

Types 8025 - 8035 BATCH

Batch controller



Operating Instructions

We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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Operating Instructions 1311/2_EU-ML 00564510 ORIGINAL_FR

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1 ABOUT THIS MANUAL

This manual describes the entire life cycle of the device. Please keep this manual in a safe place, accessible to all users and any new owners.

This manual contains important safety information.

Failure to comply with these instructions can lead to hazardous situations.

- ▶ This manual 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.



ATTENTION

Warns against a possible risk.

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

NOTE

Warns against material damage.

- ▶ Failure to observe this warning may result in damage to the device or system.



Indicates additional information, advice or important recommendations.



Refers to information contained in this manual or in other documents.

→ Indicates a procedure to be done.

1.2 Definition of the word "device"

The word "device" used within this manual refers to the dosing controller 8025 or 8035 Batch with serial numbers higher or equal to 20 000.

2 INTENDED USE AND EXPORT OF THE DEVICE

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

- ▶ The dosing controller 8025 or 8035 Batch, installed in series with one or two valves, has been designed to do the dosing of one or several quantities (volumes or masses) of a liquid.
- ▶ This device must be protected against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of climatic conditions.
- ▶ This device must be used in compliance with the characteristics and commissioning and use conditions specified in the contractual documents and in the user manual.
- ▶ 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.

- ▶ Observe any existing restraints when the device is exported.

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 devices.
- the local safety regulations for which the operating company is responsible including the staff in charge of installation and maintenance.



Danger 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.

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.

Danger due to high temperatures of the fluid.

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

Danger due to the nature of the fluid.

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



Various dangerous situations

To avoid injury take care:

- ▶ not to use the device in explosive atmospheres.
- ▶ not to use the device for the dosing of gaz.
- ▶ not to use the device in an environment incompatible with the materials it is made of.
- ▶ not to subject the device to mechanical loads (e.g. by placing objects on top of it or by using it as a step).
- ▶ not to make any external or internal modifications to the device.
- ▶ to prevent any unintentional power supply switch-on.
- ▶ to ensure that installation and maintenance work are carried out by qualified, authorised personnel in possession of 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.

NOTE

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 the EN 61340-5-1 and 5-2 norms.
- ▶ Also ensure that you do not touch any of the live electrical components.

NOTE

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).

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: www.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 these operating instructions.

4.3 Information on the Internet

You can find the user manuals and technical data sheets regarding the type 8025 or 8035 Batch at:
www.burkert.com

5 DESCRIPTION

5.1 Area of application

When mounted in series with one or two valves the dosing controller 8025 or 8035 Batch enables the dosing of one or several quantities of a liquid.

It controls the opening or closing of the valves via the relay outputs and counts the quantity of flown liquid.

The dosing is done either locally by pressing the navigation keys under the display or remotely by a PLC via one up to four digital inputs.

The dosing principle is described in chap. [“9.5”](#).

The eight available dosing modes are described in chap. [“9.6”](#).

5.2 General description

The 8025 Batch is a dosing controller available in compact, wall-mounted or panel-mounted versions and the 8035 Batch is a dosing controller available in compact versions.

- A compact version of the 8025 Batch is made up of a flow sensor with paddle wheel and an electronic module (electronics integrated in a housing with cover and lid, display and 2 cable glands).
- A compact version of the 8035 Batch is made up of a flow sensor-fitting type S030 with paddle wheel and an electronic module SE35 (electronics integrated in a housing with cover and lid, display and 2 cable glands).
- A panel-mounted version is an electronics integrated in an open housing with display.
- A wall-mounted version is an electronics integrated in a housing with cover, display and 5 cable glands.

The device has four digital inputs (called DI1 to DI4), two transistor outputs (called DO1 and DO4, which can be parametered), two relay outputs (called DO2 and DO3, which can be parametered) and four totalizers (two volume or mass totalizers and two totalizers of the done dosings).

Depending on the version the device is energized by a 12-36 V DC or a 115/230 V AC power supply.

