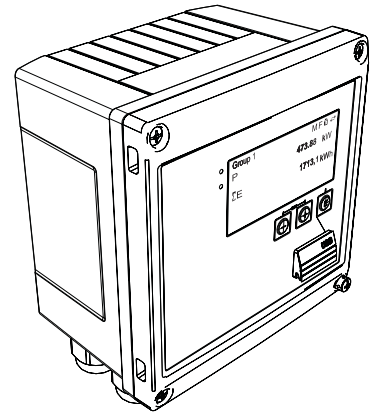
KA00293K/09/EN/04.14
71268931

Brief Operating Instructions
EngyCal RS33

Steam calculator

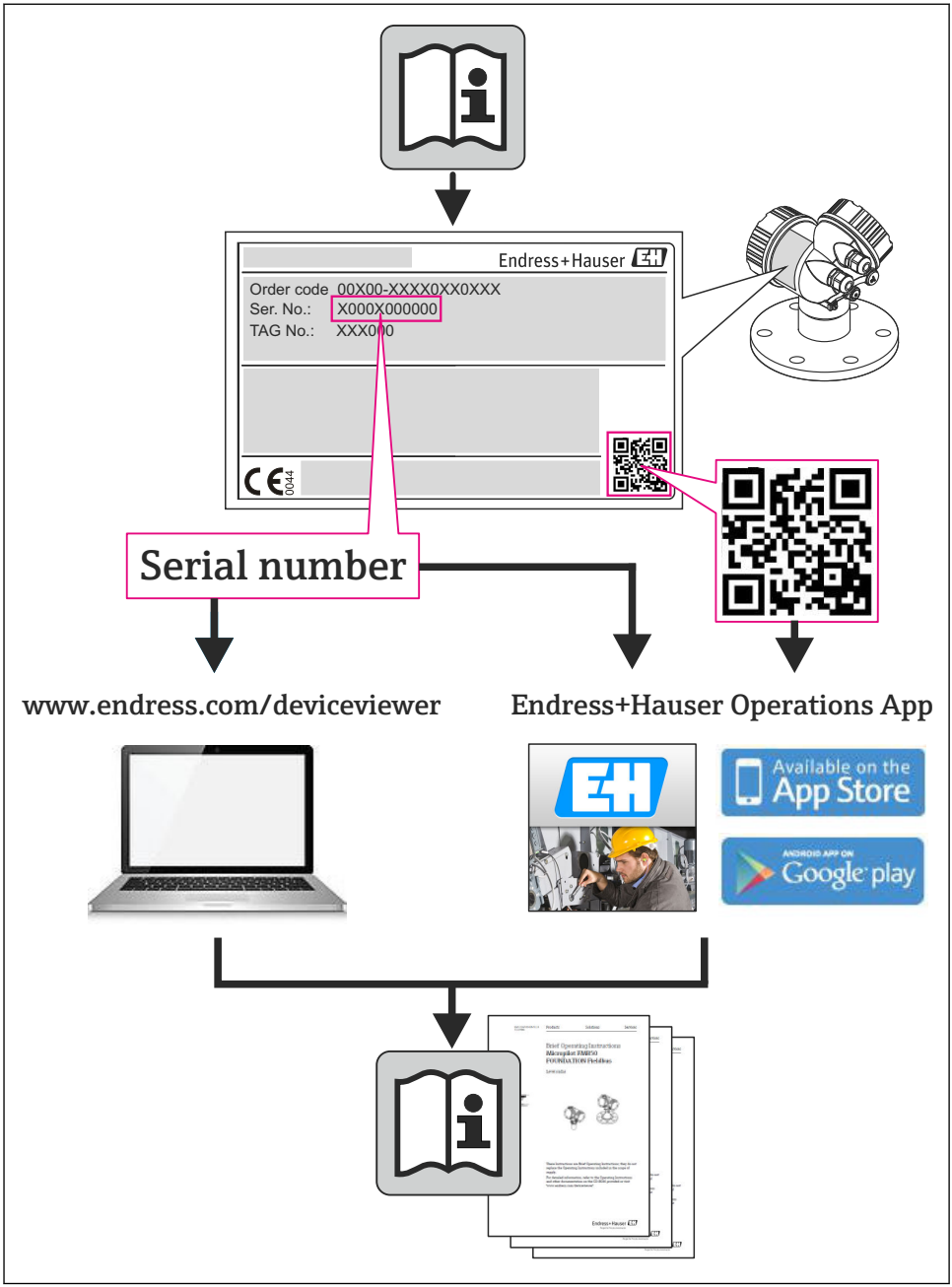


These Instructions are Brief Operating Instructions; they are not a substitute for the Operating Instructions pertaining to the device.

For detailed information, refer to the Operating Instructions and other documentation.

Available for all device versions via:
- Internet: www.endress.com/deviceviewer
- Smart phone/Tablet: Endress+Hauser Operations App

Endress+Hauser
People for Process Automation


Endress+Hauser
Order code 00X00-XXXX0XX0XXX
Ser. No.: X000X000000
TAG No.: XXX000
0044
Serial number
www.endress.com/deviceviewer
Endress+Hauser Operations App
Available on the App Store
ANDROID APP ON Google play

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1 Document information

1.1 Document conventions

1.1.1 Safety symbols

Symbol	Meaning
DANGER	**DANGER!** This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
WARNING	**WARNING!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
CAUTION	**CAUTION!** This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
NOTICE	**NOTE!** This symbol contains information on procedures and other facts which do not result in personal injury.

1.1.2 Electrical symbols

Symbol	Meaning
A0011197	**Direct current** A terminal to which DC voltage is applied or through which direct current flows.
 A0011198	**Alternating current** A terminal to which alternating voltage is applied or through which alternating current flows.
 A0017381	**Direct current and alternating current** ▪ A terminal to which alternating voltage or DC voltage is applied. ▪ A terminal through which alternating current or direct current flows.
 A0011200	**Ground connection** A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
 A0011199	**Protective ground connection** A terminal which must be connected to ground prior to establishing any other connections.
 A0011201	**Equipotential connection** A connection that has to be connected to the plant grounding system: This may be a potential equalization line or a star grounding system depending on national or company codes of practice.
 A0012751	**ESD - electrostatic discharge** Protect the terminals from electrostatic discharge. Failure to observe this may result in destruction of parts of the electronics.

1.1.3 Symbols for certain types of information

Symbol	Meaning	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	1., 2., 3. ...	Series of steps
	Result of a sequence of actions		Visual inspection

1.1.4 Symbols in graphics

Symbol	Meaning
1, 2, 3,...	Item numbers
1., 2., 3. ...	Series of steps
A, B, C, ...	Views
A-A, B-B, C-C, ...	Sections
 A0013441	Flow direction
 A0011187	**Hazardous area** Indicates a hazardous area.
 A0011188	**Safe area (non-hazardous area)** Indicates a non-hazardous area.

1.1.5 Tool symbols

Symbol	Meaning
 A0011220	Flat-blade screwdriver
 A0011219	Phillips screwdriver
 A0011221	Allen key

Symbol	Meaning
 A0011222	Open-ended wrench
 A0013442	Torx screwdriver

2 Safety instructions

Safe operation of the device is only guaranteed if the Operating Instructions have been read and the safety instructions they contain have been observed.

2.1 Requirements for the personnel

The personnel must fulfill the following requirements for its tasks:
- ▶ 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 beginning work, the specialist staff must have read and understood the instructions in the Operating Instructions and supplementary documentation as well as in the certificates (depending on the application)
- ▶ Following instructions and basic conditions

2.2 Designated use

The steam calculator is a flow computer for calculating the mass and energy flow of steam. The mains powered device is designed for use in industrial environments.

- The manufacturer accepts no liability for damages resulting from incorrect use or use other than that designated. It is not permitted to convert or modify the device in any way.
- The device may only be operated when installed.

2.3 Workplace safety

For work on and with the device:
- ▶ Wear the required personal protective equipment according to federal/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.

Environmental requirements

If a plastic transmitter housing is permanently exposed to certain steam and air mixtures, this can damage the housing.
- ▶ If you are unsure, please contact your Endress+Hauser Sales Center for clarification.
- ▶ If used in an approval-related area, observe the information on the nameplate.

