bürkert
FLUID CONTROL SYSTEMS

Type 8025 - 8035 - SE35

Flowmeter - Flow Transmitter
Durchflussmessgerät - Durchflusstransmitter
Débitmètre - Transmetteur de débit

Operating Instructions

Bedienungsanleitung
Manuel d'utilisation

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1 ABOUT THESE OPERATING INSTRUCTIONS

These Operating Instructions describes the entire life cycle of the device. Please keep these Operating Instructions in a safe place, accessible to all users and any new owners.

These Operating Instructions contains important safety information.

Failure to comply with these instructions can lead to hazardous situations. Pay attention in particular to the chapters 3 Basic safety information and 2 Intended use.

▸ Whatever the version of the device, these Operating Instructions must be read and understood.

1.1 Symbols used

DANGER

Warns against an imminent danger.

▸ Failure to observe this warning can result in death or in serious injury.

WARNING

Warns against a potentially dangerous situation.

▸ Failure to observe this warning can result in serious injury or even death.

CAUTION

Warns against a possible risk.

▸ Failure to observe this warning can result in substantial or minor injuries.

NOTICE

Warns against material damage.

Indicates additional information, advice or important recommendations.

Refers to information contained in these Operating Instructions or in other documents.

▸ Indicates an instruction to be carried out to avoid a danger, a warning or a possible risk.

→ Indicates a procedure to be carried out.

Indicates the result of a specific instruction.

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1.2 Definition of the word "device"

The word "device" used within these Operating Instructions always refers to:

- the flowmeter type 8025 compact version,
- the flow transmitter type 8025 in panel version,
- the flow transmitter type 8025 in wall-mounted version,
- the flowmeter type 8035 or
- the flow transmitter type SE35.

2 INTENDED USE

Use of the device that does not comply with the instructions could present risks to people, nearby installations and the environment.

The flowmeter type 8025 compact version, the flowmeter type 8035 and the flow transmitter SE35 associated with a sensor-fitting are designed to measure the flow rate of a liquid and to totalise the volume of a liquid.

The flow transmitter type SE35 must be mounted on a sensor-fitting type S030, S070 or S077.

The flow transmitter type 8025 in panel or in wall-mounted version is a transmitter that must be connected to:

- an 8020 flow sensor with a sinus or a pulse output, only in "Low Power" version,
- an 8030 flow sensor with a sinus or a pulse output, only in "Low Power" version.

▸ Use this device in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the operating instructions.

▸ Never use this device for security applications.

▸ Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.

▸ Only operate a device in perfect working order.

▸ Requirements for the safe and proper operation of the device are proper transport, storage and installation, as well as careful operation and maintenance.

▸ Only use the device as intended.

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3 BASIC SAFETY INFORMATION

This safety information does not take into account any contingencies or occurrences that may arise during installation, use and maintenance of the product.

The operating company is responsible for the respect of the local safety regulations including for the staff safety.

Danger due to electrical voltage.

- If a 12...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- All equipment connected to the wall-mounted or to the panel versions of the flow transmitter 8025 must be double insulated with respect to the mains according to the standard UL/EN 61010-1.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Risk of injury due to high fluid temperatures.

- Use safety gloves to handle the device.
- Stop the circulation of fluid and drain the pipe before loosening the process connections.

Risk of injury due to the nature of the fluid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous fluids.

Various dangerous situations

To avoid injury take care:

- not to use the device in explosive atmospheres.
- not to use the device in an environment incompatible with the materials it is made of.
- not to subject the device to mechanical loads.
- not to make any modifications to the device.
- to prevent any unintentional power supply switch-on.
- to carry out the installation and maintenance work by qualified and skilled staff with the appropriate tools.
- to guarantee a defined or controlled restarting of the process, after a power supply interruption.
- to use the device only if in perfect working order and in compliance with the instructions provided in the operating instructions.
- to observe the general technical rules when installing and using the device.

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NOTICE

The device may be damaged by the fluid in contact with.

- Systematically check the chemical compatibility of the component materials of the device and the fluids likely to come into contact with it (for example: alcohols, strong or concentrated acids, aldehydes, alkaline compounds, esters, aliphatic compounds, ketones, halogenated aromatics or hydrocarbons, oxidants and chlorinated agents).

NOTICE

Elements / Components sensitive to electrostatic discharges

This device contains electronic components sensitive to electrostatic discharges. They may be damaged if they are touched by an electrostatically charged person or object. In the worst case scenario, these components are instantly destroyed or go out of order as soon as they are activated.

- To minimise or even avoid all damage due to an electrostatic discharge, take all the precautions described in standard EN 61340-5-1.
- Also ensure that you do not touch any of the live electrical components.

4 GENERAL INFORMATION

4.1 Manufacturer's address and international contacts

To contact the manufacturer of the device, use following address:

Bürkert SAS

Rue du Giessen

BP 21

F-67220 TRIEMBACH-AU-VAL

You may also contact your local Bürkert sales office.

The addresses of our international sales offices are available on the internet at: country.burkert.com

4.2 Warranty conditions

The condition governing the legal warranty is the conforming use of the device in observance of the operating conditions specified in this Operating Instructions.

4.3 Information on the Internet

You can find the Operating Instructions and Technical Data Sheets regarding the types 8025, 8035 and SE35 at: country.burkert.com

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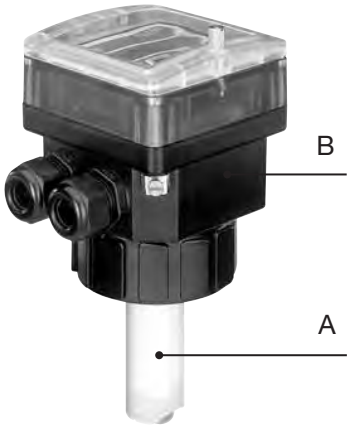
5 DESCRIPTION

According to the version, the device requires a 12...36 V DC or a 115/230 V AC power supply.

The electrical connection is carried out via a male fixed connector or on the terminal blocks of the electronic board: whether directly, whether via 2 or 3 cable glands.

5.1 Construction of the flowmeter 8025 compact version

The flowmeter 8025 compact version comprises:

	A: a paddle-wheel flow sensor, the rotation of which generates pulses. Set in rotation by the flow, the 4 permanent magnets integrated in the vanes of the paddle generate pulses, the frequency of which is proportional to the flow velocity of the fluid. A conversion coefficient specific to each pipe (material and diameter) is necessary to establish the flow rate value associated with the measurement. The conversion coefficient (K-factor) expressed in pulses per litre is given in the Operating Instructions for the S020 fitting used, available under country.burkert.com
	B: a flow transmitter with display and 2 cable glands

5.2 Construction of the flow transmitter 8025 in panel version

	The 8025 in panel version is a flow transmitter with display

5.3 Construction of the flow transmitter 8025 in wall-mounted version

	The 8025 in wall-mounted version is a flow transmitter with display and 3 cable glands

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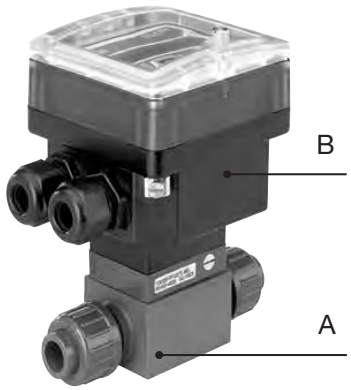
5.4 Construction of the flow transmitter SE35

	The SE35 is a flow transmitter with display and 2 cable glands

5.5 Construction of the flowmeter 8035

The flowmeter 8035 comprises:

	A: an S030 sensor-fitting including the paddle-wheel flow sensor. Set in rotation by the flow, the 4 permanent magnets integrated in the vanes of the paddle generate pulses, the frequency of which is proportional to the flow velocity of the fluid. A conversion coefficient specific to each pipe (material and diameter) is necessary to establish the flow rate value associated with the measurement. The conversion coefficient (K-factor) expressed in pulses per litre is given in the Operating Instructions for the S030 sensor-fitting used available under country.burkert.com
	B: a flow transmitter type SE35 (see chapter 5.4)

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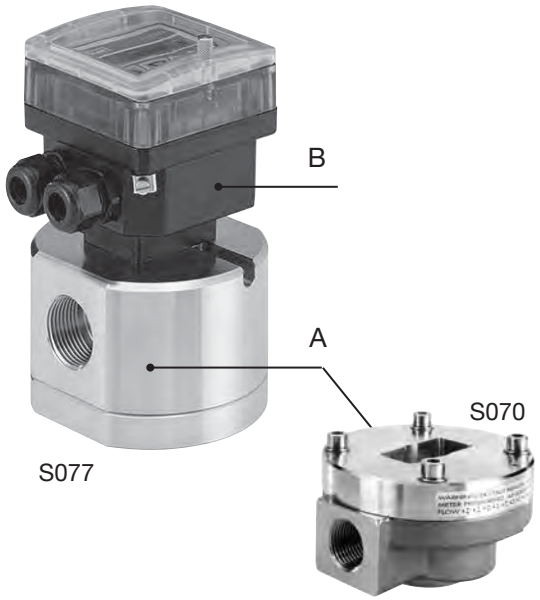
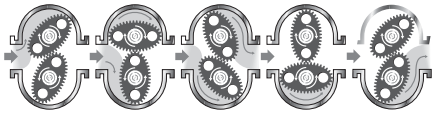
5.6 Construction of the flow transmitter SE35 with sensor-fitting S070 or S077



A: an S070 or S077 sensor-fitting including the flow sensor with oval gears.

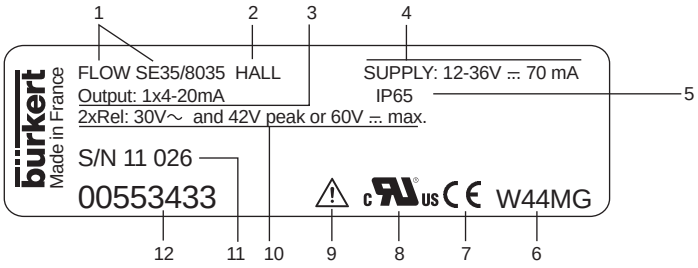


Set in rotation by the flow, the magnets integrated in the oval gears generate pulses, the frequency of which is proportional to the volume of fluid. A conversion coefficient specific to each pipe (material and diameter) is necessary to establish the flow rate value associated with the measurement.

The conversion coefficient (K-factor) expressed in pulses per litre is given in the Operating Instructions for the S070 or S077 sensor-fitting used, available under: country.burkert.com

B: a flow transmitter type SE35 (see chapter 5.4)

5.7 Description of the rating plate



1. Measured quantity and type of the device
2. Type of sensor
3. Characteristics of the current output
4. Power supply and max. of current consumption
5. Protection class of the device
6. Manufacturing code
7. Conformity logo
8. Certification
9. Warning: Before using the device, take into account the technical specifications described in the Operating Instructions.
10. Specification of the relay outputs
11. Serial number
12. Article number

Fig. 1: Rating plate of the device (example)

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6 TECHNICAL DATA

6.1 Technical data of the flowmeter 8025 compact version

6.1.1 Conditions of use of a 8025 compact version

Ambient temperature	
• 12...36 V DC version	• –10 °C...+60 °C
• 115/230 V AC version	• –10 °C...+50 °C
Air humidity	< 80 %, non condensated
Height above see level	max. 2000 m
Operating conditions	Continuous operation
Mobility of the device	Fixed device
Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
Protection class according to IEC/EN 60529	IP65 [1], device wired, cover lid screwed tight and cable glands tightened or female connector plugged in and secured with screws (depending on the version)

[1] not evaluated by UL

6.1.2 Conformity to standards and directives of a 8025 compact version

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of Conformity (if applicable).

Conformity to the Pressure Equipment Directive

→ Make sure the device materials are compatible with the fluid.

→ Make sure the pipe DN and the PN are adapted for the device.

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

• Device used on a piping (PS = maximum admissible pressure; DN = nominal diameter of the pipe)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PSxDN ≤ 5000

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UL-Certification

Finished devices with variable key PU01 or PU02 are UL-certified devices and comply also with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1

Identification on the device	Certification	Variable key
c US	UL-recognized	PU01
c UL US LISTED Measuring Equipment EXXXXXX	UL-listed	PU02

6.1.3 Fluid data of a 8025 compact version

Type of fluid	neutral or slightly aggressive liquids
Fluid viscosity	max. 300 cSt
Rate of solid particles	max. 1 %
Fluid temperature	The fluid temperature may be restricted by the fluid pressure and the material the S020 fitting used is made of (see Fig. 2)
• with S020 fitting in PVC	• 0 °C...+50 °C
• with S020 fitting in PP	• 0 °C...+80 °C
• with S020 fitting in PVDF, stainless steel or brass	• –15 °C...+80 °C
Fluid pressure	PN10 [1] max The fluid pressure may be restricted by the fluid temperature and the material the S020 fitting used is made of (see Fig. 2)
Flow rate measurement	
• Measurement range	
- Sensor with pulse output (Hall)	- 0.3...10 m/s
- Sensor with sinus output (coil)	- 0.5...10 m/s
• Measurement deviation	
- with standard K-factor of the S020 fitting	- ±2.5 % of the measured value [2]
- with K-factor determined with a teach-in procedure	- ±1 % of the measured value (at the value of the teach-in flow rate) [2]
• Linearity	• ±0.5 % of the full scale (10 m/s)
• Repeatability	• ±0.4 % of the measured value [2]

[1] not evaluated by UL

[2] Determined in the following reference conditions: medium = water, water and ambient temperatures 20 °C, min. upstream and downstream distances respected, appropriate pipe dimensions

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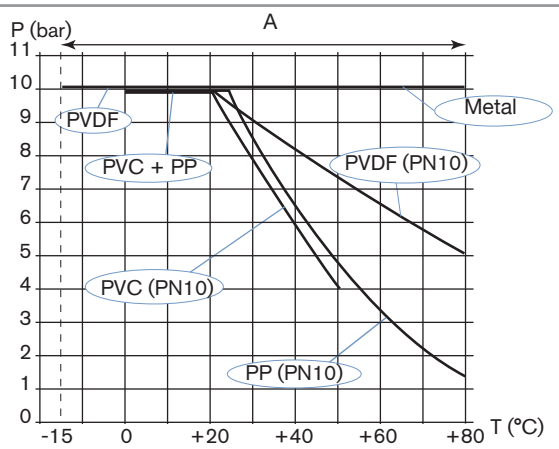

A: range of use

Fig. 2: Fluid temperature / fluid pressure dependency curves for the 8025 compact version, depending on the material the S020 fitting is made of

6.1.4 Material data of a 8025 compact version

Part	Material
Housing /cover, lid, nut	PC
Frontfoil	Polyester
Screws	Stainless steel
Male fixed connector or cable glands	PA
Identification label	Polyester
Wetted parts	
• Sensor holder / Paddle-wheel	• PVDF
• Axis and bearings of the paddle-wheel	• Ceramics
• Seal	• FKM (optional EPDM)
• Fitting S020	• Refer to the Operating Instructions of the fitting

6.1.5 Dimensions of a 8025 compact version

→ Please refer to the technical data sheets regarding the flowmeter type 8025 compact version, available at: country.burkert.com

6.1.6 Electrical data of a 8025 compact version

12...36 V DC power supply	• filtered and regulated • oscillation rate: ±10 % • Connection to main supply: permanent (through external SELV (safety extra-low voltage) and through LPS (limited power source))
Power source (not supplied) **for versions supplied with 12...36 V DC**	• Limited power source according to UL / EN 60950-1 standards • or limited energy circuit according to UL / EN 61010-1, Paragraph 9.4

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115/230 V AC power supply	
• frequency	• 50/60 Hz
• supplied voltage	• 27 V DC, regulated
• Maximum current	• 125 mA
• integrated protection	• 125 mA time-delay fuse
• power	• 3 VA
Maximum current consumption version 12...36 V DC without relais	25 mA
Maximum current consumption version 12...36 V DC with relais	70 mA
Maximum current consumption version 115/230 V AC	125 mA max. at 27 V DC
Pulse output (transistor)	polarized, potential-free
• type	• NPN/PNP (wiring dependant)
• function	• pulse output, adjustable pulse value
• frequency (f)	• 2.5...400 Hz
• electrical data	• 5...36 V DC, 100 mA max., voltage drop 2.5 V DC at 100 mA
• duty cycle	• 0.5
• protection	• galvanically insulated, and protected against over-voltages, polarity reversals and short-circuits
Relay output	
• operating	• hysteresis, adjustable thresholds, normally open
• electrical data of the load (non UL recognized devices)	• 230 V AC / 3 A or 40 V DC / 3 A (resistive load)
• electrical data of the load (UL recognized devices)	• max. 30 V AC and 42 V peak / 3 A or max. 60 V DC / 1 A To use the relay outputs in a wet location, observe the following DANGER safety instruction.
Current output	4...20 mA, sinking or sourcing mode (wiring dependant)
• accuracy	• ± 1 %
• response time (10 %...90 %)	• 6 s (default)
• max. loop impedance, 12...36 V DC version	• 900 Ω at 30 V DC, 600 Ω at 24 V DC, 50 Ω at 12 V DC
• max. loop impedance, 115/230 V AC version	• 800 Ω
• wiring, version without relays	• 2-wire
• wiring, version with relays	• 3-wire
Protection against polarity reversals	yes

DANGER

Danger due to the operation of the relay outputs of a UL device in a wet location.

▸ If a UL device is used in a wet location:

- energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
- or energize the relay outputs with a direct voltage of max. 35 V DC.

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6.2 Technical data of the flow transmitter 8025 in panel version

The following technical data are relevant for the flow transmitter 8025 in panel version, connected to a Bürkert flow sensor 8020, 8030 or SE30 in a "Low Power" version only.

6.2.1 Conditions of use of a 8025 in panel version

Ambient temperature	–10 °C...+60 °C
Air humidity	< 80 %, non condensated
Height above see level	max. 2000 m
Operating conditions	Continuous operation
Mobility of the device	Fixed device
Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
Protection class according to IEC/EN 60529	
• front parts	• IP65 [1], installation completed and closed cabinet
• non front parts	• IP20 [1] in the closed cabinet

[1] not evaluated by UL

6.2.2 Conformity to standards and directives of a 8025 in panel version

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of Conformity (if applicable).

UL-Certification

Finished devices with variable key PU01 or PU02 are UL-certified devices and comply also with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1

Identification on the device	Certification	Variable key
c US	UL-recognized	PU01
c UL US LISTED Measuring Equipment EXXXXXX	UL-listed	PU02

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6.2.3 Material data of a 8025 in panel version

Part	Material
Housing /cover	PC
Frontfoil	Polyester
Screws (4)	Stainless steel
Cable glands	PA
Identification label	Polyester

6.2.4 Dimensions of a 8025 in panel version

→ Please refer to the technical data sheets regarding the flow transmitter type 8025 in panel version, available at: country.burkert.com

6.2.5 Electrical data of a 8025 in panel version

12...36 V DC power supply	• filtered and regulated • oscillation rate: ±10 % • Connection to main supply: permanent (through external SELV (safety extra-low voltage) and through LPS (limited power source))
Power source (not supplied) **for versions supplied with 12...36 V DC**	• Limited power source according to UL / EN 60950-1 standards • or limited energy circuit according to UL / EN 61010-1, Paragraph 9.4
Maximum current consumption version 12...36 V DC without relais	25 mA
Maximum current consumption version 12...36 V DC with relais	70 mA
Pulse output (transistor)	polarized, potential-free
• type	• NPN/PNP (wiring dependant)
• function	• pulse output, adjustable pulse value
• frequency (f)	• 2.5...400 Hz
• electrical data	• 5...36 V DC, 100 mA max., voltage drop 2.5 V DC at 100 mA
• duty cycle	• 0.5
• protection	• galvanically insulated, and protected against over-voltages, polarity reversals and short-circuits
Relay output	
• operating	• hysteresis, adjustable thresholds, normally open
• electrical data of the load (non UL recognized devices)	• 230 V AC / 3 A or 40 V DC / 3 A (resistive load)
• electrical data of the load (UL recognized devices)	• max. 30 V AC and 42 V peak / 3 A or max. 60 V DC / 1 A To use the relay outputs in a wet location, observe the following DANGER safety instruction.

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Current output	4...20 mA, sinking or sourcing mode (wiring dependant)
• accuracy	• ± 1 %
• response time (10 %...90 %)	• 6 s (default)
• max. loop impedance, 12...36 V DC version	• 900 Ω à 30 V DC, 600 Ω à 24 V DC, 50 Ω à 12 V DC
• wiring, version without relays	• 2-wire
• wiring, version with relays	• 3-wire
Protection against polarity reversals	yes

DANGER

Danger due to the operation of the relay outputs of a UL device in a wet location.

▸ If a UL device is used in a wet location:

- energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
- or energize the relay outputs with a direct voltage of max. 35 V DC.

6.2.6 Specifications of a flow sensor connected to a 8025 in panel version

Sensor input	
• signal frequency	• 2.5...400 Hz
• pulse signal (Hall)	• NPN, open collector
• sinus signal (coil)	• typical sensitivity of 35 mV peak-peak, at 252 Hz
Sensor output	
• power supply	• 10...34 V DC (V+ minus 2 V DC), 1 mA max.

6.3 Technical data of the flow transmitter 8025 in wall-mounted version

The following technical data are relevant for the flow transmitter 8025 in wall-mounted version, connected to a Bürkert flow sensor 8020, 8030 or SE30 in a "Low Power" version only.

6.3.1 Conditions of use of a 8025 in wall-mounted version

Ambient temperature	–10 °C...+60 °C
Air humidity	< 80 %, non condensated
Height above see level	max. 2000 m
Operating conditions	Continuous operation
Mobility of the device	Fixed device
Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
Protection class according to IEC/EN 60529	IP65 [1], device wired, cover lid screwed tight and cable glands tightened

[1] not evaluated by UL

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6.3.2 Conformity to standards and directives of a 8025 in wall-mounted version

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of Conformity (if applicable).

6.3.3 Material data of a 8025 in wall-mounted version

Part	Material
Housing, cover	ABS
Frontfoil	Polyester
Screws (4)	Stainless steel
Cable glands / Cable clips	PA
Identification label	Polyester

6.3.4 Dimensions of a 8025 in wall-mounted version

→ Please refer to the technical data sheets regarding the flow transmitter type 8025 in wall-mounted version, available at: country.burkert.com

6.3.5 Electrical data of a 8025 in wall-mounted version

12...36 V DC power supply	• filtered and regulated • oscillation rate: ±10 % • Connection to main supply: permanent (through external SELV (safety extra-low voltage) and through LPS (limited power source))
Power source (not supplied) **for versions supplied with 12...36 V DC**	• Limited power source according to UL / EN 60950-1 standards • or limited energy circuit according to UL / EN 61010-1, Paragraph 9.4
115/230 V AC power supply	
• frequency	• 50/60 Hz
• supplied voltage	• 27 V DC, regulated
• Maximum current	• 250 mA
• integrated protection	• 250 mA time-delay fuse
• power	• 6 VA
Maximum current consumption version 12...36 V DC without relais	25 mA
Maximum current consumption version 12...36 V DC with relais	70 mA
Maximum current consumption version 115/230 V AC	250 mA max. at 27 V DC

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Pulse output (transistor)	polarized, potential-free
• type	• NPN/PNP (wiring dependant)
• function	• pulse output, adjustable pulse value
• frequency (f)	• 2.5...400 Hz
• electrical data	• 5...36 V DC, 100 mA max., voltage drop 2.5 V DC at 100 mA
• duty cycle	• 0.5
• protection	• galvanically insulated, and protected against over-voltages, polarity reversals and short-circuits
Relay output	
• operating	• hysteresis, adjustable thresholds, normally open
• electrical data of the load	• 230 V AC / 3 A or 40 V DC / 3 A (resistive load)
Current output	4...20 mA, sinking or sourcing mode (wiring dependant)
• accuracy	• ± 1 %
• response time (10 %...90 %)	• 6 s (default)
• max. loop impedance, 12...36 V DC version	• 900 Ω à 30 V DC, 600 Ω à 24 V DC, 50 Ω à 12 V DC
• max. loop impedance, 115/230 V AC version	• 800 Ω
• wiring, version without relays	• 2-wire
• wiring, version with relays	• 3-wire
Protection against polarity reversals	yes

6.3.6 Specifications of a flow sensor connected to a 8025 in wall-mounted version

Sensor input	
• signal frequency	• 2.5...400 Hz
• pulse signal (Hall)	• NPN, open collector
• sinus signal (coil)	• typical sensitivity of 35 mV peak-peak, at 252 Hz
Sensor output	
• power supply	• 10...34 V DC (V+ minus 2 V DC), 1 mA max.

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6.4 Technical data of the flow transmitter SE35

The technical data of the flow transmitter SE35 may be restricted by the sensor-fitting used.

▸ Please refer to the Operating Intstructions of the concerned fitting or sensor-fitting.

