Operation manual

MONITOR 4.0

Analog Transmitter with Switch Output

Read this manual prior to performing any task!

Meister Strömungstechnik GmbH
Im Gewerbegebiet 2
63831 Wiesen
Germany
Telephone: +49 6096 9720 - 0
Fax: +49 6096 9720 - 30
E-mail: sales@meister-flow.com
Internet: www.meister-flow.com

MONITOR 4.0, 3, en_US

These instructions were compiled by:
Meister Strömungstechnik GmbH
Subject to change without notice

These instructions facilitate the safe and efficient handling of a transmitter (referred to as "device" in the following). The instructions are an integral part of the device and must be kept within easy reach for the personnel in the immediate vicinity of the device at all times. Personnel must carefully read and understand these instructions before commencing all work. The basic requirement for safe work is adherence to all safety and handling instructions stipulated in these instructions. The local accident-prevention regulations and general safety standards and regulations for the field of application of the device also apply. Illustrations in these instructions are provided to aid general understanding and might deviate from the actual model. No claims can be derived from any such differences.

Limitations of liability

All details and instructions in this manual have been compiled under consideration of the valid standards and regulations, the current state-of-technology and our many years of knowledge and experience. The manufacturer does not accept any liability arising from:

- non-observance of any details in these instructions
- improper use of the device, or use that is not in accordance with these instructions
- use of non-trained personnel
- unauthorized retrofitting or technical changes that have not been authorized by the manufacturer
- use of non-approved replacement parts

The duties and obligations agreed upon in the delivery contract apply in full, as well as the general terms and conditions, the terms of delivery by the manufacturer and the valid legal regulations applicable at the conclusion of the contract.

Copyright

Table of contents

1 Overview **6**
1.1 Short description 6
1.2 Warranty and guarantee provisions 6
1.3 Customer service 6

2 Safety **7**
2.1 Explanation of symbols 7
2.2 Correct use in accordance with these instructions 9
2.3 Special precautions 10
2.3.1 Hazards from electrical current 10
2.3.2 Hazards from high or low temperatures 11
2.4 Personnel requirements 12
2.5 Protective systems 13
2.6 Responsibility of the owner 13

3 Design and function **15**
3.1 Overview 15
3.2 Device description 15

4 Transport, packaging and storage **16**
4.1 Safety instructions for transport 16
4.2 Transport inspection 16
4.3 Packaging 16
4.4 Symbols on the shipping box 17
4.5 Storage 17

5 Installation and initial startup **19**
5.1 Possible device combinations 19
5.2 Electrical connection 21

6 Operation **23**
6.1 Electrical outputs 23
6.1.1 Analog output 23
6.1.2 Switch output 23

7 Troubleshooting **28**
7.1 Troubleshooting guide 29
8 Disassembly and disposal **32**
8.1 Return Materials 32
8.1.1 Return Materials Authorization 32
8.2 Disposal 32
9 Technical Data **33**
9.1 Device data plate and identification marking 33
9.1.1 Device data plate 33
9.1.2 Identification marking 33
9.2 Dimension sheet 33
9.3 Electrical data 34
9.4 Operating data 36
10 Glossary **37**
11 Index **38**

1 Overview

1.1 Short description

Fig. 1: Analog transmitter MONITOR 4.0

The analog transmitter MONITOR 4.0 measures the continuous flow of liquids and gases. It is designed for factory mounting on MEISTER flowmeters and flow monitors.

The position of the float is detected by means of a Hall-Sensor. The corresponding flow rate is output as an analog current signal (4-20 mA).

In addition the device has an electrical switch output. It can be programmed via button press.

1.2 Warranty and guarantee provisions

Warranty and guarantee provisions are contained in the general terms and conditions of Meister Strömungstechnik.

1.3 Customer service

For technical support, please contact our customer service department (for contact details, see Page 2).

Furthermore, our staff is always interested in receiving new information and experiences gained from application of the device, which may be useful in improving our products.

2 Safety

This chapter provides an overview of important safety aspects required for optimum protection of personnel as well as for safe installation and safe operation of the device.

Non-observance of the handling and safety instructions listed in this manual may result in hazardous/dangerous conditions and in damage to property.

2.1 Explanation of symbols

Safety instructions

Safety instructions in this manual are marked by symbols. The safety instructions are preceded by signal words that indicate the level of danger/hazard.

To prevent accidents or injury to persons as well as damage to property, always observe the safety instructions and proceed carefully.

DANGER!

This combination of symbol and signal word indicates an immediate, dangerous condition that results in death or serious injury if it is not avoided.