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 EC directives listed in the device-specific EC Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

2.6 IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

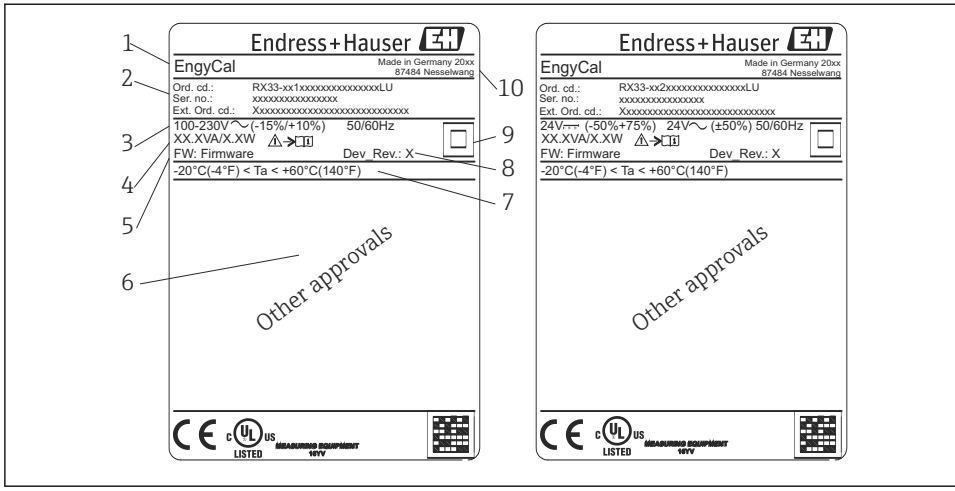
IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

3 Identification

3.1 Device tag

3.1.1 Nameplate

Compare the nameplate on the device with the following diagram:



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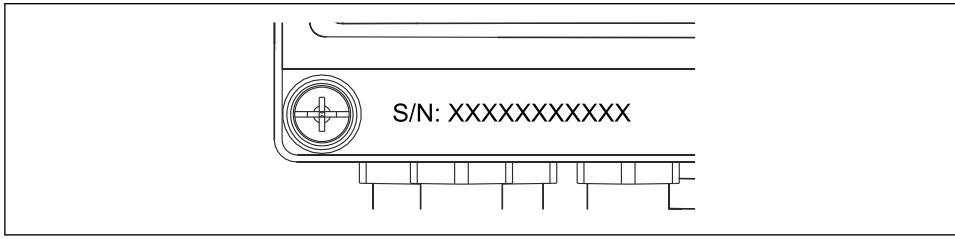
1 Device nameplate (example)

1 *Device tag*
2 *Order code and serial number*
3 *Supply voltage*
4 *Power consumption*
5 *Firmware version*
6 *Approvals, if available*
7 *Ambient temperature range*
8 *Device revision*
9 *Device protected by double or reinforced seal*
10 *Place and year of manufacture*

3.1.2 Serial number on the front of the device



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2 Serial number on front of device

3.2 Scope of delivery

The scope of delivery of the steam calculator comprises:
- Steam calculator (field housing)
- Brief Operating Instructions in paper form
- Optional 3 pcs. connection clamps (5 positions apiece)
- Optional interface cable and DVD set with FieldCare Device Setup parameter configuration software
- Optional Field Data Manager software MS20
- Optional mounting hardware for DIN rail, panel mounting, pipe mounting
- Optional overvoltage protection

Please note the device accessories in Section Accessories in the Operating Instructions.

3.3 Certificates and approvals

The steam calculator meets the general requirements for steam calculators in accordance with OIML R75 and EN-1434.

According to European law, steam calculators are not subject to mandatory verification. However, approval as part of individual measuring point verification is possible. Furthermore, national type approvals are currently pending for the device.

CE mark, Declaration of Conformity

The device is designed 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. The device complies with the applicable standards and regulations in accordance with EN 61010-1 "Safety requirements for electrical equipment for measurement, control and laboratory use".

The device described in these Operating Instructions therefore complies with the statutory requirements of the EU Directives. The manufacturer confirms that the device has been successfully tested by applying the CE mark.

4 Installation

4.1 Incoming acceptance, transport, storage

Compliance with the permitted environmental and storage conditions is mandatory. Precise specifications are provided in the "Technical Information" section of the Operating Instructions.

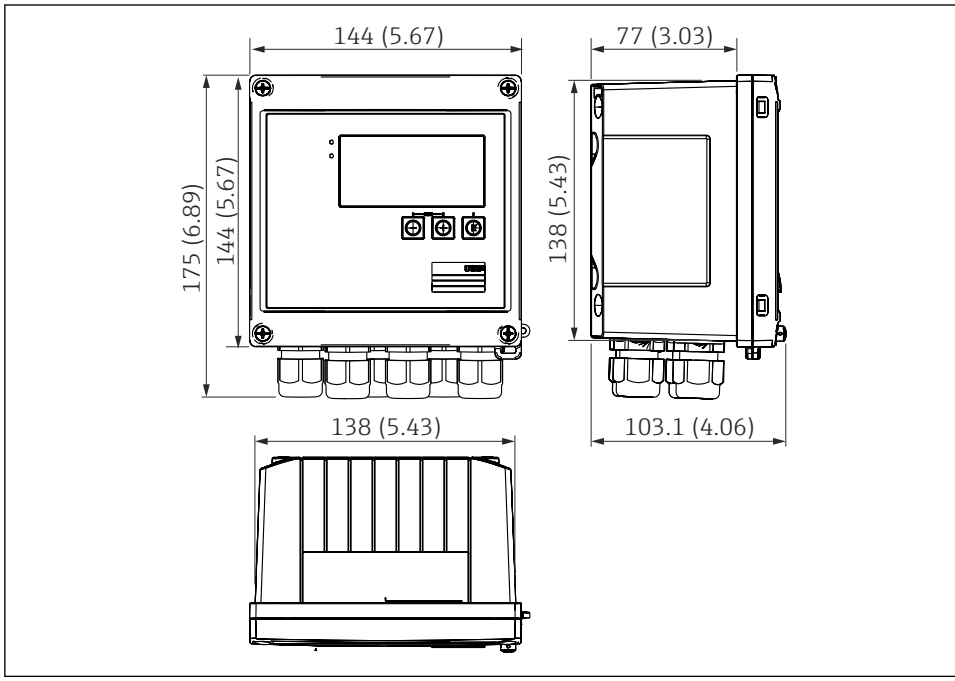
4.1.1 Incoming acceptance

On receipt of the goods, check the following points:
- Is the packaging or the content damaged?
- Is the delivery complete? Compare the scope of delivery against the information on your order form.

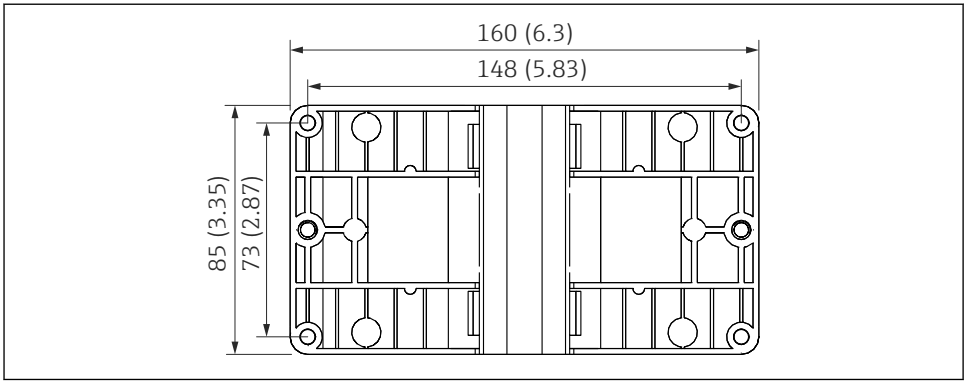
4.1.2 Transport and storage

Please note the following:
- Pack the device in such a way as to protect it reliably against impact for storage (and transportation). The original packaging provides optimum protection.
- The permitted storage temperature is −40 to +85 °C (−40 to +185 °F); it is possible to store the device at borderline temperatures for a limited period (48 hours maximum).