6.4.1 Conditions of use of a flow transmitter SE35

Ambient temperature	
• 12...36 V DC version	• –10 °C...+60 °C
• 115/230 V AC version	• –10 °C...+50 °C
Air humidity	< 80 %, non condensated
Height above see level	max. 2000 m
Operating conditions	Continuous operation
Mobility of the device	Fixed device
Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
Protection class according to IEC/EN 60529	IP65 [1], device wired, cover lid screwed tight and cable glands tightened or female connector plugged in and secured with screws (depending on the version)

[1] not evaluated by UL

6.4.2 Conformity to standards and directives of a flow transmitter SE35

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of Conformity (if applicable).

UL-Certification

Finished devices with variable key PU01 or PU02 are UL-certified devices and comply also with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1

Identification, on the device	Certification	Variable key
c UL us	UL-recognized	PU01
c UL us LISTED Measuring Equipment EXXXXXX	UL-listed	PU02

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6.4.3 Material data of a flow transmitter SE35

Part	Material
Housing / cover / lid / nut	PC
Frontfoil / screws	Polyester
Screws	Stainless steel
Male fixed connector or cable glands	PA
Identification label	Polyester

6.4.4 Dimensions of a flow transmitter SE35

→ Please refer to the technical data sheets regarding the flow transmitter SE35, available at: country.burkert.com

6.4.5 Electrical data of a flow transmitter SE35

12...36 V DC power supply	• filtered and regulated • oscillation rate: ±10 % • Connection to main supply: permanent (through external SELV (safety extra-low voltage) and through LPS (limited power source))
Power source (not supplied) **for versions supplied with 12...36 V DC**	• Limited power source according to UL / EN 60950-1 standards • or limited energy circuit according to UL / EN 61010-1, Paragraph 9.4
115/230 V AC power supply	
• frequency	• 50/60 Hz
• supplied voltage	• 27 V DC, regulated
• Maximum current	• 125 mA
• integrated protection	• 125 mA time-delay fuse
• power	• 3 VA
Maximum current consumption version 12...36 V DC without relais	25 mA
Maximum current consumption version 12...36 V DC with relais	70 mA
Maximum current consumption version 115/230 V AC	125 mA max. at 27 V DC
Pulse output (transistor)	polarized, potential-free
• type	• NPN/PNP (wiring dependant)
• function	• pulse output, adjustable pulse value
• frequency (f)	• 2.5...400 Hz
• electrical data	• 5...36 V DC, 100 mA max., voltage drop 2.5 V DC at 100 mA
• duty cycle	• 0.5
• protection	• galvanically insulated, and protected against over-voltages, polarity reversals and short-circuits

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Relay output	
• operating	• hysteresis, adjustable thresholds, normally open
• electrical data of the load (non UL recognized devices)	• 230 V AC / 3 A or 40 V DC / 3 A (resistive load)
• electrical data of the load (UL recognized devices)	• max. 30 V AC and 42 V peak / 3 A or max. 60 V DC / 1 A To use the relay outputs in a wet location, observe the following DANGER safety instruction.
Current output	4...20 mA, sinking or sourcing mode (wiring dependant)
• accuracy	• ± 1 %
• response time (10 %...90 %)	• 6 s (default)
• max. loop impedance, 12...36 V DC version	• 900 Ω at 30 V DC, 600 Ω at 24 V DC, 50 Ω at 12 V DC
• max. loop impedance, 115/230 V AC version	• 800 Ω
• wiring, version without relays	• 2-wire
• wiring, version with relays	• 3-wire
Protection against polarity reversals	yes

DANGER

Danger due to the operation of the relay outputs of a UL device in a wet location.

▸ If a UL device is used in a wet location:
- energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
- or energize the relay outputs with a direct voltage of max. 35 V DC.

6.5 Technical data of the flowmeter 8035

The flowmeter 8035 comprises an S030 sensor-fitting including the paddle-wheel flow sensor and a flow transmitter type SE35 (see chapter 5.5).

The technical data of the flowmeter 8035 may be restricted by the S030 sensor-fitting used.

▸ Please refer to the Operating Intstructions of the concerned sensor-fitting S030.

6.5.1 Conditions of use of a flowmeter 8035

Ambient temperature	
• 12...36 V DC version	• –10 °C...+60 °C
• 115/230 V AC version	• –10 °C...+50 °C
Air humidity	< 80 %, non condensated
Height above see level	max. 2000 m
Operating conditions	Continuous operation
Mobility of the device	Fixed device
Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
Protection class according to IEC/EN 60529	IP65 [1], device wired, cover lid screwed tight and cable glands tightened or female connector plugged in and secured with screws (depending on the version)

[1] not evaluated by UL

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6.5.2 Conformity to standards and directives of a flowmeter 8035

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of Conformity (if applicable).

Conformity to the Pressure Equipment Directive

→ Make sure the device materials are compatible with the fluid.

→ Make sure the pipe DN and the PN are adapted for the device.

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- Device used on a piping (PS = maximum admissible pressure; DN = nominal diameter of the pipe)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PSxDN ≤ 5000

UL-Certification

Finished devices with variable key PU01 or PU02 are UL-certified devices and comply also with the following standards:

- UL 61010-1
- CAN/CSA-C22.2 n°61010-1

Identification on the device	Certification	Variable key
c US	UL-recognized	PU01
c UL US LISTED Measuring Equipment EXXXXXX	UL-listed	PU02

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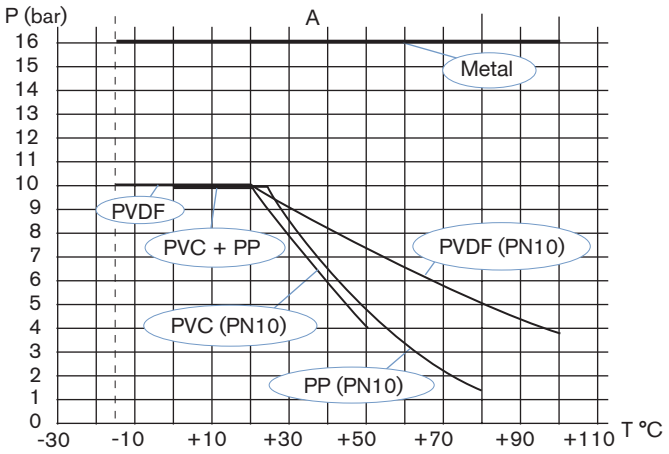
6.5.3 Fluid data of a flowmeter 8035

Type of fluid	neutral or slightly aggressive liquids
Fluid viscosity	max. 300 cSt
Rate of solid particles	max. 1 %
Fluid temperature	The fluid temperature may be restricted by the fluid pressure and the material the S030 sensor-fitting used is made of (see Fig. 3)
• with sensor-fitting S030 in PVC	• 0 °C...+50 °C
• with sensor-fitting S030 in PP	• 0 °C...+80 °C
• with sensor-fitting S030 in PVDF, stainless steel or brass	• –15 °C...+100 °C
Fluid pressure	The fluid pressure may be restricted by the fluid temperature and the material the S030 sensor-fitting used is made of (see Fig. 3)
• with sensor-fitting S030 in plastic	PN10 [1]
• with sensor-fitting S030 in metal	PN16 [1] (PN40 [1] on request)
Flow rate measurement	
• Measurement range	• 0.3...10 m/s
• Measurement deviation	
- with standard K-factor of the S030 sensor-fitting	- ±2.5 % of the measured value [2]
- with K-factor determined with a teach-in procedure	- ±1 % of the measured value [2] (at the value of the teach-in flow rate)
• Linearity	• ±0.5 % of the full scale (10 m/s)
• Repeatability	• ±0.4 % of the measured value [2]

[1] not evaluated by UL

[2] Determined in the following reference conditions: medium = water, water and ambient temperatures 20 °C, min. upstream and downstream distances respected, appropriate pipe dimensions



A: range of use

Fig. 3: Fluid temperature/pressure dependency curves for the flowmeter 8035, depending on the material the S030 sensor-fitting is made of

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6.5.4 Material data of a flowmeter 8035

Part	Material
Housing / cover / lid / nut	PC
Frontfoil	Polyester
Screws	Stainless steel
Male fixed connector or cable glands	PA
Identification label	Polyester
Wetted parts	
• Sensor-fitting S030	• Refer to the Operating Instructions of the sensor-fitting

6.5.5 Dimensions of a flowmeter 8035

→ Please refer to the technical data sheets regarding the flowmeter 8035, available at: country.burkert.com

6.5.6 Electrical data of a flowmeter 8035

→ Please refer to the electrical data of the flow transmitter SE35, chapter 6.4.5, page 25.

6.6 Technical data of the flow transmitter SE35 associated with a sensor-fitting S070 or S077

The technical data of the flow transmitter SE35 associated with a sensor-fitting S070 or S077 may be restricted by the S070 or S077 sensor-fitting used.

▸ Refer to the Operating Intstructions of the related sensor-fitting S070 or S077.

6.6.1 Conditions of use of a SE35 with sensor-fitting S070 or S077

Ambient temperature	
• 12...36 V DC version	• –10 °C...+60 °C
• 115/230 V AC version	• –10 °C...+50 °C
Air humidity	< 80 %, non condensated
Height above see level	max. 2000 m
Operating conditions	Continuous operation
Mobility of the device	Fixed device
Use	Indoor and outdoor (Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, against the effects of climatic conditions)
Installation category	Category I according to UL/EN 61010-1
Degree of pollution	Degree 2 according to UL/EN 61010-1
Protection class according to IEC/EN 60529	IP65 [1], device wired, cover lid screwed tight and cable glands tightened or female connector plugged in and secured with screws (depending on the version)

[1] not evaluated by UL

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6.6.2 Conformity to standards and directives of a SE35 with sensor-fitting S070 or S077

The applied standards, which verify conformity with the EU Directives, can be found on the EU Type Examination Certificate and/or the EU Declaration of Conformity (if applicable).

Conformity to the Pressure Equipment Directive

→ Make sure the device materials are compatible with the fluid.

→ Make sure the pipe DN and the PN are adapted for the device.

The device conforms to Article 4, Paragraph 1 of the Pressure Equipment Directive 2014/68/EU under the following conditions:

- Device used on a piping (PS = maximum admissible pressure; DN = nominal diameter of the pipe)

Type of fluid	Conditions
Fluid group 1, Article 4, Paragraph 1.c.i	DN ≤ 25
Fluid group 2, Article 4, Paragraph 1.c.i	DN ≤ 32 or PSxDN ≤ 1000
Fluid group 1, Article 4, Paragraph 1.c.ii	DN ≤ 25 or PSxDN ≤ 2000
Fluid group 2, Article 4, Paragraph 1.c.ii	DN ≤ 200 or PS ≤ 10 or PSxDN ≤ 5000

6.6.3 Fluid data of an SE35 with sensor-fitting S070 or S077

Type of fluid	Please refer to the Operating Intstructions of the concerned sensor-fitting S070 or S077
Fluid temperature	The fluid temperature may be restricted by the fluid pressure and the material the S070 or S077 sensor-fitting used is made of • Please refer to the Operating Intstructions delivered with the sensor-fitting S070 or S077 or to the concerned technical datasheet
Fluid pressure	The fluid pressure may be restricted by the fluid temperature and the material the S070 or S077 sensor-fitting used is made of • Please refer to the Operating Intstructions delivered with the sensor-fitting S070 or S077 or to the concerned technical datasheet
Flow rate measurement	
• Measurement range	
- viscosity > 5 mPa.s	- S070 : 2...1200 l/min - S077 : 2...1200 l/min
- viscosity < 5 mPa.s	- S070 : 3...616 l/min - S077 : 3...616 l/min

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• Measurement deviation	
- with standard K-factor of the sensor-fitting	- S070 : ±0.5 % of the measured value [1)] - S077 : ±1 % of the measured value [1)]
- with K-factor determined with a teach-in procedure	- S070 : ±0.5 % of the measured value [1)] (at the value of the teach-in flow rate) - S077 : ±0.5 % of the measured value [1)] (at the value of the teach-in flow rate)
• Repeatability	• ±0.03 % of the measured value [1)]

[1)] Determined in the following reference conditions: medium = water, water and ambient temperatures 20 °C, min. upstream and downstream distances respected, appropriate pipe dimensions

6.6.4 Material data of an SE35 with sensor-fitting S070 or S077

Part	Material
Housing / cover / lid / nut	PC
Frontfoil	Polyester
Screws	Stainless steel
Male fixed connector or cable glands	PA
Identification label	Polyester
Wetted parts	
• Sensor-fitting S070	• Refer to the Operating Instructions of the concerned sensor-fitting

6.6.5 Dimensions of an SE35 with sensor-fitting S070 or S077

→ Please refer to the technical data sheets regarding the flowmeter 8035, available at: country.burkert.com

6.6.6 Electrical data of an SE35 with sensor-fitting S070 or S077

→ Please refer to the electrical data of the flow transmitter SE35, chapter 6.4.5, page 25.

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7 INSTALLATION

7.1 Safety instructions

DANGER

Risk of injury due to electrical voltage.

- If a 12...36 V DC or a 14...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- All equipment connected to the wall-mounted or to the panel versions of the flow transmitter 8025 must be double insulated with respect to the mains according to the standard UL/EN 61010-1.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Risk of injury due to high fluid temperatures.

- Use safety gloves to handle the device.
- Stop the circulation of fluid and drain the pipe before loosening the process connections.

Risk of injury due to the nature of the fluid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of aggressive fluids.

WARNING

Risk of injury due to nonconforming installation.

- The electrical and fluid installation can only be carried out by qualified and skilled staff with the appropriate tools.
- Observe mounting instructions of the fitting or sensor-fitting.

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation.

- Take appropriate measures to avoid unintentional activation of the installation.
- Guarantee a set or controlled restarting of the process subsequent to any intervention on the device.

Risk of injury if the fluid pressure/temperature dependency is not respected.

- Take account of fluid temperature-pressure dependency according to the nature of the materials the fitting is made of (see the technical data and the operating instructions of the fitting used).
- Comply with the Pressure Equipment Directive 2014/68/EU.

Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.

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7.2 Fluid installation of the compact version of the flowmeter 8025

The compact version of the flowmeter 8025 is inserted into an S020 fitting mounted on the pipes:

1. Install the S020 fitting on the pipes,
2. Install the compact version of the flowmeter 8025 in the S020 fitting,
3. Finalise the installation of the 8025.

7.2.1 Install the S020 fitting on the pipes

→ Select an S020 fitting suitable for the speed of the fluid in the pipes

To select a fitting, refer to the calculation tables on the technical data sheet for the relevant fitting.

→ Choose a position for the fitting according to the design of the pipes, in such a way that:

- the upstream and downstream distances are respected according to the design of the pipes, see Fig. 4 and norm EN ISO 5167-1,
- the pipes are always filled to the level of the sensor (see Fig. 5),
- when mounted vertically, the flow direction of the fluid is upwards (see Fig. 5),
- air bubbles do not form around the sensor (see Fig. 5).

→ If necessary, use a flow conditioner to improve measurement precision,

→ Install the fitting on the pipes according to the instructions in the relevant Operating Instructions.

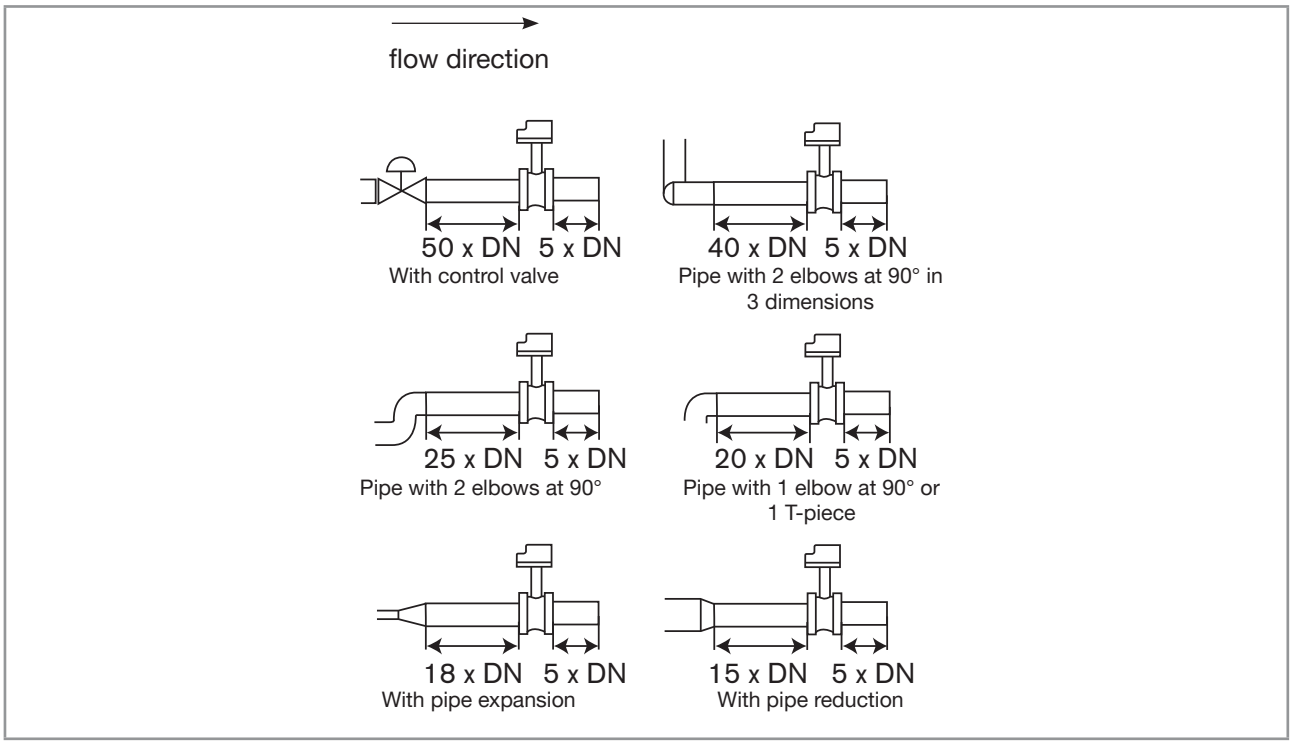

Fig. 4: Upstream and downstream distances depending on the design of the pipes

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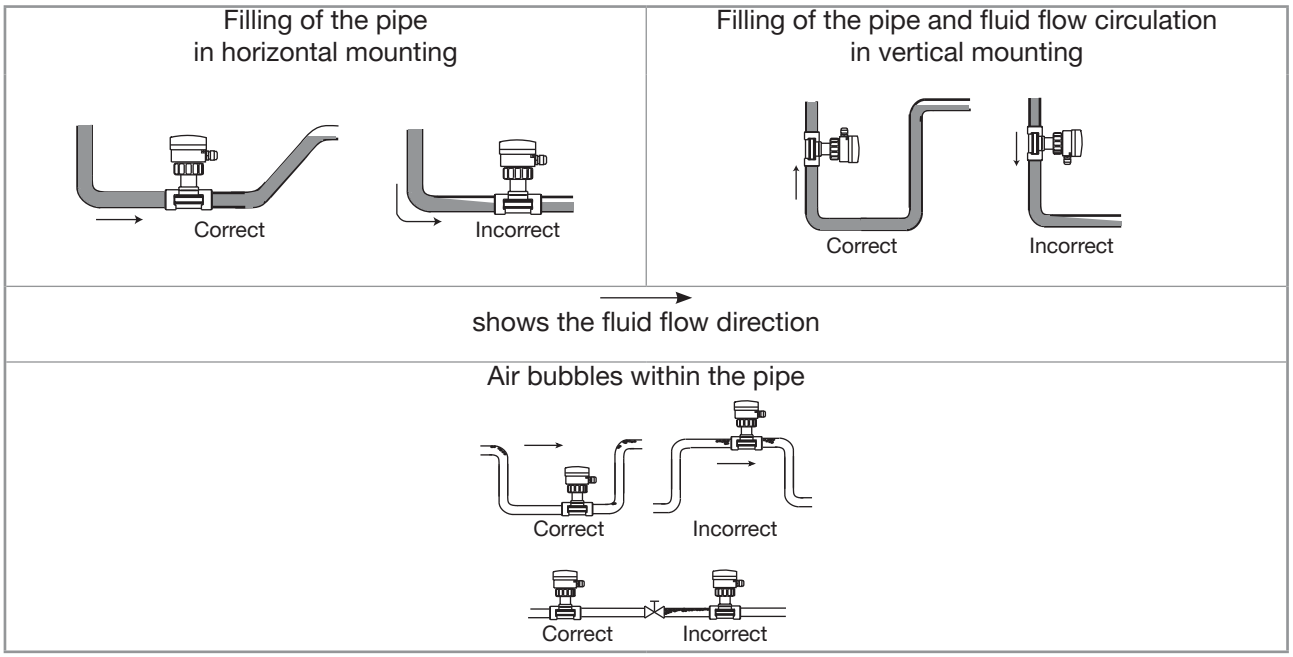
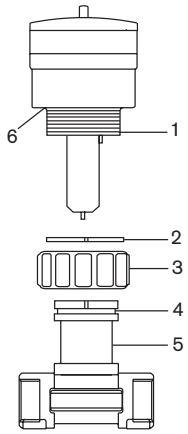


Fig. 5: Filling of the pipe, flow direction of the fluid, Vertical mounting Air bubbles within the pipe

7.2.2 Installation of the flowmeter 8025 into the fitting S020



→ Install the fitting [5] onto the pipe following the instructions in chapter 7.2.1.

→ Check that there is a seal [6] on the device [1] and that it is not damaged. Replace the seal if necessary.

→ Insert the nut [3] on the fitting [5].

→ Insert the snap ring [2] into the groove [4].

→ Check that the seal [6] is correctly inserted on the device [1].

→ Insert the device [1] into the fitting [5].

If the mounting is correctly done the device cannot be turned around anymore.

→ Hand lock the assembly with nut [3].

Fig. 6: Installation of the flowmeter 8025 compact version on the S020 fitting

7.2.3 Finalise the installation of the flowmeter 8025

→ Wire the device and switch it on (see chapter 8.6).

→ Set the K-factor or determine it with Teach-In (see chapter 9.6.3).

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7.3 Installation of the flowmeter 8035

The flowmeter 8035 comprises a flow transmitter SE35 and a sensor-fitting S030. The flow transmitter SE35 is assembled on the sensor-fitting S030 by a quarter-turn rotation system:

1. Install the S030 sensor-fitting on the pipes,
2. Install the flow transmitter SE35 on the sensor-fitting S030,
3. Finalise the installation of the flowmeter 8035.

7.3.1 Install the S030 sensor-fitting on the pipes

→ Select a sensor-fitting S020 suitable for the speed of the fluid in the pipes

To select a sensor-fitting, refer to the calculation tables on the technical data sheet for the relevant sensor-fitting.

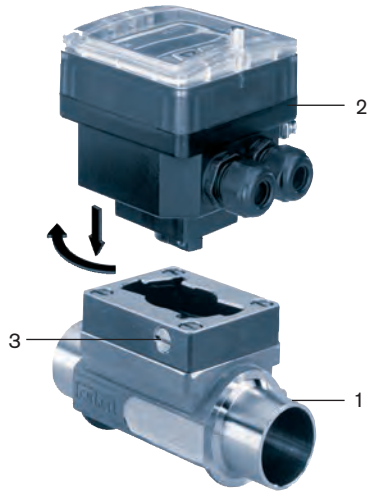
→ Choose a position for the sensor-fitting according to the design of the pipes, in such a way that:

- the upstream and downstream distances are respected according to the design of the pipes, see Fig. 4, chapter 7.2.1 and norm EN ISO 5167-1,
- the pipes are always filled to the level of the sensor (see Fig. 5, chapter 7.2.1),
- when mounted vertically, the flow direction of the fluid is upwards (see Fig. 5, chapter 7.2.1),
- air bubbles do not form around the sensor-fitting (see Fig. 5, chapter 7.2.1).

→ If necessary, use a flow conditioner to improve measurement precision,

→ Install the sensor-fitting on the pipes according to the instructions in the relevant Operating Instructions.

7.3.2 Install the flow transmitter SE35 on the sensor-fitting S030



→ Install the flow transmitter [2] in the sensor-fitting [1].

→ Turn the flow transmitter [2] by a quarter turn.

→ Tighten the lateral screw or screws [3] to lock the flow transmitter in place on the sensor-fitting.

Fig. 7: Installation of the flow transmitter SE35 on the sensor-fitting S030

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7.3.3 Finalise the installation of the flowmeter 8035

→ Wire the flow transmitter SE35 and switch it on (see chapter 8.6).

→ Set the K-factor or determine it with Teach-In (see chapter 9.6.3).

7.4 Installation of the flow transmitter SE35 on the sensor-fitting S070 or S077

The flow transmitter SE35 is installed on the pipes using the sensor-fitting S070 or S077. The flow transmitter SE35 is assembled on the sensor-fitting S070 or S077 by a quarter-turn system:

1. Install the sensor-fitting S070 or S077 on the pipes,
2. Install the flow transmitter SE35 on the sensor-fitting S070 or S077,
3. Finalise installation.

7.4.1 Install the sensor-fitting S070 or S077 on the pipes

→ Select a sensor-fitting S070 or S077 suitable for the viscosity of the fluid.