WARNING!

This combination of symbol and signal word indicates a possibly dangerous condition that might result in death or serious injury if it is not avoided.

CAUTION!

This combination of symbol and signal word indicates a possibly dangerous condition that might result in minor or slight injury if it is not avoided.

NOTICE!

This combination of symbol and signal word indicates a possibly dangerous condition that might result in damage to property and to the environment if it is not avoided.

Tips and recommendations

This symbol emphasizes useful tips and recommendations as well as information for efficient and failure-free operation.

Signs used in these instructions

The following signs and highlightings are used in these instructions to identify handling instructions, the description of results, lists/enumerations, references and other elements:

- Designates step-by-step handling instructions
  - ⇨ Designates a state or an automatic sequence as a result of a specific operating step
- Designates randomly ordered enumerations and list entries

↳ *"Signs used in these instructions" on page 8*, designates references to chapters in these instructions

2.2 Correct use in accordance with these instructions

The device is designed and constructed exclusively for the intended use described herein.

Correct use in non-hazard areas
The transceiver designed to be mounted on a flowmeter / flow monitor. This combination serves exclusively to monitor the continuous flow of liquid and gaseous media within a temperature range of -20 °C to 70 °C / -4 °F to 158 °F.

CAUTION!

Changed operating temperatures dependent on the installed device

Observe the specified media temperatures of the flowmeter as they might limit the temperature range of the liquid and gaseous media.

Correct use in explosion-hazard zones

DANGER!

This device is not certified for the use in explosion-hazard zones!

Any additional or different application, above and beyond the correct use in accordance with these instructions, is deemed as incorrect use.

WARNING!

Danger due to incorrect use!

Incorrect use of the transmitter may result in dangerous conditions.

- Use the transmitter only within the stipulated performance limits
- Do not subject the transmitter to severe temperature fluctuations
- Do not subject the transmitter to vibrations
- Do not open the transmitter
- Do not use the transmitter as the sole monitoring device to prevent dangerous conditions
- The transmitter must be installed so that it is protected from damage by mechanical force. If necessary, install an appropriate impact protection device

All claims for damages due to incorrect use are excluded.

2.3 Special precautions

The following section lists residual risks that might arise from the device.

To reduce health risks and prevent dangerous conditions, observe the safety instructions listed here as well as the safety instruction in the other chapters of these Operating Instructions.

These Operating Instructions cannot cover all conceivable dangers because many dangers arise, not from the device itself, but from the respective media flowing through it. Always observe the appropriate safety data sheets when using hazardous media!

2.3.1 Hazards from electrical current

Electrical current

DANGER!

Danger to life from electrical current!

There is an immediate risk to life from electrocution on touching live parts. Damaged electrical insulation or components can be extremely dangerous.

- Only qualified electricians shall work on the electrical system.
- If the insulation is damaged, immediately switch off and have repairs performed.
- Before commencing work on live parts of the electrical systems and operating equipment, disconnect the equipment and ensure that it remains disconnected for the duration of the work. Observe these 5 safety rules when doing so:
  - Isolate (disconnect)
  - Secure against switching back on
  - Check for absence of voltage
  - Ground and short

  - Cover or cordon off other live parts in the vicinity
- Never bridge fuses or put them out of operation. Always observe the correct current ratings when replacing fuses
- Keep moisture away from live parts. This can result in short-circuit

2.3.2 Hazards from high or low temperatures

Hot or cold surfaces

WARNING!

Risk of injury from hot or cold surfaces!

Surfaces of components may heat up or cool down dramatically due to the media flowing through them. Skin contact with hot or cold surfaces may cause severe skin burn or frostbite.

- Always wear temperature-resistant protective work clothing and protective gloves when working near hot or cold surfaces
- Before commencing work, make sure that all surfaces have been cooled down or warmed up to ambient temperature

2.4 Personnel requirements

WARNING!

Risk of injury due to insufficiently trained and qualified personnel!

If unqualified personnel work on the device or are located within its hazard zone, dangers arise which may result in serious injury and considerable damage to property.

- All work must be performed by qualified personnel only.
- Keep unqualified personnel away from hazard zones.

Authorized personnel is to be restricted to those persons who can be expected to perform their work reliably. Persons whose ability to respond is influenced, e.g. by drugs, alcohol or medication, are not authorized.

Observe the age and occupational regulations at the site when choosing personnel.

The following lists the personnel qualifications for the various areas of activity:

Qualified electrician
Due to specialized training, knowledge and experience as well as knowledge of the relevant standards and regulations, the qualified electrician is able to independently perform work on the electrical systems as well as to detect and avoid possible risks and dangers.

