



Operating instructions
Vortex flow meter

GB

SV0527
SV0528
SV0529

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1 Preliminary note

You will find instructions, technical data, approvals and further information using the QR code on the unit / packaging or at www.ifm.com.

1.1 Symbols used

- ✓ Requirement
- Instructions
- ▷ Reaction, result
- [...] Designation of keys, buttons or indications
- Cross-reference
-  Important note
Non-compliance may result in malfunction or interference.
-  Information
Supplementary note

1.2 Warnings used



CAUTION

Warning of personal injury

- ▷ Slight reversible injuries may result.

2 Safety instructions

- The unit described is a subcomponent for integration into a system.
 - The system architect is responsible for the safety of the system.
 - The system architect undertakes to perform a risk assessment and to create documentation in accordance with legal and normative requirements to be provided to the operator and user of the system. This documentation must contain all necessary information and safety instructions for the operator, the user and, if applicable, for any service personnel authorised by the architect of the system.
- Read this document before setting up the product and keep it during the entire service life.
- The product must be suitable for the corresponding applications and environmental conditions without any restrictions.
- Only use the product for its intended purpose (→ Intended use).
- Only use the product for permissible media.
- If the operating instructions or the technical data are not adhered to, personal injury and/or damage to property may occur.
- The manufacturer assumes no liability or warranty for any consequences caused by tampering with the product or incorrect use by the operator.
- Installation, electrical connection, set-up, operation and maintenance of the product must be carried out by qualified personnel authorised by the machine operator.
- Protect units and cables against damage.

3 Intended use

The unit monitors liquid media.

The unit detects the process categories volume flow (volumetric flow quantity/time) and medium temperature.

3.1 Application area

- Water
- Hydrous media (deionised water, cooling water)



Pressure Equipment Directive (PED):

The units comply with the Pressure Equipment Directive and are designed and manufactured for group 2 fluids in accordance with the sound engineering practice. Use of media from group 1 fluids on request.

4 Function

- The device detects flow based on the Vortex measuring principle.
- As additional process value the unit detects the medium temperature.
- The unit displays the current process values.
- The device can be operated in SIO mode (standard input-output) or in IO-Link mode. The basic operation mode is SIO. When connected to an IO-Link master, the device automatically switches to IO-Link mode. Additional manual switching is not required.

Output OUT1 selection options

- Switching signal flow
- Frequency signal flow
- IO-Link

Output OUT2 selection options

- Switching signal flow
- Switching signal temperature
- Frequency signal flow
- Frequency signal temperature

5 Installation



CAUTION

If the medium temperature is above 50 °C (122 °F), parts of the housing can increase in temperature to over 65 °C (149 °F).

▷ Risk of burns.

▶ Protect the housing against contact with flammable substances and unintentional contact.



▶ Ensure that the system is free of pressure during installation.

▶ Ensure that no media can leak at the mounting location during installation.

▶ Fit the device in the pipe in accordance with the flow direction (arrow on the device).

Recommended tightening torque: 30 Nm.

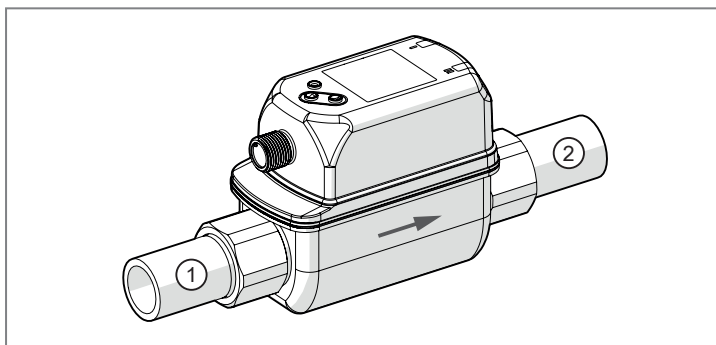
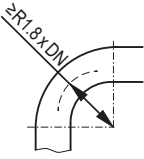


Fig. 1: Inlet pipe length (1) and outlet pipe length (2), direction of flow (arrow)

Structures in the pipe, bends, valves, reducing pieces and the like affect the function of the unit.

▶ Adhere to the distances between sensor and interference.