To select a sensor-fitting, refer to the technical data sheet for the relevant sensor-fitting.

CAUTION

Risk of damage when installing the sensor-fitting.

▸ Follow the installation instructions given in the Operating Instructions for the sensor-fitting.

→ Install the sensor-fitting S070 or S077 on the pipes in such a way that:

- the axles of the oval gears are set horizontally, as shown in Fig. 8,
- the installation instructions given in the Operating Instructions for the relevant sensor-fitting are respected.

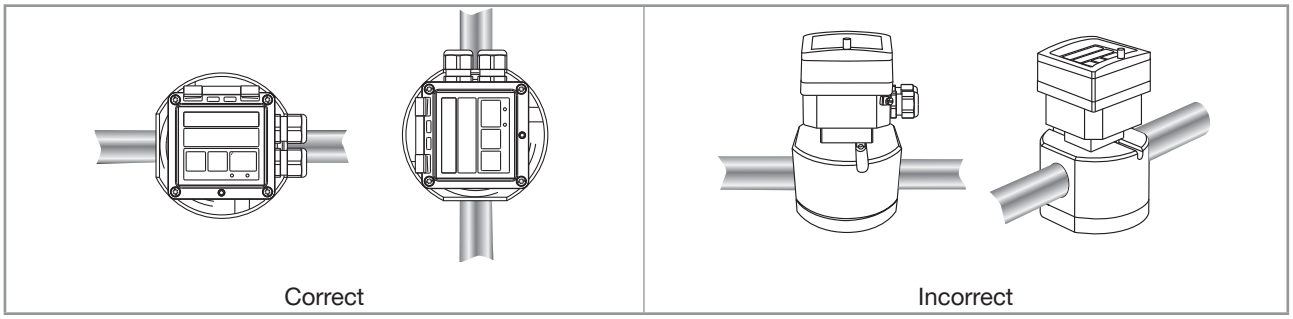

Fig. 8: The axle of the oval gears must be horizontal

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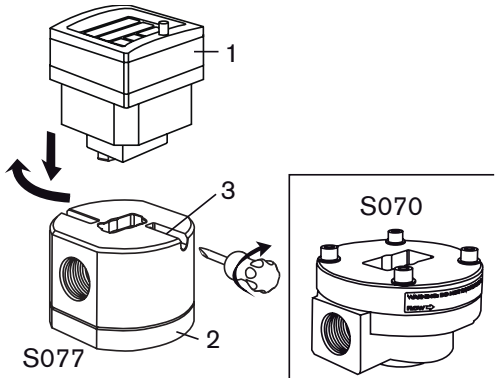
7.4.2 Install the flow transmitter SE35 on the sensor-fitting S070 or S077



→ Insert the flow transmitter [1] in the sensor-fitting [2].

→ Turn the flow transmitter [1] by a quarter turn.

→ Tighten the lateral screw or screws [3] to lock the flow transmitter [1] in place on the sensor-fitting [2] (max. torque 1 Nm).

Fig. 9: Installation of the flow transmitter SE35 on the sensor-fitting S070 or S077

7.4.3 Finalise installation of the flow transmitter SE35 with the sensor-fitting S070 or S077

→ Wire the device and switch it on (see chapter 8.6).

→ Set the K-factor or determine it with Teach-In (see chapter 9.6.3).

7.5 Installation of a flow transmitter 8025 in panel version

Install the panel version of the device in a cabinet with a protection class at least IP54 to ensure a degree of pollution 2 inside the cabinet.

→ Respect the dimensions indicated in Fig. 10 to cut the opening in the cabinet door.

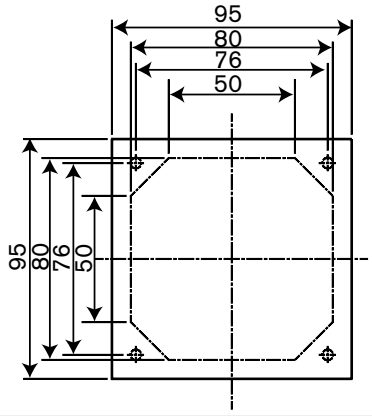


Fig. 10: Dimensions [mm] of the electrical cabinet frontage cutting plan

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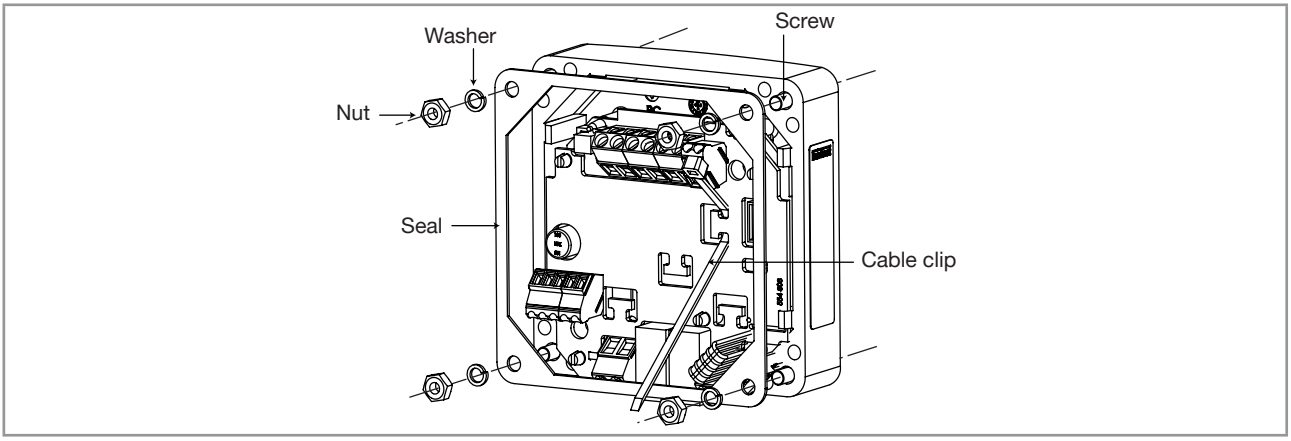

Fig. 11: Installation of a flow transmitter 8025 in panel version

→ Insert the 4 screws in the housing (from the front). If the cabinet door is too thick use the 4 supplied M4*25 screws.

→ Insert the seal on the external threads of the 4 screws (rear of the housing).

→ Put the assembly on the cutout, electronics turned to the inside of the cabinet.

→ Put the 4 washers on the 4 screws.

→ Put a nut on each of the 4 screws and tighten the nuts to secure the device to the cabinet.

→ Wire according to the instructions in chapter 8.6, 8.6.3 or 8.7.3.

→ Set the K-factor or determine it with Teach-In (see chapter 9.6.3).

7.6 Installation of a flow transmitter 8025 in wall-mounted version

NOTICE

Risk of material damage if the cable glands are not tightly screwed on the housing

▸ Before installing the wall-mounted housing on its support, tighten the nuts of the entry item of the cables glands at a torque of 1.5 Nm.

The flow transmitter in a wall-mounted version has 4 holes in the bottom of the housing.

→ Remove the blanking strips covering the screws (Fig. 12).

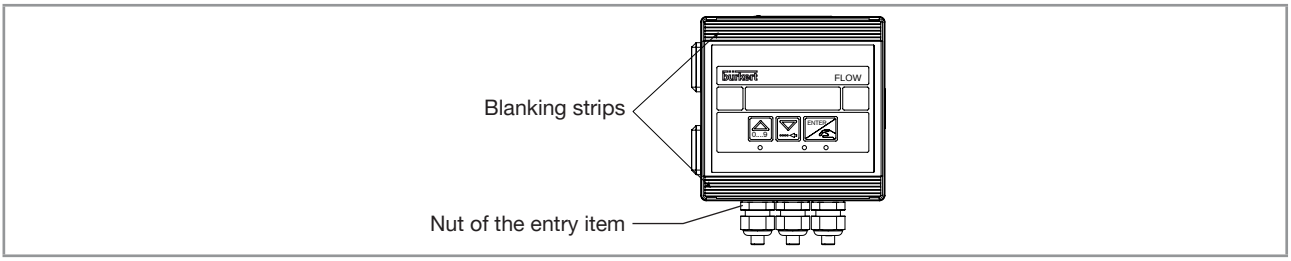

Fig. 12: Location of the fastening nuts and the covering strips

→ Loosen the 4 screws and open the cover to get access to the holes [1].

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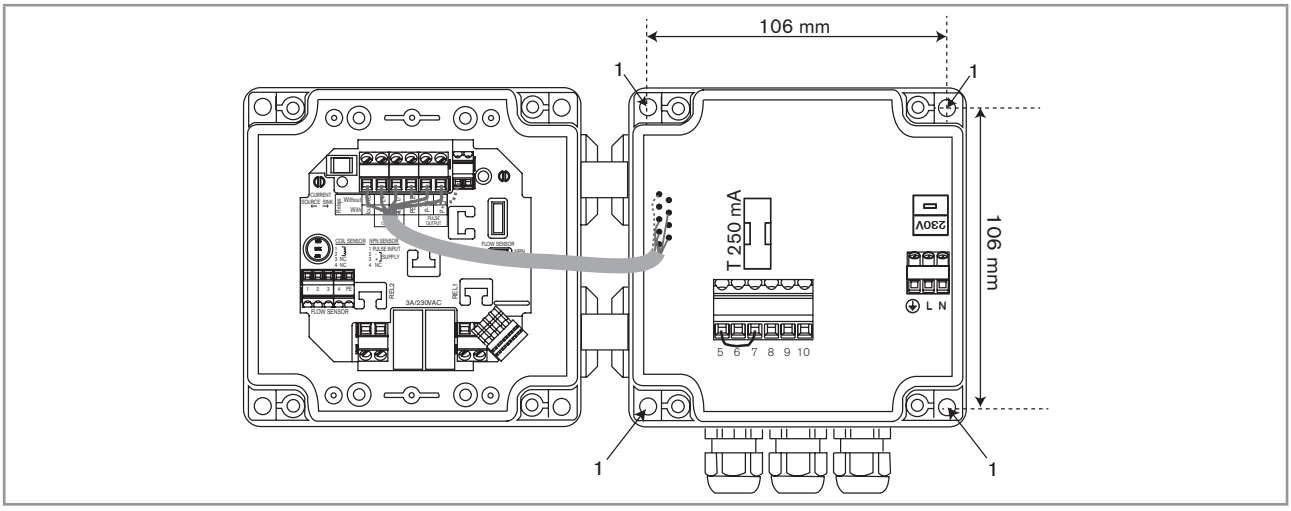

Fig. 13: Installation of a wall-mounted version

→ Secure the housing to the support respecting the dimensions indicated in Fig. 13.

→ Wire according to the instructions in chapter 8.6, 8.6.3 or 8.7.3.

→ Close the housing and tighten the 4 screws of the cover.

→ Set the K-factor or determine it with Teach-In (see chapter 9.6.3).

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8 WIRING

8.1 Safety instructions

DANGER

Risk of injury due to electrical voltage.

- If a 12...36 V DC or a 14...36 V DC powered version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- All equipment connected to the wall-mounted or to the panel versions of the flow transmitter 8025 must be double insulated with respect to the mains according to the standard UL/EN 61010-1.
- Observe all applicable accident protection and safety regulations for electrical equipment.

AVERTISSEMENT

Risk of injury due to non-conforming installation.

- The electrical and fluid installation can only be carried out by qualified and skilled staff with the appropriate tools.
- Fit a circuit breaker or a switch to the electrical installation in which the device is installed.
- Install the circuit breaker or switch in a place which is easy to reach.
- Identify the circuit breaker or switch as the electrical power cut-off system for the device.
- Install appropriate overload safety devices. For the versions fed at 115/230 V AC, insert the device protecting against overcurrents in the live conductor (L) and the neutral conductor (N).
- Do not power a device, version 12...36 V DC, with an alternating voltage or with a direct voltage higher than 36 V DC.
- Do not power a device, version 115/230 V AC, with an alternating voltage higher than 230 V AC, or with a direct voltage.

AVERTISSEMENT

Risk of injury due to unintentional switch on of power supply or uncontrolled restarting of the installation.

- Take appropriate measures to avoid unintentional activation of the installation.
- Guarantee a set or controlled restarting of the process subsequent to any intervention on the device.

Protect the device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.

For a correct operation of the device, respect the following recommendations for the electrical installation:

- Make sure the installation is equipotential. See chapter 8.3.
- Do not install the cables near high voltage or high frequency cables; if a combined installation cannot be avoided, a minimum space of 30 cm should be respected.

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For a device fed at 12...36 V DC, respect the following recommendations for the electrical installation:

- Use a filtered and regulated 12...36 V DC power supply. The circuit has to be safety extra low voltage (SELV), with a safe energy level.

The power supply of the device can be damaged if it is not protected.

- Protect the device power supply by means of a 300 mA slow blow fuse and a switch.

The power supply of a transistor output can be damaged if it is not protected.

- Protect the power supply of each transistor output by means of a 125 mA slow blow fuse.

The relays can be damaged if not protected.

- Protect the relays by means of a max. 3 A fuse and a circuit breaker (depending on the process).
- Do not apply both a dangerous voltage and a safety extra-low voltage to the relays.

The device can be damaged if it is not tight.

- Insert the supplied blanking plugs into the unused cable glands to ensure the tightness of the device.

8.2 Specifications of the connection cables

8.2.1 8025 compact version, 8035 and SE35

Specification of the cables and the conductors (not supplied)	**Recommended value**
Shielded cable	yes
Length of the cable	max. 50 m
External diameter of the cable	5...8 mm
Operating temperature, UL device	min. 90 °C
Operating temperature, non UL device	min. 80 °C
Cross section of the local earth conductor	min. 0.75 mm^2
Cross section of the conductors, except the local earth conductor	0.2...1.5 mm^2

Tab. 1: Specifications of the cables and wires for the female connector type 2518 with article number 00572264 (supplied), or the female connector type 2509 with article number 00162673 (not supplied)

Specification of the cables and the conductors (not supplied)	**Recommended value**
Shielded cable	yes
Length of the cable	max. 50 m
External diameter of the cable, if 1 cable per cable gland	6...12 mm
External diameter of a cable, if 2 cables per cable gland	3...5 mm, using the supplied multi-way seal
Operating temperature, UL device	min. 90 °C
Operating temperature, non UL device	min. 80 °C
Cross section of the local earth conductor	min. 0.75 mm^2
Cross section of the conductors, except the local earth conductor	0.2...1.5 mm^2

Tab. 2: Specifications of the cables and wires for the wiring through the M20x1.5 cable glands

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8.2.2 8025 in panel version

Specification of the cables and the conductors (not supplied)	**Recommended value**
Shielded cable	yes
Length of the cable	max. 50 m
Operating temperature, UL device	min. 90 °C
Operating temperature, non UL device	min. 80 °C
Cross section of the conductors	0.2...1.5 mm²

Tab. 3: Specifications of the cables and wires for the direct wiring to the terminal blocks of a panel-mounted version

8.2.3 8025 in wall-mounting version

Specification of the cables and the conductors (not supplied)	**Recommended value**
Shielded cable	yes
Length of the cable	max. 50 m
External diameter of the cable, if 1 cable per cable gland	4...8 mm
Operating temperature, UL device	min. 90 °C
Operating temperature, non UL device	min. 80 °C
Cross section of the conductors	0.2...1.5 mm²

Tab. 4: Specifications of the cables and wires for the wiring through the M16x1.5 cable glands

8.3 Making the installation equipotential

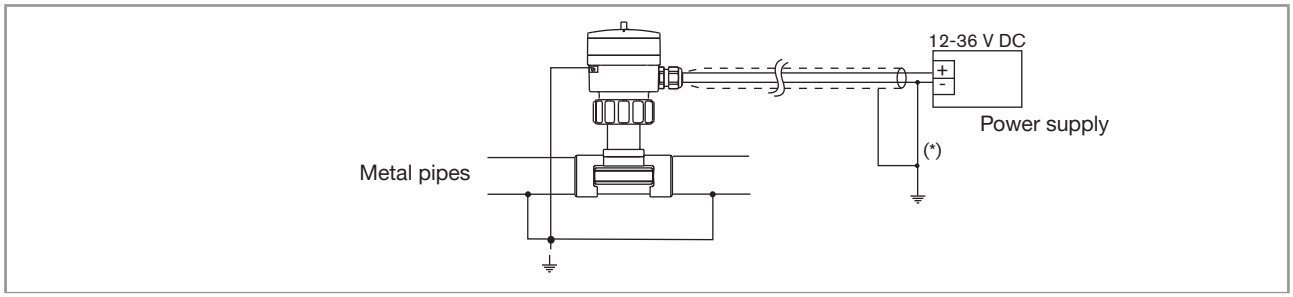
To ensure the equipotentiality of the installation (power supply - device - fluid):

→ Connect together the various earth spots in the installation to eliminate the potential differences that may occur between different earthes.

→ Observe faultless earthing of the shield of the power supply cable, at both ends.

→ Connect the negative power supply terminal to the earth to suppress the effects of common mode currents. If this connection cannot be made directly, a 100 nF/50 V capacitor can be fitted between the negative power supply terminal and the earth.

→ Special attention has to be paid if the device is installed on plastic pipes because direct earthing is not possible. Proper earthing is performed by earthing together the metallic instruments such as pumps or valves, that are as close as possible to the device. If no such instrument is near the device, insert metallic earth rings inside the plastic pipes upstream and downstream from the device and connect these parts to the same earth. The earth rings must be in contact with the fluid.



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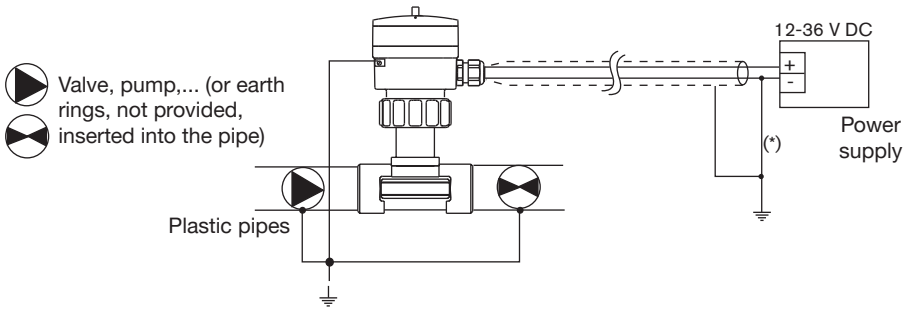
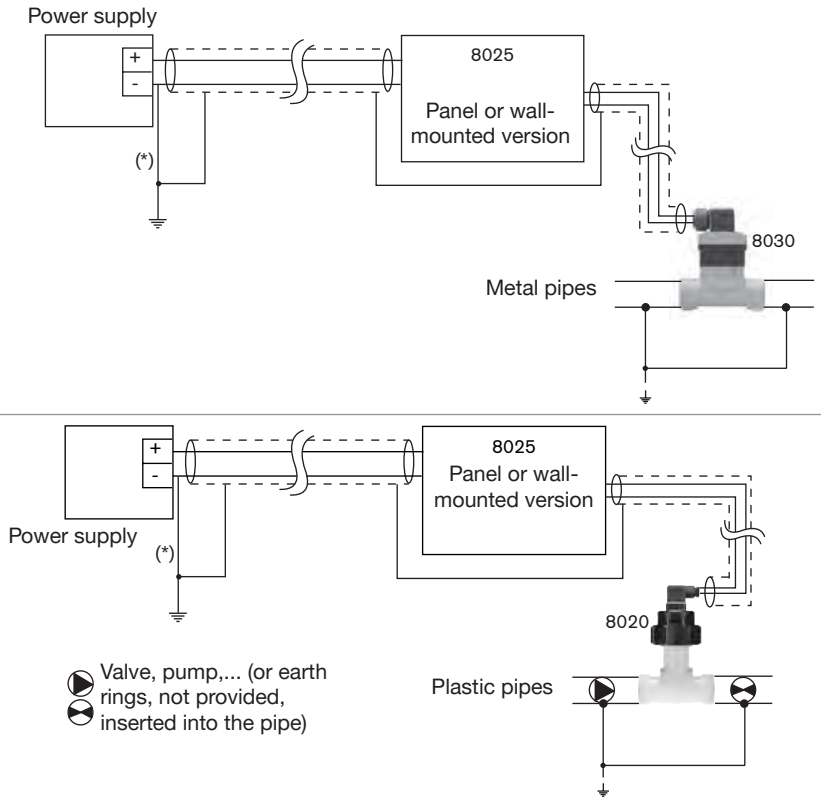


*) If a direct earth connection is not possible, fit a 100 nF/50 V capacitor between the negative power supply terminal and the earth.

Fig. 14: Flowmeter 8025 compact version, flowmeter 8035 and flow transmitter SE35 - Equipotentiality skeleton diagram with metal or plastic pipes



*) If a direct earth connection is not possible, fit a 100 nF/50 V capacitor between the negative power supply terminal and the earth.

Fig. 15: Flow transmitter 8025 in panel or wall-mounted version - Equipotentiality skeleton diagram with metal or plastic pipes

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8.4 Wiring of devices with a 4 pin male fixed connector

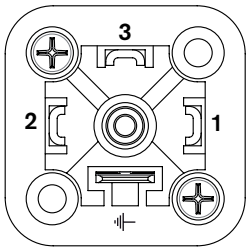
	1: V+ (12...36 V DC) 2: Positive pulse output 3: L– (0 V DC) ⏚: Negative pulse output

Fig. 16: Pin assignment of the 4 pin male fixed connector

→ Assemble and wire the female connector type 2518 (supplied) according to Fig. 17.

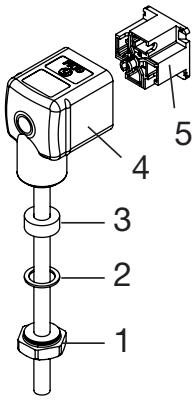
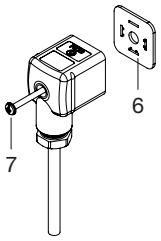
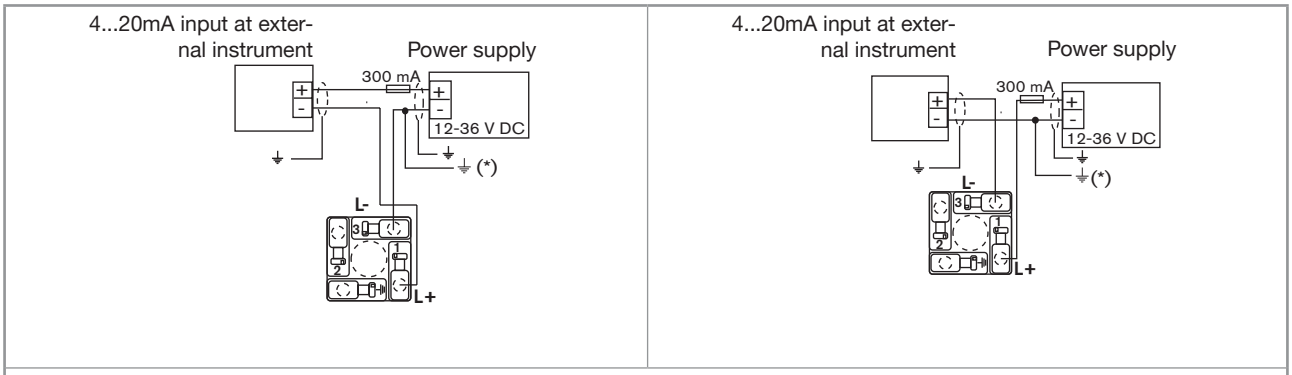
	→ Unscrew the pressure screw [1] and remove the pressure ring [2] and the seal [3]. → Remove contact holder [5] from the cover [4]. → Insert the cable into pressure screw [1], through the pressure ring [2], through the seal [3] and finally through the cover [4]. → Connect the wires on the contact holder [5]. → Position the contact holder [5] in steps of 90° then put it back into cover [4], pulling gently on the cable so that the wires do not clutter the housing. → Tighten the pressure screw [1] (1.5...2 Nm).
	→ Place the seal [6] between the connector and the fixed connector on the device and then plug the type 2518 connector into the fixed connector. → Insert and tighten the central screw [7] (0.5...0.6 Nm) to ensure tightness and correct electrical contact.