Additionally, the electrician must provide proof of his/her professional qualification that certifies his/her ability to perform work on electrical systems.

The qualified electrician must fulfill the requirements contained in the valid legal accident-prevention regulations.

Qualified personnel
Due to their specialized training, knowledge and experience as well as their knowledge of the relevant standards and regulations, qualified personnel are able to independently perform the work assigned to them as well as to detect and avoid possible risks and dangers.

2.5 Protective systems

Integration within an emergency-stop concept is required

The device is designed for use as a part of a machine or system. It does not have its own controller and does not have an autonomous emergency-stop function.

Before starting up the device, install the emergency-stop equipment and incorporate it into the safety chain of the machine or system.

Connect the emergency-stop equipment so that if there is an interruption in the power supply or in the activation of the power supply after an interruption, dangerous conditions are excluded for persons and valuables.

The emergency-stop equipment must always be freely accessible.

2.6 Responsibility of the owner

Owner

The owner is the person who operates the device himself for business or commercial purposes or who cedes such use/application to a third-party and who, during operation of the device, has full legal product stewardship for protection of the user, the personnel or third-parties.

Duties of the owner

The device is used in the commercial sector. The owner of the device is therefore subject to legal obligations pertaining to work safety.

In addition to the safety instructions contained in these Operating Instructions, the safety, accident prevention and environmental protection regulations applicable to the field of application of the device must be observed.

In particular this includes:

- The owner must inform himself regarding the valid health and safety regulations and must perform a risk assessment to additionally determine the risks resulting from the special work conditions arising at the location at which the device is used, especially in regard to the media used. He must then implement these within Operating Instructions for use of the device.
- **For the USA:**
  The "Occupational Health and Safety Act" of 1970 stipulates that it is the duty of the owner to provide a safe workplace. He must hereby ensure that the device is operated and maintained compliant to valid commercial, industrial, local, federal and state laws, standards and regulations.

- **For Canada:**
  The "Canadian Centre for Occupational Health and Safety Act" of 1978 stipulates that all Canadians have “...a fundamental right to a healthy and safe working environment.” It is therefore the duty of the owner to provide a safe workplace. He must ensure that the device is operated and maintained compliant to valid commercial, industrial, local, provincial, territorial and federal laws, standards and regulations.
- Appropriate to the working conditions and the media used, the owner must affix signs within the working area that inform the user of the hazards and dangers present.
- During the entire period of use of the device, the owner must check periodically to ensure that the Operating Instructions correspond to the current state of regulations, and he must make adjustments as necessary.
- The owner must clearly regulate and determine responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The owner must fit/retrofit suitable safety equipment within the complete plant/system.
- The owner must ensure that all staff/personnel have thoroughly read and understand these instructions before handling the device. Additionally, he must train the personnel at regular intervals and warn them of dangers.
- The owner must provide the personnel with the required safety equipment and must instruct them that its wear is mandatory.

Additionally, the owner is responsible for ensuring that the device is always kept in a technically perfect condition.

- The owner must implement suitable safety measures, appropriate to the media used.
- The owner must ensure that the maintenance intervals described in these Operating Instructions are adhered to at all times.

3 Design and function

3.1 Overview

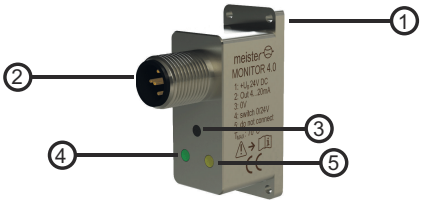


Fig. 2: MONITOR 4.0 Front view

1 Stainless steel housing
2 Connector M12x1
3 Push-button for programming the switch point
4 Power-On-LED (green)
5 Status-LED (yellow)

3.2 Device description

The transmitter MONITOR 4.0 measures the continuous flow of liquids and gases. The transmitter is designed for factory mounting on MEISTER flowmeters and flow monitors.

The position of the float is detected by means of a Hall-Sensor. The corresponding flow rate is transmitted as an analog current signal (4-20 mA).

In addition, the device has an electrical switch output, which can be programmed via the push-button.

4 Transport, packaging and storage

4.1 Safety instructions for transport

Improper transport

NOTICE!

The device could be damaged if transported improperly!

Objects to be transported may fall or overturn if transported improperly. This may result in damage to the device and/or property.

– Proceed carefully when unloading transported packages, both on delivery and when transporting in-house. Observe the symbols and instructions on the shipping box
– Remove packaging material just prior to assembly

4.2 Transport inspection

On delivery, make an immediate check for completeness and check for transport damages.

