Operating Instructions
Picomag Insertion IO-Link

Electromagnetic flowmeter

IO-Link

Endress+Hauser

People for Process Automation

- Make sure the document is stored in a safe place such that it is always available when working on or with the device.
- To avoid danger to individuals or the facility, read the "Basic safety instructions" section carefully, as well as all other safety instructions in the document that are specific to working procedures.
- The manufacturer reserves the right to modify technical data without prior notice. Your Endress+Hauser sales organization will supply you with current information and updates to this manual.

Table of contents

1 About this document

1.1 Document function

These Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.

1.2 Symbols

1.2.1 Safety symbols

⚠ DANGER

This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.

⚠ WARNING

This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in serious or fatal injury.

⚠ CAUTION

This symbol alerts you to a potentially dangerous situation. Failure to avoid this situation can result in minor or medium injury.

NOTICE

This symbol alerts you to a potentially harmful situation. Failure to avoid this situation can result in damage to the product or something in its vicinity.

1.2.2 Electrical symbols

Symbol	Meaning
⎓	Direct current
⏚	**Ground connection** A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.

1.2.3 Communication-specific symbols

Symbol	Meaning
✸	**Bluetooth®** Wireless data transmission between devices over a short distance.
◉ IO-Link®	**IO-Link** Communications system for connecting intelligent sensors and actuators to an automation system. In the IEC 61131-9 standard, IO-Link is standardized under the name "Single-drop digital communication interface for small sensors and actuators (SDCI)".

1.2.4 Symbols for certain types of information

Symbol	Meaning
☑	**Permitted** Procedures, processes or actions that are permitted.
☑☑	**Preferred** Procedures, processes or actions that are preferred.
☒	**Forbidden** Procedures, processes or actions that are forbidden.
🛈	**Tip** Indicates additional information.
📖	Reference to documentation
📄	Reference to page
🖼	Reference to graphic
▶	Notice or individual step to be observed
1., 2., 3....	Series of steps
↳	Result of a step

1.2.5 Symbols in graphics

Symbol	Meaning
1, 2, 3, ...	Item numbers
A, B, C, ...	Views

1.3 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
- *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
- *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate

1.4 Registered trademarks

⬙ IO-Link®
Is a registered trademark. It may only be used in conjunction with products and services by members of the IO-Link Community or by non-members who hold an appropriate license. For more specific guidelines on use, refer to the IO-Link Community rules on: www.io-link.com.

Bluetooth® wireless technology
⑧®
The Bluetooth® word mark and logos are registered trademarks owned by the Bluetooth SIG, Inc. and any use of such marks by Endress+Hauser is under license.

Apple®
Apple, the Apple logo, iPhone, and iPod touch are trademarks of Apple Inc., registered in the U.S. and other countries. App Store is a service mark of Apple Inc.

Android®
Android, Google Play and the Google Play logo are trademarks of Google Inc.

2   Basic safety instructions

2.1   Requirements for the personnel

The personnel for installation, commissioning, diagnostics and maintenance must fulfill the following requirements:
▶ Trained, qualified specialists must have a relevant qualification for this specific function and task.
▶ Are authorized by the plant owner/operator.
▶ Are familiar with federal/national regulations.
▶ Before starting work, read and understand the instructions in the manual and supplementary documentation as well as the certificates (depending on the application).
▶ Follow instructions and comply with basic conditions.

The operating personnel must fulfill the following requirements:
▶ Are instructed and authorized according to the requirements of the task by the facility's owner-operator.
▶ Follow the instructions in this manual.

2.2   Intended use

Application and media
The measuring device described in this manual is intended only for the flow measurement of liquids with a minimum conductivity of 10 µS/cm.

To ensure that the measuring device remains in proper condition for the operation time:
▶ Use the measuring device only for media to which the process-wetted materials have an adequate level of resistance.
▶ Not suitable for use in ambient atmospheres with contamination by harmful gases, e.g. hydrogen sulfide, sulfur dioxide, nitrogen oxides or chlorine gas.

Incorrect use
Non-designated use can compromise safety. The manufacturer is not liable for damage caused by improper or non-designated use.

⚠ **WARNING**

Danger of breakage due to corrosive or abrasive fluids and ambient conditions!
▶ Verify the compatibility of the process fluid with the sensor material.
▶ Ensure the resistance of all fluid-wetted materials in the process.
▶ Keep within the specified pressure and temperature range.

Residual risks

⚠ **CAUTION**

Risk of hot or cold burns! The use of media and electronics with high or low temperatures can produce hot or cold surfaces on the device.
▶ Mount suitable touch protection.

2.3   Workplace safety

When working on and with the device:
▶ Wear the required personal protective equipment as per national regulations.

2.4 Operational safety

Risk of injury!
▶ Operate the device in proper technical condition and fail-safe condition only.
▶ The operator is responsible for interference-free operation of the device.

2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EU directives listed in the device-specific EU Declaration of Conformity. The manufacturer confirms this by affixing the CE mark to the device..

2.6 IT security

The manufacturer warranty is valid only if the product is installed and used as described in the Operating Instructions. The product is equipped with security mechanisms to protect it against any inadvertent changes to the settings.

IT security measures, which provide additional protection for the product and associated data transfer, must be implemented by the operators themselves in line with their security standards.

2.7 Device-specific IT security

2.7.1 Access via Bluetooth® wireless technology

Secure signal transmission via Bluetooth® wireless technology uses an encryption method tested by the Fraunhofer Institute.
- The device is not visible via *Bluetooth*® wireless technology without the SmartBlue App.
- Only one point-to-point connection is established between the device and a smartphone or tablet.
- The *Bluetooth*® wireless technology interface can be disabled via SmartBlue.

2.7.2 Protecting access via a password

Different passwords are available to protect access to the device via the Bluetooth® interface or write access to the device parameters:

- Bluetooth key
  The password protects a connection between an operating device (e.g. smartphone, tablet) and the device via the Bluetooth® interface.
- User-specific access code
  Protect write access to the device parameters via the SmartBlue app.

General notes on the use of passwords

- The access code and Bluetooth key supplied with the device should be changed during commissioning.
- Follow the general rules for generating a secure password when defining and managing the access code or Bluetooth key.
- The user is responsible for the management and careful handling of the access code and Bluetooth key.

2.7.3   Access via the SmartBlue app

Two access levels (user roles) are defined for the device: the **Operator** user role and the **Maintenance** user role. The **Maintenance** user role is the default setting.

If a user-specific access code is not defined (in the **Set access code** parameter), the default setting **0000** continues to apply and the **Maintenance** user role is automatically enabled. The device's configuration data are not write-protected and can be edited at all times.

If a user-specific access code has been defined (in the **Set access code** parameter), all the parameters are write-protected and the device is accessed with the **Operator** user role. The previously defined access code must first be entered again before the **Maintenance** user role is enabled and all the parameters can be write-accessed.

3   Incoming acceptance and product identification

3.1   Incoming acceptance

On receipt of the delivery:

1. Check the packaging for damage.
   ↳ Report all damage immediately to the manufacturer.
     Do not install damaged components.

2. Check the scope of delivery using the delivery note.

3. Compare the data on the nameplate with the order specifications on the delivery note.

4. Check the technical documentation and all other necessary documents, e.g. certificates, to ensure they are complete.

   If one of the conditions is not satisfied, contact the manufacturer.

3.2   Product identification

The following options are available for identification of the measuring device:
• The device label
• Order code with breakdown of the device features on the delivery note
• Enter the serial number on the device label in *W@M Device Viewer* (www.endress.com/deviceviewer): all the information about the measuring device is displayed.
• Enter the serial number on the device label into the *Endress+Hauser Operations App* or scan the 2-D matrix code (QR code) on the measuring device with the *Endress+Hauser Operations App*: all the information about the measuring device is displayed.

3.2.1   Symbols on the device

Symbol	Meaning
⚠	**WARNING!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury. Please consult the documentation for the measuring instrument to discover the type of potential danger and measures to avoid it.
📖	**Reference to documentation** Refers to the corresponding device documentation.

4 Storage and transport

4.1 Storage conditions

Observe the following notes for storage:
- ▸ Store in the original packaging to ensure protection from shock.
- ▸ Store in a dry place.
- ▸ Do not store outdoors.

Storage temperature → 🕮 32

4.2 Transporting the product

Transport the measuring instrument to the measuring point in the original packaging.

Do not remove the protective cap mounted on the sensor tip. It prevents mechanical damage to the sensor tip.

4.3 Packaging disposal

All packaging materials are environmentally friendly and 100% recyclable:
Carton in accordance with European Packaging Directive 94/62EC; recyclability is confirmed by the affixed RESY symbol.

5   Product description

The device consists of a transmitter and a sensor.

The device is available as a compact version:
The transmitter and sensor form a mechanical unit.

5.1   Product design
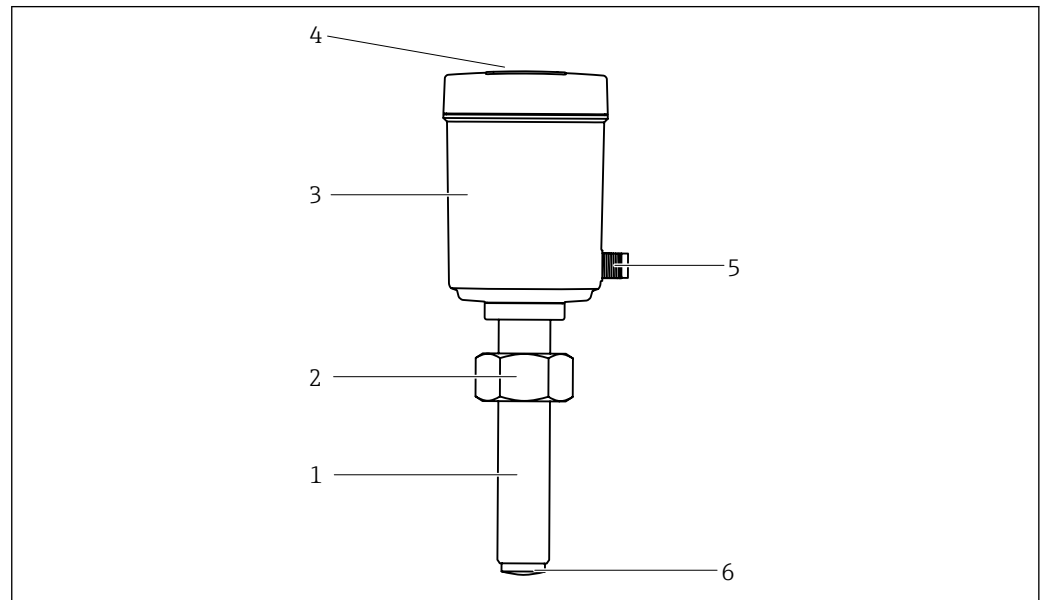
🖼 *1   Important components of a measuring instrument*

1   Sensor
2   Union nut M30x2 with clamping ring
3   Transmitter housing
4   Display
5   Device plug
6   Sensor tip with 4 electrodes (measuring electrodes and empty pipe detection electrode)

5.2   Product functionality

Picomag Insertion is a sensor that can measure flow velocity, temperature and conductivity of electrically conductive liquids.