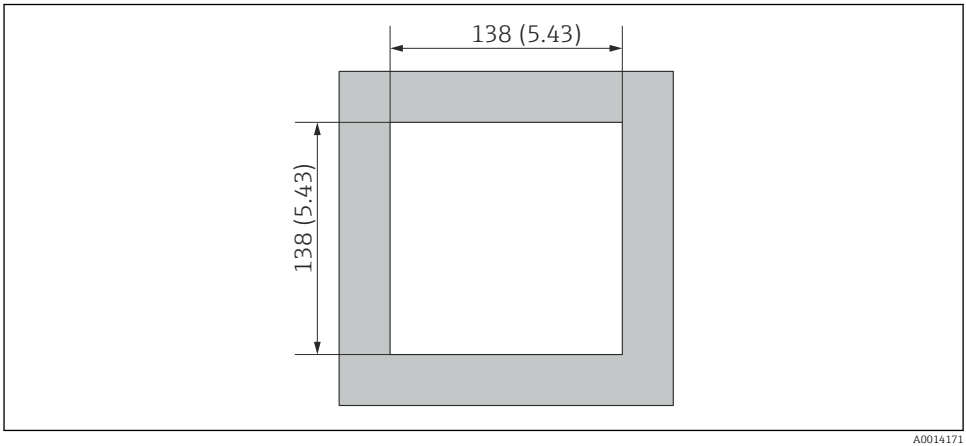
4.2 Dimensions



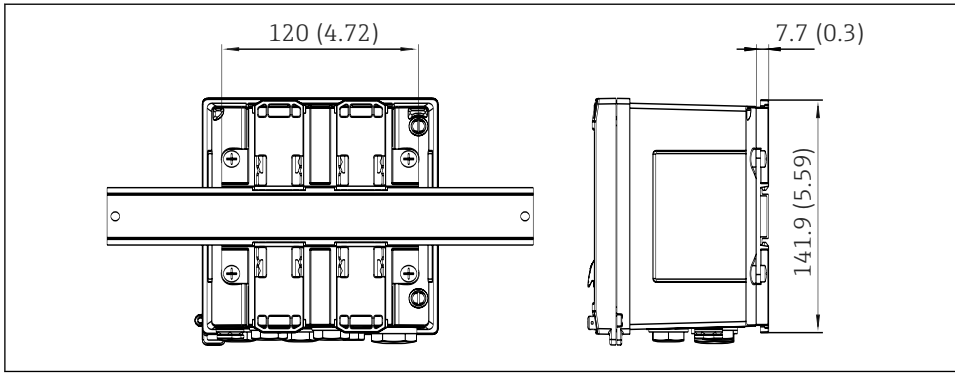
3 Dimensions of the device in mm (in)



4 Dimensions of the mounting plate for wall, pipe and panel mounting in mm (in)



5 Dimensions of the panel cutout in mm (in)



6 Dimensions of DIN rail adapter in mm (in)

4.3 Installation conditions

With the appropriate accessories the device with field housing is suitable for wall mounting, pipe mounting, panel mounting and DIN rail installation. [1].

The orientation is only determined by the legibility of the display. Connections and outputs are fed out of the bottom of the device. The cables are connected via coded terminals.

Operating temperature range:–20 to 60 °C (–4 to 140 °F)

You can find more information in the "Technical data" section.

NOTICE

Overheating of the device due to insufficient cooling

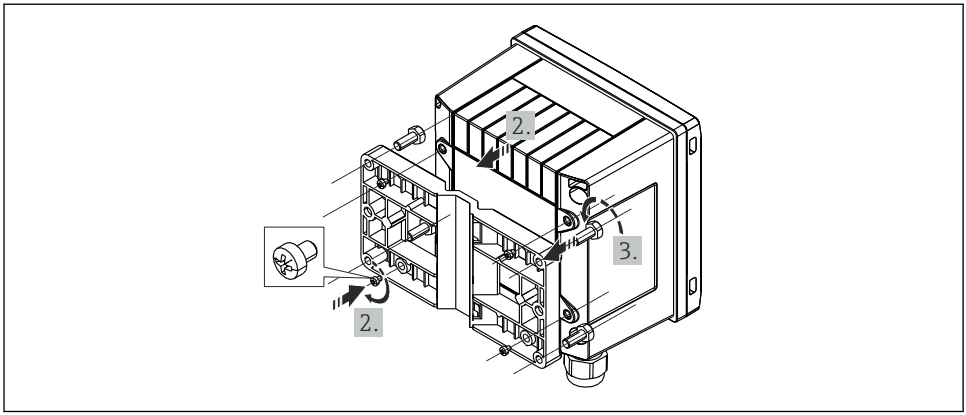
- To avoid heat buildup, please always ensure that the device is sufficiently cooled. Operating the device in the upper temperature limit range decreases the operating life of the display.

4.4 Installation

4.4.1 Wall mounting

1. Use the mounting plate as the template for drilled holes, dimensions (→ 4, 12)
2. Attach the device to the mounting plate and fasten it in place from the rear using 4 screws.
3. Fasten the mounting plate to the wall using 4 screws.

1) According to UL approval panel or surface mountable only.



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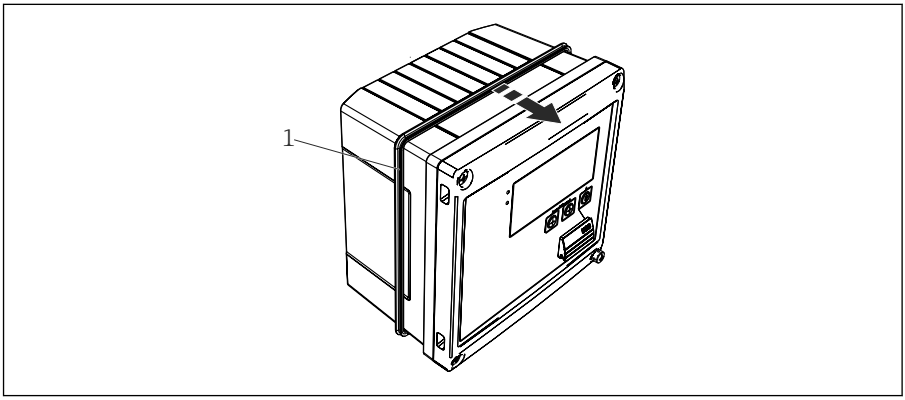
7 Wall mounting

4.4.2 Panel mounting

1. Make the panel cutout in the required size, dimensions (→ 5, 12)
2. 

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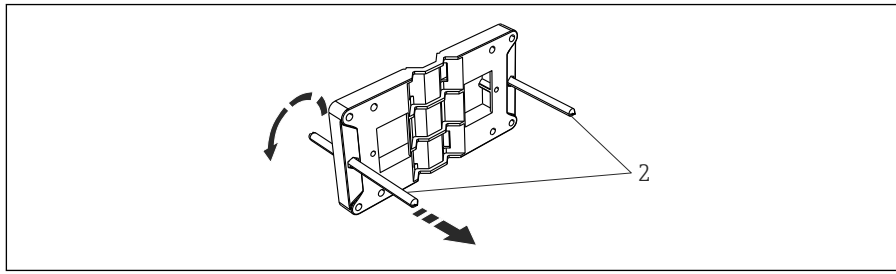
8 Panel mounting

Attach the seal (item 1) to the housing.

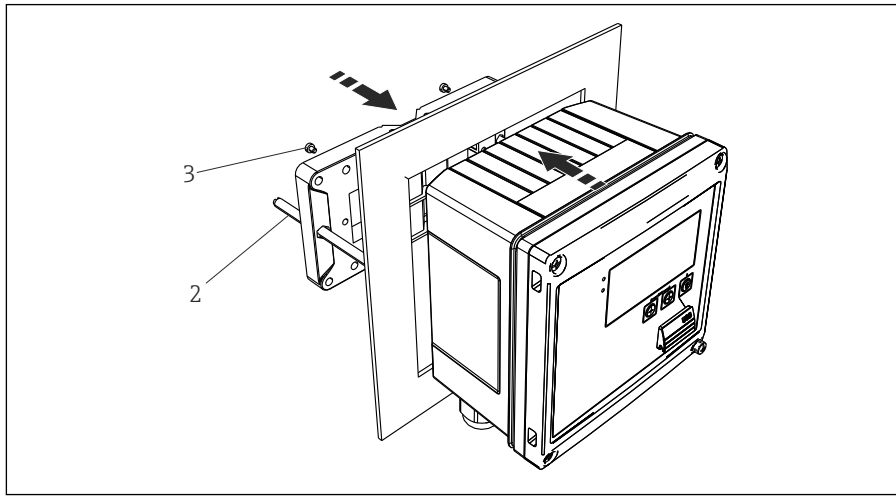
3.



9 Preparing the mounting plate for panel mounting

Screw the threaded rods (item 2) into the mounting plate (dimensions (→ 4, 12)).

4.



