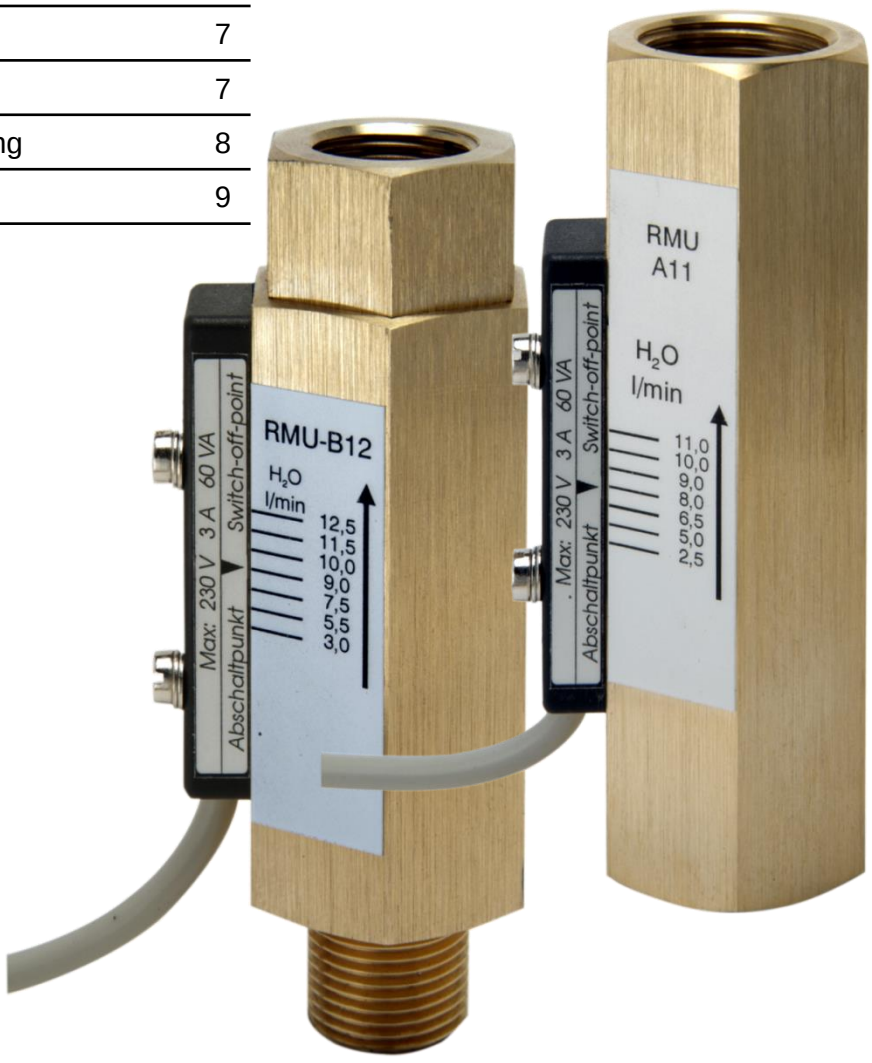
Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

Content



B-EN-RMU-20190218

Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

1 Introduction
The flow monitors of the RMU series are characterized by reliable function and simple operation. To take full advantage of this device, please note the following.

Every person who has been commissioned with the commissioning or operation of this device must have read and understood the operating instructions and in particular the safety instructions!

2. Safety instructions
2.1. General information
To ensure safe operation, the device may only be operated in accordance with the instructions in the operating instructions. During use, the legal and safety regulations required for the respective application must be observed in addition. This also applies to the use of accessories.

2.2. Intended use
The RMU Series instruments are designed to monitor the continuous flow of liquids. Any other use is considered improper use. Unless otherwise indicated, the scales of the devices refer to water. In particular, applications in which impulsive loads occur (for example, pulsed operation) should be discussed and reviewed in advance with our technical staff.

The devices of the RMU series must not be used as the sole means of averting dangerous conditions on machines and systems.

Machines and systems must be designed so that faulty conditions can not lead to a dangerous situation for the operating personnel.