Disturbance	Inlet pipe length (1)	Outlet pipe length (2)
Non-ideal bend	$\geq 5 \times \text{DN}$	$\geq 1 \times \text{DN}$
Ideal bend 	$\geq 0.5 \times \text{DN}$	
Multiple bends (2 x 90°)	$\geq 15 \times \text{DN}$	
Reduction of the internal pipe diameter	$\geq 15 \times \text{DN}$	$\geq 15 \times \text{DN}$
Valve or pump	$\geq 25 \times \text{DN}$	

Tab. 1: Distances for inlet and outlet pipe lengths; DN = nominal width of the pipe

▶ Make sure that pipe and sensor have the same internal diameter.

▶ Avoid deposits, accumulated gas and air in the pipe system.

▶ Install the unit so that the measuring pipe is always completely filled.

▶ Install in front of or in a rising pipe.

▶ For direct installation, fix the device on the housing bottom using 4 M4 DIN 7985 lens screws. Maximum housing insertion depth: 5.5 mm.

▶ Mount the device in a way that no mechanical forces are exerted on the pipe. To do so, use angle brackets if required.



Information about available accessories at www.ifm.com

5.1 Non recommended installation position

- Directly in front of a falling pipe.
- In a falling pipe.
- Directly in front of the spout of a pipe.
- Directly in front of a valve.
- On the suction side of a pump.
- At the highest point of the pipe system.

6 Electrical connection



The unit must be connected by a qualified electrician.

Observe the national and international regulations for the installation of electrical equipment.

Voltage supply according to SELV, PELV.

► Disconnect power.

► Connect the unit as follows:

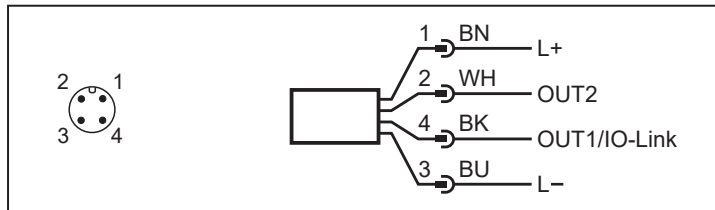


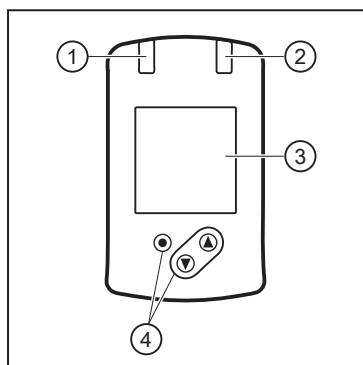
Fig. 2: Wiring diagram (colours to DIN EN 60947-5-2)

BK: black
BU: blue

BN: brown
WH: white

Pin	Connection
1	L+
3	L-
4 (OUT1)	- Switching signal flow - Frequency signal flow - IO-Link
2 (OUT2)	- Switching signal flow - Switching signal temperature - Frequency signal flow - Frequency signal temperature

7 Operating and display elements



- 1: Switching status LED for OUT1
- 2: Switching status LED for OUT2
- 3: TFT display
- 4: Keys for changing views and parameter setting

Fig. 3: Operating and display elements

8 Menu

The figures in which the menus are displayed show the parameters that can be set on the unit by key input. These parameters and other functions are also available via the IO-Link interface.

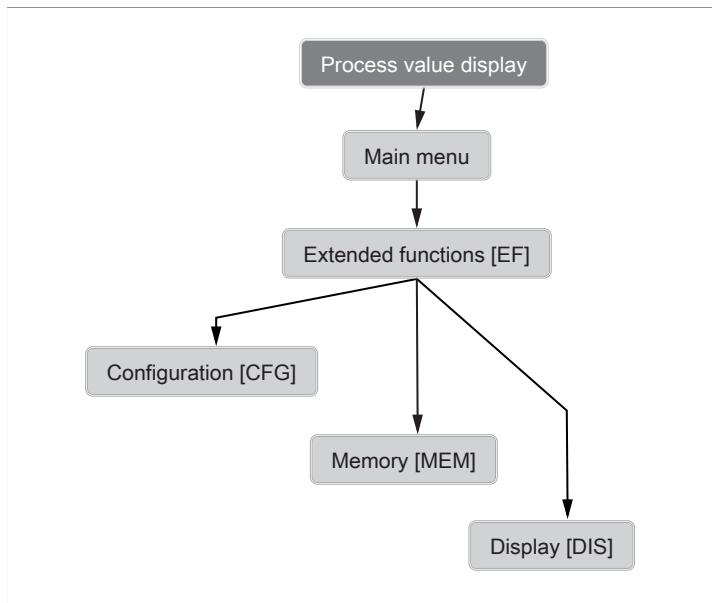


Fig. 4: Menu overview

8.1 Main menu and submenus



The displayed parameters change when the factory setting is changed. The following menu displays show the maximum available parameters.

