9 Specifications

Operating Data

<table>
<thead>
<tr>
<th>DUM/A</th>
<th>DUM/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure: brass PN 200 bar</td>
<td>stainl. st. PN 300 bar</td>
</tr>
<tr>
<td>Pressure drop: 0.62 - 0.8 bar</td>
<td></td>
</tr>
<tr>
<td>Temperature max.: 100°C (optional 160°C)</td>
<td></td>
</tr>
<tr>
<td>Accuracy: ±5% of final value</td>
<td></td>
</tr>
</tbody>
</table>

Electrical Data:

<table>
<thead>
<tr>
<th>SPST N.O.</th>
<th>SPST D (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>max. 250V • 3A • 100VA</td>
<td>max. 250V • 1.5A • 50VA</td>
</tr>
</tbody>
</table>

Material:

<table>
<thead>
<tr>
<th>Other plug types or cable lengths on request</th>
</tr>
</thead>
<tbody>
<tr>
<td>brass</td>
</tr>
</tbody>
</table>

Seals:

<table>
<thead>
<tr>
<th>Other plug types or cable lengths on request</th>
</tr>
</thead>
<tbody>
<tr>
<td>brass</td>
</tr>
</tbody>
</table>

Indicators:

<table>
<thead>
<tr>
<th>Other plug types or cable lengths on request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macrolon/brass nickel plated</td>
</tr>
</tbody>
</table>

(1) Minimum load 3VA

Operating instruction FWS-DUM/A

3 Principle of operation

The flowmonitors type DUM/A operate on the principle of the float type flow indicator. Through the flowing 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. Additionally the actual flow rate can be read from the side mounted indicators. The float is reset 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.

4 Installation

4.1 Process connection

Caution! To avoid the damage of the flowmonitor or the instruments and which hold a corresponding qualification are such persons, which are familiar with the erection, installation, commissioning and operation of these instruments and which hold a corresponding qualification.

4.2 Environment conditions

Before employment of anti-freeze and anti-corrosive float and effect the function.

4.3 Qualified personnel

The instruments, type DUM/A, must only be installed by qualified personnel, which are familiar with the erection, installation, commissioning and operation of these instruments and which hold a corresponding qualification for this function.

Operating instruction FWS-DUM/A
Operating instruction FWS-DUM/A

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

Connection: change over

5.1 Standard switch contact

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

Important instruction: When using the socket DIN 43650, the ingress protection IP65 is only warranted in connection with a suitable cablediameter. For info 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 overload. 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)

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

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
- operational 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.

Fault finding hints

The switch contact does not react:

- The switch contact is permanent in break position

8 Fault finding hints

- No flow
  - check for medium flow
- Flow to low or switch contact adjusted to high
  - Adjust switch point to a lower flow
  - Use instrument with different range
- Incorrect reduced (pipe diameter to small)
  - reduce according to section 4
- Float got stuck (polluted)
  - Clean the instrument and ensure free movement of the float
- Switch contact faulty
  - Eliminate the reason for the fault (short circuit, overload)
  - Exchange switch contact, refer section 5

- The switch contact is permanent in made position

1. Flow to high and switch contact adjusted to low
  - Reduce flow
  - Adjust switch contact to a higher flow

2. Float got stuck (polluted)
  - Clean the instrument and ensure free movement of the float

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

- Switch point does not match with actual flow

1. No medium specific scale
  - Request a correction table or medium specific scale
2. Incorrect reduced
  - reduce according to section 4

3. Instrument polluted
  - clean the instrument

4. Instrument defect
  - Return instrument for repair and calibration to manufacturer