2.3. Qualified personnel
The devices of the RMU series may only be installed by qualified personnel who are able to use the devices professionally. Qualified personnel are persons who are familiar with the installation, assembly, commissioning and operation of these devices and who have the appropriate qualifications for their job.

B-EN-RMU-20190218

Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

3. Functional description
The devices of the RMU series operate on the float measuring principle . Due to the flow of the medium, a float is moved and the integrated magnets generate a magnetic field. The position of the float is determined by the switching contact. The float is returned to its original position by a spring. As a result, the installation position is arbitrary. The units are calibrated for installation with flow from bottom to top. Since the weight of the float influences the measurement result, deviations occur in other mounting positions**.**

4. Assembly
4.1. Process connection
Attention ! The following requirements must be strictly adhered to, otherwise the flow monitor or the plant will be damaged.
- For installation on site, a process connection suitable for the device must be available.
- Check connection size
- Check screw-in depth
- Use suitable sealants (liquid sealants will damage the flow monitor when they enter)
- Seal properly

4.2. Environmental conditions
- The flow switch must not be used as a supporting part in pipe constructions.
- The medium must not carry any solid bodies with it. Magnetic particles accumulate on the magnetic float and impair its function.
- Check corrosion and antifreeze for compatibility before use.
- External magnetic fields affect the switching contact. Keep sufficient distance to magnetic fields (such as electric motors).
- Pipes, process connections or holders made from ferromagnetic material influence the magnetic field of the flow monitor. To such materials (for example steel) keep a distance of 100mm.
- Changes in the cross section, branches or bends in the piping influence the measuring accuracy. Provide a calming section of 10 x DN in front of the device, 5 x DN behind the device. Never reduce the pipe diameter directly in front of the device!
- In the case of liquid media, ensure that the device is vented by suitable measures!

Warning! The following requirements must be met, otherwise the function of the flow switch will be impaired or measurement results will be falsified.

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

5. Electrical connection
The switching contacts used in the devices are potential-free and require no power supply.

Attention! Switch contact and device are coordinated. After replacing a switching contact, it must be readjusted. Please request the corresponding assembly instructions!

Condition of contact on device without flow:

Wiring diagram normally open

5.1. Standard switching contact
Connection diagram see above, cable housing with 1 m cable connected.

5.2. Switch contact with cable
The wires of the connection cable are numbered according to the connection diagram above.

5.3. special types
Switching contacts in special designs (plug, pre-assembled cable) are available on request.

5.4. Contact protection measures
Attention! The following requirements must be strictly adhered to, otherwise the switching contact will be destroyed!

The reed contacts used in the switch contacts are very sensitive to overload due to the design. None of the voltage, current or power values may be exceeded (not even for a short time).

There is a risk of overload from:
- inductive loads
- capacitive loads
- ohmic loads

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

Inductive load
There is danger of voltage peaks from inductive loads when switching off (up to 10 times the rated voltage). Inductive loads are caused by, e.g.:
- Contactors, relays
- Solenoid valves
- Electric motors

Examples of protective measures:

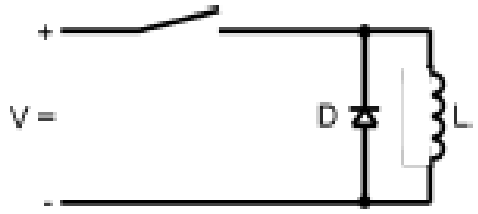

Fig 1: Example 1

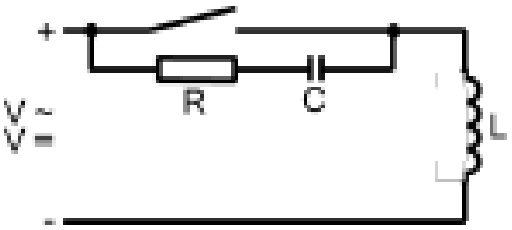

Fig. 2: Example 2

Capacitive loads
There is a danger of high current peaks from capacitive loads when switching-on the switch contact (exceeding rated current). Capacitive loads are caused by, e.g.:
- Long connecting cables
- Capacitive consumers

Example of protective measure:

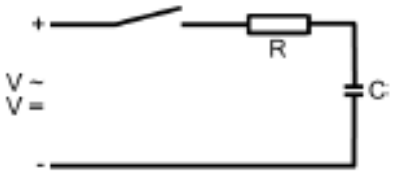

Fig. 3 : Protective measure against capacitive loads

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

Ohmic load
There is a danger of high current peaks from ohmic loads when switching-on the switch contact. The reason for this is that the glow filament has a low resistance at low temperatures. Ohmic loads are caused by, e.g.:

- Filament bulbs
- Motors during startup

Examples of protective measures:

Fig. 4: Example 1

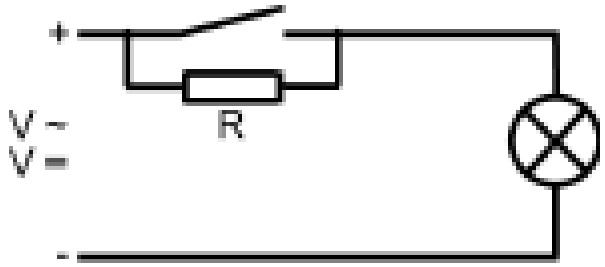

Fig. 5: Example 2

Protection against ohmic loads can be achieved through installation of a resistor in the circuit, or by heating the glow filament. For connection to high impedance consumers (ex. PLC), a protective circuit is not needed.

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

Connection to PLC
A protective circuit is not necessary for connection to high-impedance consumers (eg PLC).

6. Setting the switching point

Release the locking screw of the switch contact.
Move the switch contact until the arrow on the switch contact coincides with the desired switch point.
Tighten the locking screw of the switch contact.

Hints
The set switching point corresponds to the switch-off point of the switching contact with falling flow.
The current state of the switch contact may be e.g. be determined with a continuity tester.
The states of the switching contact refer to the NO contact (N.O.).

7. Maintenance and care

Due to the small number of moving parts, the devices are very low maintenance.

However, regular function checks and maintenance not only increase the service life and functional reliability of the device, but also the entire system.

The maintenance intervals depend on
- Pollution of the medium
- Environmental conditions (e.g., vibrations)

During maintenance at least the following points must be checked:
- Function of the switch contact
- Tightness of the device
- Mobility of the float

It is up to the operator, depending on the application, to define suitable maintenance intervals.

Hints
The movement of the float and the function of the switch contact can be checked by changing the flow and monitoring the switching state of the switch contact.
For cleaning, flushing with clean medium is sufficient in most cases. In persistent cases (such as limescale), it may be cleaned with commercially available cleaners, provided they do not attack the materials of the equipment.

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

8. Notes for troubleshooting

The switching contact does not switch.

- The switch contact is constantly at rest.
  1. No flow
     - ▶ Check, if media is actually flowing.
  2. Flow too low or switching contact set too high
     - ▶ Set the switching contact to lower flow.
     - ▶ Use a device with a different measuring range.
  3. Wrong reduced (too small cable cross-section)
     - ▶ Reduce according to section 4.
  4. Float stuck (pollution)
     - ▶ Clean the device and make the float working.
  5. Switch contact defective
     - ▶ Eliminate the cause of the defect (short circuit, overload)
     - ▶ Replace the switching contact, see point 5.

- The switching contact is constantly switched..
  1. Flow too high or switching contact too low
     - ▶ Reduce the flow
     - ▶ Set the switching contact to a higher flow.
  2. Float stuck (pollution)
     - ▶ Clean the device and make the float practicable
  3. Switch contact defective
     - ▶ Eliminate the cause of the defect (short circuit, overload)
     - ▶ Replace the switching contact, see point 5.