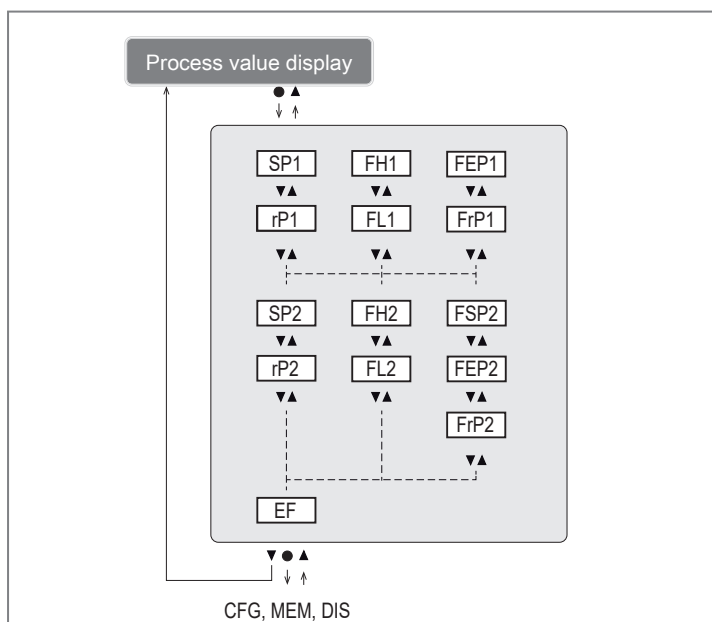


Fig. 5: Main menu

Parameter	Explanation
SPx	Switch point for switching output OUTx with hysteresis function
rPx	Reset point for switching output OUTx with hysteresis function
FHx	Upper limit for switching signal OUTx with window function
FLx	Lower limit for switching signal OUTx with window function

Parameter	Explanation
FSPx	Frequency start point for OUTx = Lower measured value from which a frequency signal is output (only for temperature measurement).
FEPx	Frequency end point for OUTx = Upper measured value at which the frequency signal set under FrPx is output.
FrPx	Frequency signal that is output when the upper measured value (MEW or FEPx) is reached.
EF	Change to the EF (extended functions) submenu