Electrical connection is made on the terminal blocks of the electronic board, either directly or via 2 or 5 cable glands.

5.3 Available versions of type 8025 Batch

The following versions of the dosing controller 8025 Batch are available.

All these versions have four digital inputs (DI1 to DI4), two transistor outputs (DO1 and DO4), two relay outputs (DO2 and DO3) and four totalizers.

Version 8025 Batch	Supply voltage	Flow sensor		UL ²⁾	Order code
		Type	Seal material		
Compact	12-36 V DC	Hall, short	FKM ¹⁾	no	419520
		Hall, short	FKM ¹⁾	yes	564414
		Hall, long	FKM ¹⁾	no	419522
	115/230 V AC	Hall, short	FKM ¹⁾	no	419521
		Hall, long	FKM ¹⁾	no	419529
Panel	12-36 V DC	-	-	no	419536
		-	-	yes	564415
Wall-mounted	12-36 V DC	-	-	no	433740
	115/230 V AC	-	-	no	433741

¹⁾ A set with a black EPDM seal for the flow sensor, an M20x1,5 cable gland plug, a 2x6mm multi-way seal and a mounting instruction sheet, is delivered with each device in a compact version.

²⁾ identified by the logo  on the name plate of the device.

5.4 Available versions of the electronic module SE35 Batch

The following versions of the electronic module SE35 Batch are available.

All these versions have four digital inputs (DI1 to DI4), two transistor outputs (DO1 and DO4), two relay outputs (DO2 and DO3) and four totalizers.

A set with a black EPDM seal (not used), an M20x1,5 cable gland plug, a 2x6mm multi-way seal and a mounting instruction sheet, is delivered with each electronic module.

Supply voltage	UL ²⁾	Order code
12-36 V DC	no	443360
	yes	564398
115/230 V AC	no	423926

The order codes of the sensor-fitting S030 can be found within the related data sheet: refer to the data sheet at www.burkert.com.

²⁾ identified by the logo  on the name plate of the device.

5.5 Description of the name plate

	<ol style="list-style-type: none"> 1. Type of the device 2. Type of flow sensor 3. Power supply and max. current consumption 4. Protection class of the device 5. Manufacturing code
<ol style="list-style-type: none"> 6. Conformity logo 7. Specifications of the relay outputs DO2 and DO3 8. Warning: Before using the device, take into account the technical specifications described in these operating instructions. 9. Specifications of the transistor outputs DO1 and DO4 10. Serial number 11. Order code 	

Figure 1: Name plate of a non-UL device

	<ol style="list-style-type: none"> 1. Type of the device 2. Sensor specifications 3. Specifications of the transistor outputs DO1 and DO4 4. Power supply and max. current consumption 5. Protection class of the device 6. Manufacturing code
<ol style="list-style-type: none"> 7. Conformity logos 8. Warning: Before using the device, take into account the technical specifications described in these operating instructions. 9. Specifications of the relay outputs DO2 and DO3 10. Serial number 11. Order code 	

Figure 2: Name plate of a UL device

6 TECHNICAL DATA

6.1 Operating conditions

Ambient temperature	
▪ 8025 compact, 115/230 V AC	▪ -10 to +50 °C
▪ 8035, 115/230 V AC	▪ -10 to +50 °C
▪ other versions	▪ -10 to +60 °C
Air humidity	< 80%, non condensated
Height above sea level	max. 2000 m
Installation class	Class I acc. to UL 61010-1
Degree of pollution	Degree 2 acc. to EN 61010-1
Protection rating	acc to EN 60529
▪ compact version	▪ IP65, device wired and cable glands tightened and cover lid screwed tight.
▪ wall-mounted version	▪ IP65, device wired, cable glands tightened, cover lid screwed tight and entry item nuts of the cable glands tightened at a screwing torque of 1.5 Nm.
▪ panel version	▪ front side IP65, rear side IP20

6.2 Conformity to standards and directives

The device conforms to the EC directives through the following standards:

- EMC: EN 61000-6-2, EN 61000-6-3
- LVD: EN 61010-1
- Environmental testing: Vibration: EN 60068-2-6, Shock: EN 60068-2-27.