Two different measurements can be made.
• Flow measurement: Displays the measured value continuously.
• Monitoring of flow: Binary display if the measured value is below or above a configurable set point.

6 Mounting

6.1 Mounting location
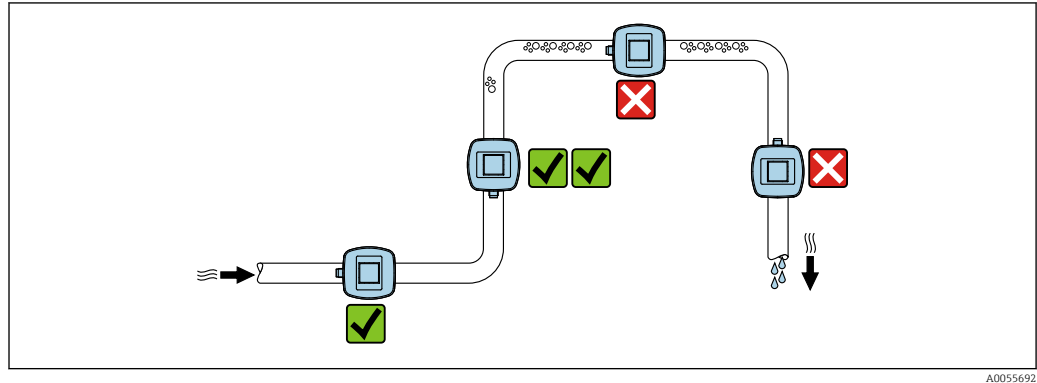
Preferably install the sensor in an ascending pipe.

6.2 Mounting position
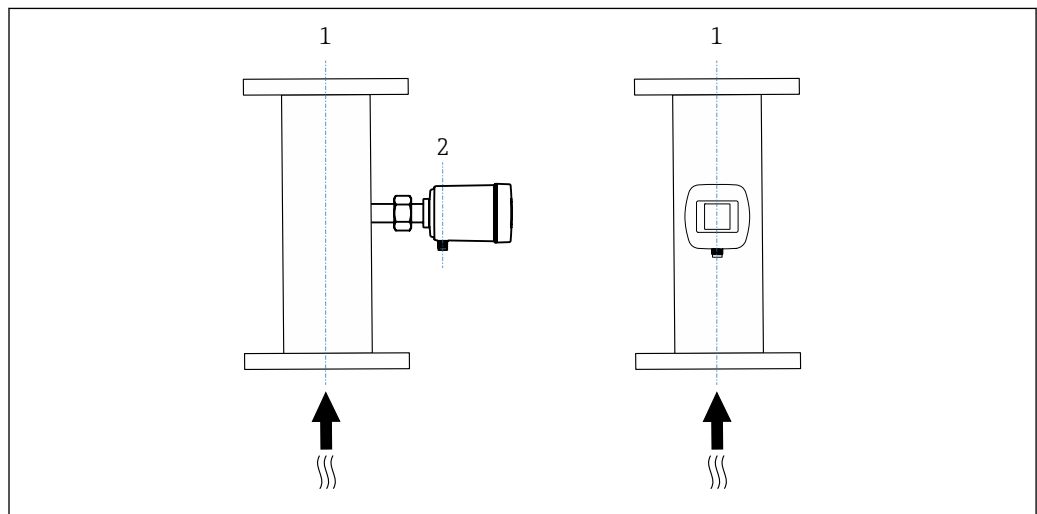
1   Display
2   Display parallel to piping

Install the sensor in such a way that the medium flow will strike the measuring electrodes correctly. The sensor must be positioned parallel to the pipe to ensure this is the case. The display can be used as a visual aid for alignment.

6.3 Orientation for horizontal pipe
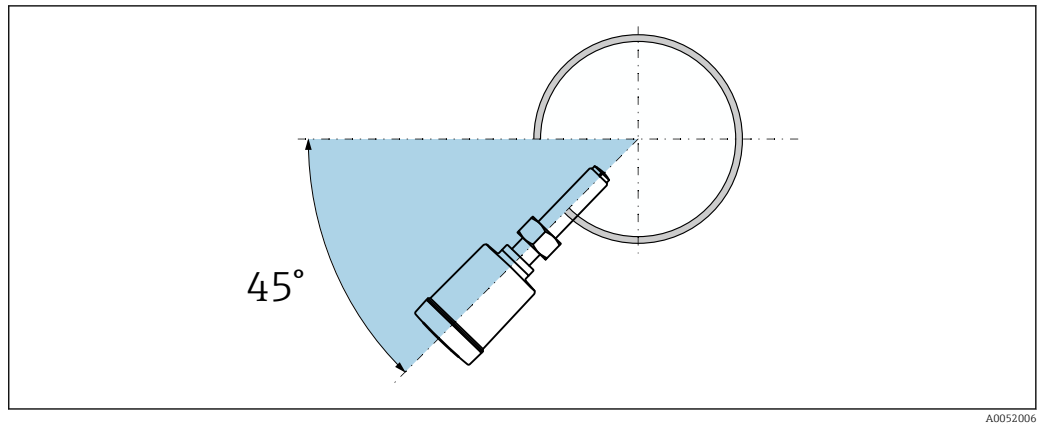
This orientation is recommended if the device is installed in a horizontal pipe. This ensures that the transmitter is not additionally heated by the flowing medium and the maximum ambient temperature of the transmitter is observed. In addition, this orientation ensures that the measuring electrodes are largely immersed in the flowing medium.

Empty pipe detection is only of limited use in this installation position.

6.4 Inlet and outlet runs

If possible, install the measuring instrument upstream and not downstream of fittings such as valves, T-pieces or elbows.

If the measuring instrument is used for monitoring the flow rate (→ 🖺 13), no inlet/outlet runs are required.

If the measuring instrument is used for flow measurement (→ 🖺 13), observe the following inlet run to comply with accuracy specifications:
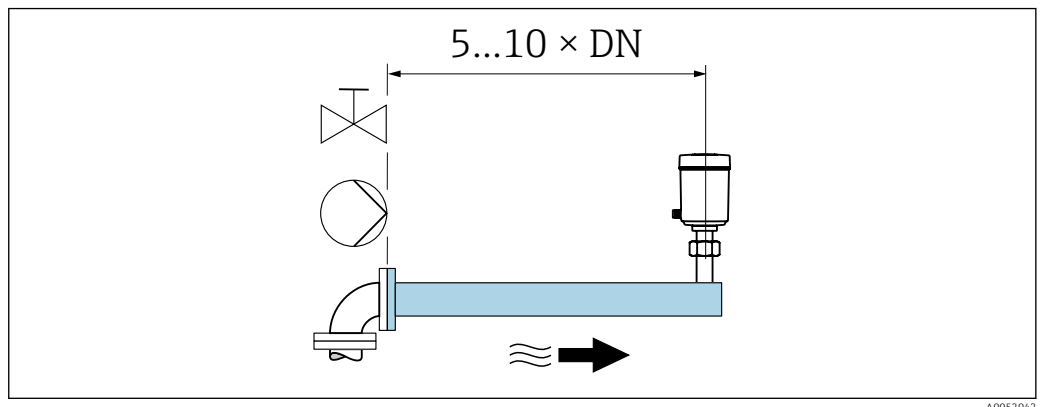
6.5 Installing the welding socket in steel and stainless steel piping

NOTICE

Damage to the measuring instrument
▸ Only weld the welding socket when the measuring instrument is not installed.

The measuring instrument is mounted in steel and stainless steel pipes using a welding socket. The welding sockets can be ordered as an accessory → 🗎 30. Two different types of welding socket are available, depending on the nominal diameter.

