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MASTERPIECES
MADE IN GERMANY

Operation manual

FLOWSONIQ®

FSQ/S1

H2O SPEC

FUNCTION

The FlowSoniq® FSQ/S1 ultrasonic flow meters and counters operate according to the ultrasonic measuring principle (transit time difference method).

FSQ/S1 B 1 R0001 07-25 E M

TABLE OF CONTENTS

0 - NOTES - OPERATING MANUAL

- Every person responsible for commissioning or operating this device must have read and understood these operating instructions and in particular the safety instructions. These operating instructions are intended for trained specialist personnel (see chapter 1.3).
- The device is designed exclusively for the intended use described in chapter 1.2. Any use beyond the intended use or any other use is considered misuse.
- Read the relevant instructions carefully before each work step and follow the specified sequence.

Read the "Safety instructions" section particularly carefully. If you have any problems or questions, please contact us directly:

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FSQ/S1 B 3 R0001 07-25 E M

0 - NOTES - OPERATING MANUAL

Safety signs and symbols used:

WARNING! / CAUTION! Risk of injury!
This sign indicates dangers that may cause personal injuries that could lead to health defects or cause considerable damage to property.

CAUTION! Electric current!
This sign indicates dangers which could arise from handling of electric current.

CAUTION! Material damage!
This sign indicates actions which could lead to possible damage to material or environmental damage.

FOLLOW THE OPERATING MANUAL!

NO DOMESTIC WASTE!
The device must not be disposed of together with domestic waste.

NOTICE!
This symbol indicates important notices, tips or information.

Observe and follow the information marked with this symbol.

Device label

1.0 - DEVICE DESCRIPTION

The FSQ/S1 from Meister Strömungstechnik GmbH uses two ultrasonic sensors arranged opposite each other to determine the flow rates and total volumes of liquids in pipe systems using the ultrasonic transit time difference method.
The transit time of the sound depends on the flow velocity. Both sensors work alternately as transmitter and receiver. The difference in transit time is proportional to the flow velocity. In contrast to other ultrasonic measuring systems, the method works parallel to the flow. This results in an extremely compact design, high accuracy, excellent measurement dynamics and the ability to measure very high flow velocities without constricting the cross-section. Typical areas of application are cooling circuits, water treatment and process water applications.

Versions:

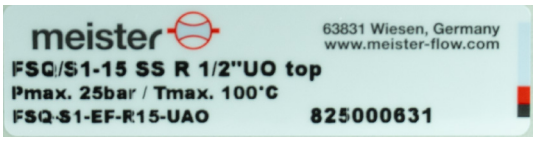
The FSQ/S1 is used with various measuring tubes:

- **R 1/2" Measuring tube stainless steel version, max. flowrate 80 L/min**
- **R 1/2" Measuring tube brass version, max. flowrate 80 L/min**

The FSQ/S1 can be installed in any position. The housing is individually pre-assembled at the factory so that the device can be integrated into machines and systems to save space. At the same time, the illuminated display is always easy to read. The process connection is a conical male R-thread according to EN 10226-1 (Witworth pipe thread).

Type plate:

It contains the most important technical data.



1.1 - DELIVERY

All devices have been carefully checked for proper functioning before shipment.

- Immediately upon receipt, carefully check the outer packaging for damage or signs of improper handling.
- Report any damage to the carrier and your sales representative.
  In such a case, a description of the defect, the type and the serial number of the appliance must be provided.
  Any transport damage must be reported immediately after delivery. Damage reported later cannot be recognized

Unpacking:

- Carefully unpack the unit to prevent any damage.
- Check the completeness of the delivery based on the delivery note.

1.2 - INTENDED USE

The operational safety of the device supplied is only guaranteed if it is used as intended. The specified limit values (see chapter 9.0-Technical data) must never be exceeded! Before installation, check whether the materials of the device wetted by the medium are suitable for the liquid used (see chapter 9 - Materials).

WARNING: Not a safety component!
The devices of the FSQ/S1 series must not be used as the sole monitoring devices to detect or even prevent dangerous operating states in systems and machines. The system or machine itself must be designed in such a way that critical conditions that pose a danger to people and the environment are excluded by design.

The ultrasonic measuring devices of the FSQ/S1 series are used for the reliable measurement of flow rates, monitoring and total quantity detection of liquids that do not corrode the materials used. Any other use of the device is not permitted and is outside the scope of application.

1.3 - PERSONNEL REQUIREMENTS

Qualified personnel:
Specialist personnel to their technical training, knowledge and experience as well as knowledge of the relevant regulations, qualified personnel are able to carry out the work assigned to them and to independently recognize and avoid possible dangers. Trained specialist personnel are those persons who are familiar with the installation and commissioning of this type of device and are appropriately qualified.

Qualified electrician:
The qualified electrician is able to carry out work on electrical systems and independently recognize and avoid potential hazards due to their many years of knowledge and experience as well as knowledge of the relevant standards and regulations. They must also provide proof of their professional qualification, which certifies their ability to carry out work on electrical systems. The qualified electrician must comply with the provisions of the applicable statutory regulations on accident prevention.

1.4 - EXCLUSION OF LIABILITY

We accept no liability for any damage or malfunctions resulting from incorrect installation, inappropriate use of the device or failure to follow the instructions set force in this operating manual.

