate at the magnetic float and effect the function.
- Before employment of anti-freeze and anti-corrosive check compatibility.

Warning! The following requirements must be adhered to, otherwise the function of the flowmonitor will be affected or the measuring results will be falsified:

- External magnetic fields will influence the switch contact. Keep sufficient distance to magnetic fields (e.g. Electromotors).
- Piping, process connections or supports made from ferromagnetic material influence the magnetic field of the flowmonitor. Keep a space of 100mm to those materials (e.g. steel).
- The accuracy is influenced by cross-section changes, branches or elbows in the piping. Provide a straightening section of 10x DN upstream and 5x DN downstream of the instrument. Never reduce the pipe diameter direct ahead of the instrument!
- With liquids ensure through suitable steps the de-activation of the instrument.

medium a float is set in motion, whose integrated magnets create a magnetic field. The position of the float is detected with the switch contact. The float is reseted to the starting point by means of a spring, which allows the installation in any position in a system. The instruments are adjusted for the installation with flow from bottom to top. The weight of the float influences the measuring result, therefore a different mounting position will show discrepancies to the actual flow.

The instruments are viscosity compensated for a range from 30 to 600 cSt, this means, that occurring differences within this range, due to viscosity changes, will remain within the stated measuring tolerance.

Overall dimensions mm

<table>
<thead>
<tr>
<th>DKM-1</th>
<th>DKM-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>34</td>
</tr>
<tr>
<td>B</td>
<td>40</td>
</tr>
<tr>
<td>G</td>
<td>40</td>
</tr>
<tr>
<td>DN</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>T</td>
<td>20</td>
</tr>
<tr>
<td>L</td>
<td>21</td>
</tr>
</tbody>
</table>

All rights reserved

Wika Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Straße 30
DE-63911 Klingen/Main
5 Electrical connection

The switch contacts are potential free and do not need any supply.

Attention! Switch contact and unit are matched. After the exchange of a switch contact a readjustment must be made. Kindly request the relevant instruction.

Switch position under No flow condition:

Connection: normally open
DIN 43650 M 12x1

Connection: change over
DIN 43650 M 12x1

5.1 Standard switch contact
Pin-allocation of the supplied socket (DIN 43650 Form A or C). The Ground-pin is not used.

M 12x1

Important instruction:
When using the socket DIN 43650, the ingress protection IP65 is only warranted in connection with a suitable cablediameter.
For infos on this subject please refer to page 4.

5.2 Switch contact with cable
The individual cores of the cable are marked according to the above connection diagram.

5.3 Special design
On request special designed switch contacts (socket, ready-made cable) can be supplied.

5.4 EEx-proof switch contacts
Attention!
For the connection of EEx-proof switch units special instructions apply, which must be followed! Pay attention to the hints in the separate operating instruction for EEx-proof switch contacts!

5.5 Contact protection arrangement
Attention!
The following requirements must be adhered to under any circumstances, otherwise the switch contact will be destroyed!
The reed-contacts employed in the switch contacts are, due to their construction, very fragile against over load. Non of the values voltage, current and wattage must be exceeded (Not even for a fractional moment).

The danger of overloads exist by means of:
- inductive loads
- capacitive loads
- resistive loads

Inductive load
This kind of load will be caused by:
- contactors, relais
- solenoid valves
- electricmotors

Danger:
Voltage peaks during switch off (up to 10-times of the nominal voltage)

Precautionary measure: (sample)

Capacitive load
This kind of load will be caused by:
- extrem long leads
- capacitive consumption

Danger:
High current peaks during switch on of the switch contact (exceeding the nominal current)

Precautionary measure: (sample)

Limiting the current by means of a resistor

Resistive load
This kind of load will be caused by:
- incandescent bulbs
- Motor start up

Danger:
High current peaks during switch on of the switch contact, because the filament has low resistance at low temperatures.

Precautionary measure: (sample)

Limiting the current by means of a resistor or heating of the filament.

6 Switchpoint adjustment

- Loosen the lock screw of the switch contact
- Shift the switch contact until the arrow on the switch contact is in coincidence with the desired switch point.
- Tighten the lock screw of the switch contact.

Hints:
- The adjusted switch point corresponds to the switch off point of the switch contact with decreasing flow.
- The actual switch position can be checked by means of an universal tester.
- The above description of the adjustment refers to the normally open contact.

7 Maintenance

Due to the few moving parts the instruments do not require much service. A functional check and service on a regular base will not only increase the lifetime and reliability of the instrument, but of the entire plant.

The service intervals depend on
- the pollution of the media
- environmental conditions (e.g. vibrations)

During maintenance at least the following points should be checked:
- operation of the switch contact
- leakage test of the instrument
- free movement of the float

It is the obligation of the user to lay down appropriate service intervals depending on the application.

Hints:
- The free movement of the float and the operation of the switch contact can be checked by varying the flow and observing the switch contact status.
- In most cases a purification can be achieved by flushing the instrument with clean media. In obstinate cases (e.g. calcareous deposits) cleaning can be done with commercial purifier, as long as the purifier is not aggressive against the material of the instrument.

8 Fault finding hints

The switch contact does not react:

- The switch contact is permanent in break position

1. Flow to low or switch contact adjusted to high

- Flow to low or switch contact adjusted to high
  - Adjust switch point to a lower flow
  - Use instrument with different range

2. Float got stuck (polluted)

- Float got stuck (polluted)
  - Reduce according to section 4

3. Contact protection arrangement

- Eliminate the reason for the fault (short circuit, overload)
  - Exchange switch contact, refer section 5

4. Switch contact faulty

- Eliminate the reason for the fault (short circuit, overload)
  - Exchange switch contact, refer section 5