Fig. 17: Assembling and wiring the female connector type 2518 (supplied)

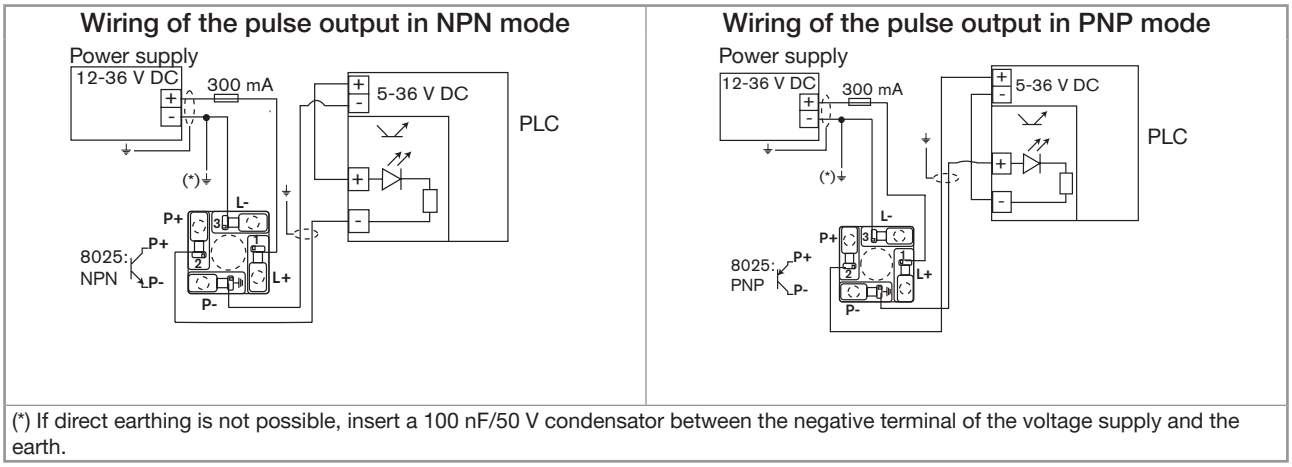
→ Wire the electrical supply and the current output using one of the wiring plans of Fig. 18.



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 18: Possible wiring of the current output of a device with 4 pin male fixed connector

→ Wire the transistor output using one of the wiring plans of Fig. 19.



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 19: Wiring of the pulse output in NPN or PNP mode, of a device with 4 pin male fixed connector

8.5 Configuring the selectors

Make sure the power supply is off before moving the selectors.

A device with 4 pin male fixed connector has no selectors to configure.

→ Before wiring the device, configure the selectors on the electronic board: see chapter 8.5.1 to 8.5.3.

8.5.1 FLOW SENSOR selector

The FLOW SENSOR selector makes it possible to configure the type of flow sensor: coil or Hall.

For the version with male fixed connector, the selector is factory-set depending on the output signal of the flow sensor mounted on the device.

▸ Do not modify the selector position on a device with male fixed connector.

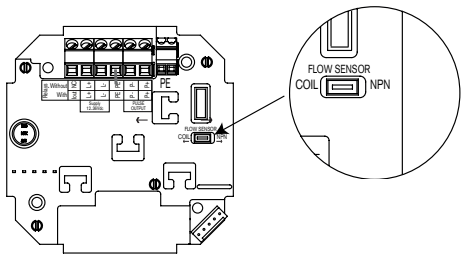


Fig. 20: Position of the FLOW SENSOR connector on the electronic board

Tab. 5: Positioning of the FLOW SENSOR selector depending on the output signal of the flow sensor

Output signal of the remote sensor	Position of the FLOW SENSOR selector
Pulse, NPN (hall)	NPN
Sinus (coil)	COIL

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8.5.2 SOURCE/SINK selector

On a device with relays, the SOURCE/SINK selector enables to set the 4...20 mA current output, in sourcing or in sinking mode.

→ Set the selector depending on the type of wiring.

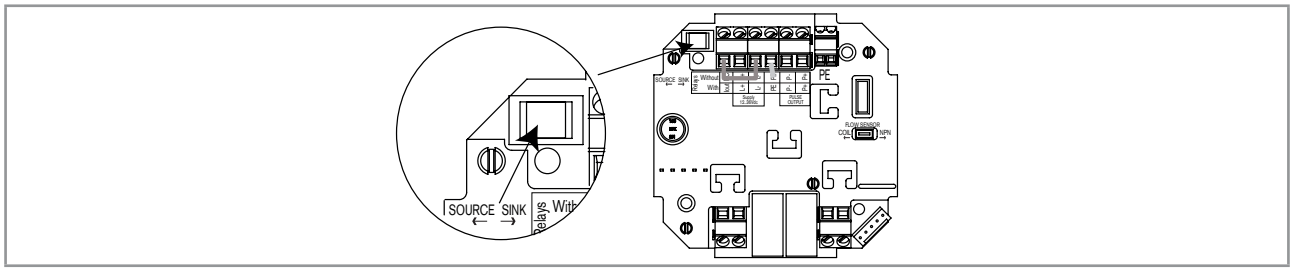

Fig. 21: Position of the SOURCE/SINK selector on a device with relay

Tab. 6: Positioning of the SOURCE/SINK selector depending on the wiring of the current output on a device with relays

Wiring the 4...20 mA output	Position of the SOURCE/SINK selector on a device with relays
Not wired (jumper wire in place)	SOURCE
Sourcing mode	SOURCE
Sinking mode	SINK

8.5.3 115/230 V AC selector

The 115/230 V AC selector enables to configure the supply voltage of a device supplied with 115/230 V AC.

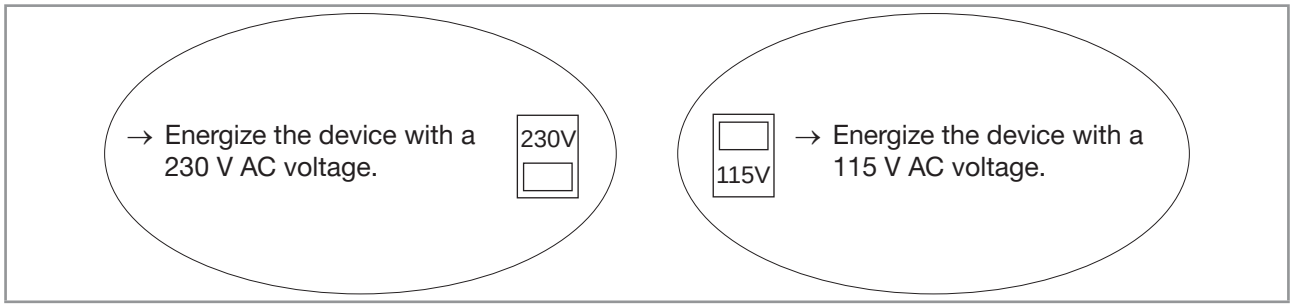

Fig. 22: Supply voltage selector on a device supplied with 115/230 V AC

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8.6 Wiring the 8025 compact version, the 8035 and the SE35, with or without relays, with cable glands

8.6.1 Wiring instructions

Seal the unused cable gland using the blanking plug supplied to make sure the device is tight.

→ Unscrew the nut of the cable gland.

→ Remove the transparent disc inside the cable gland.

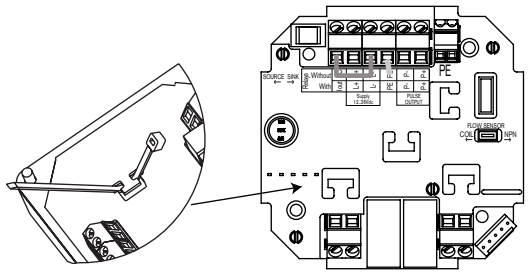
→ Insert the blanking plug.

→ Screw the nut back.

→ Unfasten the screw and lift the transparent lid.

→ Untighten the 4 screws and remove the cover from the device.

→ For the versions with relays, insert the cable clip as shown Fig. 23.



→ Insert the supplied cable clips into:

- the slots of the electronic board,
- and, if the device has such a board, the slots of the 115/230 V AC power supply board.

Fig. 23: Inserting the cable clips

→ Unscrew the nuts of the cable glands.

→ Pass the cables through a nut and through a cable gland.

→ Set the selectors according to chapter 8.5.

→ Connect the terminal block according to chapter 8.6.2 to 8.6.6.

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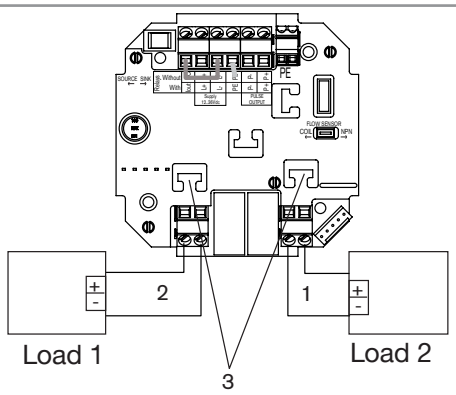
8.6.2 Wiring of the relays (versions with relay output)

DANGER

Danger due to the operation of the relay outputs of a UL device in a wet location.

▸ If a UL device is used in a wet location:

- energize the relay outputs with an alternating voltage of max. 16 Vrms and 22.6 Vpeak.
- or energize the relay outputs with a direct voltage of max. 35 V DC.



1. relay 1 connection
2. relay 2 connection
3. fixation slots

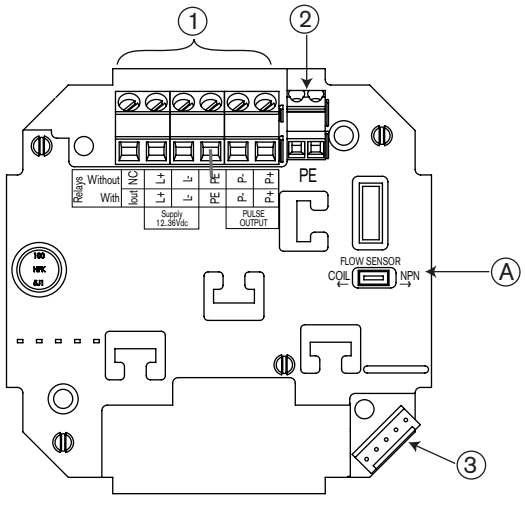
→ Always secure the relays connection cables in the slots marked [3] (see Fig. 23).

Fig. 24: Wiring of the relays

8.6.3 Wiring the power supply, the current output and the pulse output, version 12...36 V DC, without relays

→ Before wiring the device, configure the selectors on the electronic board (see chapter 8.5).

→ Obey the wiring instructions given in chapter 8.6.1.



Switch (A): see chapter 8.5.1

Terminal block 1

NC: not connected

L+: positive power supply

L–: negative power supply

PE: wiring of the PE between the main board and the protection board

P–: negative pulse output

P+: positive pulse output

Terminal block 2 PE

Wiring of the cable shields

Connector 3: connection of the flow sensor

Fig. 25: Terminal assignment of a version 12...36 V DC without relays, with cable glands

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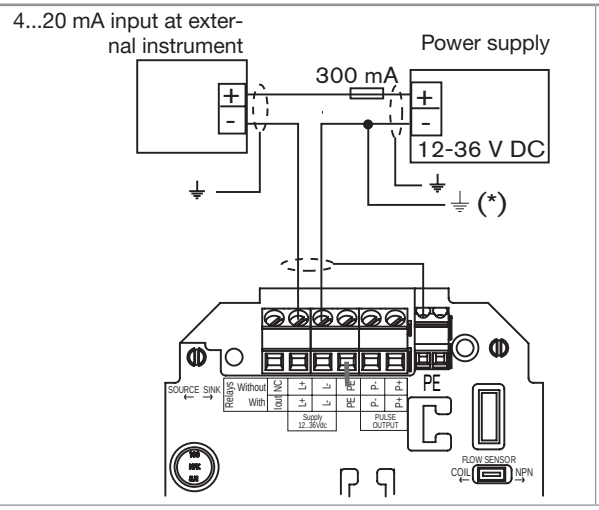
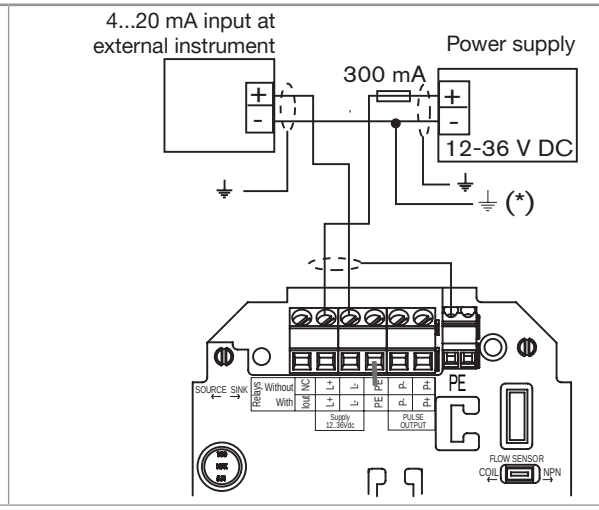
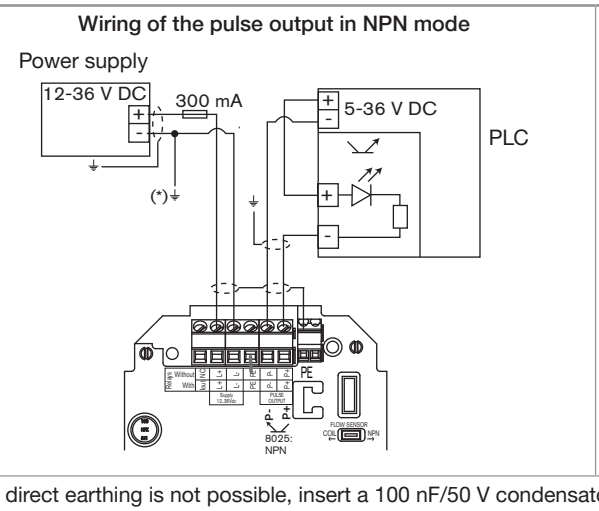
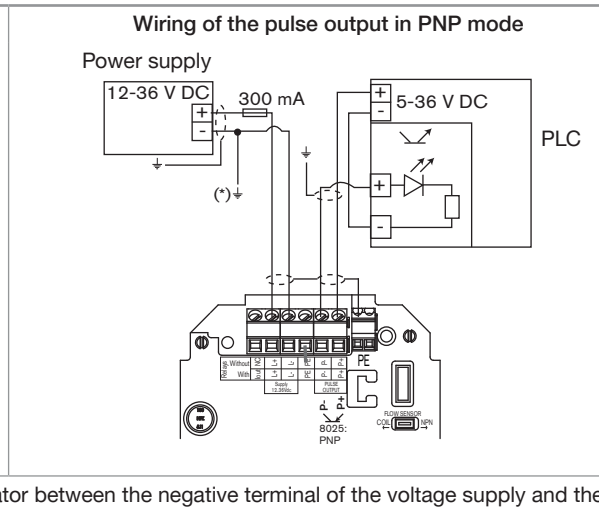




(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 26: Possible wiring of the current output of a version 12...36 V DC, without relays, with cable glands





(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 27: Wiring, in NPN or PNP mode, of the pulse output of a version 12...36 V DC, without relays, with cable glands

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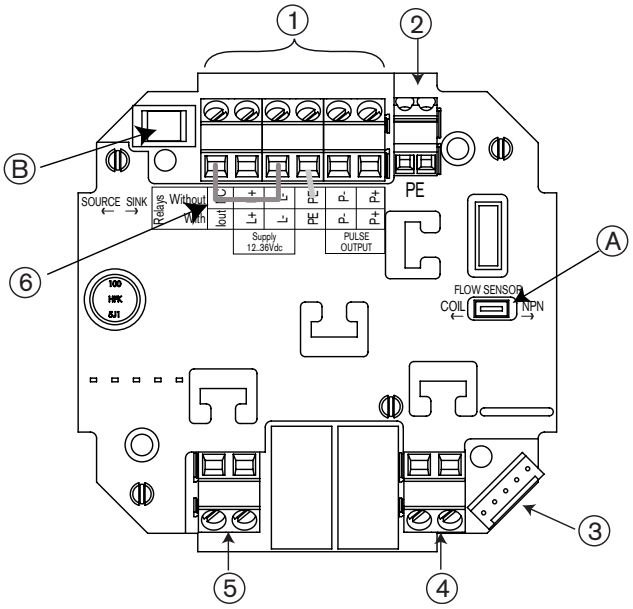
8.6.4 Wiring the power supply, the current output and the pulse output, version 12...36 V DC, with relays

→ Before wiring the device, configure the selectors on the electronic board (see chapter 8.5).

→ Obey the wiring instructions given in chapter 8.6.1.



Switch (A): see chapter 8.5.1

Switch (B): see chapter 8.5.2

Terminal block 1

Iout: 4...20 mA output

L+: positive power supply

L–: negative power supply

PE: wiring of the PE between the main board and the protection board

P–: negative pulse output

P+: positive pulse output

Terminal block 2 PE

Wiring of the cable shields

Connector 3: connection of the flow sensor

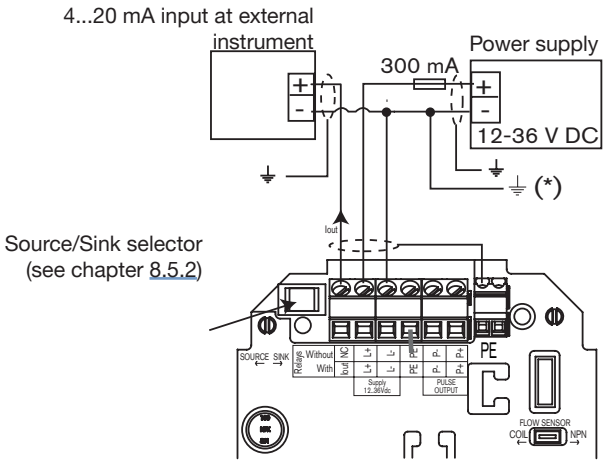
Terminal block 4: wiring of relay 1, see chapter 8.6.2

Terminal block 5: wiring of relay 2, see chapter 8.6.2

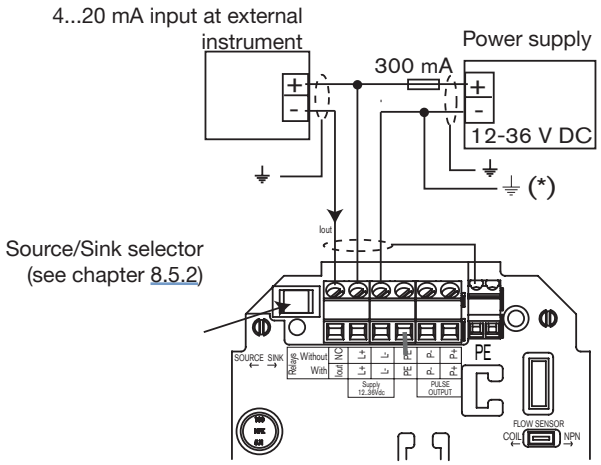
Jumper wire 6: jumper wire to be removed if the 4...20 mA output is connected

Fig. 28: Terminal assignment of a version 12...36 V DC, with relays, with cable glands

Wiring of the current output in sourcing mode



Wiring of the current output in sinking mode

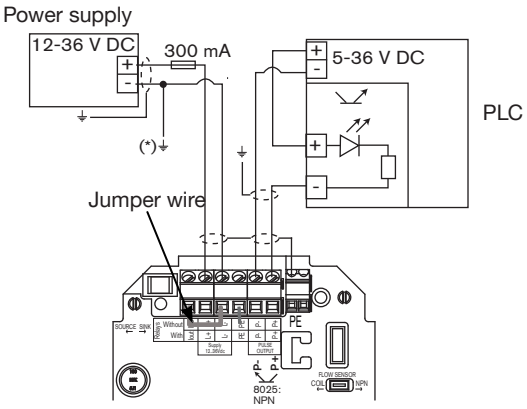


(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

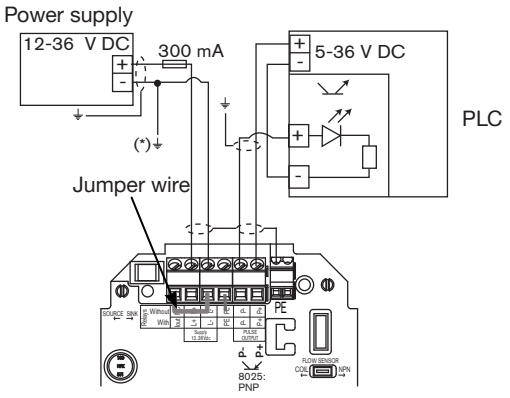
If the current output is wired, remove the jumper wire between the terminals Iout and L–.

Fig. 29: Wiring, in sourcing or sinking mode, of the current output of a 12...36 V DC version, with relays, with cable glands

Wiring of the pulse output in NPN mode



Wiring of the pulse output in PNP mode



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

- If the current output is not wired, make sure the jumper wire between the terminals Iout and L– is in place.

Fig. 30: Wiring, in NPN or PNP mode, of the pulse output of a 12...36 V DC version, with relays, with cable glands

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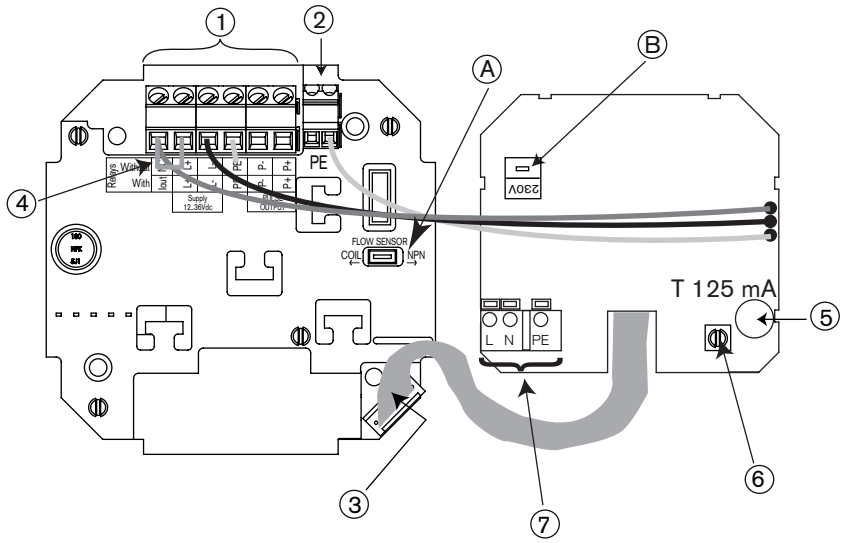
8.6.5 Wiring the power supply, the current output and the pulse output, version 115/230 V AC, without relays

→ Before wiring the device, configure the selector on the electronic board (see chapter 8.5).

→ Obey the wiring instructions given in chapter 8.6.1.

The red wire is wired on the NC terminal to make the wiring of the 4...20 mA output easier (see Fig. 32). The jumper wire [4] between L+ and NC energizes the NC terminal.



Switch (A): see chapter 8.5.1

Switch (B): see chapter 8.5.3

Terminal block 1

NC: not connected (terminal for the wiring of the 4...20 mA output)

L+ (red wire, factory wired)

PE: wiring of the PE between the main board and the protection board

L– (black wire, factory wired)

P–: negative pulse output

P+: positive pulse output

Terminal block 2 PE

Shield wiring (green/yellow wire, factory wired)

Connector 3: connection of the flow sensor

Jumper wire 4: jumper wire to be removed if the 4...20 mA output is connected

Time-delay fuse 5: fuse to protect the 115 V AC or 230 V AC power supply

Earth terminal 6 of the housing: internally connected to the earth plug

Terminal block 7: wiring of the 115/230 V AC power supply

Fig. 31: Terminal assignment of a version 115/230 V AC without relays, with cable glands

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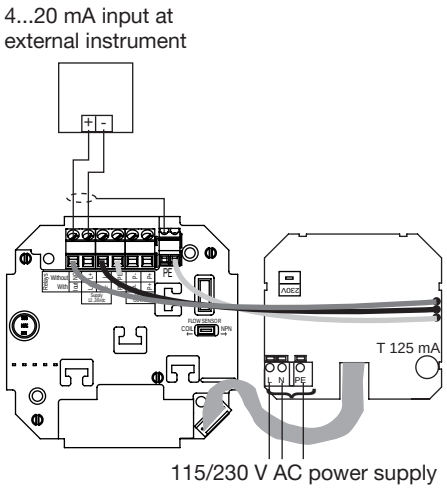
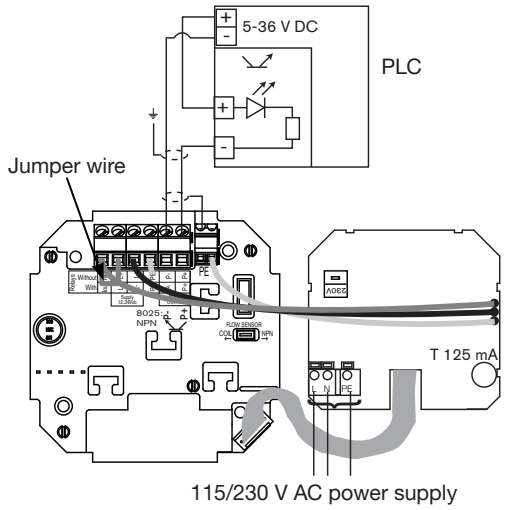


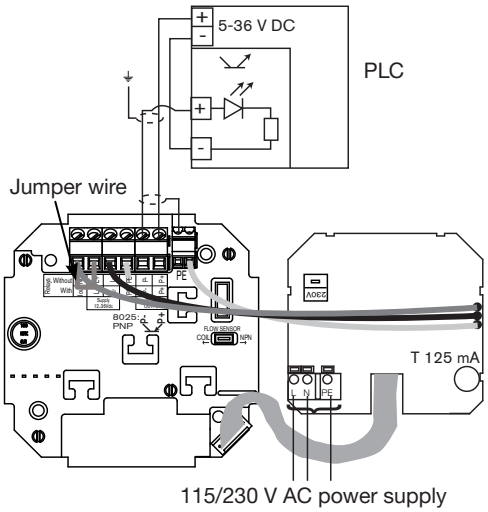
If the current output is wired, remove the jumper wire between the terminals NC and L+.