The UL devices with PU01 variable key comply with the following standards:

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

6.3 Technical data

6.3.1 General technical data

Type of fitting	
▪ 8025, compact version	▪ S020, DN20 (except DN20 v2) to DN400
▪ 8035	▪ S030, DN6 to DN65

<p>Fluid temperature, compact version</p> <ul style="list-style-type: none"> ▪ 8025, compact version ▪ 8035 	<p>The fluid temperature may be restricted by the fluid pressure and the materials the fitting used is made of. See "Figure 7", chap. "7.2.1" or "Figure 14", chap. "7.5".</p> <ul style="list-style-type: none"> ▪ -15 to +80 °C ▪ -15 to +100 °C
<p>Fluid pressure, compact version</p> <ul style="list-style-type: none"> ▪ 8025, compact version ▪ 8035 	<p>The fluid pressure may be restricted by the fluid temperature and the materials the fitting used is made of. See "Figure 7", chap. "7.2.1" or "Figure 14", chap. "7.5".</p> <ul style="list-style-type: none"> ▪ PN10 ▪ PN10 or PN16
<p>Flow rate measurement, compact version</p> <ul style="list-style-type: none"> ▪ Measurement range ▪ measurement error, with a K factor Teach-In procedure ▪ Measurement error, with K factor of the fitting used ▪ Linearity ▪ Repeatability 	<ul style="list-style-type: none"> ▪ 0,3 to 10 m/s ▪ $\pm 0,5$ % of the full scale ¹⁾ ▪ $\pm (0,5$ % of the full scale + 2.5 % of the measured value) ¹⁾ ▪ $\pm 0,5$ % of the full scale ¹⁾ ▪ $\pm 0,4$ % of the measured value

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

6.3.2 Mechanical data

Part	Material
Housing and cover with lid, compact version	PC, lid with UV filter
Housing and cover, wall-mounted version	ABS
Cable glands, compact or wall-mounted versions	PA
Open housing, panel-mounted version	PC
Foil	Polyester
4 screws	Stainless steel
Flow sensor holder, 8025 compact version	PVDF
Axis and bearing of the paddle-wheel, 8025 compact version	ceramics
Paddle wheel, 8025 compact version	PVDF
O-ring seal, 8025 compact version	FKM (or EPDM, delivered with the device)
Nut, 8025 compact version	PC
Specifications of the fitting	refer to the related operating instructions
Cable clips	PA