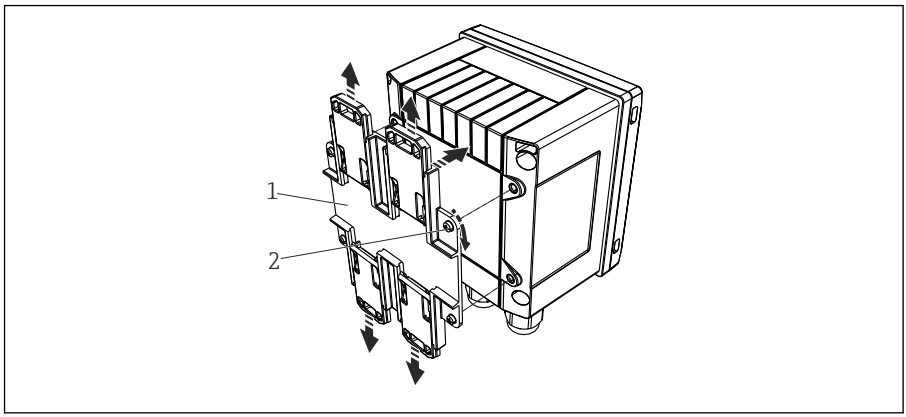
10 Panel mounting

Push the device into the panel cutout from the front and attach the mounting plate to the device from the rear using the 4 screws provided (item 3).

5. Fasten the device in place by tightening the threaded rods.

4.4.3 Support rail/DIN rail (to EN 50 022)

1.



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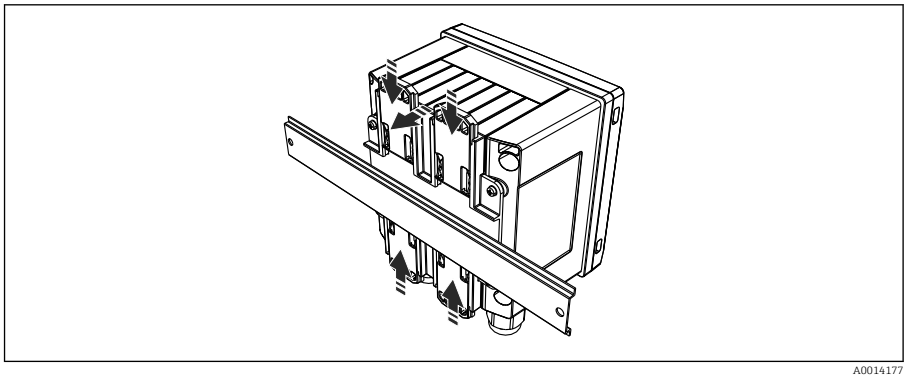
11 Preparing for DIN rail mounting

Fasten the DIN rail adapter (item 1) to the device using the screws provided (item 2) and open the DIN rail clips.

2.



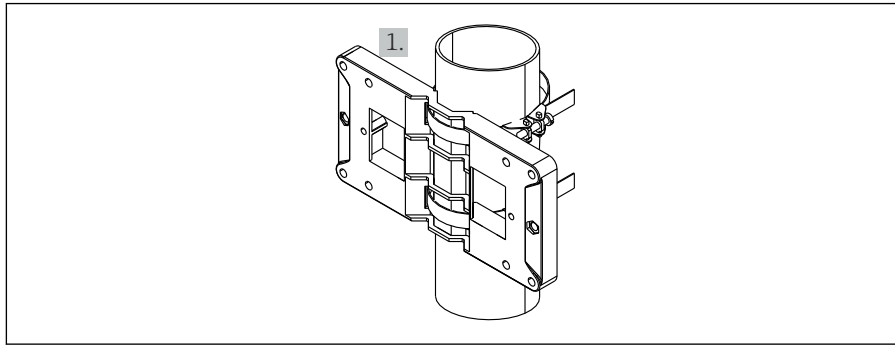
A0014177

12 DIN rail mounting

Attach the device to the DIN rail from the front and close the DIN rail clips.

4.4.4 Pipe mounting

1.

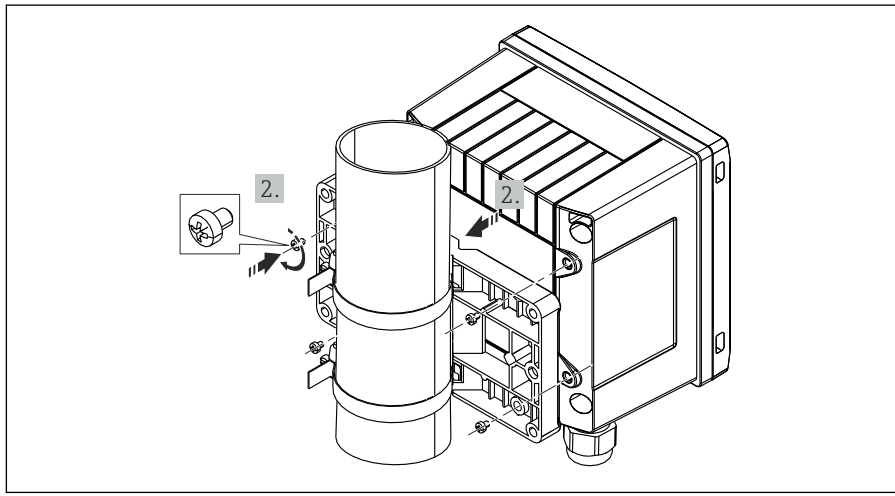


A0014178

13 Preparing for pipe mounting

Pull the steel belts through the mounting plate (dimensions (→ 4, 12)) and fasten them to the pipe.

2.



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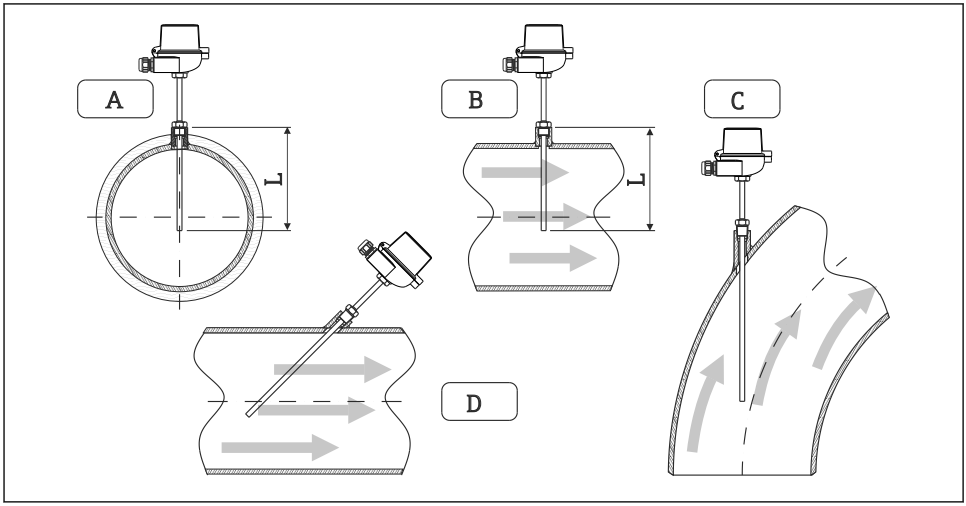
14 Pipe mounting

Attach device to mounting plate and fasten it in place using the 4 screws provided.

4.5 Installation instructions for temperature sensor(s)



15 *Installation types for temperature sensors*

A - B For cables with a small cross-section, the sensor tip must reach to the piping axis or a little farther (=L).
C - D Slanted orientation.

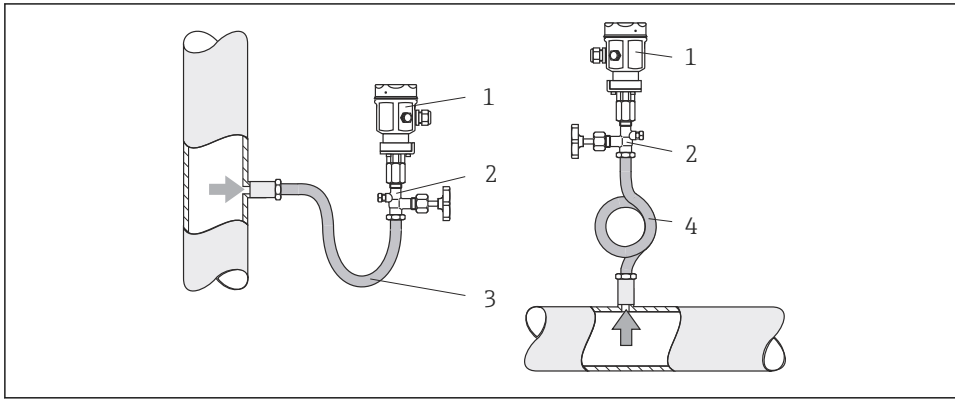
The immersion length of the thermometer influences the accuracy. If the immersion length is too small, errors in the measurement are caused by heat conduction via the process connection and the container wall. For installation in a pipe, therefore, the recommended installation depth ideally corresponds to half of the pipe diameter.