6.5.1 Welding socket for pipes DN 25

▸ Weld the welding socket onto the pipe at right angles to the axis of the piping.
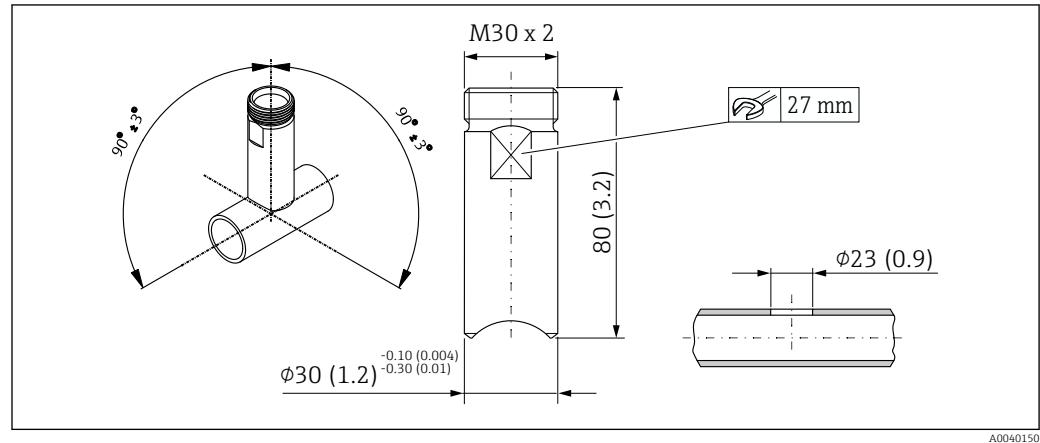
🖼 *2   Welding socket for pipes DN 25. Engineering unit mm (in)*

6.5.2 Welding socket for pipes >DN 25

▸ With the marking (according to the nominal diameter) flush against the outer wall of the pipe, weld the welding socket at right angles to the axis of the piping. The DN 300 marking must be used for nominal diameters >DN 300.
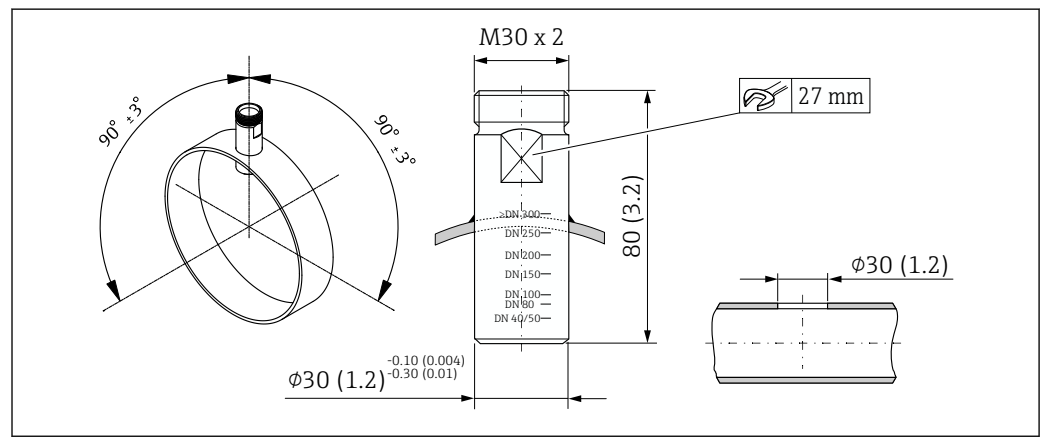
🖼 *3   Welding socket for pipes >DN 25. Unit mm (in)*

6.6   Mounting the sensor in the welding socket

NOTICE

Damage to the sensor tip

▸ When inserting the sensor into the welding socket, care must be taken to ensure the sensor tip is not damaged.

1. Insert the sensor into the welding socket taking into account the flow direction, see arrow on transmitter housing. Ensure that the device plug is positioned in the direction of the pipe axis.
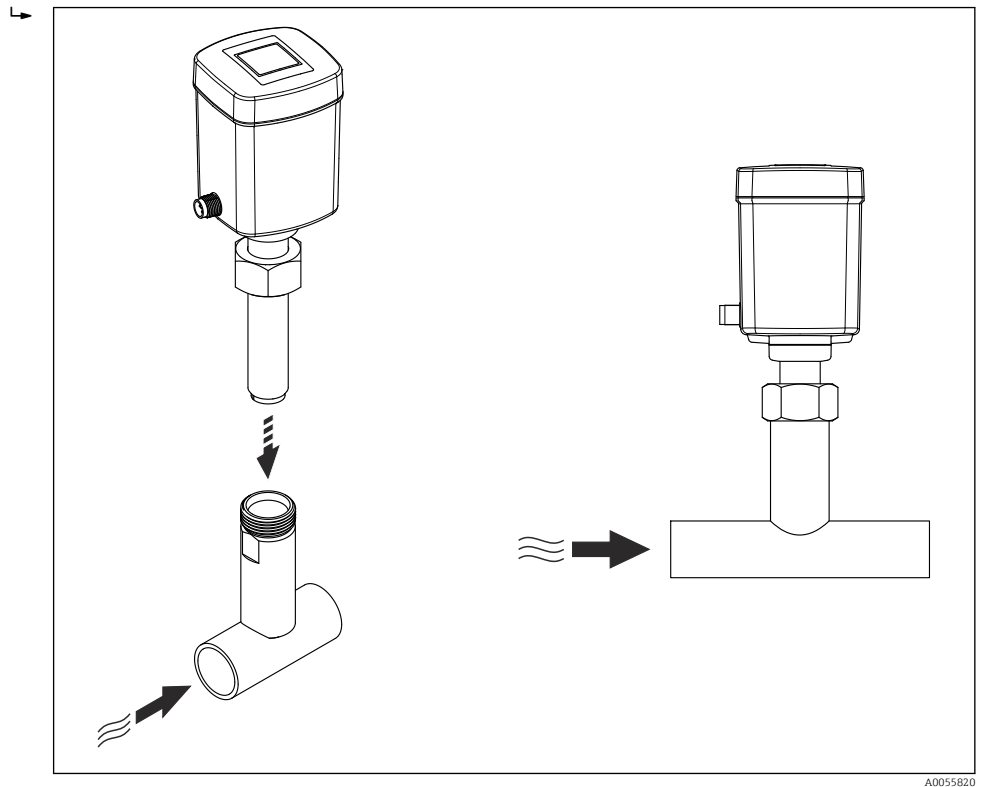
A0055820

2. Tighten the metal union nut by hand.

3. Hold the welding socket steady with an open-ended wrench, size 27 mm AF.

4. Tighten the union nut a further ½ turn approximately with an open-ended wrench, size 36 mm AF.
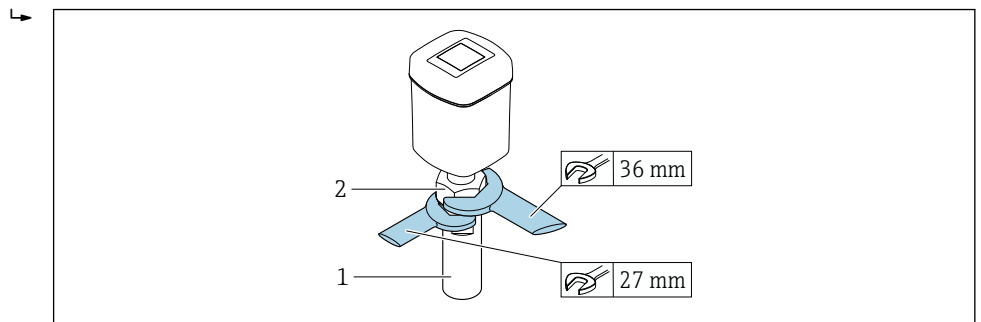
A0052179

🖼 4   *Mounting the sensor in the welding socket*

1   Welding socket
2   Metal union nut

NOTICE

Burn hazard!
If medium temperatures or ambient temperatures exceed 50 °C, areas of the housing can heat to over 65 °C.
▶ Safeguard the housing so that it cannot be touched accidentally.

6.7   Post-mounting check

Is the device undamaged (visual inspection)?	❏
Does the measuring instrument correspond to the measuring point specifications? For example: • Process temperature • Process pressure • Ambient temperature • Measuring range	❏
Is the position of the measuring electrode plane horizontal?	❏
Has the correct orientation been selected for the device → 🖺 14? • As per measuring instrument type • As per medium temperature • As per medium properties (outgassing, with entrained solids)	❏
Does the arrow on the sensor match the direction of flow of the medium?	❏
Is the tag name and labeling correct (visual inspection)?	❏
Is the device protected against strong vibrations (attachment, support)?	❏
Are the inlet and outlet runs observed ?	❏

7 Electrical connection

7.1 Electrical safety

In accordance with applicable national regulations.

7.2 Connecting requirements

7.2.1 Requirements for connecting cable

National regulations and standards apply.

Connecting cable	M12 × 1 A-coded
Conductor cross-section	At least 0.12 mm^2 (AWG26)
Degree of protection	IP65/67, pollution degree 3

7.2.2 Pin assignment, device plug
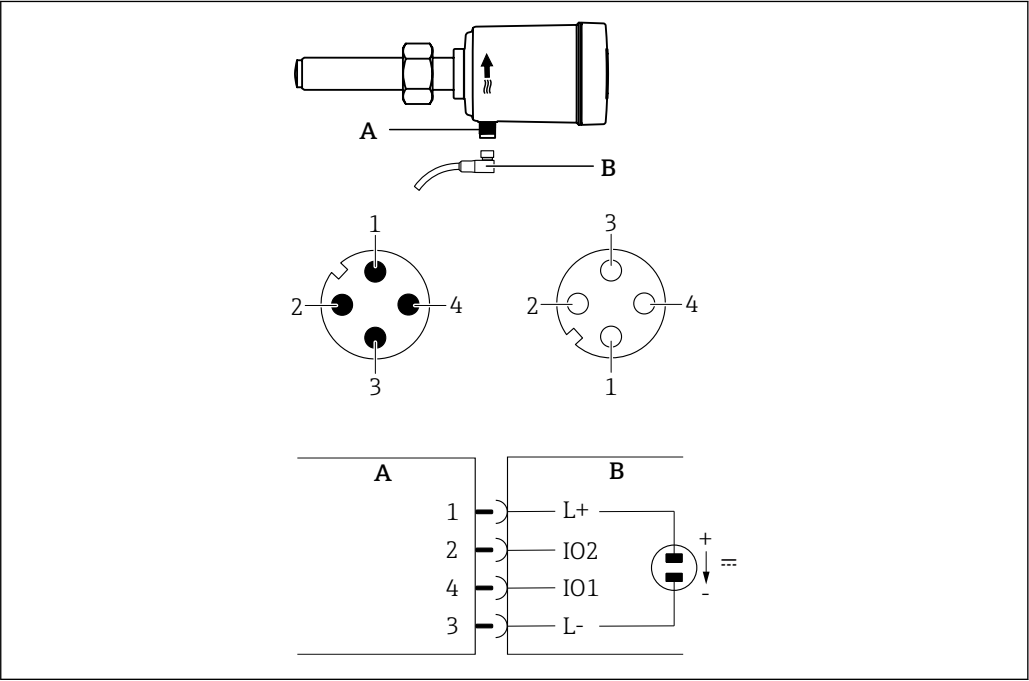
A0052005

A   Plug (measuring instrument)
B   Socket (customer side)
1 to Pin assignment
4
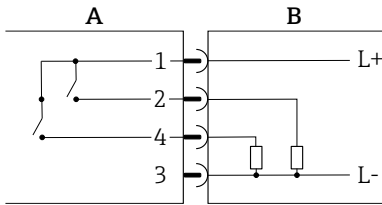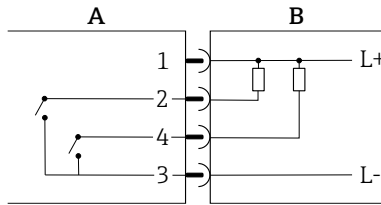
Pin assignment

Pin	Assignment	Color	Description
1	L+	Brown	Supply voltage + (18 to 30 V_{DC}/max. 3 W)
2	I/O 2	White	Input/output 2, can be configured independently of I/O 1

Pin	Assignment	Color	Description
3	L-	Blue	Supply voltage -
4	I/O 1	Black	Input/output 1, can be configured independently of I/O 2

Switch output configuration version

The switching behavior of I/O 1 and I/O 2 can be configured independently of one another.