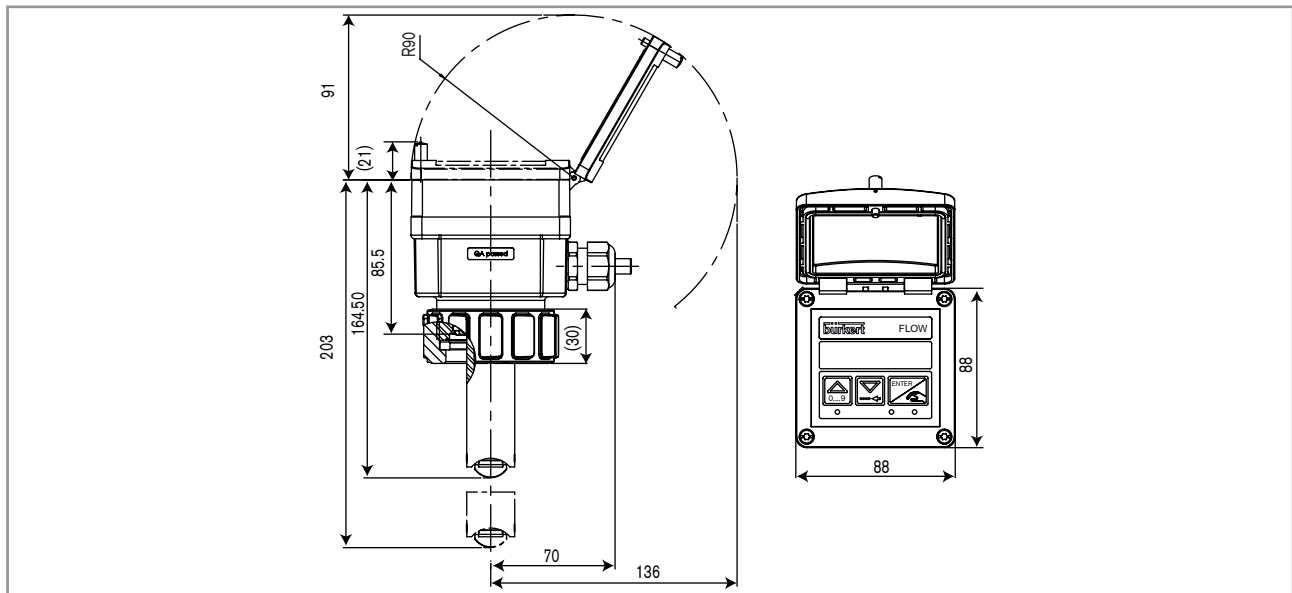


Figure 3: Dimensions of the dosing controller 8025 Batch, compact version [mm]

Table 1: Dimension H of the dosing controller 8025 Batch, compact version, inserted in an S020 fitting [mm]

					
		T-fitting	Saddle	Spigot, in plastic	Welding tab with radius, in stainless steel
DN15	187				
DN20	185				
DN25	185				
DN32	188				
DN40	192				188
DN50	198		223		193
DN65	198		222	206	199
DN80			226	212	204
DN100			231	219	214
DN110			227		
DN125			234	254	225
DN150			244	261	236
DN180			268		
DN200			280	282	257

				
	T-fitting	Saddle	Spigot, in plastic	Welding tab with radius, in stainless steel
DN250			300	317
DN300			312	336
DN350			325	348
DN400			340	

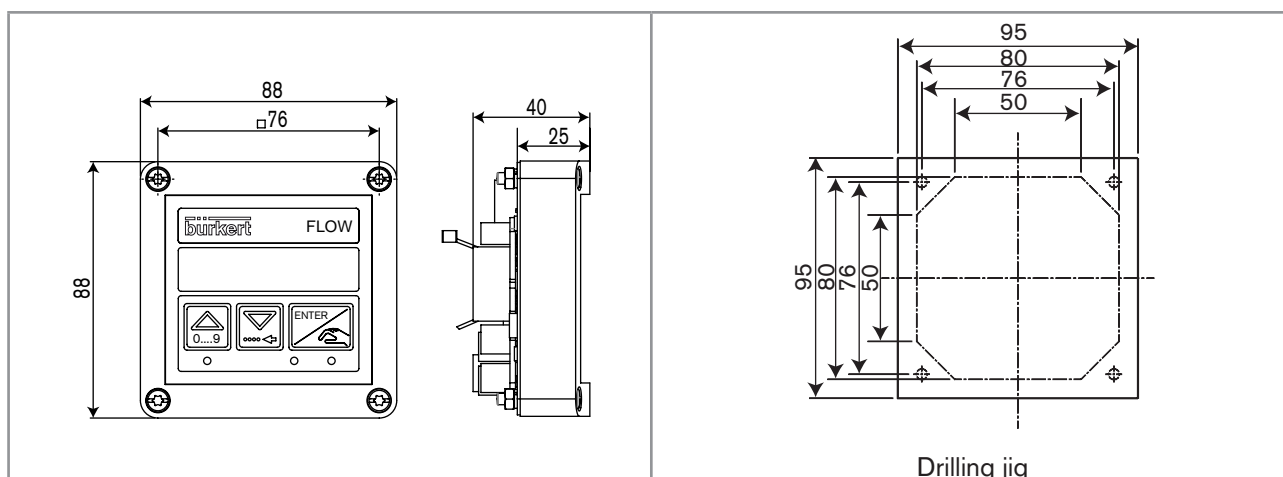


Figure 4: Dimensions of the dosing controller 8025 Batch, panel-mounted version, and of the drilling jig [mm]