- Installation possibilities: Pipes, tanks or other plant components
- Minimum immersion depth = 80 to 100 mm (3.15 to 3.94 in)
  The immersion depth should be at least 8 times the diameter of the thermowell. Example: Thermowell diameter 12 mm (0.47 in) x 8 = 96 mm (3.8 in). We recommend a standard immersion depth of 120 mm (4.72 in).

For pipes with small nominal diameters, ensure that the tip of the thermowell extends far enough into the process so that it also protrudes past the axis of the pipe ((→ 15, 18), item A and B). Another solution may be diagonal installation ((→ 15, 18), item C and D). To determine the immersion length or installation depth, all parameters of the thermometer and the process to be measured must be taken into account (e.g. flow velocity, process pressure).

Refer also to the installation recommendations EN1434-2 (D), Figure 8.

4.6 Pressure sensor installation instructions



16 Measuring arrangement for pressure measurement in steams

1 Pressure sensor
2 Shutoff device
3 U-shaped water pocket
4 O-shaped water pocket

- Mount the pressure sensor with the water pocket pipe above the tapping point. The water pocket pipe reduces the temperature to almost ambient temperature.
- Fill the water pocket pipe with liquid before commissioning.

5 Wiring

5.1 Connection instructions

⚠ WARNING

Danger! Electric voltage!

- The entire connection of the device must take place while the device is de-energized.

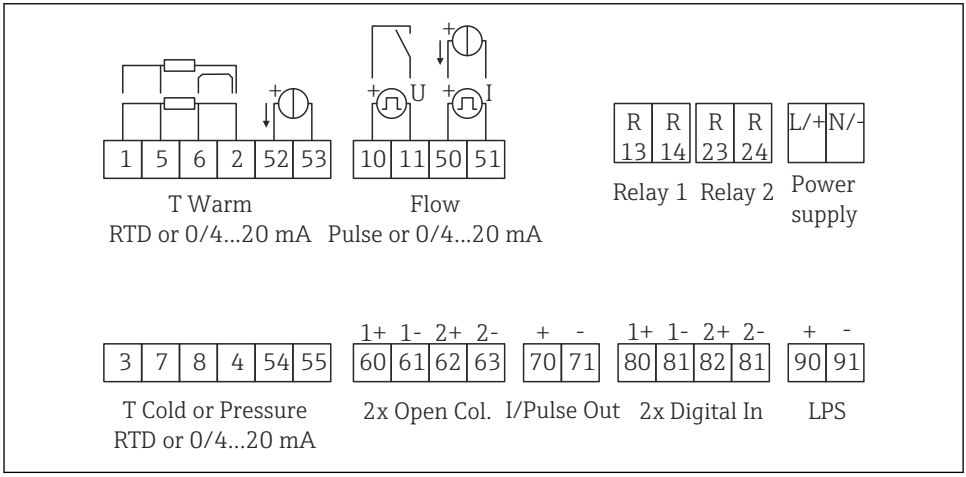
⚠ CAUTION

Pay attention to additional information provided

- Before commissioning, ensure that the supply voltage corresponds to the specification on the nameplate.
- Provide a suitable switch or power-circuit breaker in the building installation. This switch must be provided close to the device (within easy reach) and marked as a circuit breaker.
- An overload protection element (rated current ≤ 10 A) is required for the power cable.

For installing the steam calculator and the associated components, observe the general instructions according to EN 1434 Part 6.

5.2 Quick wiring guide



17 *Connection diagram of the device*

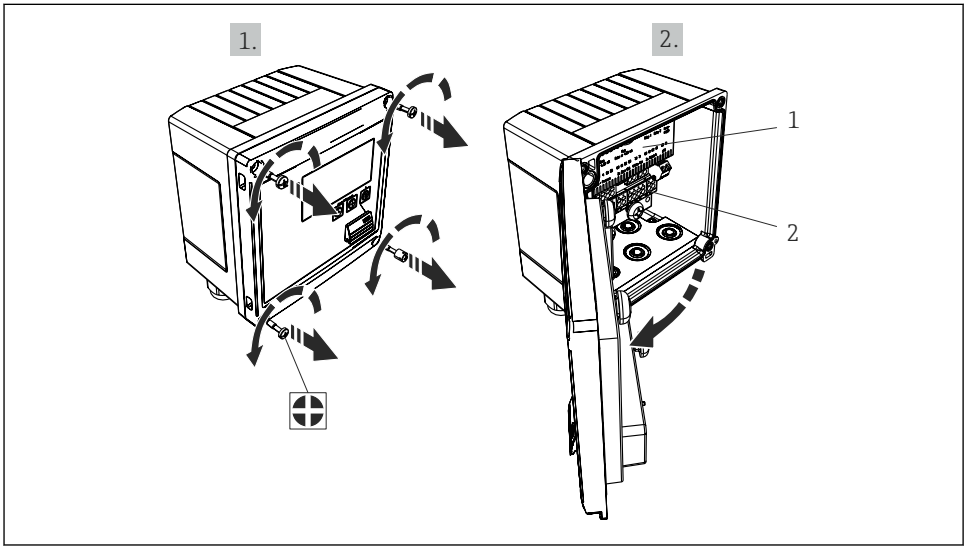
Terminal assignment

- In the case of heat differential /T, the temperature sensor for T condensate must be connected to the T Warm terminals and the temperature sensor for T steam to the T Cold terminals.
- In the case of heat differential /p, the temperature sensor for T condensate must be connected to the T Warm terminals.

Terminal	Terminal assignment	Inputs
1	+ RTD power supply	Temperature (Optionally RTD or current input)
2	- RTD power supply	
5	+ RTD sensor	
6	- RTD sensor	
52	+ 0/4 to 20 mA input	
53	Ground for 0/4 to 20 mA input	
3	+ RTD power supply	Pressure
4	- RTD power supply	
7	+ RTD sensor	
8	- RTD sensor	
54	+ 0/4 to 20 mA input	
55	Ground for 0/4 to 20 mA input	
10	+ pulse input (voltage)	Flow (Optionally pulse or current input)
11	- pulse input (voltage)	
50	+ 0/4 to 20 mA or current pulse (PFM)	
51	Ground for 0/4 to 20 mA input flow	
80	+ digital input 1 (switch input)	▪ Start tariff counter 1 ▪ Time synchronization ▪ Lock device
81	- digital input (terminal 1)	
82	+ digital input 2 (switch input)	▪ Start tariff counter 2 ▪ Time synchronization ▪ Lock device
81	- digital input (terminal 2)	
		Outputs
60	+ pulse output 1 (open collector)	Energy, volume or tariff counter. Alternative: limits/alarms
61	- pulse output 1 (open collector)	
62	+ pulse output 2 (open collector)	
63	- pulse output 2 (open collector)	
70	+ 0/4 to 20 mA/pulse output	Current values (e.g. power) or counter values (e.g. energy)
71	- 0/4 to 20 mA/pulse output	
13	Relay normally open (NO)	Limits, alarms

14	Relay normally open (NO)	
23	Relay normally open (NO)	
24	Relay normally open (NO)	
90	24V sensor power supply (LPS)	24 V power supply (e.g. for sensor power supply)
91	Power supply ground	
		Power supply
L/+	L for AC + for DC	
N/-	N for AC - for DC	