PNP [1]	NPN [2]
A0033005	A0033006
A Plug (measuring instrument) *B Socket (customer side)* *L+ Supply voltage +* *L- Supply voltage -*	*A Plug (measuring instrument)* *B Socket (customer side)* *L+ Supply voltage +* *L- Supply voltage -*
The load is switched to high side L+. The maximum load current is 250 mA. The output is protected against short-circuiting and reverse polarity.	The load is switched to low side L-. The maximum load current is 250 mA. The output is protected against short-circuiting and reverse polarity.

1)   Positive Negative Positive (high side switch)
2)   Negative Positive Negative (low side switch)

Pulse output configuration version

Option only available for output 1

A0047257
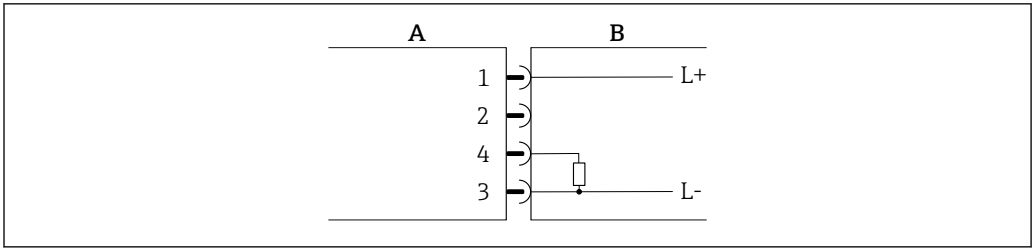
⊡ *5   Pulse output with PNP switching behavior*

A   Plug (measuring device)
B   Socket (customer side)
L+   Supply voltage +
L-   Supply voltage -

The load is switched to high side L+. The maximum load current is 250 mA. The output is protected against short-circuiting and reverse polarity.

Current output configuration version
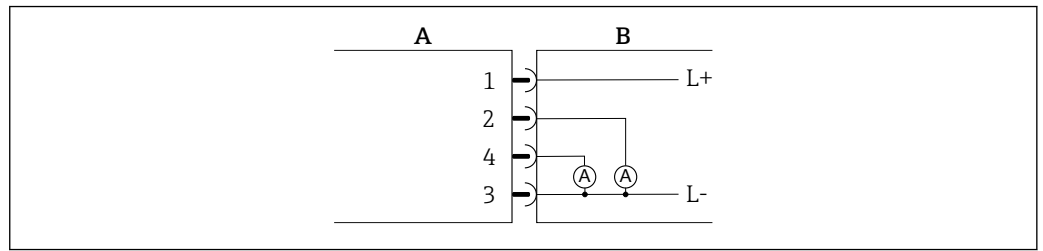
⊡ 6   Current output, active, 4 to 20 mA

A   Plug (measuring device)
B   Socket (customer side)
L+   Supply voltage +
L-   Supply voltage -

The current flows from the output to L-. The maximum load may not exceed 500 Ω. A bigger load distorts the output signal.

IO-Link configuration version

> Option only available for output 1 in the **Output 1** submenu

The measuring device features an IO-Link communication interface with a baud rate of 38,400 and with a second IO function on pin 2. This requires an IO-Link compatible module (IO-Link master) for operation. The IO-Link communication interface allows direct access to the process and diagnostics data.

7.3   Connecting the device

NOTICE

The measuring device may only be installed by properly trained technicians.

▸ Comply with national and international regulations regarding the installation of electrotechnical systems.
▸ Power supply according to EN 50178, SELV, PELV or Class 3.

1. De-energize the system.

2. Insert the device plug and tighten with the union nut to 0.6 Nm or hand-tight. The device plug must not be rotated.

3.

A0052112
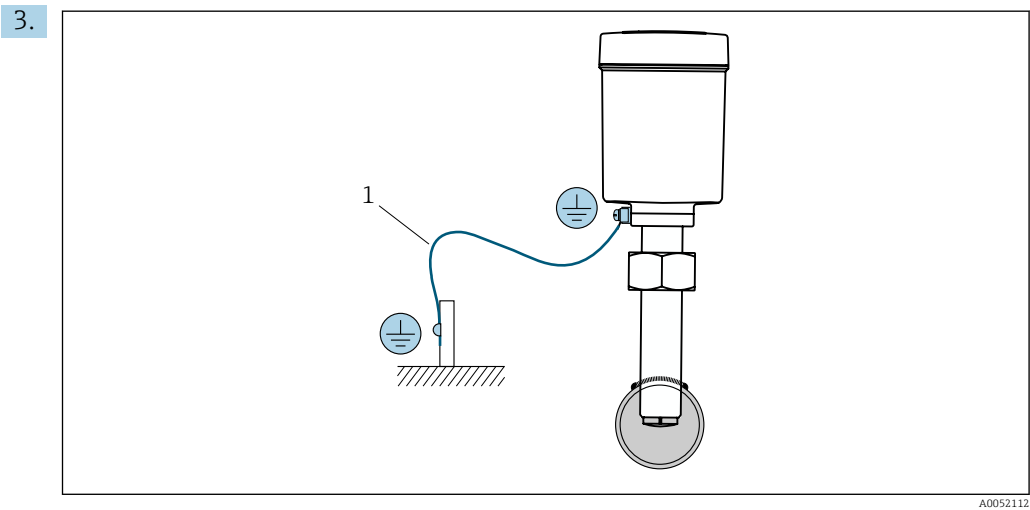
1   Ground cable

In the case of non-grounded pipes:
The device must be grounded using the ground cable accessory→ 🕮 30.

7.4   Post-connection check

Are the device and cable undamaged (visual inspection)?	❑
Are the mounted cables strain-relieved?	❑
Is the connector connected correctly?	❑
Does the supply voltage match the specifications on the transmitter nameplate?	❑
Is the pin assignment of the connector correct?	❑
Is the potential equalization established correctly?	❑

8   Operation options

8.1   Access to the operating menu via the SmartBlue app

The device can be operated and configured using the SmartBlue app.

Supported functions
- Device selection in Live List and access to the device (login)
- Configuration of the device
- Access to measured values, device status and diagnostic information

The SmartBlue app is available to download free of charge for Android devices (Google Playstore) and iOS devices (iTunes Apple Store): *Endress+Hauser SmartBlue*

Directly to the app with the QR code:

A0033202
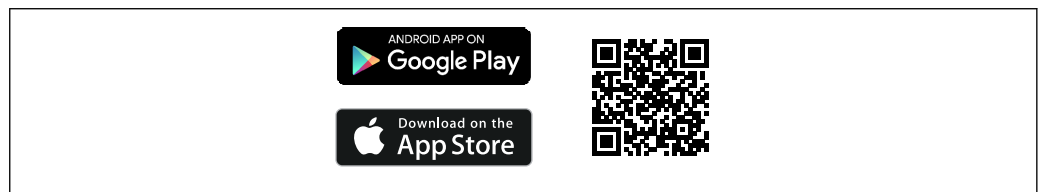
Downloading the SmartBlue app:

1. Install and start the SmartBlue app.
    ↳ A Live List shows all the devices available.
      The list displays the devices with the configured tag name. The default setting for the tag name is **EH_DMI_XYZZZZZ** (XYZZZZZ = the first 7 digits of the device serial number).

2. For Android devices, activate GPS positioning (not necessary for devices with IOS)

3. Select the device from the Live List.
    ↳ The Login dialog box opens.

Logging in:

4. Enter the user name: **admin**

5. Enter the initial password: serial number of the device (pay attention to lower/upper case).
    ↳ When you log in for the first time, a message is displayed advising you to change the password.

6. Confirm your entry.
    ↳ The main menu opens.

7. Optional: Change Bluetooth® password: Menu: Guidance → Security → Change Bluetooth password

    Forgotten your password: contact Endress+Hauser Service.

    Navigate through the various items of information about the device: swipe the screen to the side.

9   System integration

The measuring device has an IO-Link communication interface. The IO-Link interface allows direct access to process and diagnostics data and enables the user to configure the measuring device on the fly.

Properties:
- IO-Link Specification: Version 1.1
- IO-Link Smart Sensor Profile 2nd Edition
- SIO mode: yes
- Speed: COM2 (38.4 kBaud)
- Minimum cycle time: 10 ms
- Process data width: 120 bit
- IO-Link data storage: yes
- Block configuration: no
- Device operational: The measuring device is operational 4 seconds after the supply voltage is applied

More information on IO-Link is available at www.io-link.com

Overview of the entire IO-Link ISDU parameter list → 🖺 41

9.1   Overview of device description files

Current version data for the device

Firmware version	01.00.zz	Information on the firmware version can be found: • On the title page of the Operating instructions • On the device label • In the **Firmware version** parameter in the System menu
Release date of firmware version	08.2023	---
Profile version	• 1.1 • Smart Sensor Profile	---

9.2   Device master file

In order to integrate field devices into a digital communication system, the IO-Link system needs a description of the device parameters, such as output data, input data, data format, data volume and supported transfer rate.