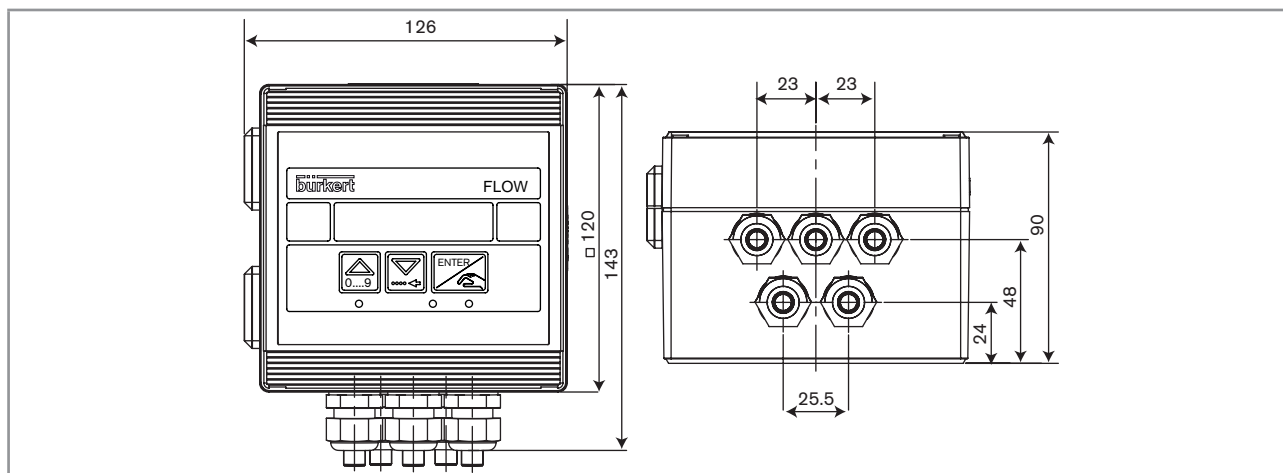


Figure 5: Dimensions of the dosing controller 8025 Batch, wall-mounted version [mm]