Fig. 32: Wiring of the current output of a 115/230 V AC version, without relays, with cable glands

Wiring of the pulse output in NPN mode



Wiring of the pulse output in PNP mode



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

- If the current output is not wired, make sure the jumper wire between the terminals NC and L+ is in place.

Fig. 33: Wiring, in NPN or PNP mode, of the pulse output of a 115/230 V AC version, without relays, with cable glands

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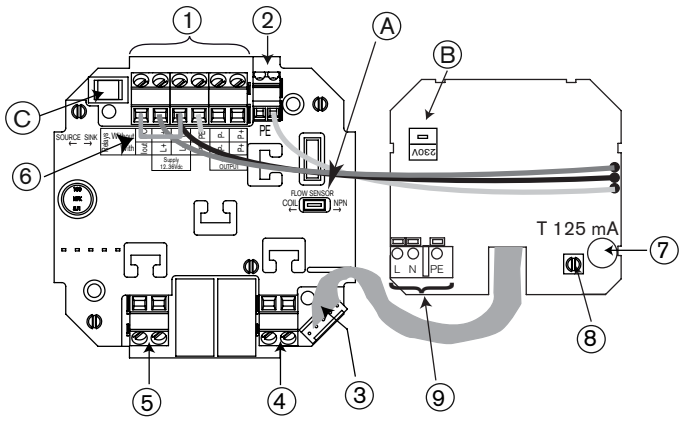
8.6.6 Wiring the power supply, the current output and the pulse output, 115/230 V AC, with relays

→ Before wiring the device, configure the selectors on the electronic board (see chapter 8.5).

→ Obey the wiring instructions given in chapter 8.6.1.



Switch (A): see chapter 8.5.1

Switch (B): see chapter 8.5.3

Switch (C): see chapter 8.5.2

Terminal block 1

Iout: 4...20 mA output

L+ (red wire, factory wired)

L– (black wire, factory wired)

PE: wiring of the PE between the main board and the protection board

P–: negative pulse output

P+: positive pulse output

Terminal block 2 PE

Shield wiring (green/yellow wire, factory wired)

Connector 3: connection of the flow sensor

Terminal block 4:
wiring of relay 1: see chapter 8.6.2

Terminal block 5:
wiring of relay 2: see chapter 8.6.2

Jumper wire 6: jumper wire to be removed if the 4...20 mA output is connected

Time-delay fuse 7: fuse to protect the 115 V AC or 230 V AC power supply

Terminal 8: earth terminal, internally connected to the earth plug

Terminal block 9: wiring of the 115/230 V AC power supply

Fig. 34: Terminal assignment of a 115/230 V AC version with relays, with cable glands

→ Connect the relays according to chapter 8.6.2.

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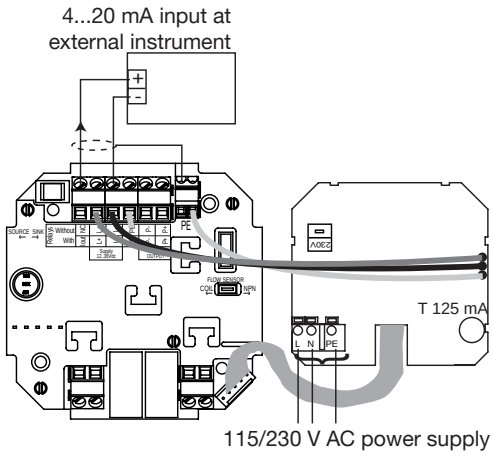
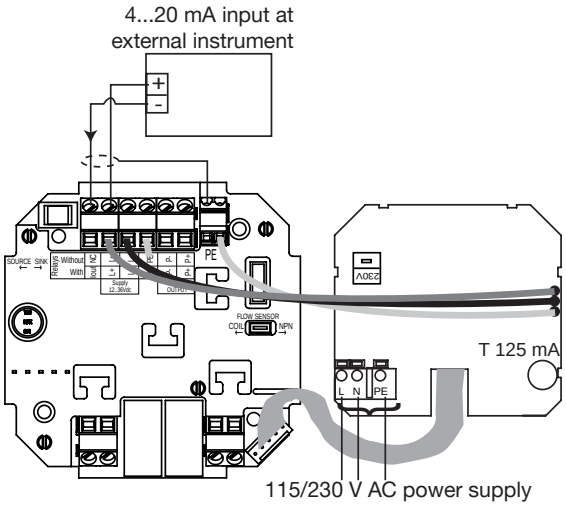


If the current output is wired, remove the jumper wire between the terminals Iout and L–.

Fig. 35: Wiring in sourcing mode of the current output of 115/230 V AC version, with relays, with cable glands



If the current output is wired, remove the jumper wire between the terminals Iout and L–.

Fig. 36: Wiring in sinking mode of the current output of a 115/230 V AC version, with relays, with cable glands

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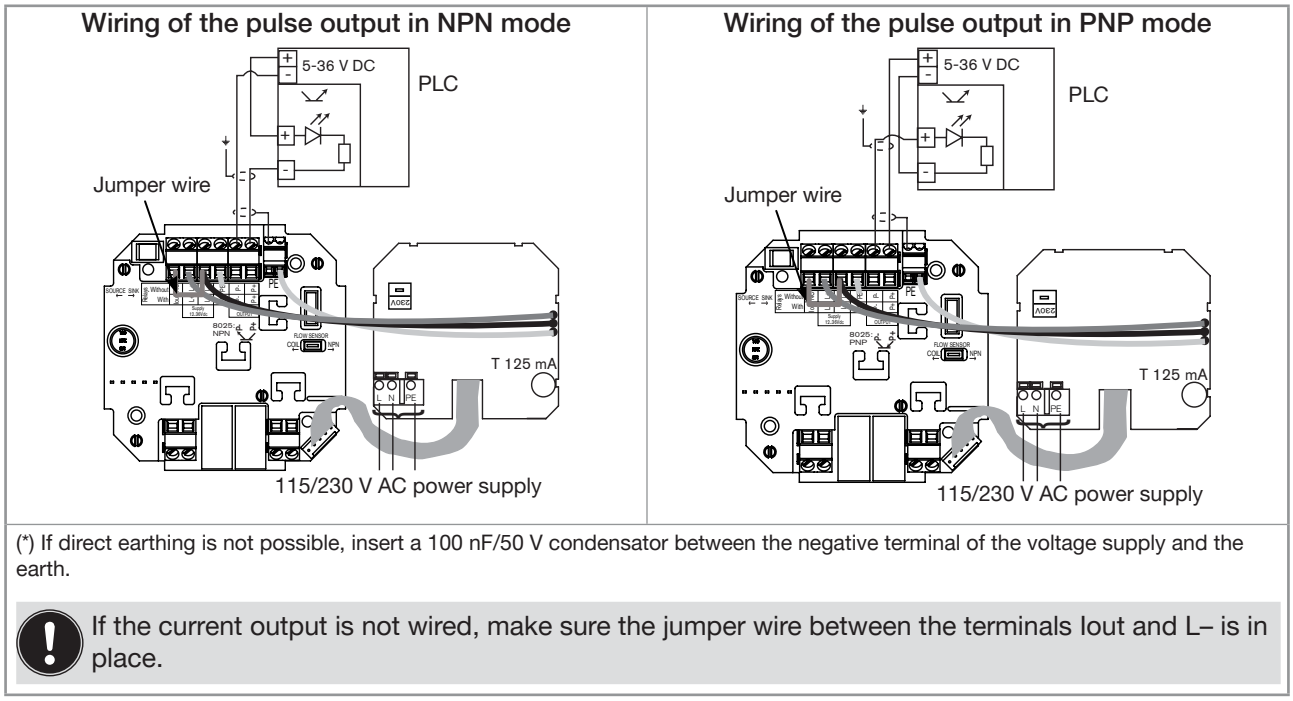

(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

If the current output is not wired, make sure the jumper wire between the terminals Iout and L– is in place.

Fig. 37: Wiring, in NPN or PNP mode, of the pulse output of a 115/230 V AC version, with relays, with cable glands

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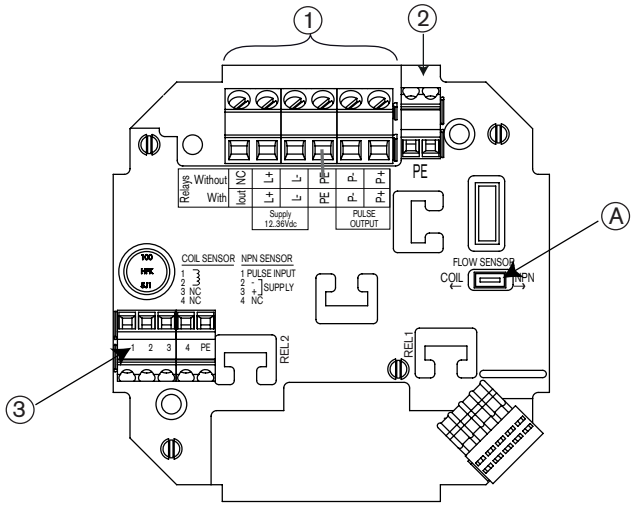
8.7 Wiring the 8025 in panel or in wall-mounted version, 12...36 V DC, with or without relays

8.7.1 Wiring the power supply, the current output and the pulse output, 12...36 V DC, without relays

→ For a wall-mounted version, follow the wiring instructions of chapter 8.8.1.

→ Configure the FLOW SENSOR selector on the electronic board (see chapter 8.5.1).

→ Connect the flow sensor to the flow transmitter according to chapter 8.7.3.



Switch (A): see chapter 8.5.1

Terminal block 1

NC: not connected

L+: positive power supply

L–: negative power supply

PE: wiring of the PE between the main board and the protection board

P–: negative pulse output

P+: positive pulse output

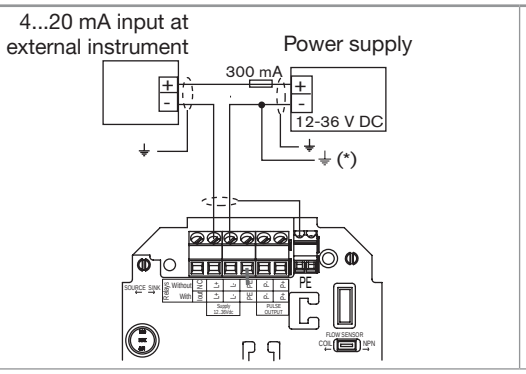
Terminal block 2 PE

Wiring of the cable shields

Connector 3: connection of the flow sensor see chapter 8.7.3

Fig. 38: Terminal assignment of a flow transmitter 8025 in panel or wall-mounted version, 12...36 V DC, without relays

→ Wire the current output according to Fig. 39.



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

Fig. 39: Possible wiring of the current output of a version 12...36 V DC, without relays

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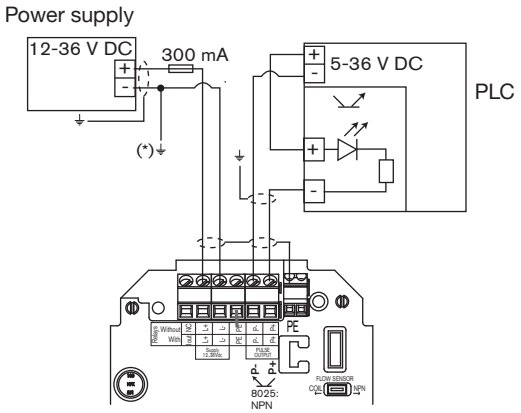
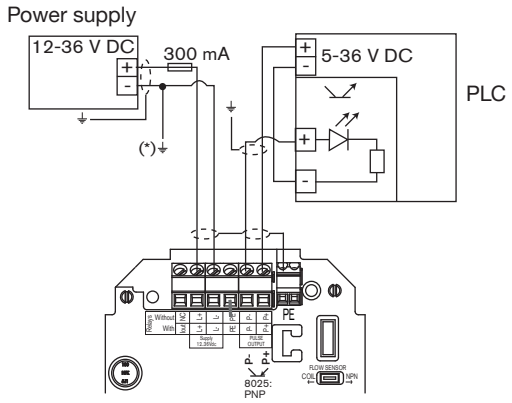
→ Wire the pulse output according to Fig. 40.

Wiring of the pulse output in NPN mode



Wiring of the pulse output in PNP mode



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

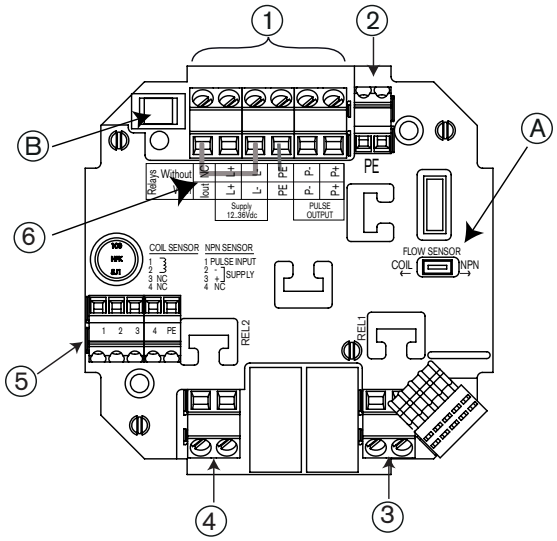
Fig. 40: Wiring, in NPN or PNP mode, of the pulse output of a version 12...36 V DC, without relays, with cable glands

8.7.2 Wiring the power supply, the current output and the pulse output, 12...36 V DC, with relays

→ For a wall-mounted version, follow the wiring instructions of chapter 8.8.1.

→ Before wiring the device, configure the selectors on the electronic board (see chapter 8.5).

→ Connect the flow sensor to the transmitter according to chapter 8.7.3.



Switch (A): see chapter 8.5.1

Switch (B): see chapter 8.5.2

Terminal block 1

Iout: 4...20 mA output

L+: positive power supply

L–: negative power supply

PE: wiring of the PE between the main board and the protection board

P–: negative pulse output

P+: positive pulse output

Terminal block 2 PE

Wiring of the cable shields

Terminal block 3: wiring of relay 1, see chapter 8.6.2

Terminal block 4: wiring of relay 2, see chapter 8.6.2

Connector 5: connection of the flow sensor: see chapter 8.7.3

Jumper wire 6: jumper wire to be removed if the 4...20 mA output is connected

Fig. 41: Terminal assignment for the flow transmitter 8025 in panel or wall-mounted version, 12...36 V DC, with relays

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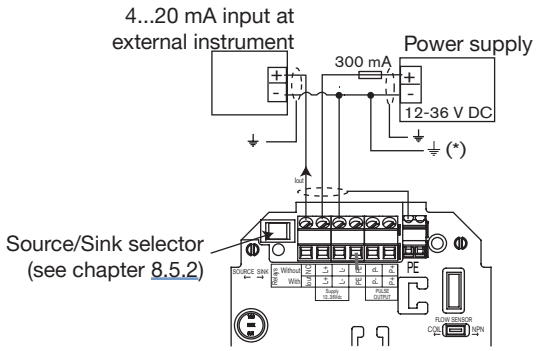
→ Insert the cable clips: see Fig. 23. chapter 8.6.1.

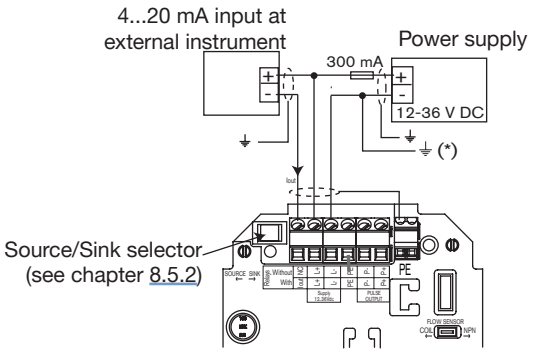
→ Wire the relays according to chapter 8.6.2.

→ Wire the current output according to Fig. 42.

Wiring of the current output in sourcing mode



Wiring of the current output in sinking mode



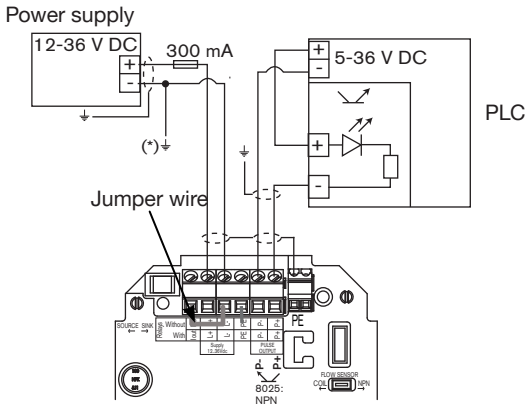
(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

If the current output is wired, remove the jumper wire between the terminals Iout and L–.

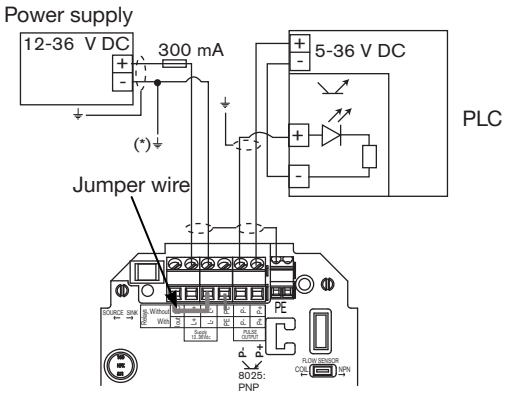
Fig. 42: Wiring, in sourcing or sinking mode, of the current output of a 12...36 V DC version, with relays, with cable glands

→ Wire the pulse output according to Fig. 43.

Wiring of the pulse output in NPN mode



Wiring of the pulse output in PNP mode



(*) If direct earthing is not possible, insert a 100 nF/50 V condensator between the negative terminal of the voltage supply and the earth.

- If the current output is not wired, make sure the jumper wire between the terminals Iout and L– is in place.

Fig. 43: Wiring in NPN or PNP mode, of the pulse output of a 12...36 V DC version, with relays, with cable glands

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8.7.3 Connecting the flow sensor to the flow transmitter 8025 in panel version or in wall-mounted version

→ Configure the FLOW SENSOR selector on the electronic board (see chapter 8.5).

→ Connect the remote flow sensor to the FLOW SENSOR terminal block of the electronic board by respecting the pin assignment depending on the output type of the remote sensor, either sinus (COIL) or pulse output (NPN).

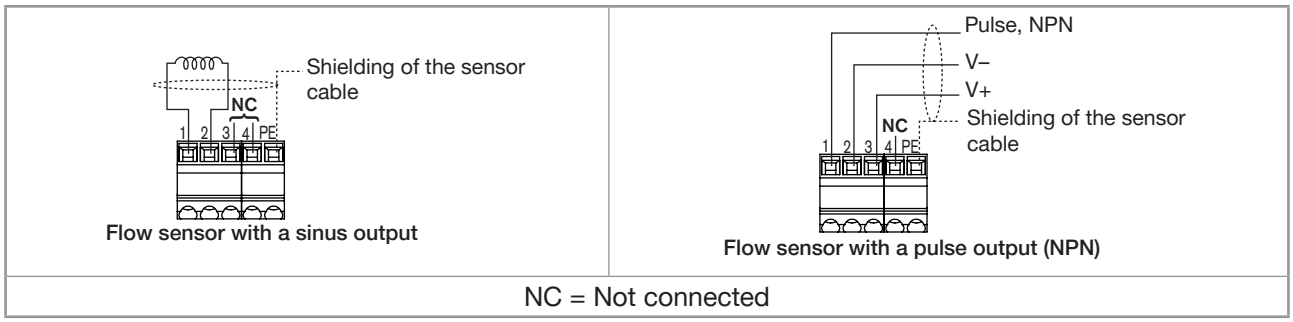

Fig. 44: Wiring of the remote flow sensor to the flow transmitter 8025

8.8 Wiring the 8025 in wall-mounted version, 115/230 V AC, with or without relays

8.8.1 Wiring instructions for a wall-mounted version

Seal the unused cable gland using the supplied blanking plug to make sure the device is tight.

→ Unscrew the nut of the cable gland.

→ Remove the transparent disc inside the cable gland.

→ Insert the blanking plug.

→ Screw the nut back.

→ Connect the flow sensor to the flow transmitter 8025 according to chapter 8.7.3.

→ Configure the selectors on the electronic board: see chapter 8.5.

→ Loosen the nuts of the cable glands.

→ Insert each cable through a nut then through the cable gland, using the cable glands as shown in Fig. 45.

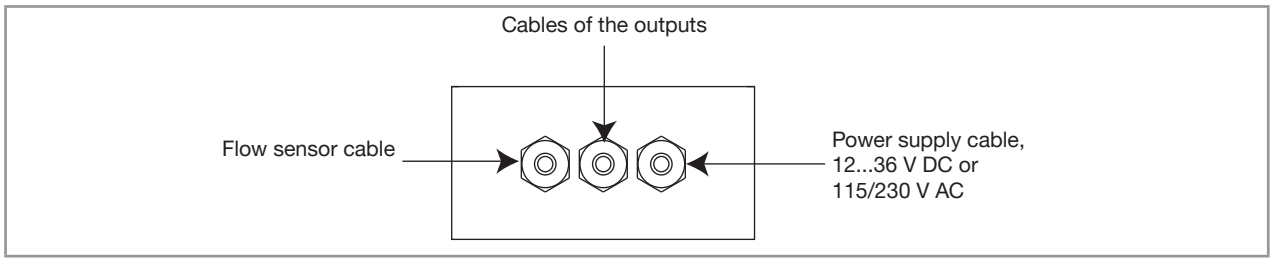

Fig. 45: Using the cable glands

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→ Remove the two terminal blocks (marked [4] and [6] in Fig. 46, chapter 8.8.2 and Fig. 50, chapter 8.8.3) from the housing.

For versions without relays:

→ Wire the device according to chapter 8.8.2.

For versions with relays:

→ Insert the cable clips: see Fig. 23, chapter 8.6.1.

→ Wire the device according to chapter 8.8.3.

→ Insert the two terminal blocks (marked [4] and [6] in Fig. 46 chapter 8.8.2 and Fig. 50 chapter 8.8.3) into their original position.

→ Let the housing completely open.

→ Secure:

- the power supply cable with a cable clip,
- the flow sensor connection cable with a cable clip
- and (depending on the version) the relay connection cables with a cable clip.

→ Tighten the cable glands making sure the cable in the housing is long enough to allow complete opening of the housing.

→ Close the cover.

→ Tighten the 4 screws.

→ Put the blanking strips on the housing.

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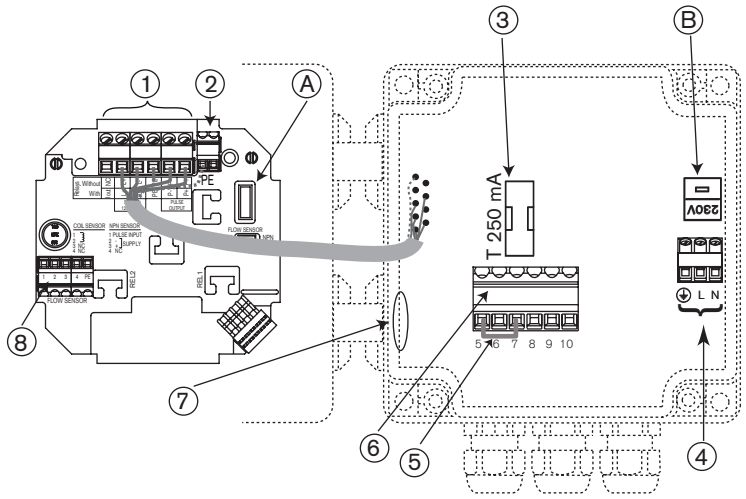
8.8.2 Wiring the power supply, the current output and the pulse output, 115/230 V AC, without relays

→ Before wiring the device, follow the instructions of chapter 8.8.1.