These data are available in the device master file (IODD [1]), provided to the IO-Link master when the communication system is commissioned.

The IODD can be downloaded as follows:
- Endress+Hauser: www.endress.com
- IODDfinder: http://ioddfinder.io-link.com

---

1)   IO Device Description

10 Commissioning

10.1 Post-mounting and post-connection check

Before commissioning the device:

▶ Make sure that the post-installation and post-connection checks have been performed successfully.

- Checklist for "Post-installation" check→ 🖹 18
- Checklist for "Post-connection" check→ 🖹 22

10.2 Switching on the measuring instrument

Once the supply voltage has been switched on, the measuring device adopts the normal mode after a maximum of 4 s. During the start-up phase, the outputs are in the same state as the measuring device in the switched-off state.

10.3 Configuring the measuring instrument

The device-specific parameters are configured via the "**Commissioning** wizard".

📖 For detailed information on the "**Commissioning** wizard": Separate "Description of Device Parameters "(GP) document → 🖹 35

11 Operation

11.1 Offline quick view of configuration

If you tap on the side of the housing (e.g. on the arrow indicating the flow direction) with your fist, the device shows an overview of the preset parameters.
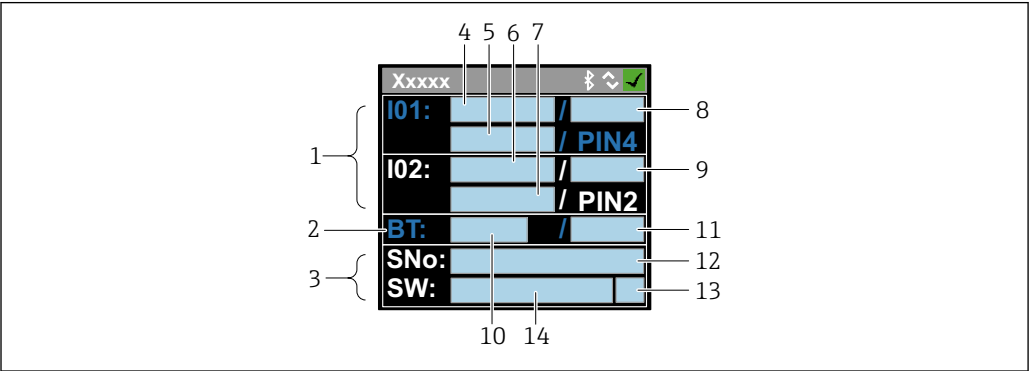
🖻 7   Information in the status layout, overview of the preconfigured parameters

1   I/O area
2   Bluetooth area
3   Identification area
4   I/O type 1
5   I/O current value type 1
6   I/O type 2
7   I/O current value type 2
8   I/O assignment type 1
9   I/O assignment type 2
10 Bluetooth module status
11 Bluetooth connection status
12 Serial number
13 User role: Operator (O), Maintenance (M)
14 Software version

I/O area (in brackets: item number → 🖻 7, 🖺 26)

I/O type (4, 6)	I/O assignment (8, 9)		I/O current value (5, 7)	
S-Out	• Alrt • LimQ • LimT • LimV • Lims • WinQ	• WinT • WinV • Wins • EPD • Off • On	• PNPOn • PNPOff	• NPNOn • NPNOff
I-Out	• s • Q • T	Off	xx.x mA	
P-Out	Q		PNPOn	PNPOff
IO-L	PD		• Dis. • Start	• Preop. • Oper.
Off	–		–	

Bluetooth area (in brackets: item number → 🖻 7, 🖺 26)

Bluetooth module status (10)	Bluetooth connection status (11)
On	Dis./Con.
Off	Dis.

12 Diagnostics and troubleshooting

12.1 General troubleshooting

For local display

Error	Possible causes	Remedial action
Local display dark and no output signals	Supply voltage does not match the voltage specified on the nameplate.	Apply the correct supply voltage → 🖹 31.
	Supply voltage has incorrect polarity.	Reverse polarity of supply voltage.
	The connecting cables are not connected correctly.	Check the cable connection and correct if necessary.

For output signals

Error	Possible causes	Remedial action
Device shows correct value on local display, but signal output is incorrect, though in the valid range.	Parameter configuration error	Check and adjust parameter configuration.
Device is measuring incorrectly.	Configuration error or device is operated outside the application.	1. Check and correct parameter configuration. 2. Observe limit values specified in the "Technical Data".

For access

Error	Possible causes	Remedial action
Measuring instrument not in smartphone or tablet live list	Bluetooth communication is disabled	1. Check whether the Bluetooth logo is visible on the local display or not. 2. Re-enable Bluetooth communication by tapping the device three times.
Device not responding via SmartBlue app	No Bluetooth connection	Enable Bluetooth function on smartphone or tablet.
	The device is already connected to another smartphone/tablet.	Check whether the device is already connected.
Login via SmartBlue app not possible	Device is being put into operation for the first time	Enter initial password (device serial number) and change.
Device cannot be operated via SmartBlue app	Incorrect password entered	Enter correct password.
	Password forgotten	Contact Endress+Hauser Service.
No write access to parameters	Current user role has limited access authorization	• Check user role • Enter the correct customer-specific access code → 🖹 23

12.2   Diagnostic information on local display

12.2.1   Diagnostic message

Faults detected by the self-monitoring system of the measuring device are displayed as a diagnostic message in alternation with the operational display.

Diagnostic message		
Alarm	**Function check**	**Warning**
Xxxxxx **F180** **TEMP.CIRC.FAIL.** A0033011	Xxxxxx **C446** **I/O 1 OVERLOAD** A0033010	Xxxxxx **S962** **EMPTY PIPE** A0033009

If two or more diagnostic events are pending simultaneously, only the message of the diagnostic event with the highest priority is shown.

Diagnostic behavior

Diagnostic message	Meaning
⊗	**Alarm** • Measurement is interrupted. • Signal outputs and totalizers assume the defined alarm condition. • A diagnostic message is generated.
⑂	**Function check** Process measured values are simulated to test the outputs/wiring. • Overload I/O 1, I/O 2 • Flow override is active
?	**Warning** • Measurement is resumed. • Measuring operation with limited accuracy • The signal outputs and totalizers are not affected. • A diagnostic message is generated.

Diagnostic behavior of outputs

Output	Diagnostic behavior
Switch output	• The output is switched off (fail-safe) if events with the status signal F occur • No further response to events with other status signals
Pulse output	• Pulse output stops if events with the status signal F occur • No further response to events with other status signals
Totalizer	• Totalizer stops if events with the status signal F occur • No further response to events with other status signals
Current output	• 3.5 mA is output to signal events with the status signal F • No further response to events with other status signals
IO-Link	• All events reported to the Master • Events read and processed further by the Master

12.3   Overview of diagnostic events

Diagnostic event	Event text	Cause	Remedial measures	Status signal [ex-factory]
181	Coil. circ. fail.	Coil/frequency failure Coil current PWM outside tolerance range	Replace the measuring instrument.	F
180	Temp. circ. fail.	Temperature sensor open circuit/short-circuit	Replace the measuring instrument.	F
201	Device fail.	Internal hardware error	Replace the measuring instrument.	F
283	Memory fail.	CRC failure	Reset to factory settings.	F
446	I/O 1 overload	Overload at output 1	Increase load impedance.	C
447	I/O 2 overload	Overload at output 2	Increase load impedance.	C
485	Simulation act.	Measured value simulation active (via remote configuration)	–	C
441	I-Out 1 range	I-output 1 at range limit	Adjust parameter or process.	S
443	P-Out 1 range	P-output 1 at range limit	Adjust parameter or process.	S
442	I-Out 2 range	I-output 2 at range limit	Adjust parameter or process.	S
962	Empty pipe	Pipe is completely or partially empty	Adjust the process.	S
834	Temperat. range	Medium temperature outside the permitted range	Adjust the process.	S

For more information on the diagnostics: see the "Diagnostics information" → 🗎 40

12.4   Device information

The **Identification** submenu contains parameters that display different information for identifying the device.

Navigation

Menu: "Guidance" → Commissioning → Identification

The following information is shown on the display by tapping once on the housing:
- Status and values for output 1
- Status and values for output 2
- Bluetooth status (On/Off)
- Serial number
- Software version

12.5   Firmware history

Release date	Firmware version	Firmware Changes	Documentation type	Documentation
03.2025	01.00.zz	Original firmware	Operating Instructions	BA002354D/06/EN/01.24

13   Accessories

Various accessories are available for the device, and can be ordered with the device or at a later stage from Endress+Hauser. An up-to-date overview of accessories is available from your local Endress+Hauser sales organization or on the product page of the Endress +Hauser website: www.endress.com.