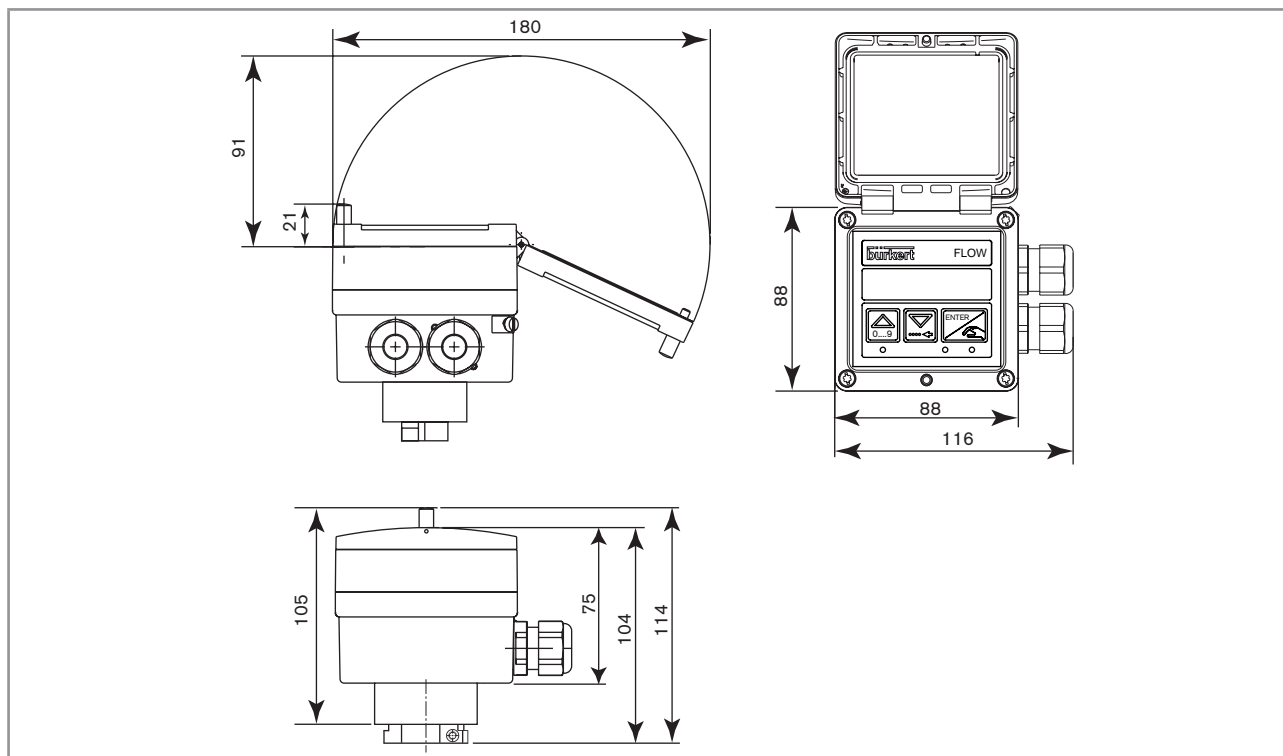
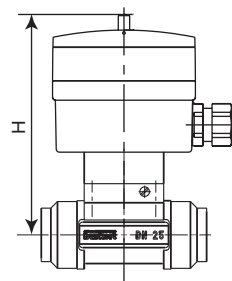


Figure 6: Dimensions of the electronic module SE35 Batch [mm]

Table 2: Dimension H [mm] of the dosing controller 8035 Batch, depending on the DN of the sensor-fitting S030

DN	H [mm] with sensor-fitting S030
06	134
08	134
15	139
20	137
25	137
32	140
40	144
50	151
65	151



6.3.3 Electrical data

Power supply 12-36 V DC	<ul style="list-style-type: none"> ▪ filtered and regulated ▪ SELV circuit, with a safe energy level ▪ max. tolerance 12 V DC: -5 % or +10% ▪ max. tolerance 36 V DC: ±10 %
Power source (not supplied)	<ul style="list-style-type: none"> ▪ limited energy source (in accordance to EN 61010-1, paragraph 9.3) ▪ or Class 2 source (in accordance to standards UL 1310/1585 and EN 60950-1)

Power supply 115/230 V AC <ul style="list-style-type: none"> frequency supplied voltage current, 8025 wall-mounted version current, 8025 and 8035 compact versions integrated protection, compact version integrated protection, wall-mounted version power, 8025 wall-mounted version power, 8025 and 8035 compact versions 	<ul style="list-style-type: none"> 50/60 Hz 27 V DC, regulated max. 250 mA max. 125 mA 125 mA time delay fuse 250 mA time delay fuse 6 VA 3 VA
Current consumption (without the consumption of the loads, the inputs and the transistor outputs) <ul style="list-style-type: none"> 12-36 V DC fed version 115/230 V AC fed version 	<ul style="list-style-type: none"> 90 mA (at 12 V DC) and 45 mA (at 36 V DC), with the consumption of the relay outputs 55 mA, with the consumption of the relay outputs
Transistor outputs DO1 and DO4 <ul style="list-style-type: none"> type DO1 function DO4 function frequency (f) Electrical data duty cycle if $0,6 < f < 300$ Hz, all versions duty cycle if $300 < f < 1500$ Hz, 8025 wall-mounted and panel-mounted versions duty cycle if $1500 < f < 2200$ Hz, 8025 wall-mounted and panel-mounted versions protection 	<ul style="list-style-type: none"> NPN/PNP (through wiring), polarized, potential-free pulse output (can be configured and parametered) dosing state (can be configured and parametered) 0,6-2200 Hz 5-36 V DC, 100 mA max., voltage drop 2,7 V DC at 100 mA > 0.45 > 0.4 < 0.4 galvanically isolated, and protected against overvoltages, polarity reversals and short-circuits
Relay outputs (DO2 and DO3) <ul style="list-style-type: none"> type DO2 function DO3 function electrical data of the load (non UL devices) electrical data of the load (UL devices) max. breaking capacity 	<ul style="list-style-type: none"> normally open, can be inverted through parameter setting valve 100%, cannot be modified alarm (can be configured and parametered) 230 V AC / 3 A or 40 V DC / 3 A max. 30 V AC and 42 V peak or max. 60 V DC, 3 A 750 VA (resistive load)