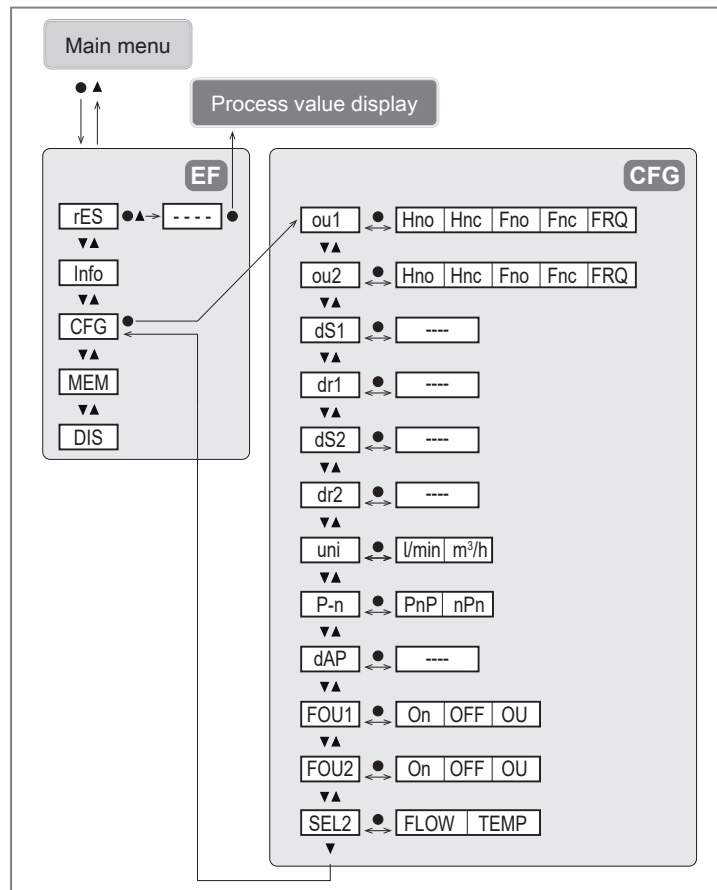


Fig. 6: Configuration [CFG] menu

Parameter	Explanation
rES	Reset to factory settings
Info	Display of the device information
CFG	Change to the CFG (configuration) submenu
MEM	Change to the MEM (memory) submenu
DIS	Change to the DIS (display) submenu.
oux	Output configuration for output OUTx (e.g. switching output with hysteresis function)
dSx	Switch-on delay for switching output OUTx in seconds
drx	Switch-off delay for switching output OUTx in seconds
uni	Standard unit of measurement for flow
P-n	Output polarity for the switching outputs
dAP	[dAP] = damping constant in seconds (63 % rise time τ).
FOUx	Behaviour of output OUTx in case of an error
SELx	Process value for output OUTx

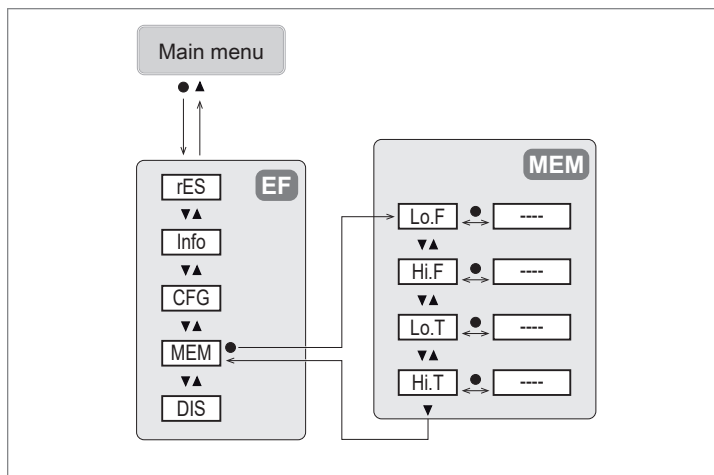


Fig. 7: Memory [MEM] menu

Parameter	Explanation
Lo.F	Lowest flow value measured
Hi.F	Highest flow value measured
Lo.T	Minimum measured temperature value
Hi.T	Maximum temperature value measured

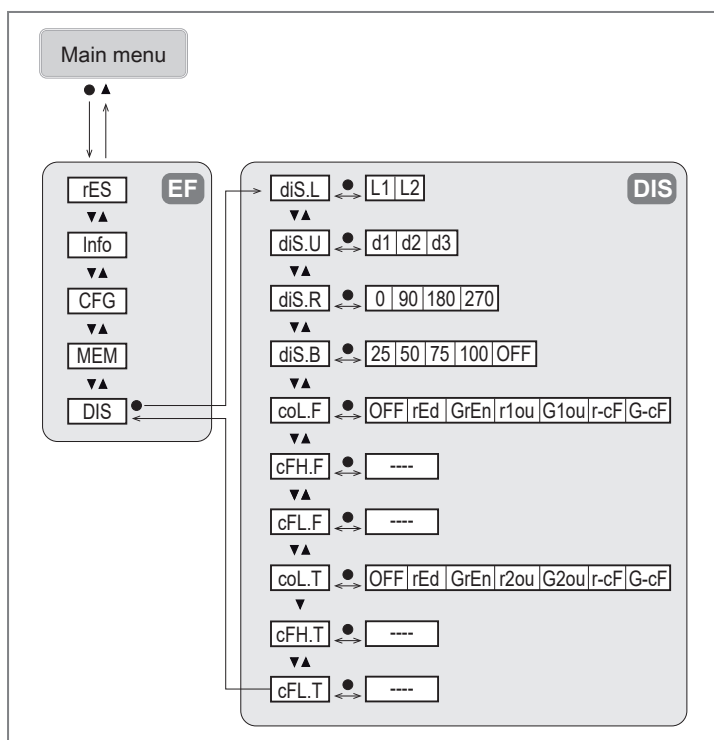


Fig. 8: Display [DIS] menu

Parameter	Explanation
diS.L	Standard process value of the display
diS.U	Update rate of the display
diS.R	Orientation of the display
diS.B	Brightness of the display
coL.F	Font colour for flow
cFH.F	Upper limit value for colour change (flow)
cFL.F	Lower limit value for colour change (flow)