Switch (A): see chapter 8.5.1

Switch (B): see chapter 8.5.3

Terminal block 1

NC: not connected

L+ (red wire, factory wired)

L– (green wire, factory wired)

PE: wiring of the PE between the main board and the protection board

P– (brown wire, factory wired)

P+ (white wire, factory wired)

Terminal block 2 PE

Shield wiring (green/yellow wire, factory wired)

Time-delay fuse 3: fuse to protect the 115 V AC or 230 V AC power supply

Terminal block 4

Wiring of the 115/230 V AC power supply

Jumper wire 5: jumper wire to be removed if the 4...20 mA output is connected

Terminal block 6

Terminal 5: 4...20 mA output

Terminal 6: positive 27 V DC power supply, available to energize an external instrument

Terminal 7: 0V (earth of the power supply available to energize an external instrument)

Terminal 8: cable shields

Terminal 9: negative pulse output

Terminal 10: positive pulse output

Marker 7: all the cables must be fitted here

Connector 8: connection of the flow sensor

Fig. 46: Terminal assignment of a wall-mounted version, 115/230 V AC, without relays

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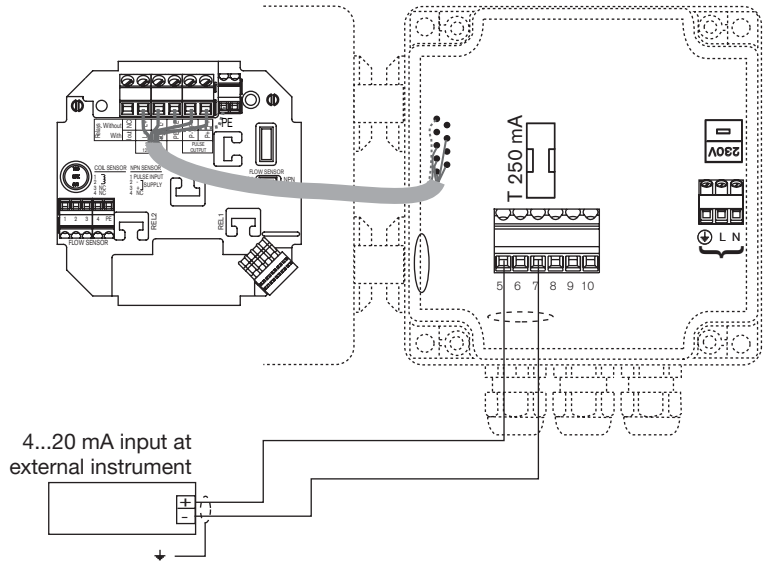
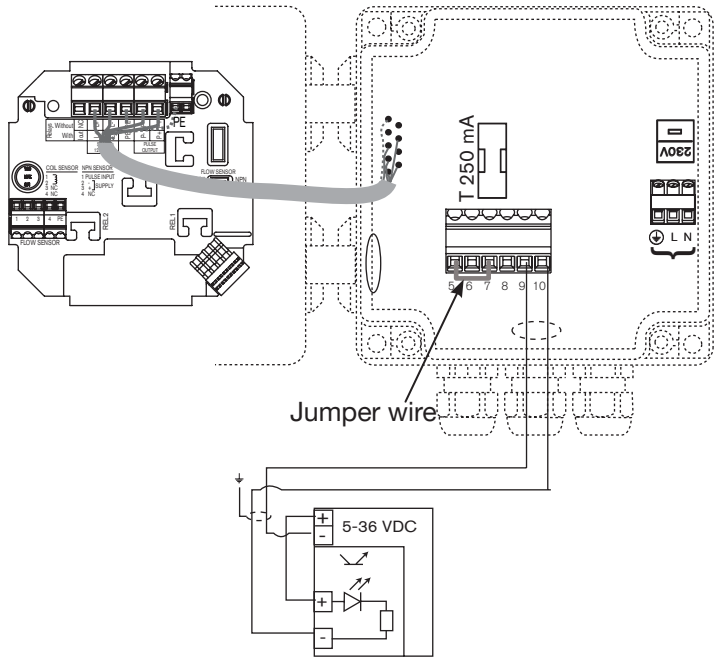


If the current output is wired, remove the jumper wire between the terminals 5 and 7.

Fig. 47: Wiring of the current output of a wall-mounted version, 115/230 V AC, without relays



- If the current output is not wired, make sure the jumper wire between the terminals 5 and 7 is in place.

Fig. 48: Wiring in NPN mode of the pulse output of a wall-mounted version, 115/230 V AC, without relays

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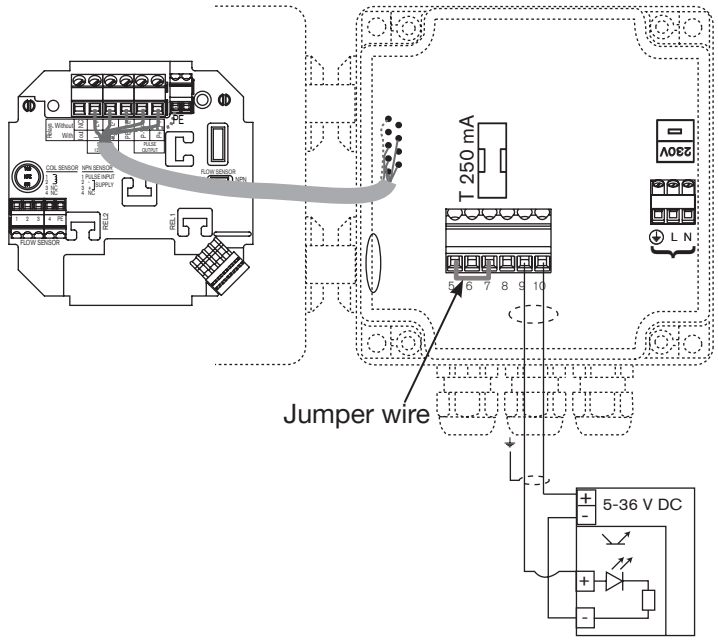

▸ If the current output is not wired, make sure the jumper wire between the terminals 5 and 7 is in place.

Fig. 49: Wiring in PNP mode of the pulse output of a wall-mounted version, 115/230 V AC, without relays

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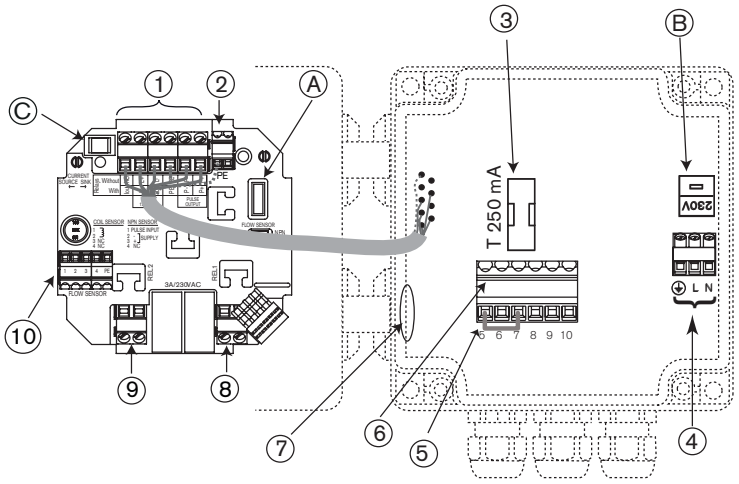
8.8.3 Wiring the power supply, the current output and the pulse output, 115/230 V AC, with relays

→ Before wiring the device, follow the instructions of chapter 8.8.1.



Switch (A): see chapter 8.5.1

Switch (B): see chapter 8.5.3

Switch (C): see chapter 8.5.2

Terminal block 1

Iout: 4...20 mA output (green wire, factory wired)

L+ (red wire, factory wired)

L– (black wire, factory wired)

PE: wiring of the PE between the main board and the protection board

P– (brown wire, factory wired)

P+ (white wire, factory wired)

Terminal block 2 PE

Shield connection (green/yellow wire, factory wired)

Time-delay fuse 3: fuse to protect the 115 V AC or 230 V AC power supply

Terminal block 4

Wiring of the 115/230 V AC power supply

Jumper wire 5: jumper wire to be removed if the 4...20 mA output is connected

Terminal block 6

Terminal 5: 4...20 mA output

Terminal 6: positive 27 V DC power supply, available to energize an external instrument

Terminal 7: 0V (earth of the power supply available to energize an external instrument)

Terminal 8: cable shields

Terminal 9: negative pulse output

Terminal 10: positive pulse output

Marker 7: all the cables must be fitted here

Terminal block 8: wiring of relay 1, see chapter 8.6.2

Terminal block 9: wiring of relay 2, see chapter 8.6.2

Connector 10: connection of the flow sensor

Fig. 50: Terminal assignment of a wall-mounted version, 115/230 V AC, with relays

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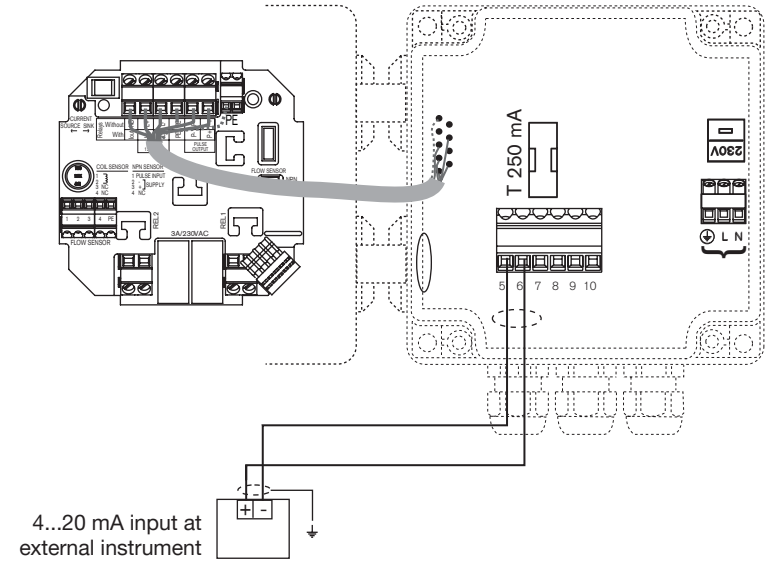
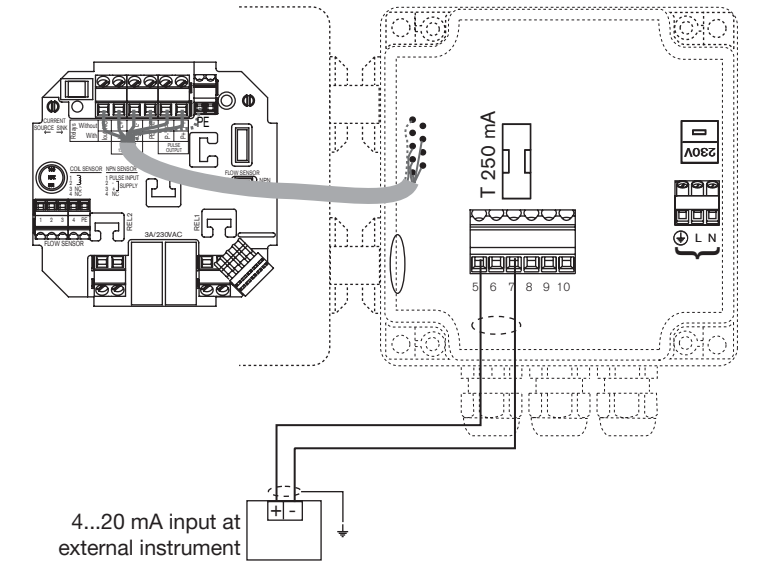
The wiring of the pulse output of a wall-mounted version with relays is the same as the wiring of a version without relays.

→ Refer to Fig. 48 and Fig. 49.



▸ If the current output is wired, remove the jumper wire between the terminals 5 and 7.

Fig. 51: Wiring in sinking mode of the current output of a wall-mounted version, 115/230 V AC, with relays



▸ If the current output is wired, remove the jumper wire between the terminals 5 and 7.

Fig. 52: Wiring in sourcing mode of the current output of a wall-mounted version, 115/230 V AC, with relays

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8.8.4 Connecting the flow sensor to the flow transmitter 8025 transmitter in wall-mounted version

→ Configure the FLOW SENSOR selector on the electronic board (see chapter 8.5).

→ Connect the remote flow sensor to the FLOW SENSOR terminal block of the electronic board by respecting the pin assignment depending on the output type of the remote sensor, either sinus (COIL) or pulse output (NPN).

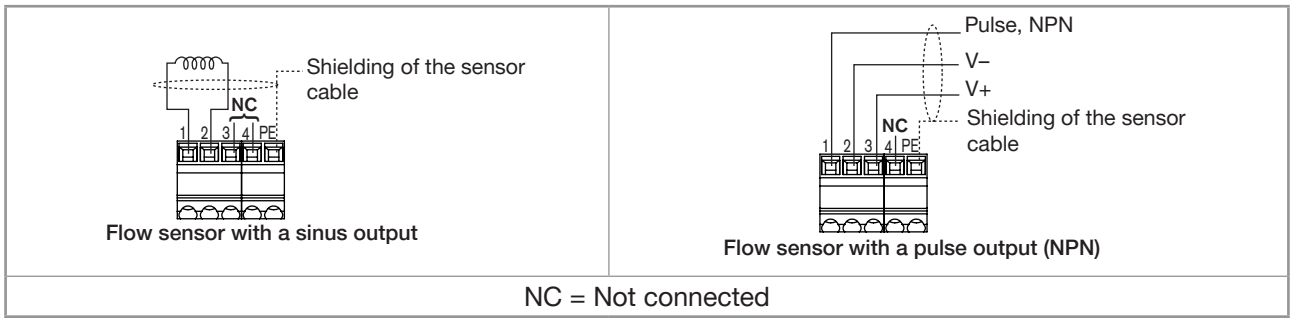

Fig. 53: Wiring of the remote flow sensor to the 8025 transmitter

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9 OPERATING AND COMMISSIONING

9.1 Safety instructions

WARNING

Risk of injury due to nonconforming operating.

Non-conforming operating could lead to injuries and damage the device and its surroundings.

- ▸ The operators in charge of operating must have read and understood the contents of these Operating Instructions.
- ▸ In particular, observe the safety recommendations and intended use.
- ▸ The device/installation must only be operated by suitably trained staff.

WARNING

Danger due to non-conforming commissioning.

Non-conforming commissioning could lead to injuries and damage the device and its surroundings.

- ▸ Before commissioning, make sure that the staff in charge have read and fully understood the contents of the Operating Instructions.
- ▸ In particular, observe the safety recommendations and intended use.
- ▸ The device / the installation must only be commissioned by suitably trained staff.
- ▸ Before commissioning, set the K-factor of the fitting used. See chapter 9.6.3.

9.2 Operating levels of the device

The device has two operating levels: the Process level and the Configuration level.

The Process level makes it possible:

- to read the flow rate measured by the device, the value of the current transmitted on the 4...20 mA analogue output, the values of both the daily and main totalizers;
- to reset the daily totalizer;
- to access the Configuration level.

The Configuration level has two menus (Parameters, Test) and makes it possible:

- to set the device parameters;
- to test some device settings.

Tab. 7: Default settings of the device

Function	Default value
LANGUAGE	English
UNIT of the flow rate	L/min, 1 decimal
UNIT of the totalizers	L
Number of decimal positions	1
4 mA current output	0.000
20 mA current output	100.0
K FACTOR	51.20

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Function	Default value
FILTER	5
Value of a pulse (PU)	00.05
Unit of the pulse output	L
Relay 1-	40.0
Relay 1+	50.0
Relay 1 inverted	no
Relay 2-	80.0
Relay 2+	90.0
Relay 2 inverted	no

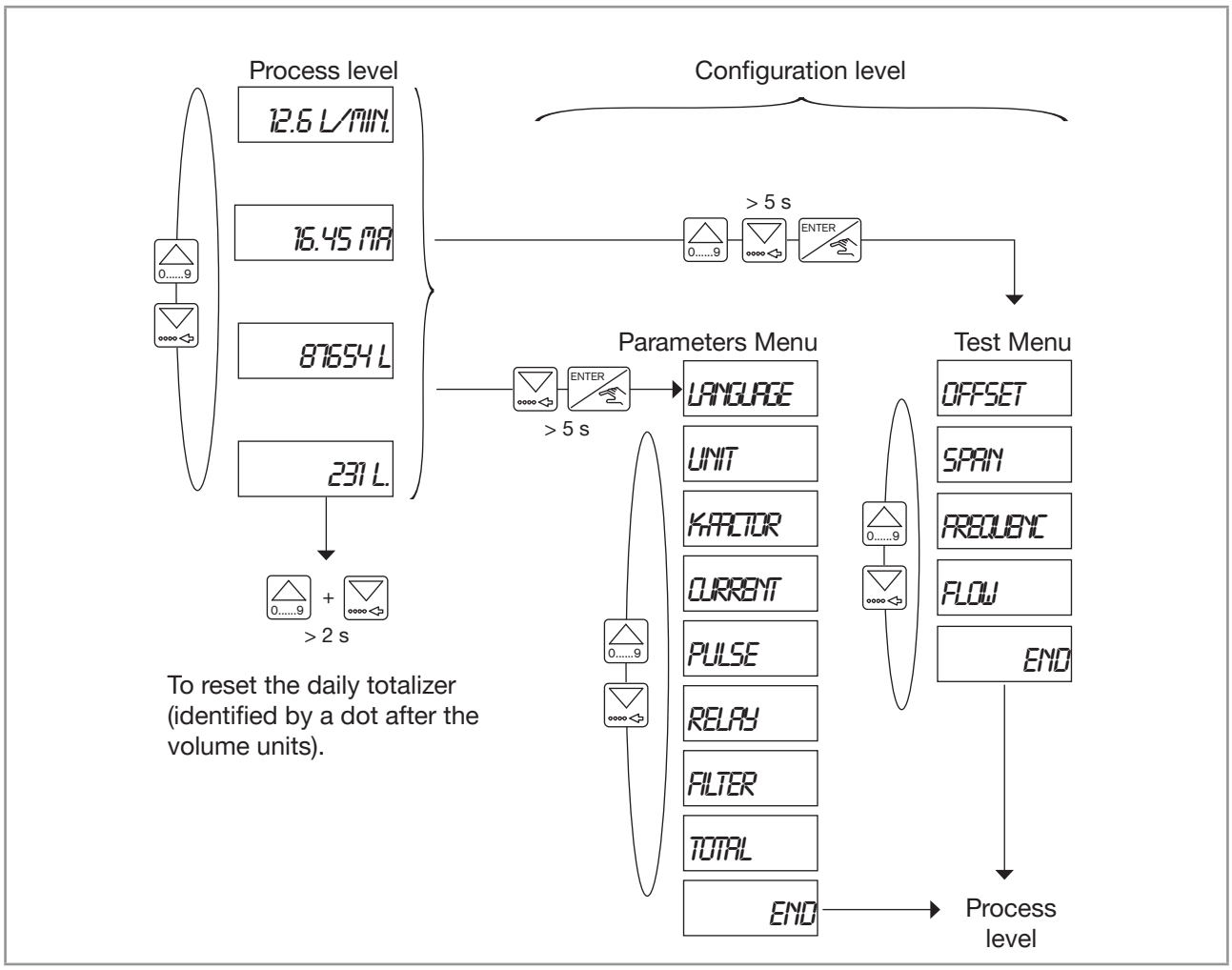

Fig. 54: Diagram of the levels of the device

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9.3 Description of the navigation keys and the status LEDs

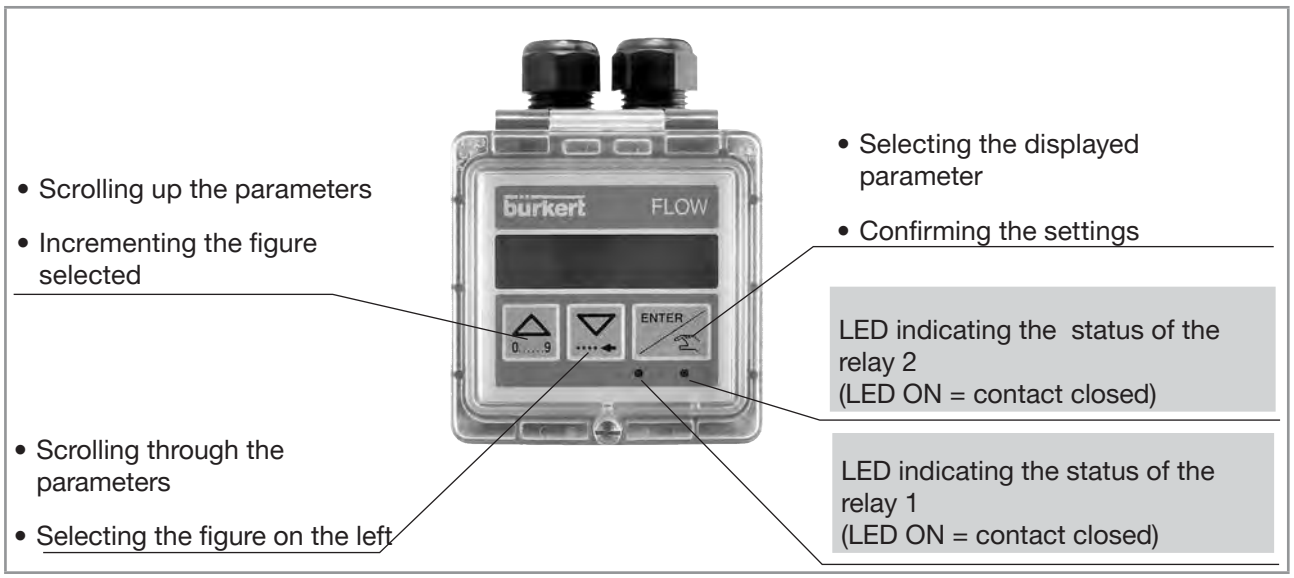

Fig. 55: Description of the display

9.4 Using the navigation keys

You want to...	Press...
move between parameters within a level or a menu.	• ▽ to go the next parameter. • △ 0.....9 to go to the previous parameter.
access the Parameters menu.	ENTER + ▽ simultaneously for 5 s, in the Process level
access the Test menu.	△ 0.....9 + ▽ + ENTER simultaneously for 5 s, in the Process level
reset the daily totalizer, from the Process level.	△ 0.....9 + ▽ simultaneously for 2 s, when the daily totalizer is displayed in the Process level
select the displayed parameter.	ENTER
confirm the displayed value.	ENTER
modify a numerical value.	• △ 0.....9 to increase the blinking digit. • ▽ to select the digit at the left of the blinking digit. • △ 0.....9 + ▽ to move the decimal point.

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9.5 Details of the Process level

This level is active by default when the device is energized.

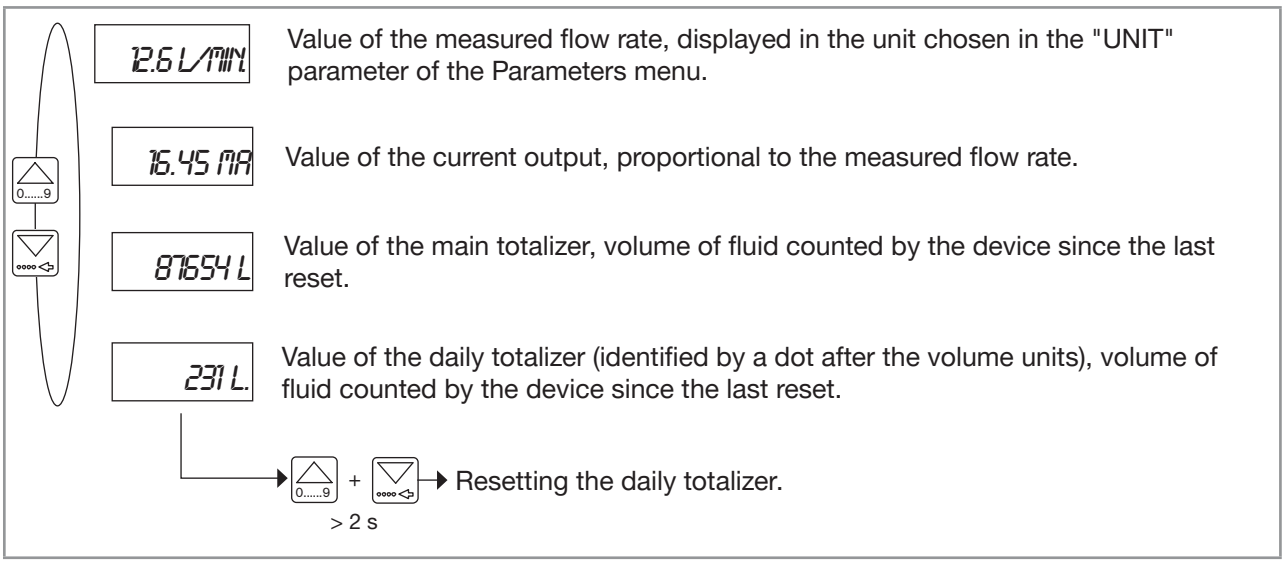

Fig. 56: Diagram of the Process level

9.6 Details of the Parameters menu

To access the Parameters menu, simultaneously press keys ENTER for at least 5 s.