2.0 - SAFETY INSTRUCTIONS

Read these operating manual carefully before installing the FSQ/S1. Failure to follow the instructions contained in, in particular the safety instructions, may result in danger to people, the environment, the device and the system.

The FSQ/S1 corresponds to the current state of the art. This applies to the accuracy, functionality and safe operation of the devices.
To ensure safe operation, the operator must be knowledgeable and safety-conscious.
Meister Strömungstechnik GmbH provides assistance for the use of the products either personally or through appropriate literature.
The customer checks the usability of the product on the basis of the technical information provided. The customer checks the suitability of the product for its intended use in customer and application-specific tests. With this test, risk and danger are transferred to our customer; our warranty expires.

Qualified personnel:

⚠ The personnel assigned to install, commission and operate the FSQ/S1 must be qualified personnel as defined in chapter 1.3. The personnel must be familiar with the contents of these operating instructions and have access to them at all times.

⚠ The electrical connection may only be carried out by a qualified electrician (chapter 1.3).

General safety instructions:

⚠ The existing national regulations on accident prevention and safety in the workplace must be observed for all work. Existing internal regulations of the operator must be observed, even if they are not mentioned in these instructions.

⚠ Use the device specification (see chapter 9 "Technical data") to ensure that the device is suitable for the ambient conditions at the place of use.

⚠ Take suitable measures to prevent the medium in the device from freezing.

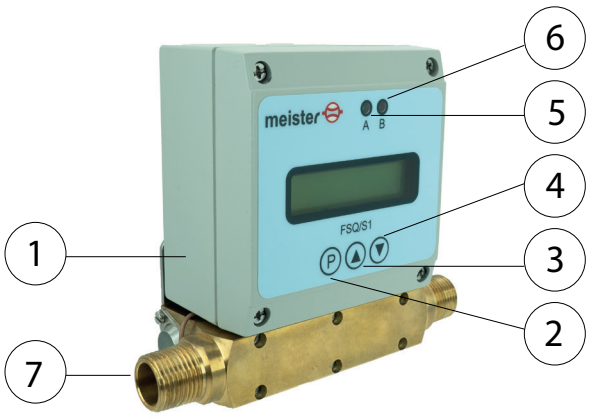
⚠ Only use the FSQ/S1 if it is in perfect condition. Damaged or faulty devices must be checked immediately and replaced if necessary.

⚠ Only use suitable tools for installation, connection and removal.

⚠ Nameplates or other markings on the device must not be removed or made illegible, as this will invalidate any warranty and manufacturer responsibility.

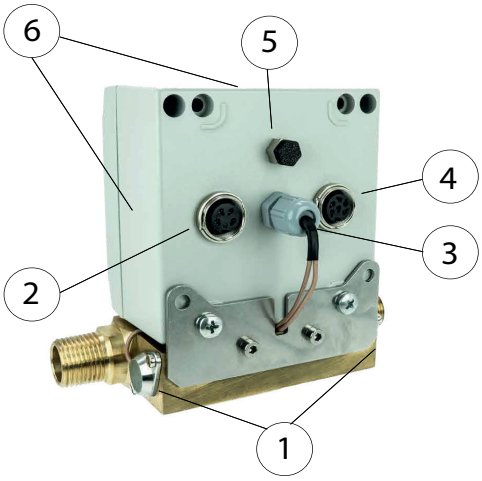
Special safety instructions:
Warnings relating specifically to individual functional sequences or activities can be found at the corresponding points in these operating instructions.

3.0 - STRUCTURE AND COMPONENTS



Front view

1. Housing	
2. Button P	confirm/select
3. Button arrow up	menu up
4. Button arrow down	menu down
5. LED A	status relay 1 green
6. LED B	status relay 2 red
7. Process connection	1/2" R-thread (conical)



Rear view

1. Ultrasonic sensors (left and right)
2. 4-pin device socket for supply voltage and output signal
3. Feed-through sensor connection
4. 6-pin device socket for relay outputs
5. Calibration connection
   The connection is for manufacturer-internal use only.
   The protective cap must not be removed.
6. Type plate + device label - Serial number and type
   (See example chapter 1.0)

4.0 - INSTALLATION

To avoid cavitation and turbulence, the greatest possible distance must be maintained from valves, pipe bends, fittings and other elements that disturb the flow. Valves in particular can disrupt the flow and lead to malfunctions. Ideally, they should therefore be installed downstream of the measuring device in the direction of flow. In this way, disruptive flows only occur downstream of the measuring device. To avoid pressure surges, it is important that the valves are opened as slowly as possible.
To ensure that the devices function properly, it is recommended to provide a straight calming section of approx.
10 x d (d = internal pipe diameter) on the inlet side and 5 x d on the outlet side.
If the pipe ends in a free outlet, the appliance must not be installed directly in front of the opening. To ensure proper function, the device must always be completely filled with medium.

The FSQ /S1 is installed directly in the pipe. The process connection of the device is a conical external thread in accordance with EN 10226-1. This is a pipe thread for thread-sealing connections.
The external thread is conical and seals when screwed into the cylindrical internal thread. Please ensure that the appropriate connection threads are available on the process side. Hemp, Teflon tape or other sealing adhesive shall be used as sealants. Please select a sealant that is suitable for the medium and the operating conditions.