If there are any visible external transport damages, proceed as follows:

- Do not accept the delivery
- Note the damage in the shipping documents or on the delivery note of the transporter and have the driver confirm by signature
- Initiate a claim for damages

Make a claim for each fault as soon as it is detected. Claims for damages can only be invoked within the valid claim periods.

4.3 Packaging

Packaging

The packaging serves to protect the individual components from transport damages, corrosion and other damages until they are installed. Do not discard the packaging and only remove the device from the shipping box immediately before installation.

Handling packaging materials

Dispose of packaging material in accordance with the valid legal regulations and local ordinances.

! NOTICE!

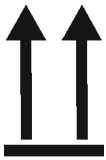
Danger to the environment due to incorrect disposal!

Packaging is made of valuable raw materials and can be reused in many cases or usefully processed and recycled. Improper disposal of packaging materials may pose a danger to the environment.

- Dispose of packaging material in an environmentally safe manner
- Comply with the local disposal regulations. If necessary, have the packaging disposed of by approved specialists.

4.4 Symbols on the shipping box

Top



The arrows indicate the top side of the package. They must always point upwards, otherwise the content may be damaged.

Fragile

Designates packages with breakable or damageable contents.

Handle the package carefully and do not allow it to fall or be subjected to jarring or severe vibration.

4.5 Storage

Storing the packages

Store the packages under the following conditions:

- Do not store in the open
- Store dry and dust-free
- Do not subject to any aggressive media
- Protect from direct sunlight
- Avoid mechanical vibrations and shocks
- Storage temperature: -20 bis 70°C
- Relative humidity: max. 60 %

- Do not stack
- If storing for longer than 3 months, regularly check the general condition of all parts as well as of the packaging

Storage instructions in addition to the instructions listed here may be listed on the packages. Follow these instructions also.

5 Installation and initial startup

5.1 Possible device combinations

NOTICE!

Detailed installation instructions can be found in the Operating Instructions Module BASICS for the specific flowmeter / flow monitor.

The MONITOR 4.0 can be factory mounted on the following flowmeters / flow monitors:

Table 1: Devices for water and similar media

Device		Transmitter		Combination
DWG	+	MONITOR 4.0	=	DWG/MONITOR 4.0
DUG	+	MONITOR 4.0	=	DUG/MONITOR 4.0
RVO/U-1	+	MONITOR 4.0	=	RVO/U-1/MONITOR 4.0
RVO/U-2	+	MONITOR 4.0	=	RVO/U-2/MONITOR 4.0
RVO/U-4	+	MONITOR 4.0	=	RVO/U-4/MONITOR 4.0
DWM	+	MONITOR 4.0	=	DWM/MONITOR 4.0
DWM/A	+	MONITOR 4.0	=	DWM/A/MONITOR 4.0
DUM	+	MONITOR 4.0	=	DUM/MONITOR 4.0
DUM/A	+	MONITOR 4.0	=	DUM/A/MONITOR 4.0
RVM/U-1	+	MONITOR 4.0	=	RVM/U-1/MONITOR 4.0
RVM/U-2	+	MONITOR 4.0	=	RVM/U-2/MONITOR 4.0
RVM/U-4	+	MONITOR 4.0	=	RVM/U-4/MONITOR 4.0
RVM/UA-1	+	MONITOR 4.0	=	RVM/UA-1/MONITOR 4.0
RVM/UA-2	+	MONITOR 4.0	=	RVM/UA-2/MONITOR 4.0
WY	+	MONITOR 4.0	=	WY/MONITOR 4.0

Table 2: Devices for oil and similar media

Device		Transmitter		Combination
DKG-1	+	MONITOR 4.0	=	DKG-1/MONITOR 4.0
DKG-2	+	MONITOR 4.0	=	DKG-2/MONITOR 4.0
DKM-1	+	MONITOR 4.0	=	DKM-1/MONITOR 4.0
DKM-2	+	MONITOR 4.0	=	DKM-2/MONITOR 4.0
DKM/A-1	+	MONITOR 4.0	=	DKM/A-1/MONITOR 4.0
DKM/A-2	+	MONITOR 4.0	=	DKM/A-2/MONITOR 4.0
DKME-1	+	MONITOR 4.0	=	DKME-1/MONITOR 4.0
DKME/A-1	+	MONITOR 4.0	=	DKME/A-1/MONITOR 4.0