- The switching point does not match the actual flow.
  1. No media-specific scale
     - ▶ Request a conversion table or a media-specific scale
  2. Wrong reduced
     - ▶ Reduce according to section 4
  3. Device dirty
     - ▶ Clean the device
  4. Device defective
     - ▶ Return the device for repair / calibration

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

9. Specifications

Operating data	RMU/A	RMU/B
Operating pressure: brass	PN 250 bar	PN 250 bar
Pressure loss	25 – 250 mbar	25 – 300 mbar
Temperature max.	100°C (optional 160°C)	
Measuring accuracy	±10% of full scale	
Electrical data	Normally open contact	Normally open contact
IP67 (1m molded cable)	Max. 250V • 3A • 60VA	Max. 230V • 3A • 60VA
Output	The contact switches off, when the flow falls below the set point.	
Power supply	Not required	
Degree of pollution	2 (EN 61058-1)	
Other connector types or cable lengths on request		

Material	RMU/A	RMU/B
Wetted parts	brass	
Spring (wetted parts)	1.4571	
Magnets (wetted parts)	Hard ferrite	
Housing (wetted parts)	brass	
Seals (at reductions only)		NBR (others on request)

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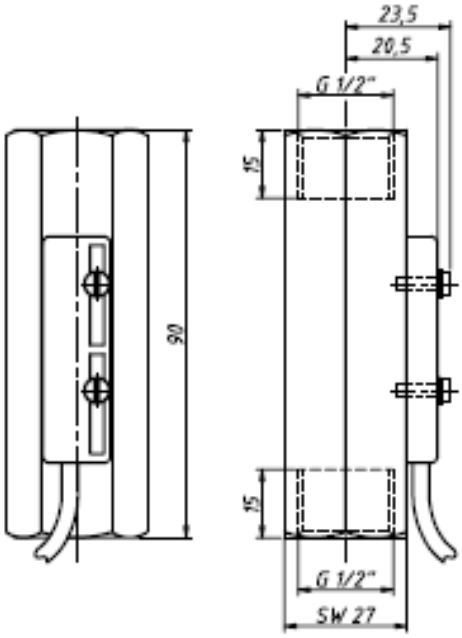
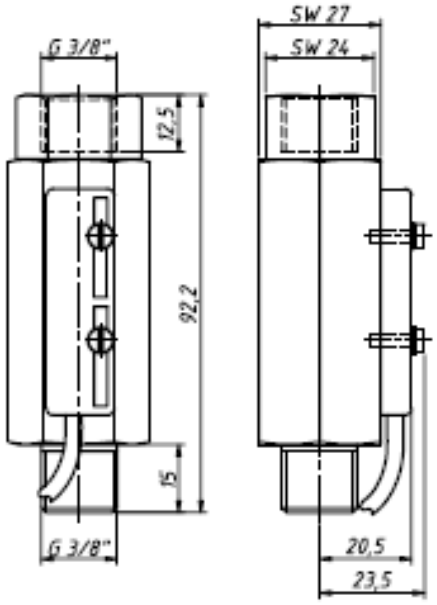
Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids



RMU-A



RMU-B

	SW	D	G-on	G-off	DN	T	L
RMU-A	27	23,5	½”	½”	15	14	90
RMU-B	27 + 24	23,5	⅜”	⅜”	10	14	92,2

Dimensions in mm

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Operating Instruction
Flow Monitors RMU
Float measuring principle for liquids

Important notes!
Technical changes and errors excepted.

These operating instructions are an integral part of the device and must be kept accessible to the personnel in the immediate vicinity of the device at all times. Persons who install, operate or service this device must read and understand these operating instructions carefully before starting any work. All safety instructions and instructions in this manual must be adhered to. In addition, the local accident prevention regulations and general safety regulations for the area of application of the device as well as all national and international legal regulations and technical standards apply.

All illustrations in this operating manual serve the basic understanding. Photos can be examples of a variant. The illustrations may differ from the actual design of the units. No claims can be deduced from any deviations.

The device has been designed and constructed exclusively for the intended use described here.

Persons installing, operating or maintaining this device must be technically qualified personnel and must comply with the applicable accident prevention regulations.

limitations of liability
All information and instructions in this operating manual have been compiled taking into account the applicable standards and regulations, the state of the art as well as our many years of knowledge and experience. Schmidt Mess- und Regeltechnik accepts no liability for damage due to

- Failure to observe this manual
- Improper use of the device
- Working by untrained personnel with this device
- Unauthorized modifications or technical modifications not approved by the manufacturer
- Use of unauthorized spare parts

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