Welding socket

Order number	Description
71596475	Welding socket set, Picomag DMI, DN 25 1"
71596477	Welding socket set, Picomag DMI, >DN 25 1"

Cable

Order number	Description
71349260	2m/6.5ft, straight, 4x0.34, M12, PUR
71349261	5m/16.4ft, straight, 4x0.34, M12, PUR
71349262	10m/32.8ft, straight, 4x0.34, M12, PUR
71349263	2m/6.5ft, 90 degrees, 4x0.34, M12, PUR
71349264	5m/16.4ft, 90 degrees, 4x0.34, M12, PUR
71349265	10m/32.8ft, 90 degrees, 4x0.34, M12, PUR

Ground terminal

Order number	Description
71596478	Ground terminal set, Picomag DMI

14   Technical data

14.1   Input

Direct measured variables	• Flow velocity at the sensor tip • Temperature • Conductivity
Calculated measured variable	Volume
Measuring range Flow velocity measurement	0.05 to 10 m/s
Measuring range Medium temperature measurement	−10 to +85 ℃ (+14 to +185 ℉)
Measuring range Conductivity measurement	20 µS/cm to 10 ms/cm

14.2   Output

Output	Max. load
Current output	500 Ω Load must not be greater
Pulse output	Max. pulse rate: 10 000 Pulse/s
Signal on alarm	• Status signal (as per NAMUR Recommendation NE 107) • Plain text display with remedial action
Switch output	• Switching behavior: PNP or NPN • Max. load 250 mA

14.3   Power supply

Supply voltage range	18 to 30 V_{DC} (SELV, PELV, Class 2)
Power consumption	Maximum 3 W • Without outputs I/O 1 and I/O 2: 120 mA • With outputs I/O 1 and I/O 2: 120 mA plus the effective load currents

14.4   Performance characteristics

Flow velocity measurement [1]	
Reference operating conditions	Water, +15 to +45 ℃, 2 to 6 bar
Linearity	±2 % o.r.±0.5 % o.f.s. ≤DN 300; ±2 % o.r.±2 % o.f.s. >DN 300
Repeatability	±0.5 % o.r.
Reaction time	Typically <3 s for 63 % of a step change (in both directions)

1)   Measured at the sensor tip.

Medium temperature measurement	
Maximum measurement error	±3.5 ℃ (>DN 50)
Repeatability	±0.5 ℃

Conductivity measurement	
Repeatability	±5 % o.r.
Maximum measurement error	±8 % o.r.

Maximum measurement error, current output	
Additional error	±20 µA
Repeatability	±10 µA
Response time T90	Typically 200 ms

The response time T90 is the time a measuring system needs to display 90% of the change of the measured value.

The deviation of the measurement at the outputs can increase depending on the device configuration.

14.5   Mounting

→ 🖺 14

14.6   Environment

Ambient temperature range	−10 to +60 ℃ (+14 to +140 ℉)
Storage temperature	−20 to +85 ℃ (−4 to +185 ℉)
Degree of protection	IP65/67, pollution degree 3
Humidity and moisture	Humidity and moisture: suitable for indoor areas with 5 to 95% rh (wet and damp locations)
Operating height	to 2 000 m
Shock resistance	20 g (11 ms) in accordance with IEC/EN60068-2-27
Vibration resistance	Acceleration up to 5 g (10 to 2 000 Hz) in accordance with IEC/EN60068-2-6
Electromagnetic compatibility (EMC)	According to IEC/EN61326 and/or IEC/EN55011 (Class A)

14.7   Process

Nominal diameter range	DN 25 to 1 000 (½ to 40")
Medium temperature range	• −10 to +85 ℃ (+14 to +185 ℉) • Permissible short-term temperature: 95 ℃ (203 ℉) maximum 20 minutes every 4 hours. If the medium temperatures are high, take the orientation from the mounting section into consideration → 🖺 14
Medium properties	Liquid, conductivity ≥ 20 µS/cm to ≥ 20 mS/cm
Pressure	Max. 16 bar$_{rel}$

Avoid cavitation in the process.

Magnetism and static electricity
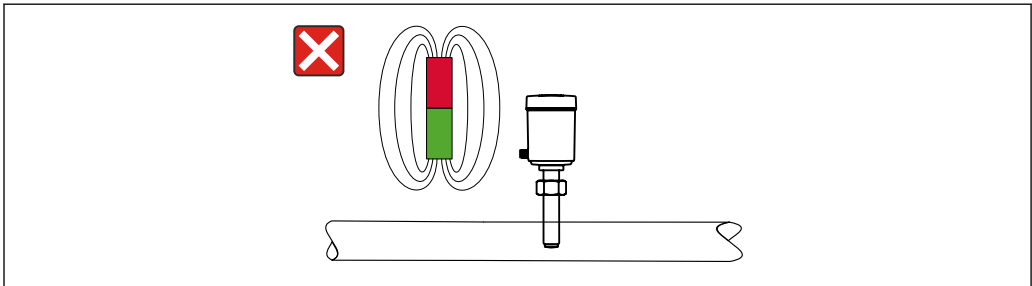
A0052107

🖾 *8   Avoid magnetic fields*

14.8   Mechanical construction

Dimensions

A0055689
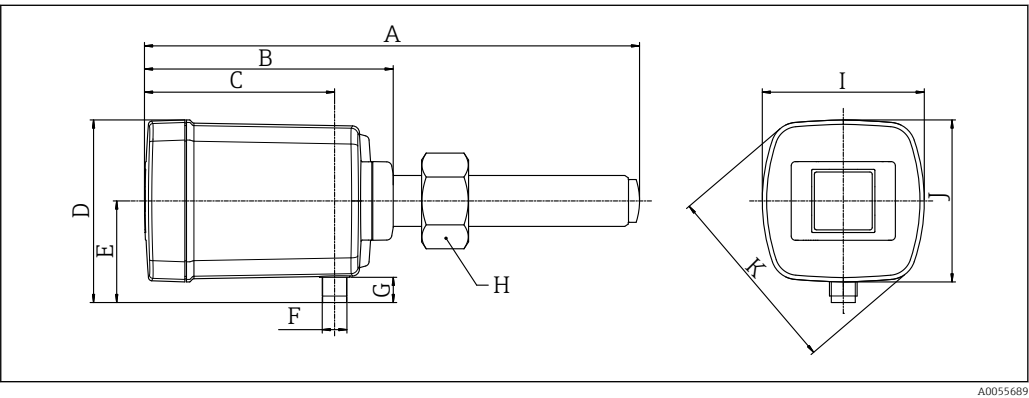
Dimensions in SI units

A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F	G [mm]	H	I [mm]	J [mm]	K [mm]
0	0	0	0	0	M12 × 1	0	AF 0	0	0	0

Dimensions in US units

A [in]	B [in]	C [in]	D [in]	E [in]	F	G [in]	H	I [in]	J [in]	K [in]
0	0	0	0	0	M12 × 1	0	AF 1$\frac{9}{16}$	0	0	0

Weight

SI unit [kg]	US unit [lbs]
0.0	0.0

Materials

Transmitter	• Transmitter housing: Polycarbonate • Device plug: Polycarbonate
Sensor	• Sensor tip: PPSU; O-ring made of FKM, EPDM alternatively • Electrodes: Stainless steel, 1.4435 • Sensor sleeve: Stainless steel, 1.4404 (316L) with 1.4404 clamping ring/1.4571 (316Ti)
Optional accessories	Welding socket 1.4404 (SS 316L)

14.9   Operability

Local display

The device has an onsite display:

A0032991
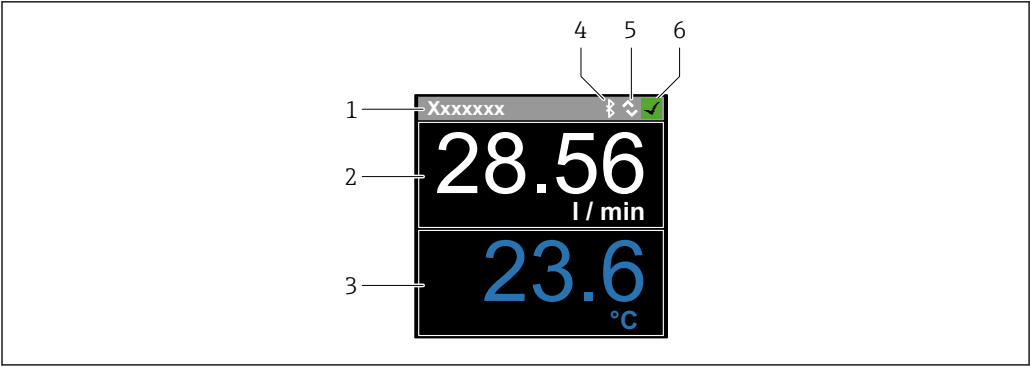
1   Tag name (configurable)
2   Measured variable 1 (configurable) with sign
3   Measured variable 2 (configurable) with sign
4   Active Bluetooth connection
5   Active I/O-Link connection
6   Device status

Display element

3 measured variables can be displayed (volume flow, temperature, conductivity).

> Floating point numbers are saved in IEEE754 format and displayed with single precision format. The values are entered in the decimal system, however. As a result, extremely small, insignificant differences can arise between the value entered and the floating point number displayed, depending on the numerical values.

Operation	• Via Bluetooth® wireless technology • Via IO-Link
Digital communication	Via IO-Link
SmartBlue app	The device has a *Bluetooth*® wireless technology interface and can be operated and configured using the SmartBlue app. • The range under reference conditions is 10 m (33 ft) • Incorrect operation by unauthorized persons is prevented by means of encrypted communication and password encryption • The *Bluetooth*® wireless technology interface can be disabled

14.10 Certificates and approvals

Current certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.

2. Open the product page.

3. Select **Downloads**.

CE mark	The device meets the legal requirements of the applicable EU Directives. These are listed in the corresponding EU Declaration of Conformity along with the standards applied. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.
UKCA marking	The device meets the legal requirements of the applicable UK regulations (Statutory Instruments). These are listed in the UKCA Declaration of Conformity along with the

designated standards. By selecting the order option for UKCA marking, Endress+Hauser confirms a successful evaluation and testing of the device by affixing the UKCA mark.

Contact address Endress+Hauser UK:
Endress+Hauser Ltd.
Floats Road
Manchester M23 9NF
United Kingdom
www.uk.endress.com

Radio approval	The measuring device has radio approval.

For detailed information on the radio approval, see the Appendix → 🔖 36 |
| Pressure Equipment Directive | Devices not bearing this marking (without PED or PESR) are designed and manufactured according to sound engineering practice. They meet the requirements of
a) Art. 4 Para. 3 of the Pressure Equipment Directive 2014/68/EU or
b) Part 1, Para. 8 of Statutory Instruments 2016 No. 1105.
The scope of application is indicated
a) in diagrams 6 to 9 in Annex II of the Pressure Equipment Directive 2014/68/EU or
b) Schedule 3, Para. 2 of Statutory Instruments 2016 No. 1105. |
| $_cUL_{US}$ listing | The measuring device is UL-listed. |
| Drinking water approval | Availability, see endress.com or Applicator: https://portal.endress.com/webapp/applicator |

14.11 Documentation

For an overview of the scope of the associated Technical Documentation, refer to the following:
• *Device Viewer* (www.endress.com/deviceviewer): Enter the serial number from the nameplate
• *Endress+Hauser Operations app*: Enter serial number from nameplate or scan matrix code on nameplate.

