9 Specifications

**Operating Data**

<table>
<thead>
<tr>
<th>RVM/U-1</th>
<th>RVM/U-2</th>
<th>RVM/U-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure: brass</td>
<td>PN 250 bar</td>
<td>PN 300 bar</td>
</tr>
<tr>
<td>Pressure: stainless steel</td>
<td>PN 300 bar</td>
<td>PN 300 bar</td>
</tr>
<tr>
<td>Pressure drop:</td>
<td>0.02 - 0.4 bar</td>
<td>0.02 - 0.3 bar</td>
</tr>
<tr>
<td>Temperature max.:</td>
<td>100°C (optional 160°C)</td>
<td></td>
</tr>
</tbody>
</table>

**Accuracy:** ±10% of full value

**Electrical Data:**

<table>
<thead>
<tr>
<th>SPST N.O.</th>
<th>SPDT</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP65 (plug connection DIN43650 Form A or C)</td>
<td>max. 250V + 1A + 50VA (1)</td>
</tr>
<tr>
<td>max. 250V + 1A + 50VA (1)</td>
<td></td>
</tr>
<tr>
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</tbody>
</table>

**M 12 x 1 plug**

<table>
<thead>
<tr>
<th>Temperature max. 85°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>not available</td>
</tr>
</tbody>
</table>

**Ex II 2G Ex e h II T6 max. 85°C**

<table>
<thead>
<tr>
<th>Cable diameter for IP65:</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8 mm</td>
</tr>
<tr>
<td>4 - 8.5 mm</td>
</tr>
</tbody>
</table>

**Power supply:**

- not necessary (need contacts)

**Output signal:**

- The contact switches off, if minimum flow is below setpoint

**Materials**

- brass
- stainless steel
- spring: stainless steel (1.4571 (316 ti))
- magnets: stainless steel (1.4571 (316 ti))
- seals: NBR (other on request) (Viton (other on request))

**Installation**

**3 Principle of operation**

The flowmeters RVM/U 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 especially the safety hints!

**2 Safety hints**

**1 General hints**

- The instruments 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 applies this for the use of accessories as well.

**2.2 Application as directed**

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

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

**2.3 Qualified personnel**

The instruments, type RVM/U, must 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.

**4 Installation**

**4.1 Process connection**

Cautions! 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 part in a pipe construction.
- The medium must not contain any solid particles. Magnetic particles will accumulate at the magnetic float and effect the function.
- Magnetic fields 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-arrangement of the instrument.
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.

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 Ex-proof switch contacts

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

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 or heating of the filament

6 Switchpoint adjustment

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.a. 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 cases a purification can be achieved by flushing the instrument with clean media. In obstinate cases (e.a. calcareous deposits) cleaning can be done with commercial purifier, as long as the purifier is not aggressive against the material of the instrument.

7 Maintenance

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8 Fault finding hints

The switch contact does not react:

- The switch contact is permanent in break position

1. 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

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

4. Switch point makes contact
- Switch point does not match with actual flow

1. No medium specific scale
- Request a correction table or medium specific scale

2. Incorrect reduced scale
- Reduce according to section 4

3. Instrument polluted
- Clean the instrument

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