This menu comprises the following configurable parameters:

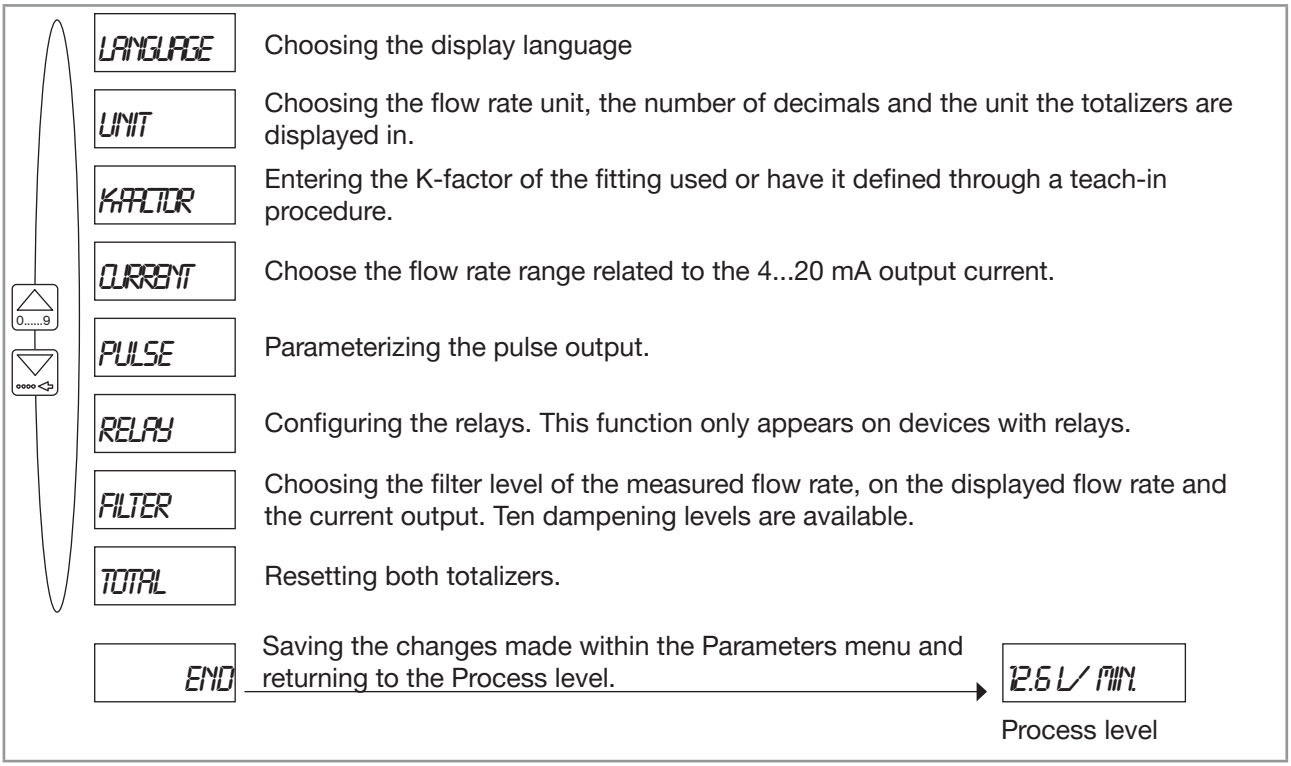

Fig. 57: Diagram of the Parameters menu

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9.6.1 Choosing the display language

When the device is energized for the first time, the display language is English.

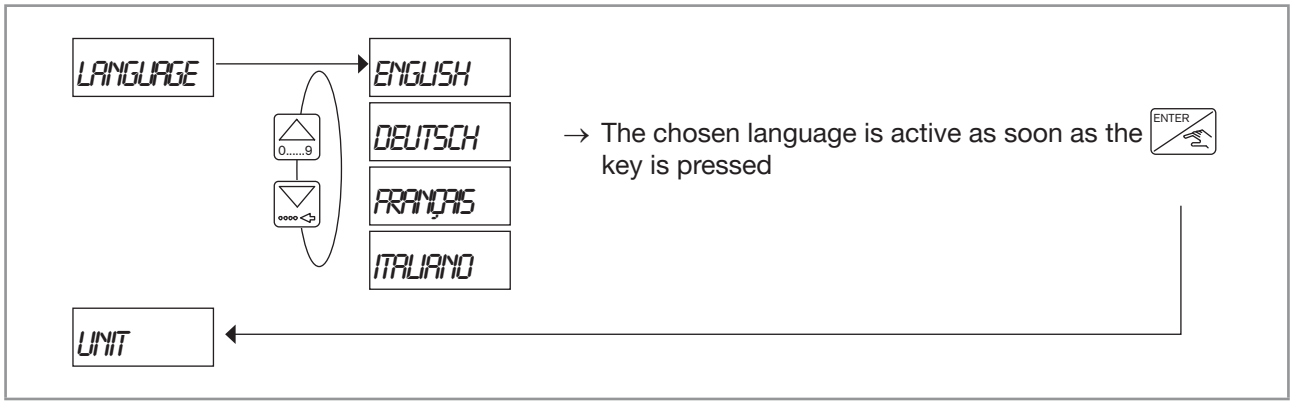

Fig. 58: Diagram of the "LANGUAGE" parameter of the Parameters menu

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parametersmenu and press ENTER to save the settings and go back to the Process level.

9.6.2 Choosing the flow rate units, the number of decimals and the units of the totalizers

The max. flow rate that can be displayed depends on the number of decimals chosen:

- 9999 if the number of decimals = 0.
- 999.9 if the number of decimals = 1.
- 99.99 if the number of decimals = 2.
- 9.999 if the number of decimals = 3.

The max. flow rate that can be displayed by the totalizers depends on the volume unit chosen:

- 9 999 999 if the volume unit chosen is "litre";
- 999 999 if the volume unit chosen is "m^3" or "gallon".

- When the flow rate unit is changed convert the flow rate values set within the "CURRENT", "PULSE" and "RELAYS" parameters of the Parameters menu.

The "UNIT" parameter makes it possible to choose:

- the flow rate units;
- a fixed number of decimals (choice 0, 1, 2 or 3) to display the flow rate in the Process level;
- the volume units of the totalizers if the unit previously chosen is in litres, in m^3 or in gallons.

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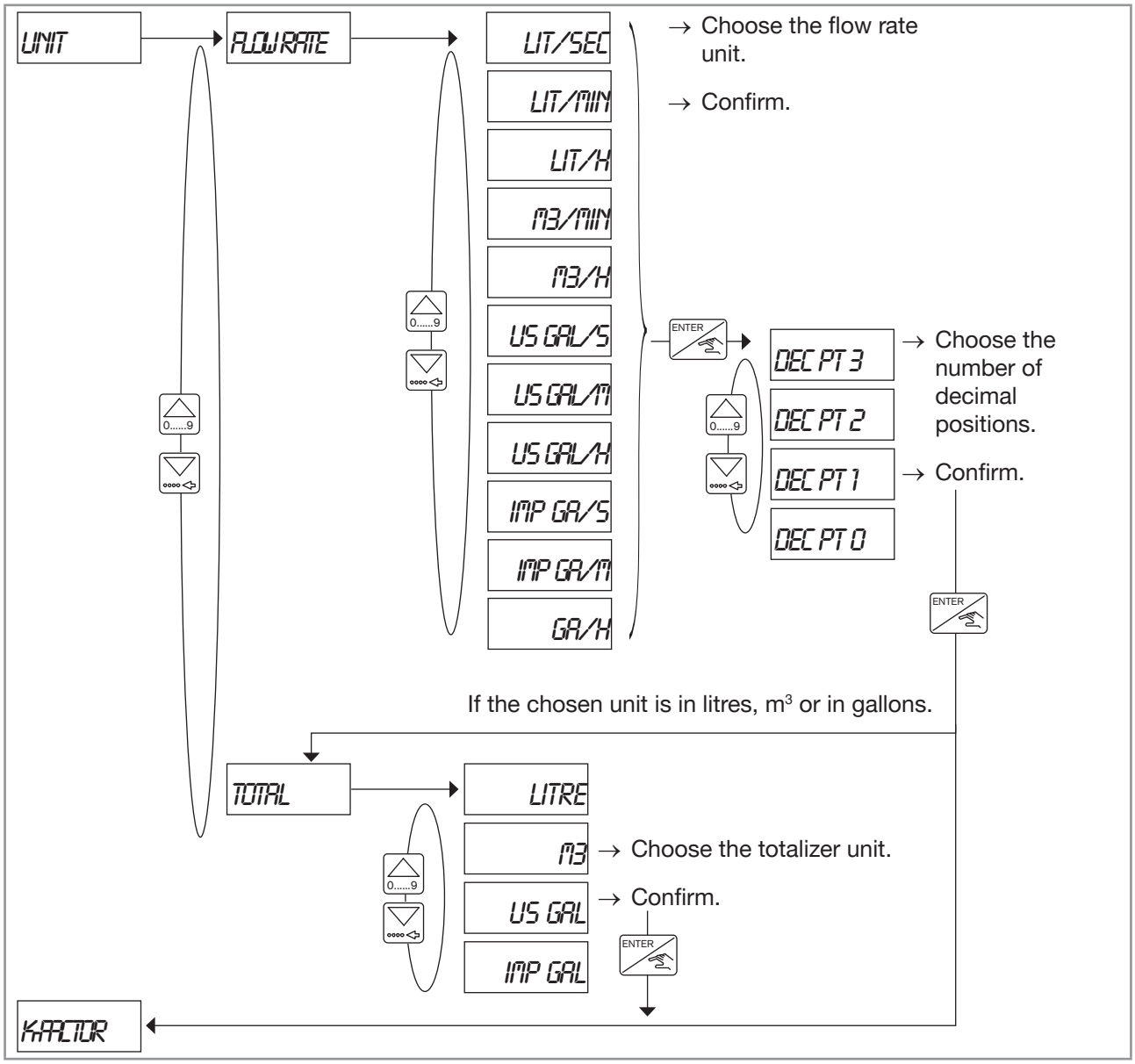

Fig. 59: Diagram of the "UNIT" parameter of the Parameters menu

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

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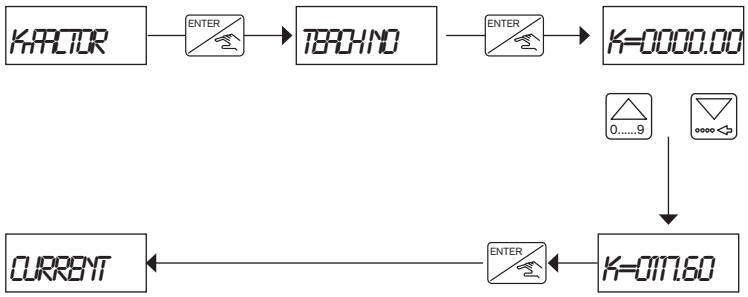
9.6.3 Entering the K-factor of the fitting used

The device determines the flow rate in the pipe using the fitting K-factor.

The K-factor of the fitting used can be entered here. The device may also determine the K-factor using a teach-in procedure: see Fig. 61.

The K-factor of the fitting used is in the Operating Instructions of the fitting.

The Operating Instructions of the Bürkert fittings is available on the internet at: country.burkert.com.



The display shows the K-factor of the fitting, last entered or determined using a Teach-In procedure.

Edit the parameter.

→ Enter the K-factor (value between 0.0001 and 9999.9) of the fitting used.

→ Confirm the displayed value.

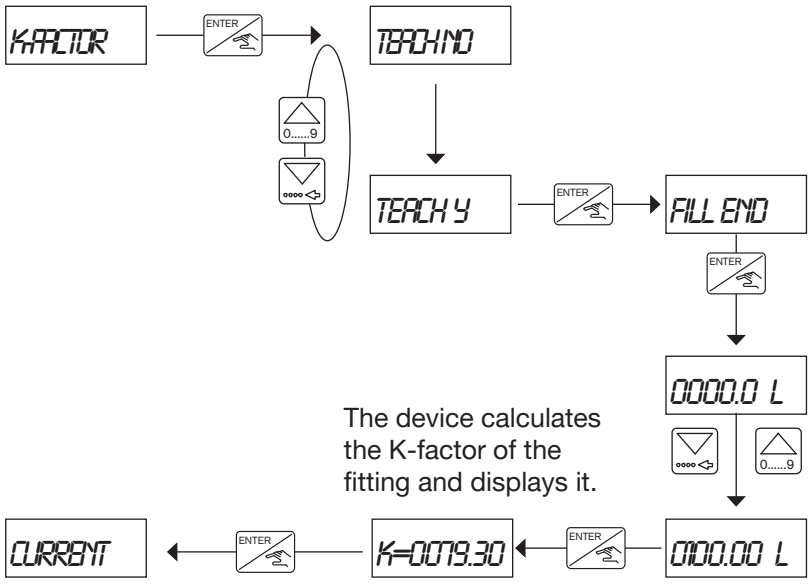
Fig. 60: Entering the K-factor of the fitting used

The teach-in is done depending on a known volume.

→ Prepare a tank with a known volume.

→ Stop the fluid circulation.

→ Confirm "TEACH Y.": "FILL END." is displayed.



→ Charge the pipe to fill the tank.

→ When the tank is full, confirm "FILL END"

Do not enter a volume value equal to 0.0 because the K-factor calculated would be equal to 0.0 and the device would not operate.

→ Enter the volume (value > 0.0 and ≤ 9999.9) of fluid that passed in the circuit.

→ Confirm.

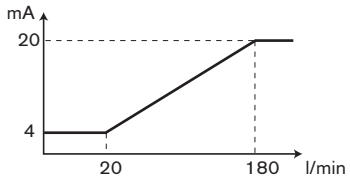
Fig. 61: Teach-in procedure depending on a volume

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

9.6.4 Configuring the current output

The 4...20 mA output provides an electrical current, the value of which reflects the flow rate measured by the device.

Example of relation between the measuring range and the current output:



→ To invert the output signal, give a lower flow rate value to the 20 mA current value than to the 4 mA current value.

→ To disable the current output, set both range bounds, 4 and 20 mA, to zero. In this case the output delivers a constant current of 4 mA.

The units and number of decimal digits are those set within the "UNIT" parameter for the display of the current output values.

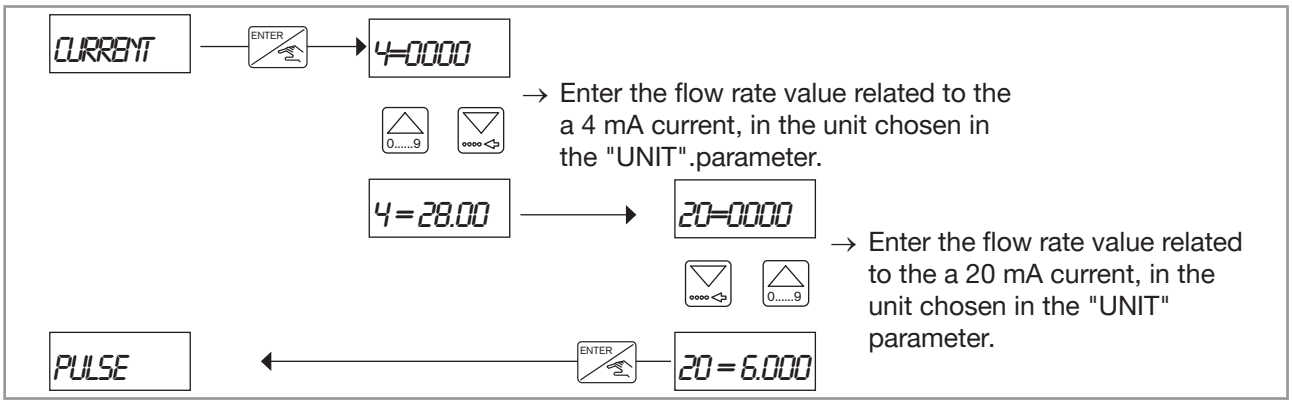


Fig. 62: Configuration of the current output

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

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9.6.5 Configuring the pulse output

This parameter makes it possible to enter the volume of liquid related to a pulse.

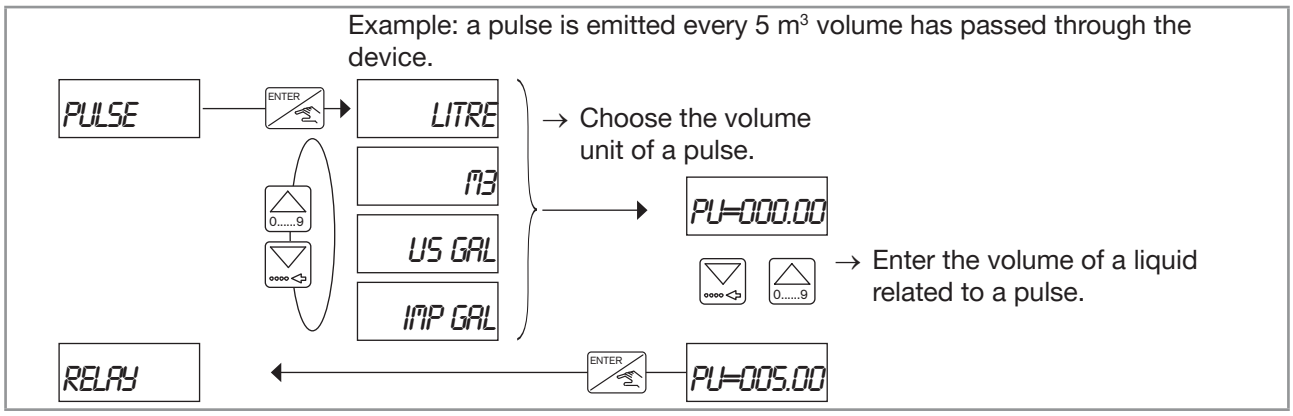


Fig. 63: Configuration of the pulse output

If the message "PU H LIM" or "PU L LIM" is displayed, see chapter 10.3.

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

9.6.6 Configuring the relays

This parameter makes it possible to set the switching thresholds and to invert or not the operating behaviour of each relay.

Both relays work in an hysteresis operating. The output status changes when a threshold is reached:

- by increasing flow rate, the output status changes when the threshold X+ is reached.
- by decreasing flow rate, the output status changes when the threshold X– is reached.

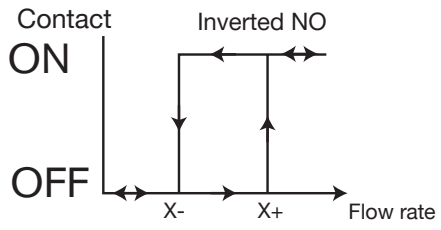
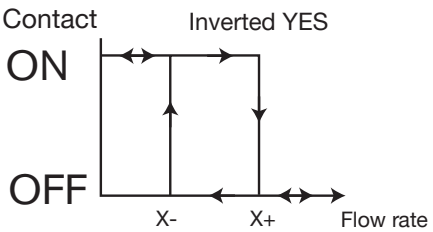
Operating behaviour, not inverted	Operating behaviour, inverted
	
X– = low switching threshold (1–, 2–) X+ = high switching threshold (1+, 2+)	

Fig. 64: Hysteresis operating, inverted or not inverted

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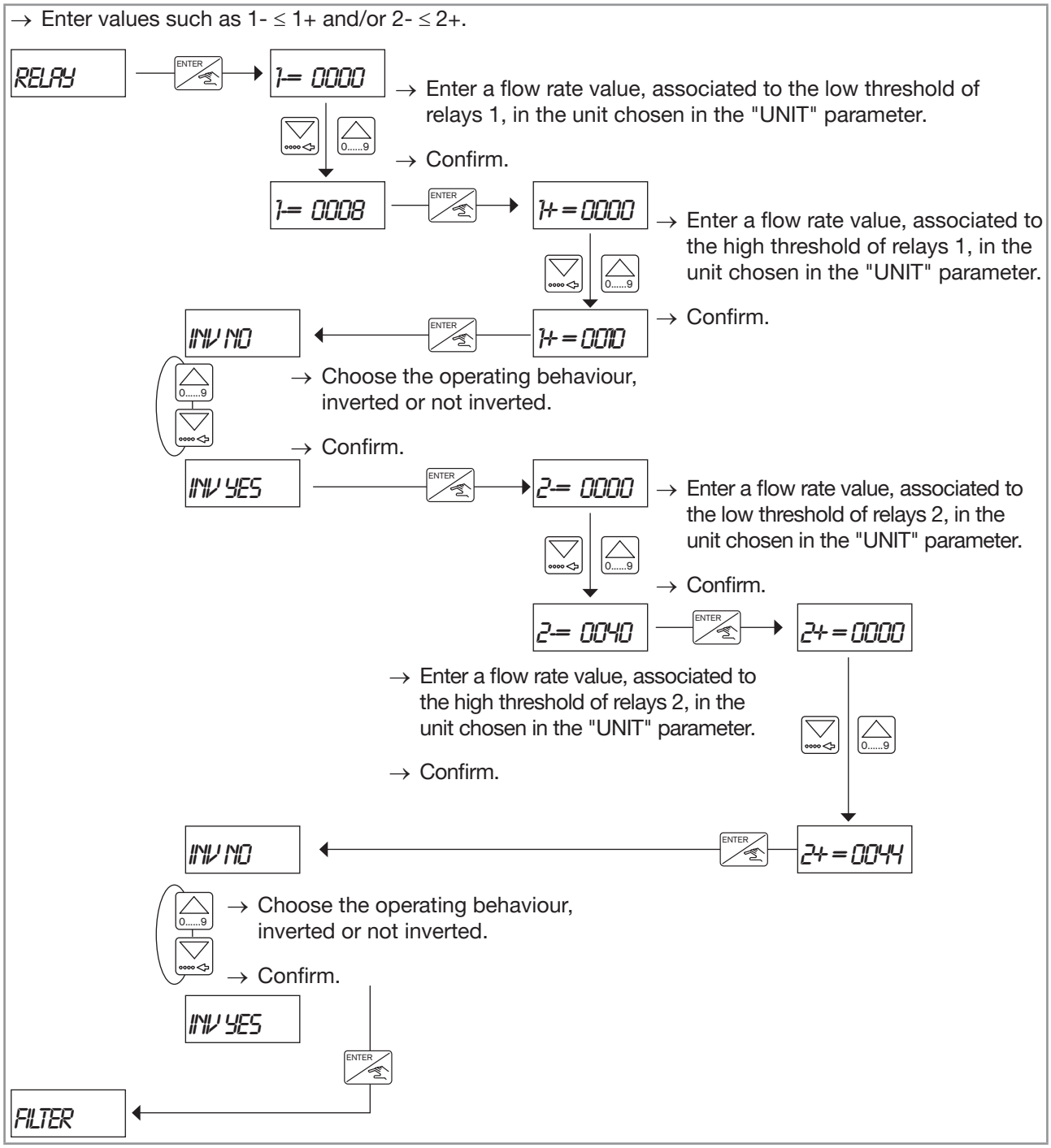

Fig. 65: Configuration of the thresholds of the relays

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

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9.6.7 Configuring the filter of the measured flow rate

This parameter makes it possible to dampen the fluctuations:

- of the display;
- of the current output.

Ten filters are available.

The following table gives the response time for each filter (10 %...90 %):

FILTER	Response time		FILTER	Response time
0	0.15 s		5	6 s
1	0.7 s		6	10 s
2	1.4 s		7	19 s
3	2.5 s		8	33 s
4	3.5 s		9	50 s

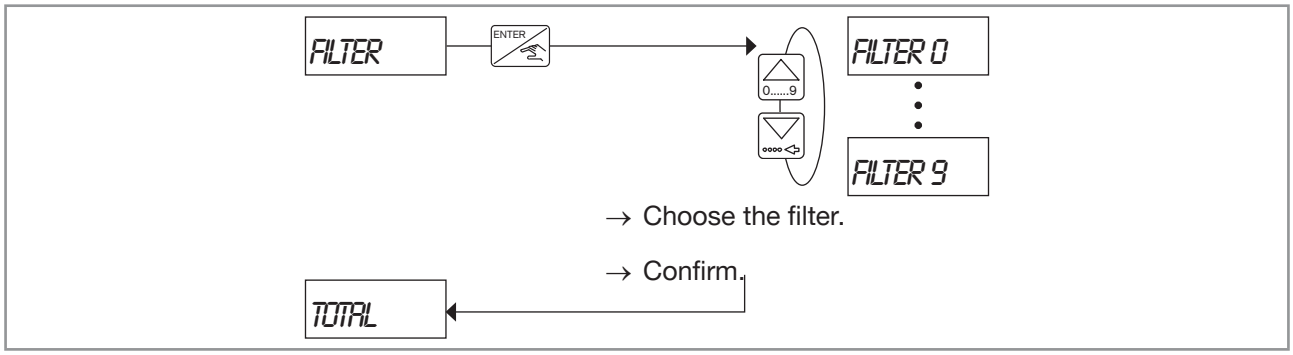

Fig. 66: Diagram of the "FILTER" parameter of the Parameters menu

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

9.6.8 Resetting both totalizers

This parameter makes it possible to reset both totalizers.