Tightness is achieved by a metallic seal between the thread flanks of the conical external thread and the cylindrical internal thread. This is optimized by the sealing aids used.
The screw-in depth can vary greatly due to the tolerances of the two threads.
When combining an external thread at the lower tolerance limit and an internal thread at the upper tolerance limit, the missing "thread-depth" shall not be achived by trying to increase the applied screw-in force.

Note:

- Install suitable and standard-compliant transition fittings at the installation location.
- Observe the specified calming distances.
- Install the FSQ/S1 in the pipe.
- Only use suitable sealing material.
- Only use suitable tools of the appropriate size.

5.0 - ELECTRICAL CONNECTION

The FSQ/S1 is electrically connected via the 4-pin and 6-pin connector on the rear of the housing.

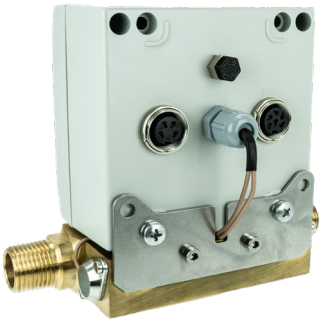
CAUTION! Electrical current!
The electrical connection of the FSQ/S1 may only be carried out by a qualified electrician (see chapter 1.3).
De-energize the electrical system before connecting the device.

CAUTION! Material damage and fire hazard!
Exceeding the specified limit values will damage the electronics. Without current limitation (e.g. fuses), there is a risk of fire due to overheating of the device.
Only connect the FSQ/S1 to a power source with limited power.

5.1 - ELECTRICAL DATA

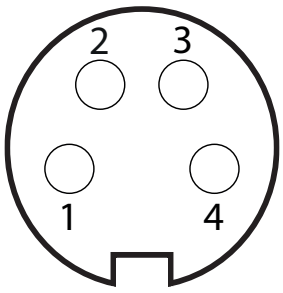
Outputs	
Current output:	4 - 20 mA
Voltage output:	0 - 10 V
Frequency output:	parameterizable, max. 32 kHz
Resistance value Ri:	2 kΩ
Limit value relay	
Quantity:	2
Type:	Switch
	30 VDC / 1 A
	120 VAC / 1 A
Voltage supply	+24 VDC ± 15 %
Current consumption	200 mA max.
Display	LCD 2 x 16 illuminated

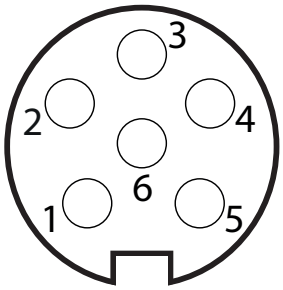
electrical connection	4 - pin or 6 - pin (included with delivery)
Protection class	IP 65, (only if connections are closed with the protective caps supplied)

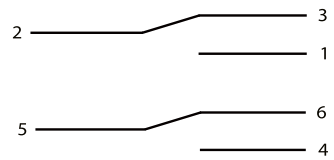


Pin-assignment Device socket 4-pin:	**Supply output signal**
Pin 1:	4 - 20 mA, 0 - 10 V or frequency output (selectable on site)
Pin 2:	GND
Pin 3:	GND
Pin 4:	+24 VDC ± 15 %

Pin-assignment Device socket 6-pin:	**Relay output**
Pin 1:	Relay 2, normally open contact
Pin 2:	Relay 2, center contact
Pin 3:	Relay 2, normally closed contact
Pin 4:	Relay 1, normally open contact
Pin 5:	Relay 1, center contact
Pin 6:	Relay 1, normally closed contact







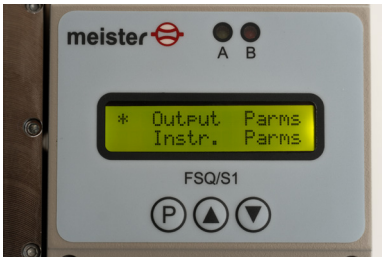
6.0 - MENU-MANUAL

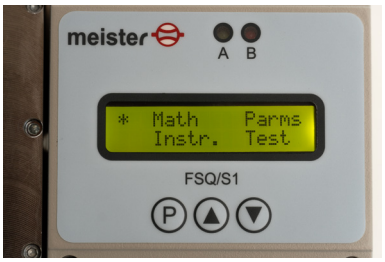
Before switching on the FSQ/S1 for the first time, follow the instructions in the following section. The operator can use the menu system to adapt the FSQ/S1 to the area of application. The menu has a flat structure. The “P” button activates the menu. Use the arrow buttons “Arrow up” and “Arrow down” to navigate (rotate) through the four menu items:

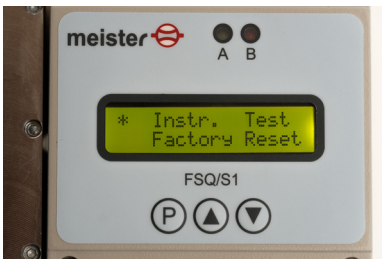
- **Output**
- **Instrument Parms**
- **Math Parms**
- **Instrument Test**
- **Restore Factory Settings**

Pressing the “P” button again activates the menu item marked “*” on the display. The desired parameter can be changed using the “Arrow up” and “Arrow down” arrow buttons. The desired setting is accepted when the “P” button is pressed again.
All parameters are stored in a non-volatile memory.