Parameter	Explanation
col.T	Font colour for temperature
cFH.T	Upper limit value for colour change (temperature)
cFL.T	Lower limit value for colour change (temperature)

9 Parameter setting

Parameter setting can be carried out via the IO-Link interface or via the operating elements on the unit.

Parameters can be set before installation or during operation.



If you change parameters during operation, this will influence the function of the plant.

- ▶ Ensure that there will be no malfunctions in your plant.

During parameter setting the unit remains in the operating mode. It continues to monitor with the existing parameter until the parameter setting has been completed.



Depending on the parameter setting, the parameters available in the menu may change.

9.1 Parameter setting via the unit keys



CAUTION

If the medium temperature is above 50 °C (122 °F), parts of the housing can increase in temperature to over 65 °C (149 °F).

- ▷ Risk of burns
- ▶ Do not touch the device with your hands.
- ▶ Use another object (e.g. a ballpoint pen) to carry out settings on the unit.

Parameter setting process in general:

Intent	Action
Change from the process value display to the main menu	[●]
Change to the submenu	Use [▼] to navigate to the submenu (e.g. EF), then [●]
Selection of the desired parameter	▲ or [▼]
Change to setting mode	[●]
Changing the parameter value	▲ or [▼] > 1 s
Acceptance of the set parameter	[●]
Exit parameter setting without saving	[▲] + [▼]
Return to next higher menu (Repeat several times to reach process value display)	[▲] + [▼]
Return to the process value display	> 30 seconds (timeout)

9.2 Parameter setting via IO-Link

Requirements for parameter setting via the IO-Link interface:

- ✓ A suitable parameter setting software, e.g. ifm moneo|configure
- ✓ The Input Output Device Description (IODD) for the device, see documentation.ifm.com
- ✓ One IO-Link master
- ▶ Connect the IO-Link master to a parameter setting software.
- ▶ Set the port of the master to the IO-Link operating mode.
- ▶ Connect the device to a free port of the IO-Link master.
- ▷ The unit switches to IO-Link mode.

- ▶ Change parameter settings in the software.
- ▶ Write parameter settings to the unit.



Notes on parameter setting → Manual of the parameter setting software

10 Factory setting

Parameter	Factory setting	User setting
SP1 (FLOW)	20 % MEW	
rP1 (FLOW)	18.5 % MEW	
FH1 (FLOW)	20 % MEW	
FL1 (FLOW)	18.5 % MEW	
FEP1 (FLOW)	100 % MEW	
FrP1 (FLOW)	100 Hz	
SP2 (FLOW, TEMP)	40 % MEW	
rP2 (FLOW, TEMP)	38.5 % MEW	
FH2 (FLOW, TEMP)	40 % MEW	
FL2 (FLOW, TEMP)	38.5 % MEW	
FSP2 (TEMP)	0 % MEW	
FEP2 (FLOW, TEMP)	100%	
FrP2 (FLOW, TEMP)	100 Hz	
ou1 (FLOW)	Hno	
ou2 (FLOW, TEMP)	Hno	
FOU1 (FLOW)	OFF	
FOU1 (FLOW, TEMP)	OFF	
SEL2 (FLOW, TEMP)	FLOW	
coL.F (FLOW)	OFF	
coL.T (TEMP)	OFF	
dS1	0 s	
dr1	0 s	
dS2	0 s	
dr1	0 s	
uni	l/min	
P-n	PnP	
dAP	0.6 s	
diS.L	L2	
diS.U	d2	
diS.R	0	
diS.B	75 %	
cFH.F	VMR	
cFL.F	MAW	
cFH.T	VMR	
cFL.T	MAW	

MAW = initial value of the measuring range

VMR = final value of the measuring range