Table 3: Devices for air and other gases

Device		Transmitter		Combination
DWG-L	+	MONITOR 4.0	=	DWG-L/MONITOR 4.0
RVO/U-L1	+	MONITOR 4.0	=	RVO/U-L1/MONITOR 4.0
RVO/U-L2	+	MONITOR 4.0	=	RVO/U-L2/MONITOR 4.0
RVO/U-L4	+	MONITOR 4.0	=	RVO/U-L4/MONITOR 4.0
DWM-L	+	MONITOR 4.0	=	DWM-L/MONITOR 4.0
DWM/A-L	+	MONITOR 4.0	=	DWM/A-L/MONITOR 4.0
RVM/U-L1	+	MONITOR 4.0	=	RVM/U-L1/MONITOR 4.0
RVM/U-L2	+	MONITOR 4.0	=	RVM/U-L2/MONITOR 4.0
RVM/U-L4	+	MONITOR 4.0	=	RVM/U-L4/MONITOR 4.0
RVM/UA-L1	+	MONITOR 4.0	=	RVM/UA-L1/MONITOR 4.0
RVM/UA-L2	+	MONITOR 4.0	=	RVM/UA-L2/MONITOR 4.0

5.2 Electrical connection

The transmitter is connected via the M12x1 connector with A-coding.

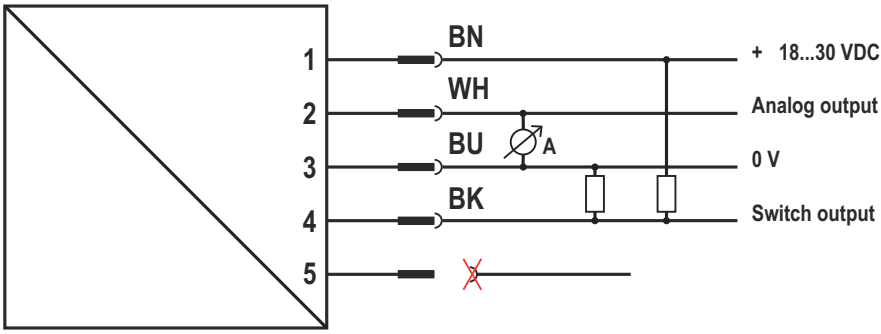


Fig. 3: MONITOR 4.0 Connection diagram

Table 4: Pin assignment of the connector

Pin	Assignment	Wire color of the connection cable
1	Power supply 24 VDC (18...30 VDC)	brown
2	Analog output (4...20 mA)	white
3	0 V	blue
4	Switch output	black
5	Must not be contacted!	

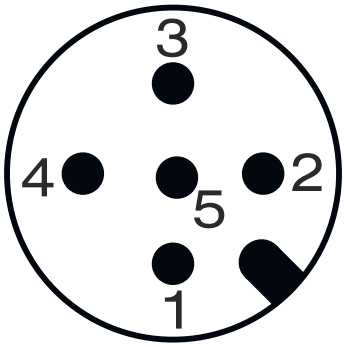


Fig. 4: MONITOR 4.0-Pin-assignment

NOTICE!

Pin 5 must not be connected!

A 4 Pin-connector cable is ideally suited.

NOTICE!

The maximum length of the connection cable must not exceed 30 m!

NOTICE!

MONITOR 4.0 may not, under any circumstances, be disconnected from the mechanical part of flowmeter / flow monitor, as this will lead to a loss of warranty.

6 Operation

6.1 Electrical outputs

6.1.1 Analog output

A Hall-sensor is used to measure the displacement of the float and the corresponding flow rate is transmitted as an analog signal (4 - 20 mA).

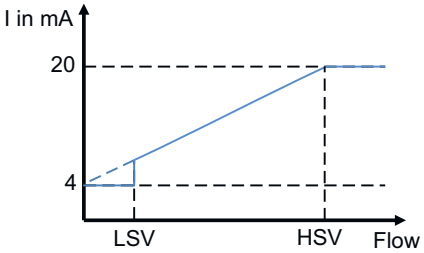


Fig. 5: MONITOR 4.0 flow curve

LSV lowest scale value
HSV highest scale value (same as nominal flow rate)

! NOTICE!

The maximum of 20 mA is transmitted when the actual flow rate reaches the nominal flow rate. A current value higher than 20 mA will not be shown even though the actual flow rate exceeds the nominal flow rate.

If the actual flow rate is lower than the lowest scale value it cannot be detected by the device. The transmitter will then show zero-value (4 mA) even though the actual flow rate might be higher than or equal to zero. Due to the design of the float-type flow meters the LSV (Lowest Scale Value) is subject to a certain tolerance. We recommend to select the device so that the flow rate to be measured is in the middle or upper third of the device.