5.2.1 Open the housing



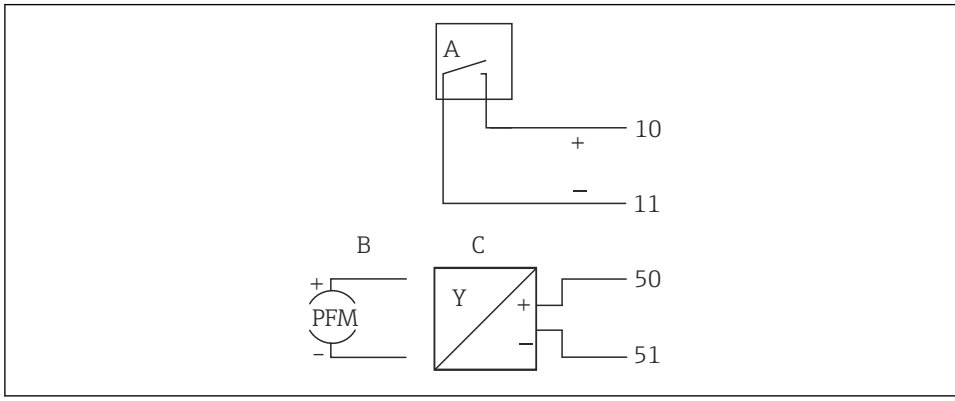
18 *Opening the housing of the device*

1 Terminal assignment labeling
2 Terminals

5.3 Connecting the sensors

5.3.1 Flow

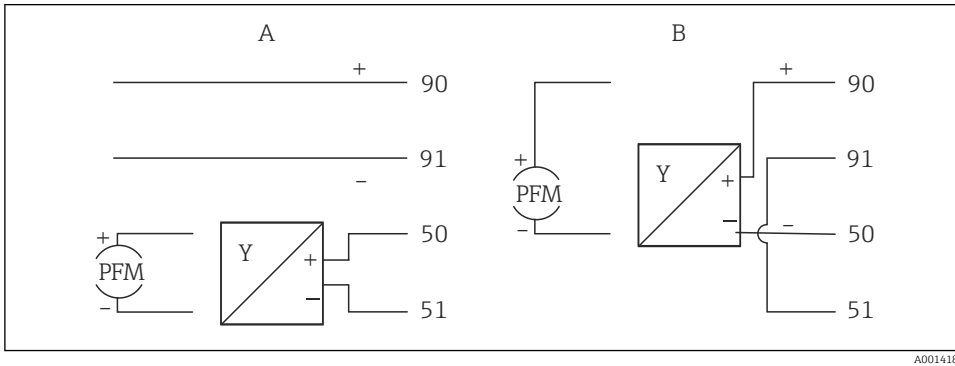
Flow sensors with external power supply



19 *Connecting a flow sensor*

A Voltage pulses or contact sensors including EN 1434 Type IB, IC, ID, IE
B Current pulses
C 0/4 to 20 mA signal

Flow sensors with power supply via the steam calculator

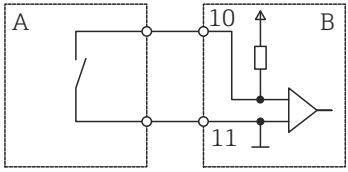
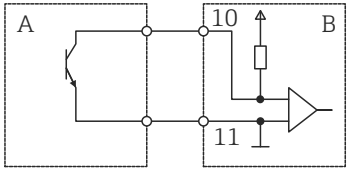
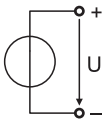
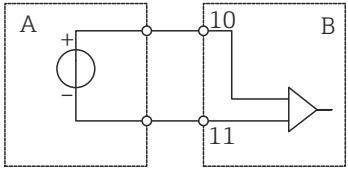


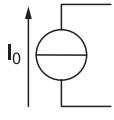
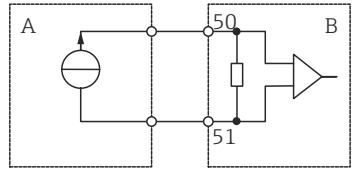
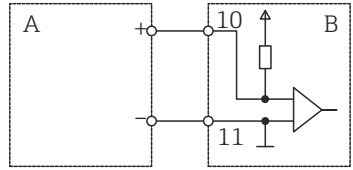
20 *Connecting active flow sensors*

A 4-wire sensor
B 2-wire sensor

Settings for flow sensors with pulse output

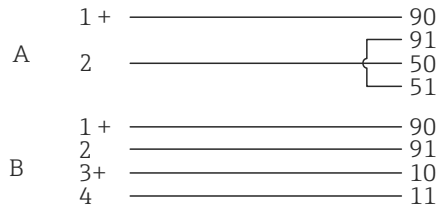
The input for voltage pulses and contact sensors is divided into different types according to EN1434 and provides a supply for switching contacts.

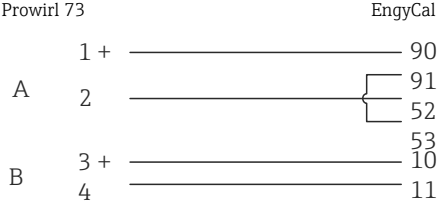
Pulse output of the flow sensor	Setting at the Rx33	Electrical connection	Notes
Mechanical contact  A0015360	Pulse ID/IE up to 25 Hz	 A0015354 *A Sensor* *B Rx33*	As an alternative, it is possible to choose "Pulse IB/IC+U" up to 25 Hz. The current flow via the contact is then lower (approx. 0.05 mA instead of approx. 9 mA). Advantage: lower power consumption, disadvantage: less immunity to interference.
Open collector (NPN)  A0015361	Pulse ID/IE up to 25 Hz or up to 12.5 kHz	 A0015355 *A Sensor* *B Rx33*	As an alternative, it is possible to choose "Pulse IB/IC+U". The current flow via the transistor is then lower (approx. 0.05 mA instead of approx. 9 mA). Advantage: lower power consumption, disadvantage: less immunity to interference.
Active voltage  A0015362	Pulse IB/IC+U	 A0015356 *A Sensor* *B Rx33*	The switching threshold is between 1 V and 2 V

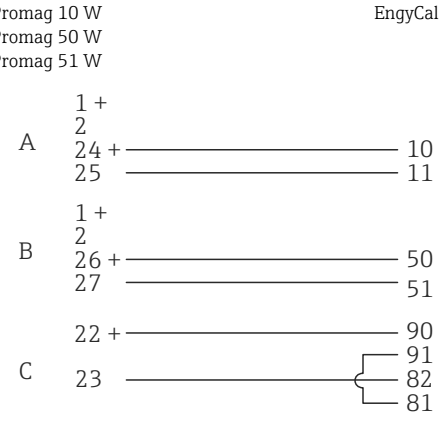
Pulse output of the flow sensor	Setting at the Rx33	Electrical connection	Notes
Active current  A0015363	Pulse I	 A0015357 *A Sensor* *B Rx33*	The switching threshold is between 8 mA and 13 mA
Namur sensor (as per EN60947-5-6)	Pulse ID/IE up to 25 Hz or up to 12.5 kHz	 A0015359 *A Sensor* *B Rx33*	No monitoring for short circuit or line break takes place.

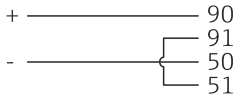
Voltage pulses and transmitters according to Class IB and IC (low switching thresholds, small currents)	≤ 1 V corresponds to Low level ≥ 2 V corresponds to High level U max 30 V, U no-load: 3 to 6 V	Floating contacts, reed transmitters
Transmitters to Class ID and IE for higher currents and power supplies	≤ 1.2 mA corresponds to Low level ≥ 2.1 mA corresponds to High level U no-load: 7 to 9 V	

Endress+Hauser flowmeters

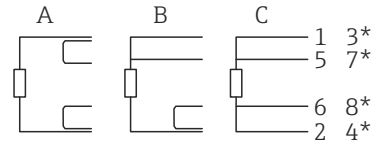
Flow sensors with PFM or pulse output: Proline Prowirl 72 and Proline Prosonic Flow 92F	Prowirl 72 Prosonic Flow 92F — EngyCal  A0014181 A = PFM B = pulse: Terminals 90/91 transmitter power supply, alternatively via external supply unit

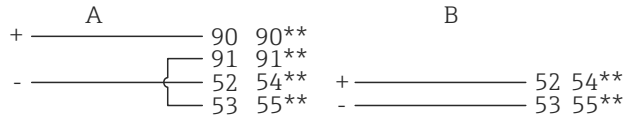
Flow sensor with temperature signal and pulse output: Proline Prowirl 73	 A = Transmitter power supply, temperature signal (0/4 to 20 mA) B = Pulse (open collector) for volume flow

Flow sensors with current or pulse output: Proline Promag 10W Proline Promag 50W Proline Promag 51W	 A = Pulse input, B = Current input, C = Direction signal via open collector Promag devices must be powered by an external power supply using terminals 1+ and 2.