Note:
Changes to a parameter must always be acknowledged by pressing the “P” button within five seconds, otherwise the device will return to measuring mode without having accepted the parameter.
System-critical parameters are protected by a code to ensure the function of the device.







6.1 - MENU ITEM 1 "OUTPUT PARMS" - OUTPUT PARAMETERS

6.1.1 Relay 1

Setting the switching point for output relay 1 (LED: A)

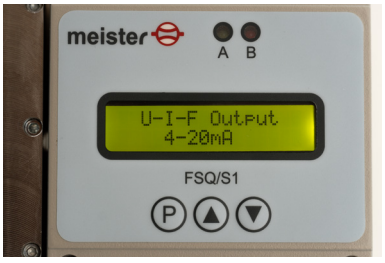
6.1.2 Relay 2

Setting the switching point for output relay 2 (LED: B)

The corresponding relay is energized when the flow rate currently measured by FSQ/S1 exceeds one of the set switching points. If a switching point of one or both relays is set to "0", they are deactivated and do not switch.

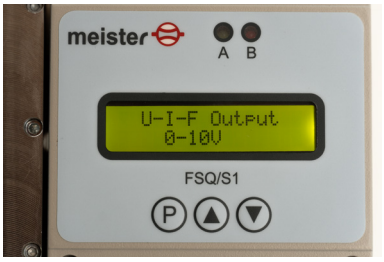
6.1.3 U I F Output

The U I F Output selects the current, voltage or frequency output of the FSQ/S1.
The outputs are made available on two pins of the 4-pin supply connector. All outputs are referenced to the device ground.
If the frequency output is selected, the desired output frequency FOUT-MAX can be adjusted within the limits of 125 Hz <= FOUT <= 32 kHZ. The signal shape is rectangular with an amplitude of approx. 16 Vpp at an operating voltage of 24 VDC and a load of 4.7 kOhm.



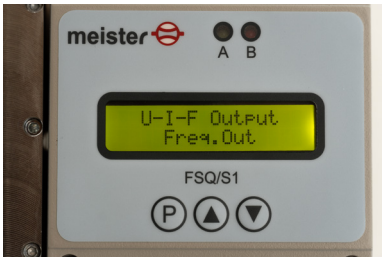
Current output

Analog current output:	4 - 20 mA
Burden:	0 -1000 Ω



Voltage output

Analog voltage output::	0 - 10 V
Resistance value Ri:	1 MΩ



Frequenz output:

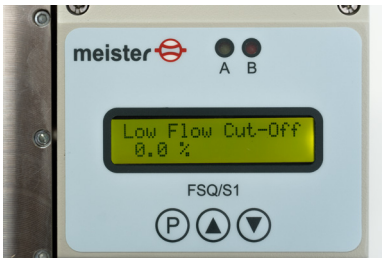
(parameterizable)

Fmax:	125 Hz - 32 kHz
Resistance value Ri:	2 kΩ

6.1 - MENU ITEM 1 "OUTPUT PARMS" - OUTPUT PARAMETERS

6.1.4 Upper flow limit - max. Flow Limit

The “max. flow limit” parameter determines the flow rate at which the maximum value of the selected output (4 - 20 mA, 0 - 10 V, FOUT) is generated. This allows the upper limit of the measuring range to be adjusted. If the “max. flow limit” value is reached during the measuring process, the selected output generates its maximum signal.



Note:
If the value of "max. flow limit" is exceeded, the display shows "Overflow".

Maximum output value of "Overflow":	
Current output	24 mA are generated
Voltage output	12 V are generated
Freq. output	Fout-Max are generated

If the flow rate is 0L/min, the display shows:	
Current output	4 mA are generated
Voltage output	0 V are generated
Freq. output	0 Hz are generated

Assignment of the analog output
If the analog output is used, the following assignment must be observed:

20 mA	max. Flow Limit
4 mA	all values below the Low Flow Cut-Off

The initial value of the measuring range can be calculated using the formula:

X = (D / Dmax. + 0,25) / 0,0625

D	Measuring range start value
Dmax	Measuring range end value
X	mA Value at start of measuring range

Example FSQ/S1 factory setting

Measuring range start value 0,5 L/min
Measuring range end value 80 L/min

4,1 mA = (0,5 / 80 + 0,25) / 0,0625

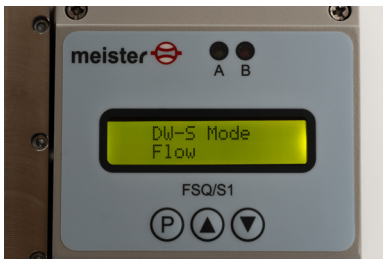
Result:
80 L/min 20 mA
0,5 L/min 4,1 mA

The assignment of the analog signal to flow-rate is linear.