6.1.2 Switch output

The device has a switch output which can be programmed using the push-button.

The switch output is configured as a minimum switch, which activates the alarm when the flow falls below the set limit. It switches back into the normal condition when the flow rate exceeds the limit value plus the set hysteresis *(see Glossary).*

> ***LED status***
>
> – *At normal operating condition the Status-LED is yellow.*
> – *When the alarm is activated the Status-LED is off.*

6.1.2.1 Programming the switch point

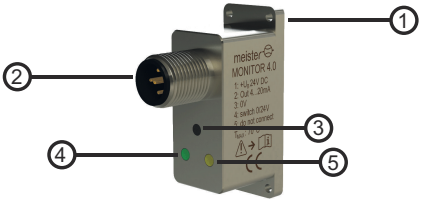


Fig. 6: MONITOR 4.0 Overview

1 Stainless steel housing
2 Connector M12x1
3 Push-button for programming the switch point
4 Power-On-LED (green)
5 Status-LED (yellow)

To program the switch-off-point, proceed as follows:

- Check power supply
  (green LED is on)
- Set required flow rate as precisely as possible
- Wait until the required flow rate has stabilized
- With a suitable object carefully press the programming button
  The switch point will be saved
  (yellow LED is flashing)
- Release the programming button
- yellow LED will extinguish
  The programming process is completed

6.1.2.2 Checking the programmed switch point

To check the programmed switch-off-point proceed as follows:

- Increase the flow rate until yellow LED lights continuously
  (yellow LED is on)
- Slowly decrease the flow rate until the yellow LED is off
  (yellow LED is off)
- Compare the actual flow rate with the required flow rate
- If necessary repeat the programming process

6.1.2.3 Operation of the switch output

> ***Configuration***
>
> *Operate the switch output either in PNP or in NPN configuration.*

Load Current

Ensure through external circuitry that the permissible load current (100 mA) is not exceeded.

In the event of external disturbances (e.g. short circuits), the switching current of the MONITOR 4.0 is limited internally to a maximum of 450 mA.

6.1.2.4 PNP-Connection

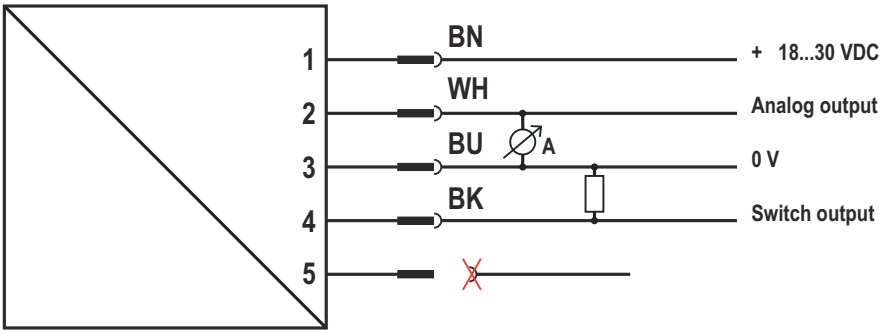


Fig. 7: MONITOR 4.0 Connection diagram

PNP-Connection

The load at the switch output must be connected to GND (0 V) as a reference point (pin 4 und pin 3).

Table 5: PNP-Output MONITOR 4.0 - Switch-schematic

Logical states	Flow rate	Status-LED (yellow)	Voltage* between pin 4 and 3
inactive / normal condition	sufficient	on	< 0,5 V
active / critical condition	too low	off	> 22,5 V

* Voltage at 24 V power supply and I < 100 mA

6.1.2.5 NPN-Connection

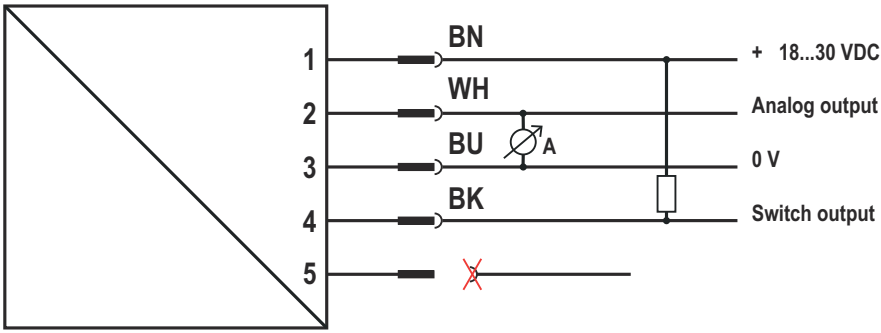


Fig. 8: MONITOR 4.0 Connection diagram

NPN-Connection

The load at the switch output must be connected to U+ as a reference point (pin 1 und pin 4).