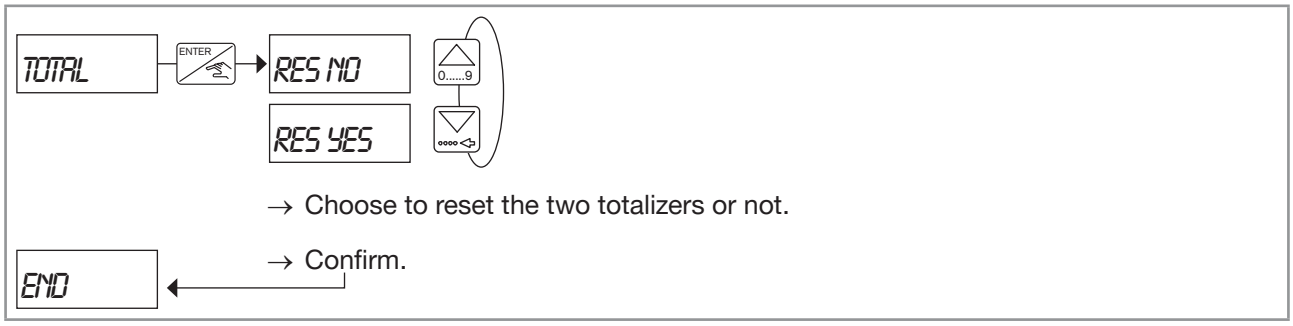

Fig. 67: Diagram of the "TOTAL" parameter of the Parameters menu

The daily totalizer can be reset from the Process level. See chapter 9.4.

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press ENTER to save the settings and go back to the Process level.

9.7 Details of the Test menu

To access the Test menu, simultaneously press keys [0.....9] [▽] [ENTER] for at least 5 s.

This menu comprises the following configurable parameters:

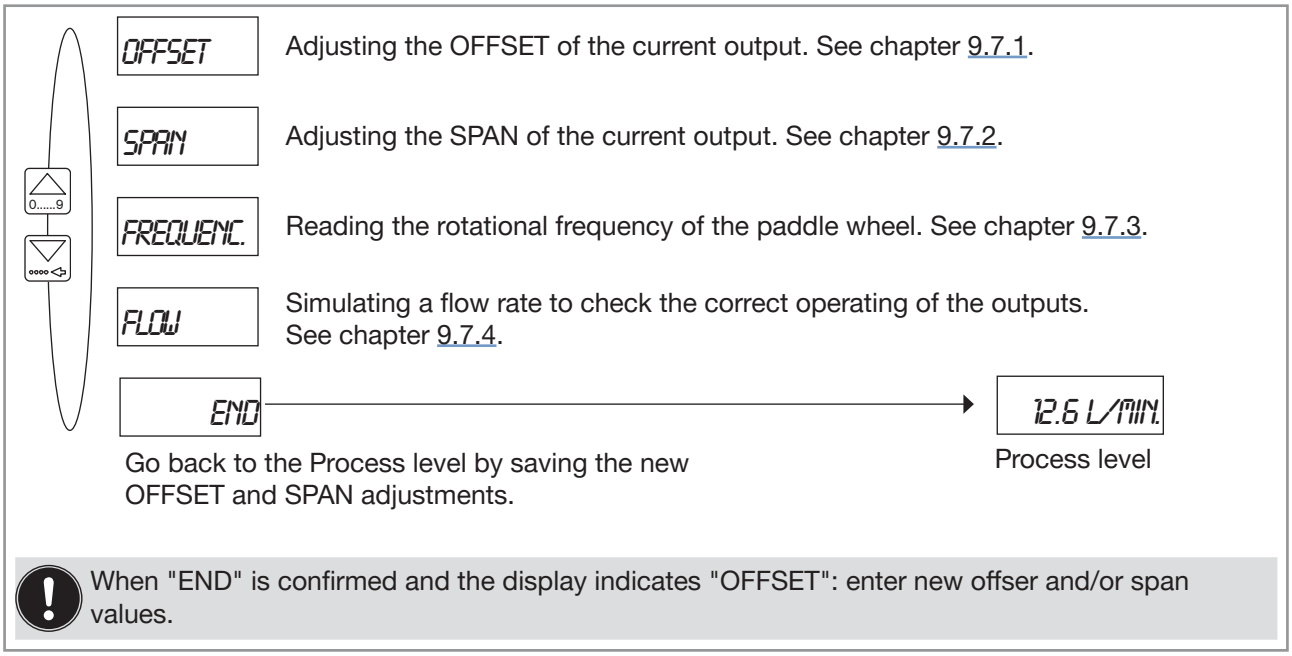

Fig. 68: Diagram of the Test menu

9.7.1 Adjusting the OFFSET of the current output

This parameter makes it possible to adjust the 4 mA current value transmitted on the 4...20 mA output.

→ Connect a multimeter into the measurement loop.

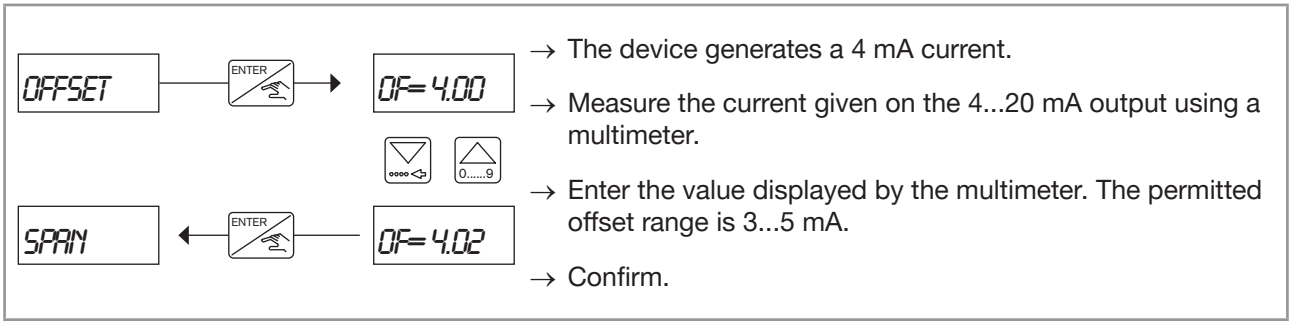

Fig. 69: Adjustment of the OFFSET

→ Adjust the default 20 mA current value: see chapter 9.7.2.

The adjusted value of the default 4 mA value (parameter "OFFSET") is taken into account when leaving the parameter "SPAN".

→ If you do not want to adjust another parameter, go to the "END" parameter of the Test menu and press [ENTER] to save the settings and go back to the Process level.

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9.7.2 Adjusting the SPAN of the current output

This parameter makes it possible to adjust the 20 mA current value transmitted on the 4...20 mA output.

→ Connect a multimeter into the measurement loop.

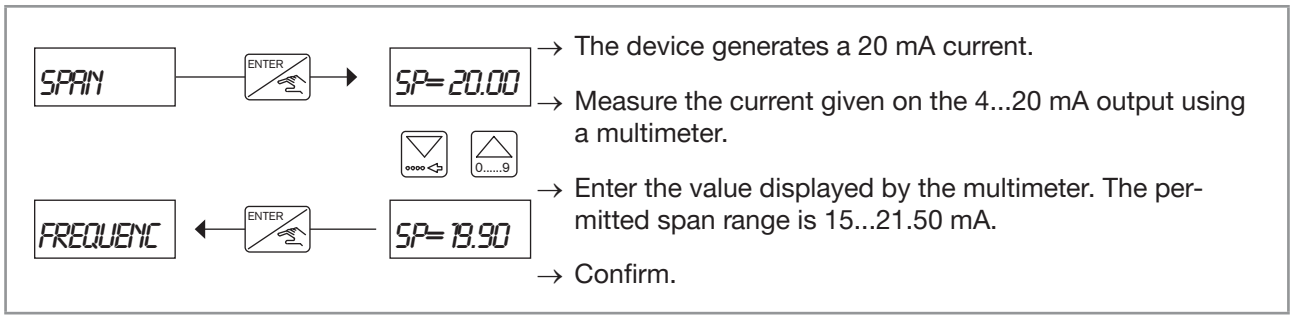

Fig. 70: Adjustment of the SPAN

→ If you do not want to adjust another parameter, go to the "END" parameter of the Test menu and press ENTER to save the settings and go back to the Process level.

9.7.3 Reading the rotational frequency of the paddle wheel

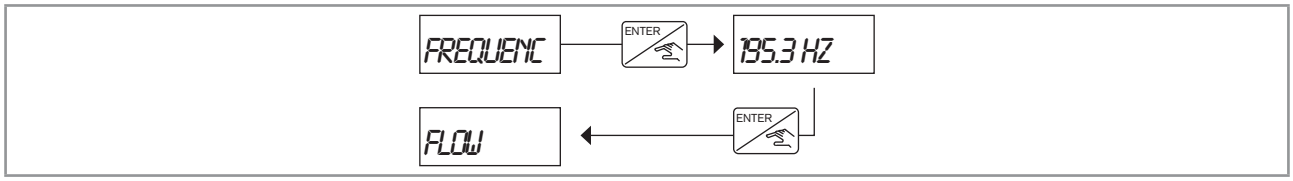

Fig. 71: Diagram of the "FREQUENC." parameter of the Test menu

→ If you do not want to adjust another parameter, go to the "END" parameter of the Test menu and press ENTER to save the settings and go back to the Process level.

9.7.4 Checking the outputs behaviour

This parameter makes it possible to simulate a flow rate in order to check that the outputs are behaving as expected by the configuration made.

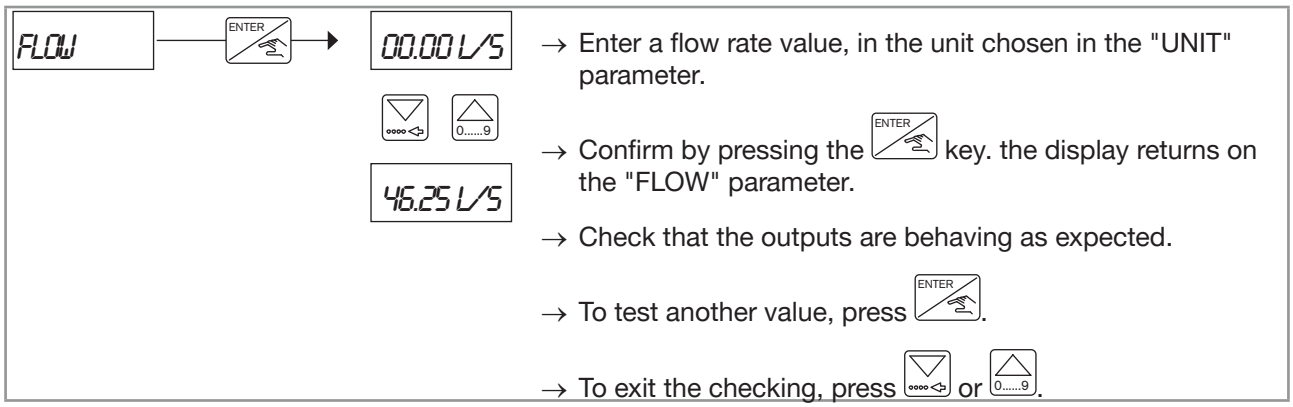

Fig. 72: Diagram of the "FLOW" parameter of the Test menu

→ If you do not want to adjust another parameter, go to the "END" parameter of the Test menu and press ENTER to save the settings and go back to the Process level.

10 MAINTENANCE AND TROUBLESHOOTING

10.1 Safety instructions

DANGER

Danger due to electrical voltage.

- Shut down the electrical power source of all the conductors and isolate it before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Risk of injury due to high pressure in the installation.

- Stop the circulation of fluid, cut off the pressure and drain the pipe before loosening the process connections.

Risk of injury due to high fluid temperatures.

- Use safety gloves to handle the device.
- Stop the circulation of fluid and drain the pipe before loosening the process connections.

Risk of injury due to the nature of the fluid.

- Respect the prevailing regulations on accident prevention and safety relating to the use of dangerous fluids.

WARNING

Risk of injury due to nonconforming maintenance.

- Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
- Guarantee a defined or controlled restarting of the process after a power supply interruption.

10.2 Cleaning the device

The device can be cleaned with a cloth dampened with water or a detergent compatible with the materials the device is made of.

Please feel free to contact your Bürkert supplier for any additional information.

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10.3 Problem solving

Message displayed	Possible cause	Recommended action
ERROR 3	Memory read error: the user settings are lost.	→ Switch the device off. → Switch the device on. → If the message is still displayed, press the ENTER key to acknowledge the error: the device operates with the default settings. → Adjust the device again. → If the message appears frequently, send the device back to your supplier.
ERROR 4	Memory read error: the totalizer values are lost.	→ Press the ENTER key to acknowledge the error: the values of the totalizers are set to those of the last start of the device. → Check the values of the totalizers.
ERROR 5	Memory read error: the user settings and the totalizer values are lost.	→ Press the ENTER key to acknowledge the error: the device operates with the default settings and the values of the totalizers are set to those of the last start of the device. → Adjust the device again. → Check the values of the totalizers. → If the message appears frequently, send the device back to your supplier.
ERROR 6	Memory read error: the totalizer values are lost.	→ Press the ENTER key to acknowledge the error: the totalizers are reset.
ERROR 7	Memory read error: the user settings and the totalizer values are lost.	→ Press the ENTER key to acknowledge the error: the totalizers are reset. → Send the device back to your supplier.
PWR FAIL	The supply voltage is too low. • The voltage at the device terminals is lower than 12 V. • The impedance of the current measurement loop is too high (see chapter 6.1.6).	→ Adjust the supply voltage so that the voltage at the device terminals is between 12 V and 36 V.
PU H LIM	The pulse value times the K-factor of the device is > 1000000. The entered volume for a pulse is too high.	→ Enter a lower volume / pulse. See chapter 9.6.5. → Check the K-factor value. See chapter 9.6.3.
PU L LIM	The pulse value times the K-factor of the device is < 1. The entered volume for a pulse is too low.	→ Enter a higher volume / pulse. See chapter 9.6.5. → Check the K-factor value. See chapter 9.6.3.

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11 SPARE PARTS AND ACCESSORIES

CAUTION

Risk of injury and/or damage caused by the use of unsuitable parts.

- Incorrect accessories and unsuitable replacement parts may cause injuries and damage the device and the surrounding area.
- Use only original accessories and original replacement parts from Bürkert.

The defective electronic board or housing of your device can be replaced.

- Contact the local Bürkert office.

11.1 Spare parts of the 8025 compact version

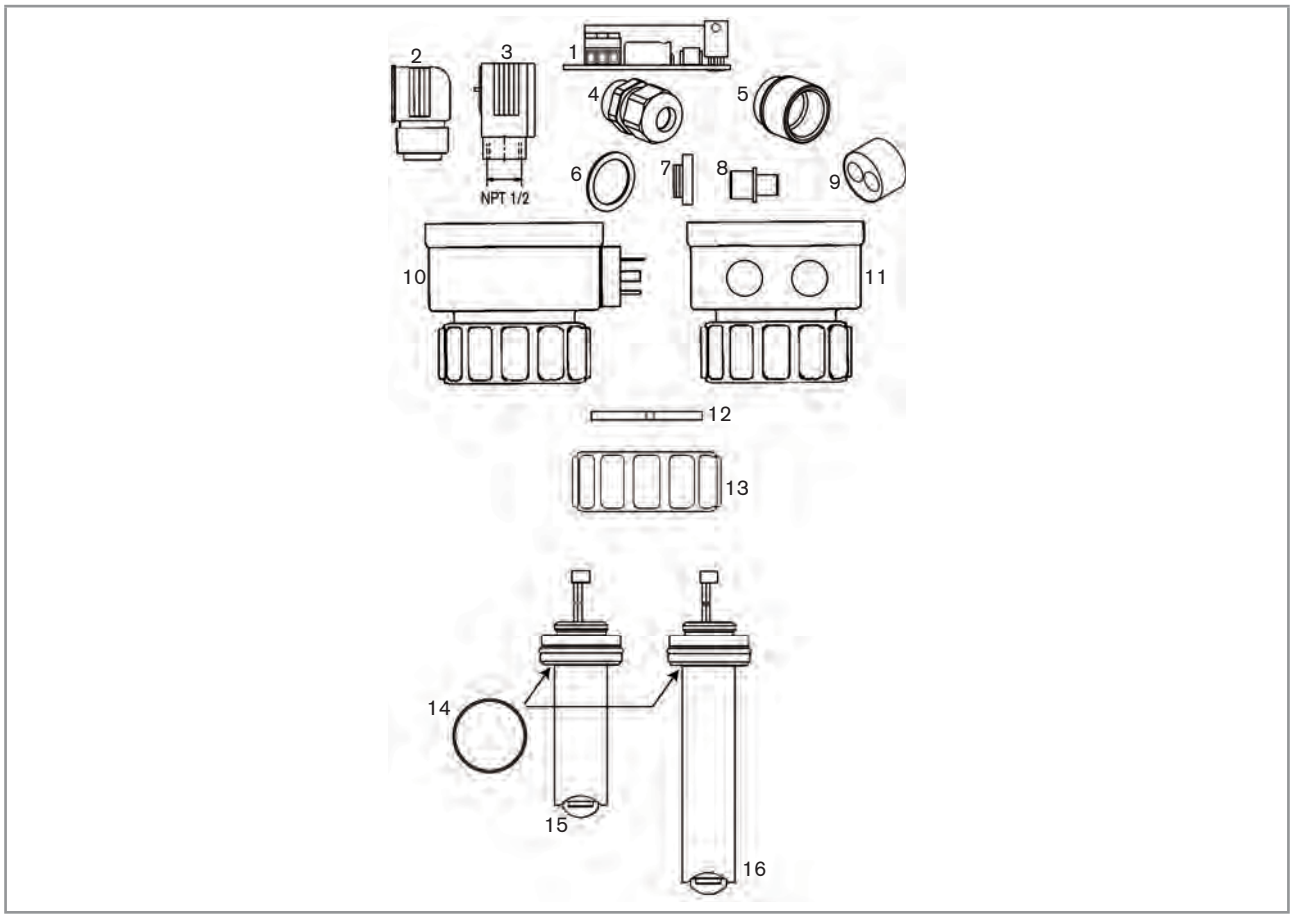

Fig. 73: Exploded view of the spare parts of a 8025, compact version

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Position Fig. 73	Designation	Article number
1	115/230 V AC supply voltage board + replacement instructions	553 168
2	Female connector with cable gland (type 2518)	572 264
3	Female connector type 2509 with NPT 1/2" reduction	162 673
4+6+7+9	Set including: • 2 M20*1.5 cable glands • 2 neoprene flat seals for cable gland or plug • 2 M20*1.5 screw plugs • 2 2*6 mm multi-way seals	449 755
5+6+7	Set including: • 2 M20*1.5 / NPT1/2" reductions (with mounted seals) • 2 neopren flat seals for the screw plug • 2 M20*1.5 screw plugs	551 782
8+9+14	Set including: • 1 M20*1.5 cable gland blanking plug • 1 2*6 mm multi-way seal for a cable gland • 1 black EPDM seal for the flow sensor • 1 mounting instruction sheet	551 775
10 + 2	Housing with female connector type 2518, snap ring and nut	425 524
11	Housing for 2 M20*1.5 cable glands, snap ring and nut	425 526
12	Snap ring	619 205
13	Nut	619 204
14	Set including: • 1 FKM green seal • 1 EPDM black seal	552 111
15	Flow sensor (coil) for DN15 to DN100 (1/4"...4") pipes + replacement instructions	633 366
	Flow sensor (Hall) for DN15 to DN100 (1/4"...4") pipes + replacement instructions	418 316
16	Flow sensor (coil) for DN ≥ 100 (≥ 5") + replacement instructions	634 757
	Flow sensor (Hall) for DN ≥ 100 (≥ 5") + replacement instructions	418 324
	Set with 8 FLOW foils	553 191

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11.2 Spare parts of the 8035 or of the SE35

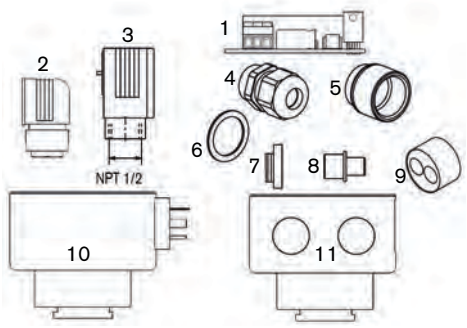

Fig. 74: Exploded view of the spare parts of a flowmeter 8035 or a flow transmitter SE35

Position Fig. 74	Designation	Article number
1	115/230 V AC supply voltage board + replacement instructions	553 168
2	Female connector with cable gland (type 2518)	572 264
3	Female connector type 2509 with NPT 1/2" reduction	162 673
4+6+7+9	Set including: • 2 M20*1.5 cable glands • 2 neoprene flat seals for cable gland or plug • 2 M20*1.5 screw plugs • 2 2*6 mm multi-way seals	449 755
5+6+7	Set including: • 2 M20*1.5 / NPT1/2" reductions (with mounted seals) • 2 neopren flat seals for the screw plug • 2 M20*1.5 screw plugs	551 782
8+9	Set including: • 1 M20*1.5 cable gland blanking plug • 1 2*6 mm multi-way seal for a cable gland • 1 black EPDM seal • 1 mounting instruction sheet	551 775
10+2	Housing with female connector type 2518, coil function	425 246
11	Housing for 2 M20*1.5 cable glands, coil function	425 247
11	Housing for 2 M20*1.5 cable glands, Hall function	425 248
	Set with 8 FLOW foils	553 191

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11.3 Spare parts of a 8025 in panel version

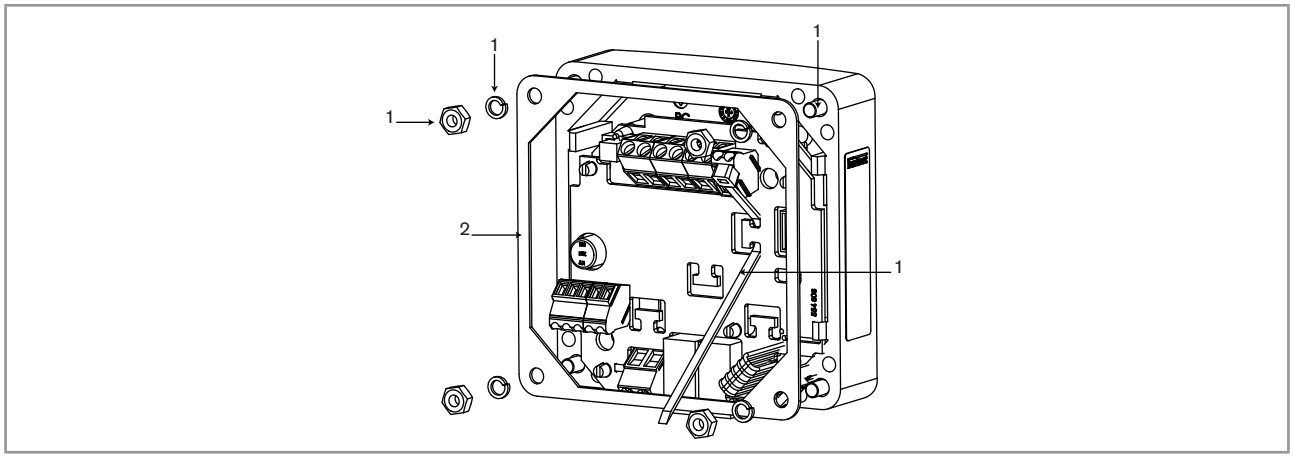

Fig. 75: Exploded view of the spare parts of a flow transmitter 8025 in panel version

Position Fig. 75	Designation	Article number
1	Mounting set (screws, washers, nuts, cable clips)	554 807
2	Seal	419 350
	Set with 8 FLOW foils	553 191

11.4 Spare parts of a 8025 in wall-mounted version

Designation	Article number
115/230 V AC supply voltage board + replacement instructions	555 722

12 PACKAGING, TRANSPORT

NOTICE

Damage due to transport

Transport may damage an insufficiently protected device.

- ▸ Transport the device in shock-resistant packaging and away from humidity and dirt.
- ▸ Do not expose the device to temperatures outside the admissible storage temperature range.
- ▸ Protect the electrical interfaces using protective plugs.

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13 STORAGE

NOTICE

Poor storage can damage the device.

- Store the device in a dry place away from dust.
- Storage temperature of the device: see Tab. 8.
- Storage temperature of the fitting or sensor-fitting:
  refer to the Operating Instructions of the corresponding fitting or sensor-fitting.

Tab. 8: Storage temperature of the versions of the device

Device	Power supply	Storage temperature
Flowmeter 8025 compact version	12...36 V DC	–10 °C...+60 °C
	115/230 V AC	–10 °C...+50 °C
Flow transmitter 8025 in panel version	12...36 V DC	–10 °C...+60 °C
Flow transmitter 8025 in wall-mounted version	12...36 V DC	–10 °C...+60 °C
	115/230 V AC	–10 °C...+60 °C
Flowmeter 8035 / Flow transmitter SE35	12...36 V DC	–10 °C...+60 °C
	115/230 V AC	–10 °C...+50 °C

14 DISPOSAL OF THE DEVICE

→ Dispose of the device and its packaging in an environmentally-friendly way.

NOTICE

Damage to the environment caused by parts contaminated by the fluid.

- Comply with the national and/or local regulations which concern the area of waste disposal.

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