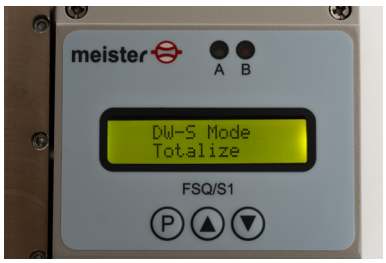
6.2 - MENU ITEM 2 "INSTRUMENT PARMS" - INSTRUMENTS PARAMETERS

6.2.1 DW-S Mode

Flow
DW-S Mode: The FSQ/S1 measures the flow rate.



Totalize
DW-S Mode: The FSQ/S1 measures the quantity.



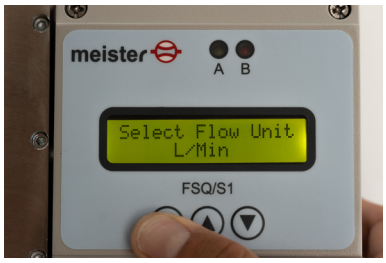
If the power supply to the FSQ/S1 is interrupted, the totalizer value is retained. Power failures can be displayed under the “Bat Check” function.

Note:
The totalizer continues to measure even if the device is not in Totalize mode. In this mode, the totalizer can be reset to zero by pressing the "Arrow up" button. The parameters are stored in a non-volatile memory for up to 10 years (without a power supply connected).

6.2.2 Flow units- Select Flow Unit

Available flow units

L / Sec	Liter per second
L / min	Liter per minute
L / H	Liter per hour
M^3 / Min	Cubic meter pro minute
M^3 / H	Cubic meter per hour
Gal / Sec	Gallons per second
Gal / Min	Gallons per minute
Gal / H	Gallons per hour
%	Percent of Max Flow Limit
m / sec	Medium speed in meters per second



Note:
The current medium speed can be displayed by pressing the " Arrow up" button in the measuring mode of the FSQ/S1. Press the "arrow down" button to display the speed of sound in the medium in m/sec. This this setting is intended for service cases and for diagnostic assistance.

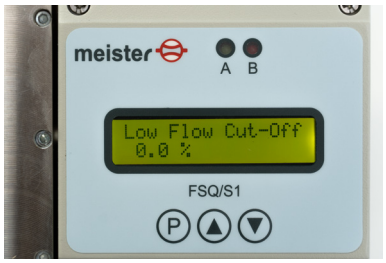
6.2 - MENU ITEM 2 "INSTRUMENT PARMS" - INSTRUMENTS PARAMETERS

6.2.3 Flow direction setting - Reverse flow

“Reverse Flow” ***reverse*** the sign of the flow.

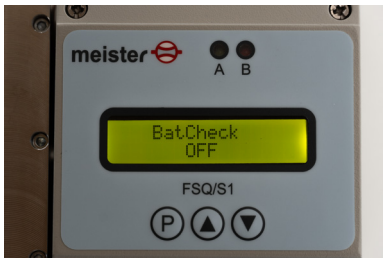
If the display of the FSQ/S1 shows “0” after installation in the piping system despite the flow being present, the flow direction must be reversed with “Reverse Flow”. For example, from “Reverse Flow ON” to “Reverse Flow OFF”. The standard flow direction is horizontal from left to right and vertical from bottom to top.

Creeping flow suppression - Low Flow Cut-Off



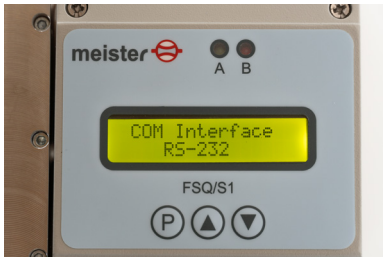
If the absolute value of the flow rate is less than or equal to “Max Flow Limit” * “Low_Flow_Cut_Off”, the calculated flow rate is reduced to zero. The low flow cut-off can be adjusted within the limits 0% to 10% of “Max Flow Limit”.

6.2.4 Power supply failure - BatCheck



If "BatCheck" is activated, the FSQ/S1 registers a power failure.
If the voltage is applied again after the failure, the device shows the message "Pwr. supply fail" in the display. The user must confirm with the "P" and "Arrow up" buttons pressed simultaneously to switch the device back to measuring mode and to acknowledge the error message.

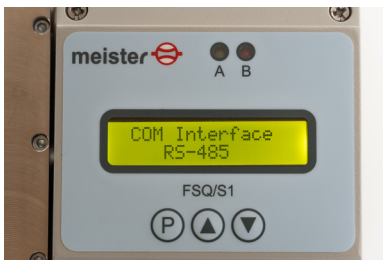
Note:
Gernerally, the factory setting can be accepted and therefore no further setting is required.



6.2.5 COM Interface - RS-232 or RS 485

This connection is only for the manufacturer's internal use (see also chapter 3.0).

The interface for the calibration connection can be selected here. The protective cap of the connection must not be removed.