Table 6: NPN-Output MONITOR 4.0 - Switch-schematic

Logical states	Flow rate	Status-LED (yellow)	Voltage* between pin 1 and 4
inactive / normal condition	sufficient	on	> 22,5 V
active / critical condition	too low	off	< 0,5 V

* Voltage at 24 V power supply and I < 100 mA

7 Troubleshooting

This chapter describes possible malfunctions of the device, their causes and repair.

If malfunctions persist or increase, shorten the maintenance interval to meet the actual operating conditions.

For malfunctions not described in this chapter, please contact the manufacturer (see service address on page 2).

7.1 Troubleshooting guide

Fault description	Cause	Remedy	Personnel
No current signal	No power supply	■ Connect power supply as per connection diagram	Qualified electrician
	Incorrect wiring	■ Correct wiring as per connection diagram	Qualified electrician
	Broken cable	■ Check continuity an replace cable if necessary	Qualified electrician
	Flowmeter / flow monitor defective	■ Remove the device from the pipe system and contact manufacturer	Qualified personnel
The current signal does not correspond to the actual flow rate	Flowmeter / flow monitor is contaminated	■ Remove the device from the pipe system, clean the device and flush the system	Qualified personnel
	The Media temperature is outside the operating range	■ Ensure correct media temperature	Qualified personnel
	Flowmeter / flow monitor defective	■ Remove the device from the pipe system and contact manufacturer	Qualified personnel
Switch output does not switch	No flow	■ Ensure that media is flowing through the system	Qualified personnel

Fault description	Cause	Remedy	Personnel
Switch output does not switch	Flow rate too low or switch value set too high	■ Set switch output to a lower flow rate ■ Increase flow rate ■ If necessary, select a device with a different measuring range	Qualified personnel
	Float is stuck	■ Remove the device from the pipe system, clean the device and flush the system	Qualified personnel
	Flow meter / flow monitor defective	■ Remove the device from the pipe system and contact manufacturer	Qualified personnel
Switch output is steadily activated	Flow rate too high or switch value set too low	■ Set switch output to a higher flow rate ■ Reduce flow rate ■ If necessary, select a device with a different flow rate	Qualified personnel
	Float is stuck	■ Remove the device from the pipe system, clean the device and flush the system	Qualified personnel
	Flow meter / flow monitor defective	■ Remove the device from the pipe system and contact manufacturer	Qualified personnel

NOTICE!

Interference caused by external magnetic fields

External magnetic fields will influence the transmitter. Keep sufficient distance to magnetic fields (e.g. electric motors).

NOTICE!

Please note that the flowmeter / flow monitor and transmitter are calibrated as a unit and must not be replaced separately. The transmitter MONITOR 4.0 must not, under any circumstances, be disconnected from the mechanical part of flowmeter / flow monitor, as this will lead to a loss of warranty.

8 Disassembly and disposal

8.1 Return Materials

8.1.1 Return Materials Authorization

For products being returned, regardless of the reason, the currently valid provisions of the returns policy set by MEISTER will apply. Return shipments which do not comply with the returns policy may be refused by MEISTER at the expense of the consignor.

8.2 Disposal

If no return or disposal agreement has been made, recycle disassembled components:

- Scrap metals
- Recycle plastic elements
- Dispose of the remaining components according to their material properties

! NOTICE!

Danger to the environment due to incorrect disposal!

Potential risk to the environment may arise due to incorrect disposal.

– Have electrical scrap, electronic components, lubricants and other supplies disposed of by approved specialists
– In case of doubt, obtain information on environmentally safe disposal from the local authority or special disposal expert

9 Technical Data

9.1 Device data plate and identification marking

The device data plate is on the mechanical part of the flowmeter / flow monitor. The transmitter MONITOR 4.0 is labeled separately.