Standard documentation	**Description of device parameters**

Measuring instrument	Documentation code
Picomag Insertion	GP01230D

15 Appendix

15.1 Radio approvals

15.1.1 Argentina

CNC ID: C-22455

15.1.2 Brazil

ADENDO AO MANUAL

Modelo: Picomag

04366-18-07311

A0037714

Para maiores informações, consulte o site da ANATEL: www.gov.br/anatel/pt-br

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
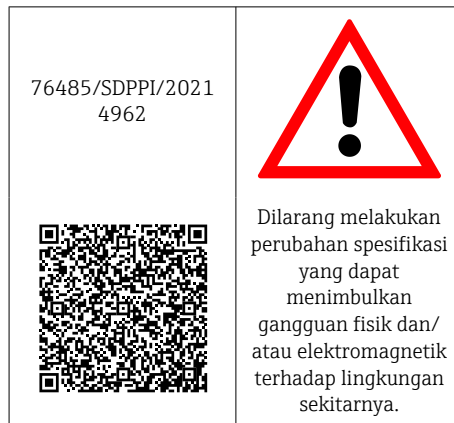
15.1.3 Europe

This device meets the requirements of the Telecommunications Directive RED 2014/53/EU.

15.1.4 India

ETA Certificate No: ETA - 1707/18-RLO(NE)

15.1.5   Indonesia

76485/SDPPI/2021 4962	⚠
[QR code]	Dilarang melakukan perubahan spesifikasi yang dapat menimbulkan gangguan fisik dan/ atau elektromagnetik terhadap lingkungan sekitarnya.

15.1.6   Canada and United States

English

This device complies with Part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:
- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class A di gital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide rea sonable protection against harmful interference when the equipment is operated in a com mercial environment. This equipment generates, uses, and can radiate radio frequency en ergy and, if not installed and used in accordance with the instruction manual, may cause h armful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to corre ct the interference at his own expense.

CAN ICES-003(A) / NMB-003(A)

ℹ Changes or modifications made to this equipment not expressly approved by Endress+Hauser Flowtec AG may void the user's authorization to operate this equipment.

Français

Le présent appareil est conforme aux CNR d'industrie Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes :
- L'appareil ne doit pas produire de brouillage, et
- L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

CAN ICES-003(A) / NMB-003(A)

ℹ Les changements ou modifications apportés à cet appareil non expressément approuvés par Endress+Hauser Flowtec AG peuvent annuler l'autorisation de l'utilisateur d'opérer cet appareil.

15.1.7 Mexico

La operación de este equipo está sujeta dos condiciones: (1) es posible que este equipo o dispositivo no cause interferencia perjudicial y (2) este equipo o dispositivo debe aceptar cualquier interferencia, incluyendo la que pueda causar su operación no deseada.

NOM ⬍ NYCE *A0034100*	IFT No.: RCPENPI21-3683

15.1.8 Republic of Korea

KC 인증

적합성평가정보

R-C-EH7-Picomag

상호 : 한국엔드레스하우저 주식회사

기자재명칭(모델명):특정소출력 무선기기(무선데이터통신시스템용무선기기)

/ Picomag

제조국 및 제조국가 : Endress+Hauser Flowtec AG / 프랑스

제조년월 : 제조년월로 표기

*사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환

경에서 사용하는 경우 전파간섭의 우려가 있습니다.

15.1.9 Singapore

Complies with IMDA Standards DA108204

15.1.10 Taiwan

低功率電波輻射性電機管理辦法

第十二條	經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
第十四條	低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。
產品名稱	Endress + Hauser
產品型號	Picomag
產地	瑞士
製造商	Endress + Hauser Flowtec AG

15.1.11 Thailand

เครื่องโทรคมนาคมและอุปกรณ์นี้ มีความสอดคล้องตามข้อกำหนดของ กสทช.

(This telecommunication equipment is in compliance with NBTC requirements.)

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Endress+Hauser

ผู้ใดมีไว้ในครอบครอง หรือ ใช้ซึ่งเครื่องวิทยุ
คมนาคมหรือตั้งสถานีวิทยุคมนาคมนี้ ต้องได้รับ
ใบอนุญาตจากเจ้าพนักงานผู้ออกใบอนุญาต
หากฝ่าฝืน มาตรา 6 หรือมาตรา 11 มีความผิด
ตามมาตรา 23 แห่งพระราชบัญญัติวิทยุคมนาคม
พ.ศ. 2498 ต้องระวางโทษปรับไม่เกินหนึ่งแสนบาท
หรือจำคุกไม่เกินห้าปี หรือทั้งปรับทั้งจำ

กสทช. | โทรคมนาคม
กำกับดูแลเพื่อประชาชน
Call Center 1200 (โทรฟรี)

A0041612

15.1.12 United Arab Emirates

TRA Registered ER68711/19

15.1.13 Other countries

Other national approvals are available on request.

15.2 IO-Link process data

15.2.1 Data structure

Bit number	151 ... 144	143 ... 136	135 ... 128	127 ... 120	119 ... 112	111 ... 104	103 ...96	95... 88	87... 80	79... 72	71... 64	63... 56	55... 48	47... 40	39... 32	31... 24	23... 16	15... 8	7...0
Data	Volume flow in l/s				Conductivity in µS/cm				Totalizer in l				Flow velocity in m/s				Temperature in $\frac{1}{10}$ ℃		Status
Data type	32-bit floating point number with single precision (IEEE 754)				32-bit floating point number with single precision (IEEE 754)				32-bit floating point number with single precision (IEEE 754)				32-bit floating point number with single precision (IEEE 754)				16-bit two's complement		8-bit

Data structure of the status bits 7 to 0

Bit	Description
0	Switches once per sampling rate
1	Reserved
2	Current status S-Out 1
3	Current status S-Out 2
4	Reserved
5	Reserved
6	Reserved
7	Reserved

15.2.2 Diagnostic information

Diagnostic code		Display text	Coding (hex)	PDValid Validity	Priority
Status NE 107	Diagnostic number				
–		SYSTEM OK	0x0000	1	1
F	181	COIL CIRC.FAIL.	0x5000	0	2
F	180	TEMP.CIRC.FAIL.	0x5000	0	3
F	201	DEVICE FAIL.	0x5000	0	4
F	283	MEMORY FAIL.	0x8C00	0	5
C	446	I/O 1 OVERLOAD	0x180C	1	6
C	447	I/O 2 OVERLOAD	0x180C	1	7
C	485	SIMULATION ACT.	0x8C01	1	8
S	441	I-OUT 1 RANGE	0x180A	1	10
S	443	P-OUT 1 RANGE	0x180B	1	12
S	442	I-OUT 2 RANGE	0x180A	1	13
S	962	EMPTY PIPE	0x180E	1	15
S	834	TEMPERAT. RANGE	0x8C20	1	16

15.3   IO-Link ISDU parameter list

The individual parts of a parameter description are described in the following section:

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
Identification								
Device tag First 10 characters displayed (starting from left)	0x0018	24	32 (max.)	string	r/w		EH_DMI_XXZZZZZ Z	
Device Name	0x0012	18	16 (max.)	string	r		Picomag	
Device ID1	0x0009	9	1	uint	r		0x01	
Device ID2	0x000A	10	1	uint	r		0x01	
Device ID3	0x000B	11	1	uint	r		0x01	
Vendor Name	0x0010	16	32 (max.)	string	r		Endress+Hauser	
Vendor ID1	0x0007	7	1	uint	r		0x00	
Vendor ID2	0x0008	8	1	uint	r		0x11	
Device Serial No. e.g. (YMXXXXZZ)	0x0015	21	11 (max.)	string	r		see nameplate	
Firmware version e.g. 01.00.00	0x0017	23	8 (max.)	string	r			
Order code E.g. DMI15-AAAAA1	0x0102	258	18 (max.)	string	r		see nameplate	
Device type	0x0100	256	2	uint	r		0x94FF	
Diagnostics								
Actual Diagnostics e.g. C485 (= SIMULATION ACT.)	0x0104	260	4	string	r			
Last Diagnostics e.g. S962 (= EMPTY PIPE)	0x0105	261	4	string	r			
Simulation Proc. Var.	0x015F	351	2	uint	r/w	enable=1 disable=0		
Sim.Proc.Var.Value Volumeflow Unit selection list from **Unit Volumeflow**	0x0166	358	4	float	r/w		0.0	-10^6 10^6
Sim.Proc.Var.Value Temperature Unit selection list from **Unit Temperature**	0x0168	360	4	float	r/w		0.0	-10^4 10^4
Sim.Proc.Var.Value Conductivity Unit selection list from **Unit Conductivity**	0x0167	359	4	float	r/w		0.0	0 10^6
Measured Values								
Volumeflow Current volume flow measured value	0x0161	353	4	float	r			
Temperature Current temperature measured value	0x0163	355	4	float	r			
Conductivity Current conductivity measured value	0x0164	365	4	float	r			
Totalizer Current totalizer measured value	0x0169	361	4	float	r/w		0.0	