DP sensors: Deltabar M PMD55, Deltabar S PMD 70/75	

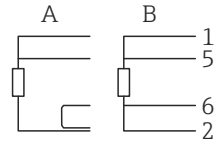
5.3.2 Temperature

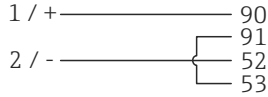
Connecting the RTD sensors	 A0014529 A = 2-wire connection B = 3-wire connection C = 4-wire connection * only use in event of energy calculation with heat differential /T, temperature sensor in steam Terminals 1, 2, 5, 6: temperature Terminals 3, 4, 7, 8: temperature

Temperature transmitter connection	 A0014528 A = without external power supply of the transmitter, B = with external power supply of the transmitter ** only use in event of energy calculation with heat differential /T, temperature sensor in steam Terminals 90, 91: transmitter power supply Terminals 52, 53: temperature input

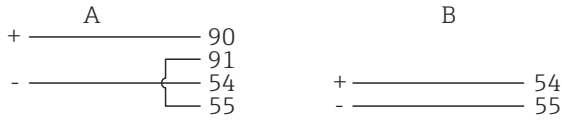
To ensure the highest level of accuracy, we recommend using the RTD 4-wire connection, as this compensates for measurement inaccuracies caused by the mounting location of the sensors or the line length of the connecting cables.

Endress+Hauser temperature sensors and transmitters

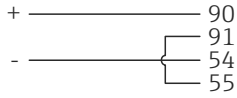
Connection for TR10 RTD sensor	 A0014530 A = 3-wire connection B = 4-wire connection Terminals 1, 2, 5, 6: temperature

Connection of TMT181, TMT121 temperature transmitter	 A0014531 Terminals 90, 91: transmitter power supply Terminals 52, 53: temperature

5.3.3 Pressure

Pressure sensor connection	 A0015152 A = 2-wire sensor with power supply via the steam calculator B = 4-wire sensor with external power supply Terminals 90, 91: transmitter power supply Terminals 54, 55: pressure

Endress+Hauser pressure transmitter Cerabar M, Cerabar S

Cerabar M, Cerabar S	 A0014532 Terminals 90, 91: transmitter power supply Terminals 54, 55: pressure

5.4 Outputs

5.4.1 Analog output

This output can be used either as a 0/4 to 20 mA current output or as a voltage pulse output. The output is galvanically isolated. Terminal assignment, (→ 20).

5.4.2 Relay

The two relays can be switched in case of fault messages or a limit violation.

Relay 1 or 2 can be selected under **Setup→Advanced setup→System→Fault switching**.

Limit values are assigned under **Setup→Advanced setup→Application→Limits**. Possible settings for limit values are described in the "Limits" section of the Operating Instructions.

5.4.3 Pulse output

Voltage level:
- 0 to 2 V corresponds to Low level
- 15 to 20 V corresponds to High level

Maximum output current:22 mA

5.4.4 Open collector output

The two digital outputs can be used as status or pulse outputs. Make the selection in the following menus **Setup→Advanced setup** or **Expert→Outputs→Open collector**

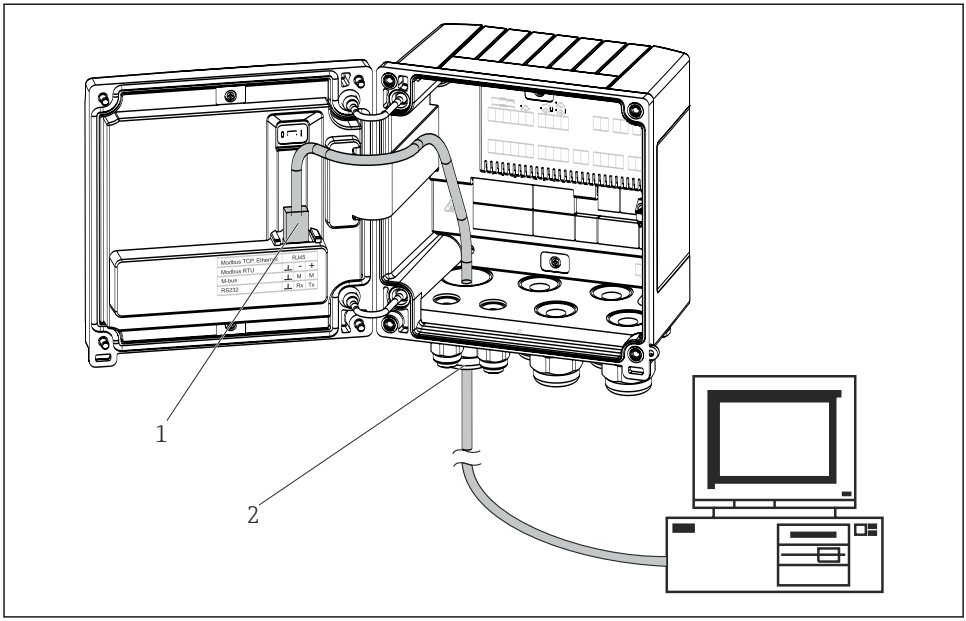
5.5 Communication

The USB interface is always active and can be used independently of other interfaces. Parallel operation of multiple optional interfaces, e.g. fieldbus and Ethernet, is not possible.

5.5.1 Ethernet TCP/IP (optional)

The Ethernet interface is galvanically isolated (testing voltage: 500 V). A standard patch cable (e.g. CAT5E) can be used to connect the Ethernet interface. A special cable gland is available for this purpose which allows users to guide pre-terminated cables through the housing. Via the Ethernet interface, the device can be connected using a hub or a switch or directly to office equipment.

- Standard: 10/100 Base T/TX (IEEE 802.3)
- Socket: RJ-45
- Max. cable length: 100 m



21 Connection of Ethernet TCP/IP, Modbus TCP

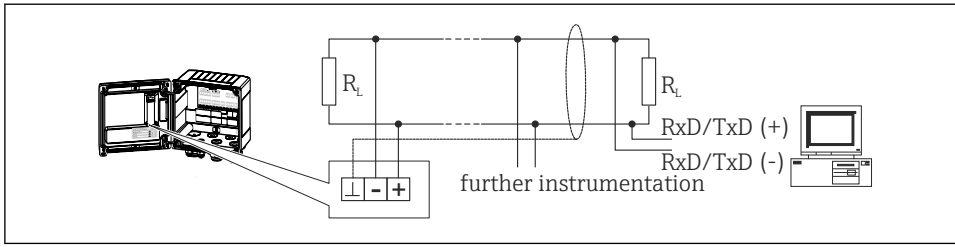
1 Ethernet, RJ45
2 Cable entry for Ethernet cable

5.5.2 Modbus TCP (optional)

The Modbus TCP interface is used to connect the device to higher-order systems to transmit all measured values and process values. The Modbus TCP interface is physically identical to the Ethernet interface (→ 21, 30).

5.5.3 Modbus RTU (optional)

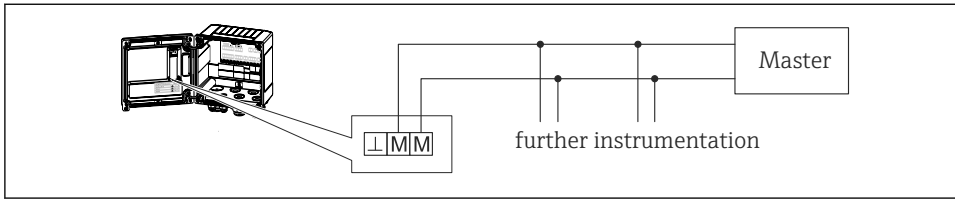
The Modbus RTU (RS-485) interface is galvanically isolated (testing voltage: 500 V) and used to connect the device to higher-order systems to transmit all measured values and process values. It is connected via a 3-pin plug-in terminal in the housing cover.



22 Connection of Modbus RTU

5.5.4 M-Bus (optional)

The M-Bus (Meter Bus) interface is galvanically isolated (testing voltage: 500 V) and used to connect the device to higher-order systems to transmit all measured values and process values. It is connected via a 3-pin plug-in terminal in the housing cover.