9.1.1 Device data plate

The device data plate is on the mechanical part of the flowmeter / flow monitor and provides the following information:

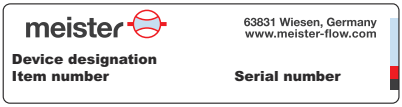


Fig. 9: Manufacturer data plate

9.1.2 Identification marking

The transmitter is labeled separately:

Fig. 10: MONITOR 4.0 marking

1 Type identification
2 Pin assignment
3 Notice to adhere to the operating instructions
4 CE-marking

9.2 Dimension sheet

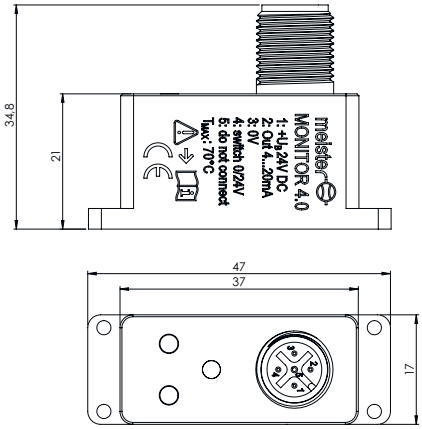


Fig. 11: MONITOR 4.0 - Dimension sheet

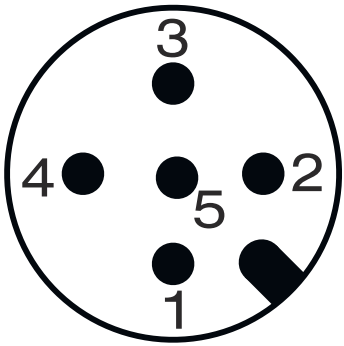


Fig. 12: MONITOR 4.0-Pin assignment

9.3 Electrical data

Transmitter with switch output

Data	Value	Unit
Power supply	24 (18...30)	VDC
Power consumption (without load)	< 1	W

Connection

Round plug M12x1

5-pin, A-coding

Ingress protection

IP 65 / IP 67

Analog output

Data	Value	Unit
Current output	4 - 20	mA
Max. load	500	Ω

Switch output

Data	Value	Unit
Max. current	100	mA
Hysteresis (electronic)	0,8	mA
Hysteresis (flow) *	5	%

* based on highest scale value

LED

LED	Status	Signal / Meaning
Green	on	Power on (Power present)
Yellow	on	Sufficient flow rate
Yellow	off	Flow rate too low
Yellow	blinking	Teaching / programming of the switch point

NOTICE!

Mating the electronics and the flowmeter / flow monitor

Please note that the flowmeter / flow monitor and transmitter are calibrated as a unit. Replacement of either part must be done by the manufacturer.

NOTICE!

Validity of additional documents

Please refer to the data sheets and operating instructions of the respective flowmeter / flow monitor.

9.4 Operating data

Description	Value	Unit
Max. operating pressure	depending on the combination of devices used (see technical data of the flowmeter / flow monitor)	
Pressure drop	depending on the combination of devices used (see technical data of the flowmeter / flow monitor)	
Viscosity range	depending on the combination of devices used (see technical data of the flowmeter / flow monitor)	
Accuracy	±1 %	
Max. media temperature	70	°C
Min. media temperature	-20	°C
Ingress protection	IP65 IP67	

NOTICE!

Ensure that the media used will not freeze and the boiling point is not exceeded.

The actual accuracy depends on the flowmeter / flow monitor being used. On request the accuracy of the device combination can be significantly increased by customized calibration.

10 Glossary

Hysterese

The switch output of the MONITOR 4.0 is a minimum switch. A minimum switch activates the alarm when the flow falls below the set limit. It switches back into the normal condition when the flow rate exceeds the limit value plus the factory set hysteresis. The difference between these two flow rates is called the "Hysteresis" of the switch output.

Hysteresis (electronic)

- In reference to the output current of the analog output the hysteresis is approx. 0,8 mA.

Hysteresis (flow rate)

- The analog output of MONITOR 4.0 is calibrated so that 0 mA represents a no-flow condition and 20 mA represents the highest scale value (see flow curve MONITOR 4.0). Therefore, based on the flow rate, a value of 0,8 mA corresponds to 5 % of highest scale value.

11 Index

A

Analog output 23

C

Contact 6
Copyright 3
Correct use 9
Customer service 6

D

Device data plate 33
Device description 15
Dimension sheet 33
Disposal 32

E

Electrical connection 21
Electrical data analog output . . . 34
Electrical data switch output 34
Electrical outputs 23
Electrical specifications 34
employment 9

G

General
    safety 7
Glossary 37

H

Hazard
    electrical current 10
Hazards
    temperature 11

L

LED 35
Limitation of liability 3

O

Operating data 36
Overview 15
Owner 13

P

Packaging 16
Precautions
    general 10

R

Return Materials Authorization . . 32

S

Safety equipment 13
Safety instructions
    transport 16
Service 6
Storage 17
Switch output 23
Symbols
    packaging 17
Symbols used
    in the instructions 7

T

Transport inspection 16

W

Warranty and guarantee provisions 6