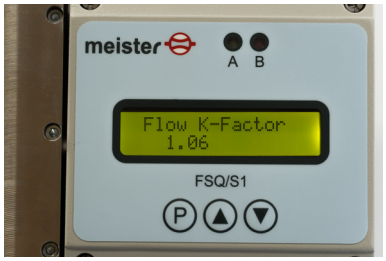


6.3 - MENU ITEM 3 "MATH. PARMS" - MATHEMATICAL PARAMETERS

6.3.1 Characteristic lines K-Factor - K-Factor

This function is used to correct the linear characteristic curve of the FSQ/S1 according to the following formula:

$Q_{korr} = Q_{ist} * K$
(The standard value of the K factor is 1.06)



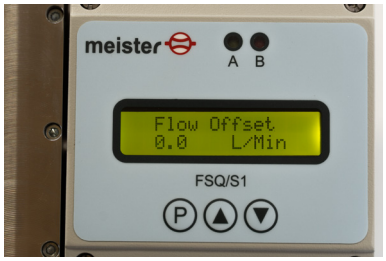
Q_{ist}	Measured flow rate
Q_{korr}	corrected flow rate
K	multiplicative constant (1.06)

Note:
If the flow conditions have changed compared to the factory calibration, this function is used.
This is protected by a separate code (CO_Code).
In this case, this code must be requested from the manufacturer.

6.3.2 Characteristic curves Flow Offset - Flow Offset

This function is used to correct the linear characteristic curve of the FSQ/S1 according to the formula:

$Q_{korr} = Q_{ist} + FlowOffset * (Q_{ist} + Q_{max}Phys)$



Qist	Measured flow rate
Qkorr	Corrected flow rate
QmaxPhys	Maximum flow rate in the pipe at V= 5 m/sec
FlowOffset	Additive constant

Note:
This is protected by a separate code (CO_Code).
In this case, this code must be requested from the manufacturer.

6.3 - MENU ITEM 3 "MATH. PARMS" - MATHEMATICAL PARAMETERS

6.3.3 Integration Time - Integration Time

The FSQ/S1 requires approx. 80 ms for a flow measurement. The average flow value is calculated with a minimum of 10 and a maximum of 100 measurements. This results in an adjustment range for the “integration time” of 0.8 to 8 seconds. This mean value is calculated using the moving exponential mean value method.

6.3.4 Auto Zero Flow - Auto Zero Instrument

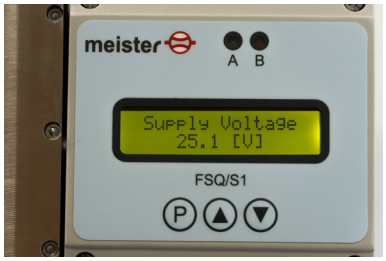
This function is used to automatically zero the device. It is assumed that the pipe system is filled without air and that the medium used is stationary.

Note:
It is carried out by the manufacturer at the factory for every new device.

6.4 - MENU ITEM 4 "INSTR. TEST" - INSTRUMENT TEST FUNCTIONS

6.4.1 Check supply voltage - Supply Voltage

If you want to display the current supply voltage, select menu item 4 “Instr. Test”. Then select the submenu item “Supply Voltage”. Press the “P” button to finish checking the supply voltage.



Note:
The permissible supply voltage for the FSQ/S1 is 24 VDC +/- 15 % and max. ripple 100 mV.
If voltage supply is low, limited function of the device and inaccurate measurement results must be expected.

6.4.2 Offset of current output 4-20 mA

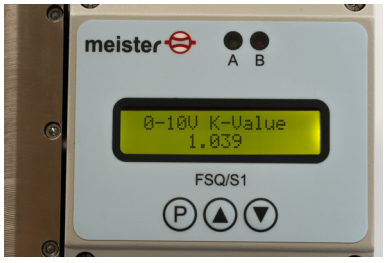
This function is for special applications and is protected by the manufacturer code.

6.4.3 K-Value of current output 4-20 mA

This function is for special applications and is protected by the manufacturer code.

6.4.4 K-Value of voltage output 0-10 V

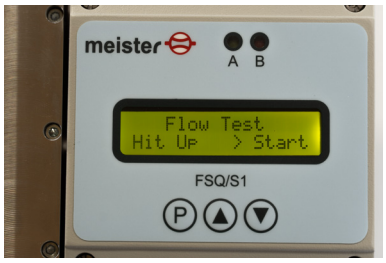
This function is for special applications and is protected by the manufacturer code.



6.4 - MENU ITEM 4 "INSTR. TEST" - INSTRUMENT TEST FUNCTIONS

6.4.5 Flow test function

This function simulates flow rates between zero and “Max Flow Limit” for demonstration or test purposes when configuring the system. During the test, the display, the relay outputs as well as the 4-20 mA, 0-10 V and the frequency output and the interface are activated. This test can be carried out without connected pipes and without medium.



6.4.6 Relais function test - Relais Test

When the relays are tested, they are automatically activated with a voltage and the relays are energized, which can be seen from the status LEDs on the front of the device. If relay 1 is activated, the green LED marked with the letter A lights up. If relay 2 is activated, the red LED B lights up. It is the responsibility of the operator to carry out a function test (e.g. relay test) and visual inspection at periodic intervals.

Note:
The relay outputs can only be set for flow measurement.

6.5 - MENU ITEM 5 "RESTORE FACTORY SETTINGS" - RESET TO FACTORY SETTINGS

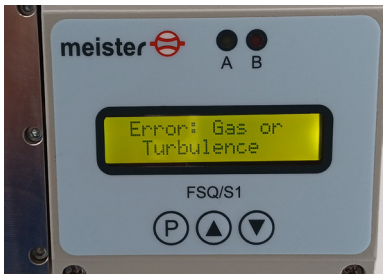
Restore factory settings - Restore Factory Settings

If you want to reset the device to factory settings, you must activate the menu sub-item “Restore Factory Settings”.