23 Connection of M-Bus

5.6 Post-connection check

After completing the device's electrical installation, carry out the following checks:

Device condition and specifications	**Notes**
Is the device or cable damaged (visual inspection)?	-
Electrical connection	**Notes**
Does the supply voltage match the specifications on the nameplate?	100 to 230 V AC/DC (±10 %) (50/60 Hz) 24 V DC (−50 % / +75 %) 24 V AC (±50 %) 50/60 Hz
Do the cables have adequate strain relief?	-
Are the power supply and signal cables correctly connected?	See wiring diagram on the housing

6 Operation

6.1 General notes for operation

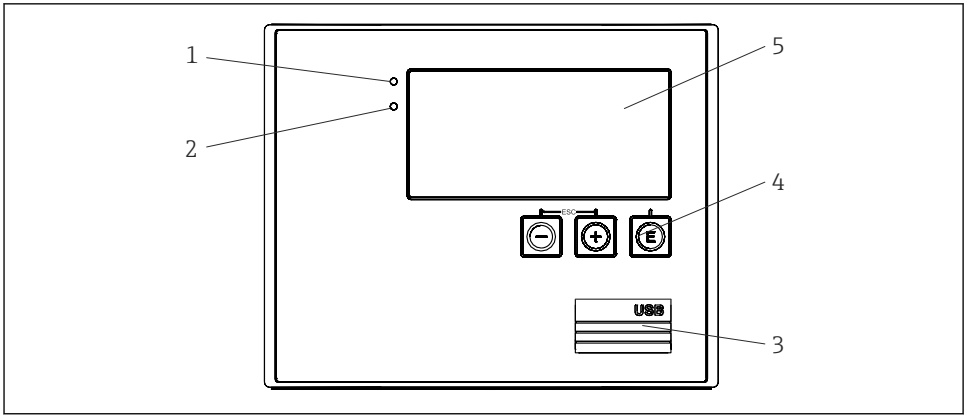
The steam calculator can be configured using keys or using the "FieldCare" operating software.

Die Bediensoftware inklusive Schnittstellenkabel ist als Bestelloption erhältlich, d.h. nicht Grundbestandteil des Lieferumfangs.

The configuration is locked if the device is locked by the hardware lock (→ 33), user code or digital input.

Details, see section "Access protection" in the Operating Instructions.

6.2 Display and operating elements



24 *Display and operating elements of the device*

1 *LED green, "Operation"*
2 *LED red, "Fault indicator"*
3 *USB connection for configuration*
4 *Operating keys: -, +, E*
5 *160x80 DOT matrix display*

Green LED for voltage, red LED for alarm/error. Green LED is always illuminated as soon as power is supplied to the device.

Slow flashing of the red LED (approx. 0.5 Hz): the device has been put into bootloader mode.

Fast flashing of the red LED (approx. 2 Hz): in normal operation: maintenance required. During firmware update: data transmission active.

Red LED illuminated constantly: device error.

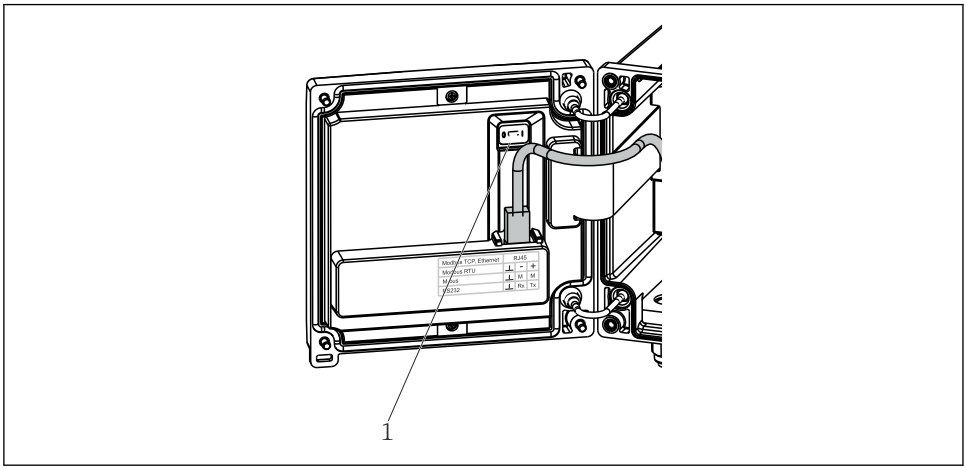
6.2.1 Operating elements

3 operating keys, "-", "+", "E"

Esc/back function: press "-" and "+" simultaneously.

Enter/confirm entry: press "E"

Hardware lock

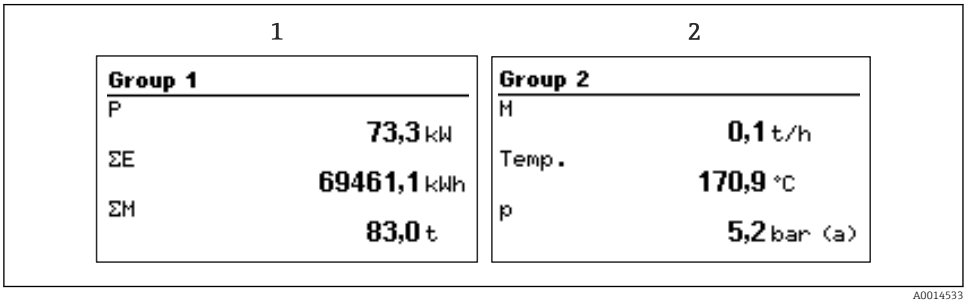


A0015168

25 Hardware lock

1 Hardware lock on the back of the housing cover

6.2.2 Display



A0014533

26 Display of the steam calculator (example)

1 Display Group 1
2 Display Group 2

6.2.3 "FieldCare Device Setup" operating software

For configuring the device using the FieldCare Device Setup software, connect the device to your computer's USB interface.

Establishing a connection

1. Start FieldCare.
2. Connect the device to the computer via USB.
3. Generate project via File/New.
4. Select communication DTM (CDI Communication USB).
5. Add device EngyCal® RS33.
6. Click "Establish connection".
7. Start configuration.

Carry out the rest of the configuration of the device according to these Operating Instructions for the device. The entire Setup menu, i.e. all parameters listed in these Operating Instructions, is also included in the FieldCare Device Setup.

NOTICE

Undefined switching of outputs and relays

- The device can enter undefined states during configuration with FieldCare! This can result in undefined switching of outputs and relays.

6.3 Operating matrix

For a complete overview of the operating matrix including all configurable parameters, see appendix of the operating instructions.

Sprache/Language	Pick list with all available operating languages. Select the language of the device.

Display/operation menu	▪ Select the group for display (automatic change or fixed display group) ▪ Setting for the display brightness and contrast ▪ Display the stored analyses (Day, Month, Year, Billing date, Totalizer)

Setup menu	In this Setup, you can configure the parameters for quick commissioning of the device. Advanced setup includes all important parameters for configuring the instrument function. ▪ Units ▪ Pulse value, Value ▪ Date and time ▪ Pressure Parameters for quick commissioning Advanced setup (settings that are not essential for basic operation of the device) Special settings can be configured via "Expert".

Diagnostics menu	Device information and service functions for a swift device check. ▪ Diagnostic messages and list ▪ Event logbook ▪ Device information ▪ Simulation ▪ Measured values, outputs

Expert menu	The Expert menu offers access to all operating options of the device, including fine tuning and service functions. ▪ Jump directly to parameters via Direct Access (only on the device) ▪ Service code for displaying service parameters (via PC operating software only) ▪ System (settings) ▪ Inputs ▪ Outputs ▪ Application ▪ Diagnostics

7 Commissioning

Make sure that all post-connection checks have been carried out before putting your device into operation:
Checklist, 'Post-connection check' section, (→ 31).

After the operating voltage is applied, the display and the green LED are illuminated. The device is now ready to operate and can be configured via the keys or the "FieldCare" parameter configuration software (→ 34).

Remove the protective film from the display as this would otherwise affect the readability of the display.

7.1 Quick commissioning/make it run

The standard application for steam mass/energy is commissioned in just a few moments by simply configuring 5 operating parameters in the **Setup** menu.

Prerequisites for quick commissioning:

- Flow transmitter with pulse output
- RTD temperature sensor, 4-wire direct connection
- Absolute pressure sensor with current output 4 to 20 mA

Menu/setup
- **Units**: Select unit type (SI/US)
- **Pulse value**: Select the unit of the pulse value of the flow transmitter
- **Value**: Enter the pulse value of the flow sensor
- **Date/time**: Set the date and time
- **Pressure**: Set the measuring range for the pressure sensor

The device is now operational and ready for measuring the steam mass and heat energy.

You can configure device functions, such as data logging, tariff function, bus connection and the scaling of current inputs for flow or temperature, in the **Advanced setup** menu or in the **Expert** menu. A description of these menus can be found in the Operating Instructions.

Here, you can also find the settings for the inputs (e.g. when connecting a relative pressure sensor, flow transmitter with a current output etc.).

- Inputs/flow:
  Select the signal type and enter the start and end of the measuring range (for current signal) or the pulse value of the flow transmitter.
- Inputs/temperature:
  Select the signal type and enter the type of connection or the start and end of the measuring range (for current signals).
- Inputs/pressure:
  Select the signal type and the pressure unit (absolute or relative) and enter the start and end of the measuring range.

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