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
Totalizer Reset	0x016A	362	2	uint	w	cancel=0 reset=1	cancel	
					System Units			
Unit Volumeflow	0x0226	550	2	uint	r/w	l/s=0 l/h=5 fl. oz/min=4 m³/h=1 l/min=2 Usgpm=3	l/min	
Unit Volume	0x0227	551	2	uint	r/w	ml=0 USozf=1 l=2 m³=3 Usgal=4	ml	
Unit Temperature	0x0228	552	2	uint	r/w	℃=0 ℉=1	℃	
Unit Conductivity	0x0229	553	2	uint	r/w	µS/cm=0 S/m=1 mS/cm=2	µS/cm=0	
Unit Totalizer	0x016B	363	2	uint	r/w	USozf=1 l=2 m³=3 Usgal=4 kl=5 Ml=6 kUsg=7	m³	
					Sensor			
Install. Direction In relation to direction of arrow on the device	0x015E	350	2	uint	r/w	forward=0 reverse=1	forward	
Low Flow Cut Off The flow rate below the selected value is zero Unit selection list from **Unit Volumeflow**	0x0160	352	4	float	r/w		0.4 l/min	0 10^6
Damping Volume flow damping via the PT1 element Unit: s	0x01A4	420	4	float	r/w		1 s	0 100

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
Output 1								
Operating Mode IO-Link is set if connected to a master	0x01F4	500	2	uint	r/w	P-Out=0 I-Out=1 S-In=2 S-Out=3 IO-Link=4 off=6	IO-Link	
Current output I-Out 1								
I - OUT Assign	0x0258	600	2	uint	r/w	off=0 volume flow=1 temperature=2 conductivity=4 velocity=3	volume flow	
Q-Start-Value ASP [1] for volume flow Unit selection list from **Unit Volumeflow**	0x0259	601	4	float	r/w		0 l/min	$-9.9\cdot10^9$ $9.9\cdot10^9$
Q-End-Value AEP [2] for volume flow Unit selection list from **Unit Volumeflow**	0x025A	602	4	float	r/w		25 l/min	$-9.9\cdot10^9$ $9.9\cdot10^9$
T-Start-Value ASP [1] for temperature Unit selection list from **Unit Temperature**	0x025F	607	4	float	r/w		-10 ℃	$-9.9\cdot10^9$ $9.9\cdot10^9$
T-End-Value AEP [2] for temperature Unit selection list from **Unit Temperature**	0x0260	608	4	float	r/w		+70 ℃	$-9.9\cdot10^9$ $9.9\cdot10^9$
s-Start-Value ASP [1] for conductivity Unit selection list from **Unit Conductivity**	0x025D	605	4	float	r/w		0	$-9.9\cdot10^9$ $9.9\cdot10^9$
s-End-Value AEP [2] for conductivity Unit selection list from **Unit Conductivity**	0x025E	606	4	float	r/w		1000	$-9.9\cdot10^9$ $9.9\cdot10^9$

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
Pulse output P-Out								
Pulse Value Unit selection list from **Unit Volume**	0x03E8	1000	4	float	r/w		0.5/1.0/2.0/10.0 ml	10^{-9} $9.9 \cdot 10^9$
Switch output S-Out 1								
Switch Polarity	0x032B	811	2	uint	r/w	PNP=0 NPN=1	PNP	
Switch Function	0x0320	800	2	uint	r/w	alarm=0 off=1 on=2 lim.vol.flow=3, lim.temp.=4 lim.vol.=5 lims=11 win.vol.flow=6 win.temp.=7 win.vol.=8 wins=13 epd=9	alarm	
Q-ON-Value Unit selection list from **Unit Volumeflow**	0x0321	801	4	float	r/w		20 l/min	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
Q-OFF-Value Unit selection list from **Unit Volumeflow**	0x0322	802	4	float	r/w		15 l/min	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
T-ON-Value Unit selection list from **Unit Temperature**	0x0327	807	4	float	r/w		+ 60 ℃	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
T-OFF-Value Unit selection list from **Unit Temperature**	0x0328	808	4	float	r/w		+ 50 ℃	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
V-ON-Value Unit selection list from **Unit Totalizer**	0x0329	809	4	float	r/w		0.2 m³	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
V-OFF-Value Unit selection list from **Unit Totalizer**	0x032A	810	4	float	r/w		0.15 m³	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
s-ON-Value Unit selection list from **Unit Conductivity**	0x0325	805	4	float	r/w		500	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
s-OFF-Value Unit selection list from **Unit Conductivity**	0x0326	806	4	float	r/w		200	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
Voltage output U-Out 1								
Q-Start-Value ASP [1] for volume flow Unit selection list from **Unit Volumeflow**	0x02BD	701	4	float	r/w		0 l/min	
Q-End-Value AEP [2] for volume flow Unit selection list from **Unit Volumeflow**	0x02BE	702	4	float	r/w		25 l/min	
T-Start-Value ASP [1] for temperature Unit selection list from **Unit Temperature**	0x02C3	707	4	float	r/w		-10 ℃	

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
T-End-Value AEP [2)] for temperature Unit selection list from **Unit Temperature**	0x02C4	708	4	float	r/w		+70 ℃	
s-Start-Value ASP [1)] for conductivity Unit selection list from **Unit Conductivity**	0x02C1	705	4	float	r/w		0 µS/cm	
s-End-Value AEP [2)] for conductivity Unit selection list from **Unit Conductivity**	0x02C2	706	4	float	r/w		1000 µS/cm	
				Digital input D-In 1				
IO-Link								
IO-LINK Vendor Name	0x0010	16	32 (max.)	string	r		Endress+Hauser	
IO-LINK Product Name	0x0012	18	16 (max.)	string	r		Picomag	
IO-LINK RevisionID	0x0004	4	1	uint	r		0x11	
				Output 2				
Operating Mode	0x01F5	501	2	uint	r/w	I-Out=1 S-In=2 S-Out=3 U-Out=5 off=6	off	
				Current output I-Out 2				
I - OUT Assign	0x028A	650	2	uint	r/w	off=0 volume flow=1 temperature=2	temperature	
Q-Start-Value ASP [1)] for volume flow Unit selection list from **Unit Volumeflow**	0x028B	651	4	float	r/w		0 l/min	
Q-End-Value AEP [2)] for volume flow Unit selection list from **Unit Volumeflow**	0x028C	652	4	float	r/w		25/50/100/750 l/min	
T-Start-Value ASP [1)] for temperature Unit selection list from **Unit Temperature**	0x0291	657	4	float	r/w		-10 ℃	
T-End-Value AEP [2)] for temperature Unit selection list from **Unit Temperature**	0x0292	658	4	float	r/w		+70 ℃	
s-Start-Value ASP [1)] for conductivity Unit selection list from **Unit Conductivity**	0x028F	655	4	float	r/w		0	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$
s-End-Value AEP [2)] for conductivity Unit selection list from **Unit Conductivity**	0x0290	656	4	float	r/w		1000	$-9.9 \cdot 10^9$ $9.9 \cdot 10^9$

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
Switch output S-Out 2								
Switch Polarity	0x035D	861	2	uint	r/w	PNP=0 NPN=1	PNP	
Switch Function	0x0352	850	2	uint	r/w	alarm=0 off=1 on=2 lim.vol.flow=3 lim.temp.=4 lim.vol.=5, win.vol.flow=6 lims=11 win.temp.=7 win.vol.=8 wins=13 epd=9	alarm	
Q-ON-Value Unit selection list from **Unit Volumeflow**	0x0353	851	4	float	r/w		20/40/80/600 l/min	
Q-OFF-Value Unit selection list from **Unit Volumeflow**	0x0354	852	4	float	r/w		15/30/60/450 l/min	
T-ON-Value Unit selection list from **Unit Temperature**	0x0359	857	4	float	r/w		+ 60 ℃	
T-OFF-Value Unit selection list from **Unit Temperature**	0x035A	858	4	float	r/w		+ 50 ℃	
V-ON-Value Unit selection list from **Totalizer**	0x035B	859	4	float	r/w		0.2/0.4/0.8/6.0 m³	
V-OFF-Value Unit selection list from **Totalizer**	0x035C	860	4	float	r/w		0.15/0.3/0.6/4.5 m³	
s-ON-Value Unit selection list from **Conductivity**	0x0357	855	4	float	r/w		500	
s-OFF-Value Unit selection list from **Conductivity**	0x0358	856	4	float	r/w		200	
Voltage output U-Out 2								
Q-Start-Value ASP [1] for volume flow Unit selection list from **Unit Volumeflow**	0x02EF	751	4	float	r/w		0 l/min	
Q-End-Value AEP [2] for volume flow Unit selection list from **Unit Volumeflow**	0x02F0	752	4	float	r/w		25/50/100/750 l/min	
T-Start-Value ASP [1] for temperature from **Unit Temperature**	0x02F5	757	4	float	r/w		-10 ℃	
T-End-Value AEP [2] for temperature from **Unit Temperature**	0x02F6	758	4	float	r/w		+70 ℃	
s-Start-Value ASP [1] for temperature from **Conductivity**	0x02F3	755	4	float	r/w		0 µS/cm	

Name	ISDU (hex)	ISDU (dec)	Size (Byte)	Data type	Access	Value range	Factory setting	Range limits
s-End-Value AEP [2] for temperature from **Conductivity**	0x02F4	756	4	float	r/w		1000 µS/cm	
Display								
Display Layout	0x01C3	451	2	uint	r/w	QV=0 QT=1 Qs=3 VT=2, Vs=4 Ts=5 QVTs=6 QVTs_m=7	QT	
Display Rotation	0x01C4	452	2	uint	r/w	0 °=0 90 °=1 180 °=2 270 °=3 auto=4	Auto	
Display Backlight	0x01C2	450	2	uint	r/w	0...100	50	
Bluetooth configuration								
Bluetooth Function	0x041A	1050	2	uint	r/w	on=1 off=0	on	
Bluetooth Tx Pwr Level	0x041B	1051	2	uint	r	0...4		
Bluetooth Conn. Status	0x041C	1052	1	uint	r			
Administration								
Set Access Code Define the access code	0x0108	264	2	uint	w		0000	
Access code Enter the access code	0x0107	263	2	uint	w			
Reset Device	0x010E	270	2	uint	w	cancel=0 restore fact.=1 restart=4	cancel	
Product Specific Process Values								
Status IO 1	0x0386	902	2	uint	r	low=0 high=1		
Status IO 2	0x0396	918	2	uint	r	low=0 high=1		

1) Analog Start Point
2) Analog End Point

Index

71681147

www.addresses.endress.com

Endress+Hauser [EH]

People for Process Automation