6.6 - GENERAL INFORMATION

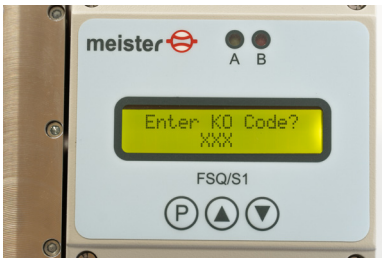
6.6.1 Error messages

Error : Gas or turbulence
If the flow is too turbulent or the proportion of air in the medium is too high, measurement is not possible and the error message "Gas or turbulence" is displayed. The causes may be that the medium used itself has too high an air content, the proportionate air is released due to turbulence in the measuring system or the measuring tube is not filled.
(See chapter 4.0 - Installation).



6.6.2 Parameter protection - PIN

The individual system-critical device parameters are protected by a PIN (personal identification number), which prevents unauthorized changes to the parameters. The parameters can only be changed by the manufacturer.



7.0 - MAINTENANCE AND CLEANING

CAUTION! Material damage!

Opening the device can damage important parts or components.
Therefore, do not carry out any repairs yourself.

Maintenance:

The FSQ/S1 is maintenance-free and cannot be repaired by the user. In the event of a defect, the device must be replaced or returned to the manufacturer for repair.

Cleaning:

Clean the FSQ/S1 with a dry or slightly damp, lint-free cloth. Do not use any sharp objects or aggressive cleaning agents when cleaning.

7.1 - RETURN TO THE MANUFACTURER

For reasons of legal regulations on environmental protection and occupational health and safety and to maintain the health and safety of our employees, all devices returned to Meister Strömungstechnik for repair must be free of toxic and hazardous substances. This also applies to cavities in the devices. If necessary, the appliance must be neutralized or rinsed by the customer before being returned to Meister Strömungstechnik. For returns, regardless of the reason, the latest valid version of Meister Strömungstechnik's returns policy applies. Meister Strömungstechnik may refuse to accept returns that do not comply with the returns policy at the sender's expense.

WARNING! Risk of injury due to inadequate cleaning!
The operator is liable for all damage of any kind, in particular for personal injury (e.g. chemical burns or poisoning), decontamination measures, disposal, etc., which are attributable to inadequate cleaning of the measuring device.

The following measures must be taken before sending the device to Meister Strömungstechnik for repair:

- Clean the device thoroughly. This is particularly important if the medium used is hazardous to health (e.g. corrosive, toxic, carcinogenic, radioactive, etc.).
- Make sure that the adhering media residue is also removed from all gaps, sealing grooves and cavities in the housing.
- Enclose a fault report with the device. Describe the application and the chemical-physical properties of the medium.
- To initiate a return procedure, please visit our website:
  https://meister-flow.de/returns/

- Please observe the instructions for the return procedure:
  https://meister-flow.de/mt-content/uploads/2019/09/meister-abwicklung-von-retouren_de-rev-01.pdf

8.0 - DISASSEMBLY AND DISPOSAL

CAUTION! Risk of injury!

Never remove the device from a system that is in operation.
Ensure that the system is switched off completly and pressure-free.

Before disassembly:

Before disassembly, check that

- the system is switched off and is in a safe and de-energized state.
- the system is depressurized and cooled down.

Disassembly:

- Remove the electrical connections.
- Remove the FSQ/S1 using suitable tools.

Disposal:

NO HOME WASTE!

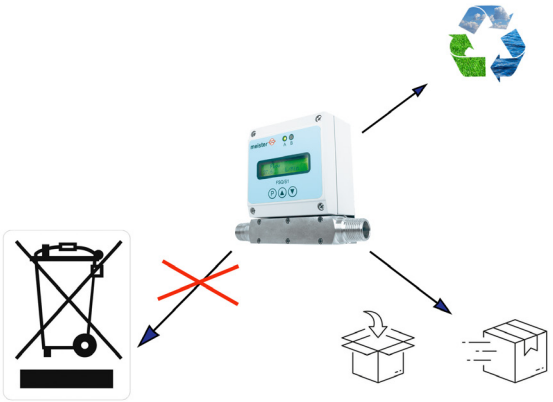
Danger to the environment due to incorrect disposal! The FSQ/S1 consists of different materials. Dispose of the device for local recycling. It must not be disposed of together with household waste.

Danger to the environment due to incorrect disposal!

Have electrical waste, electronic components, lubricants and other auxiliary materials disposed of by authorized specialist companies. If in doubt, obtain information on environmentally friendly disposal from the local municipal authority or specialized disposal companies.

or

return the FSQ/S1 to your supplier or
Meister Strömungstechnik for disposal.
For returns, regardless of the reason, Meister Strömungstechnik's returns policy applies in the latest valid version.
Meister Strömungstechnik may refuse to accept returns that do not comply with the returns policy at the sender's expense.



9.0 - TECHNICAL DATA

In the case of customized versions, technical data may differ from the specifications in these instructions. Please observe the information on the type plate.

MATERIALS

Brass-version	
Parts in contact with media	
Measuring tube:	Brass CW614N (CuZn39Pb3)
Sensors:	Stainless-steel 1.4571 (AISI 316 Ti)
Seals:	FKM (optional EPDM)
Parts not in contact with media	
Display housing:	Aluminium die-cast

Stainless steel-version	
Parts in contact with media	
Measuring tube:	Stainless-steel 1.4571 (AISI 316 Ti)
Sensors:	Stainless-steel 1.4571 (AISI 316 Ti)
Seals:	FKM (optional EPDM)
Parts not in contact with media	
Display housing:	Aluminium die-cast

OPERATING DATA

Max. operating pressure	25 bar
Pressure drop	see diagramm below
Media Temperature	-20 °C - 100 °C
Ambient air temperature	-10 °C - 60 °C
Measurement accuracy	± 2,0 % of final value
Measurement data acquisition	
Response time	0,8...8 sec.
	factory-setting is 1,6 sec.
Flow direction	adjustable in the device

MEASURING RANGES

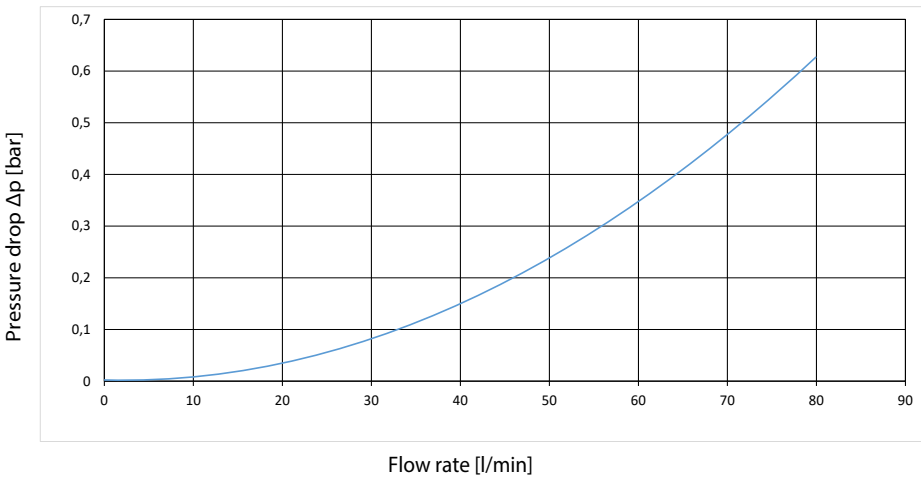
Type	Measuring range für H_2O
FSQ/S1-15	0,5 – 80 l/min

MEDIEN

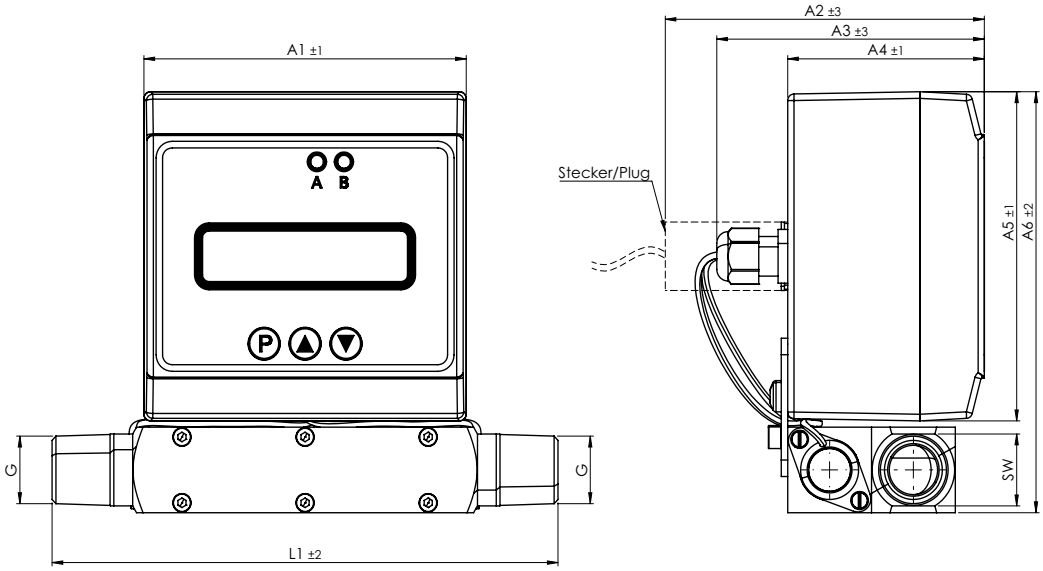
Acoustically conductive liquids

Solid content < 10 Vol. %

9.1 - PRESSURE DROP DIAGRAM



9.2 - DIMENSIONS / DRAWING



TYPE OVERVIEW

Type	Installation dimensions [mm]										
	L1	G[1]	A1	A2	A3	A4	A5	A6	SW	DN	WEIGHT [g]
FSQ/S1-15	130	R 1/2"	100	99	84	61	100	128	22	15	1634

[1] External thread EN 10226-1

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