Digital inputs DI1 to DI4	
▪ commutation threshold V_{on}	▪ 5 to 36 V DC
▪ commutation threshold V_{off} max.	▪ 2 V DC
▪ min. pulse duration	▪ 100 ms
▪ input impedance	▪ 9,4 k Ω
▪ protection	▪ galvanically isolated, and protected against polarity reversals and voltage spikes

6.3.4 Specifications of the connected flow sensor (panel-mounted and wall-mounted versions)

Signal originating from the remote sensor	
▪ type	▪ pulse, sine-wave (typical sensitivity 50 mV peak-to-peak at 250 Hz), "on/off", or standard voltage 0-5 V DC
▪ frequency	▪ 0,6 Hz to 2,2 kHz, can be adjusted
▪ max. voltage	▪ 36 V DC
Input impedance	depends on the position of selector "LOAD" on the electronic board of the 8025. See chap. "7.6.4" and "7.6.7".
Power supply, if the dosing controller is energized with a 12-36 V DC voltage	supplied by the dosing controller depending on the position of selector "SENSOR SUPPLY" of the 8025, either: <ul style="list-style-type: none"> ▪ 5 V DC, 30 mA max. ▪ (L+)-12V: supply voltage (L+) of the dosing controller minus 12 V DC (minus 12,5 V DC max.), 80 mA max. ▪ L+: supply voltage (L+) of the dosing controller (minus 1,5 V DC max.), 140 mA max.
Power supply, if the dosing controller is energized with a 115/230 V AC voltage	supplied by the dosing controller depending on the position of selector "SENSOR SUPPLY" of the 8025, either: <ul style="list-style-type: none"> ▪ 5 V DC, 30 mA max. ▪ (L+)-12V: 27 V DC minus 12 V DC (minus 12,5 V DC max.), 80 mA max. ▪ L+: 27 V DC, 80 mA max.

6.3.5 Electrical connection

Type of connection	on the terminal blocks of the electronics (and through cable glands for the compact and wall-mounted versions)
--------------------	--

Cable specifications	
▪ cable type	▪ shielded
▪ Cross section of wires	▪ 0.2 to 1.5 mm ²
▪ Diameter of each cable (for the M20x1,5 cable glands of the compact version)	▪ if only one cable is used per M20x1,5 cable gland: 6 to 12 mm
	▪ if two cables are used per M20x1,5 cable gland: 4 mm, with the supplied multi-way seal
▪ Diameter of each cable (for the cable glands M16x1,5 of the wall-mounted version)	▪ 4 to 8 mm

7 INSTALLATION AND WIRING

7.1 Safety instructions



DANGER

Danger 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.
- ▶ Observe the fluid temperature/pressure dependency depending on the fitting used.

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.

Danger due to high temperatures of the fluid.

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

Danger 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 non-conforming installation.

- ▶ The electrical installation can only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Install appropriate safety systems (correctly rated fuse and/or circuit-breaker); For the 115/230 V AC fed versions, insert a safety system between the phase and the neutral conductor.
- ▶ Respect standard NF C 15-100 / IEC 60364.

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.



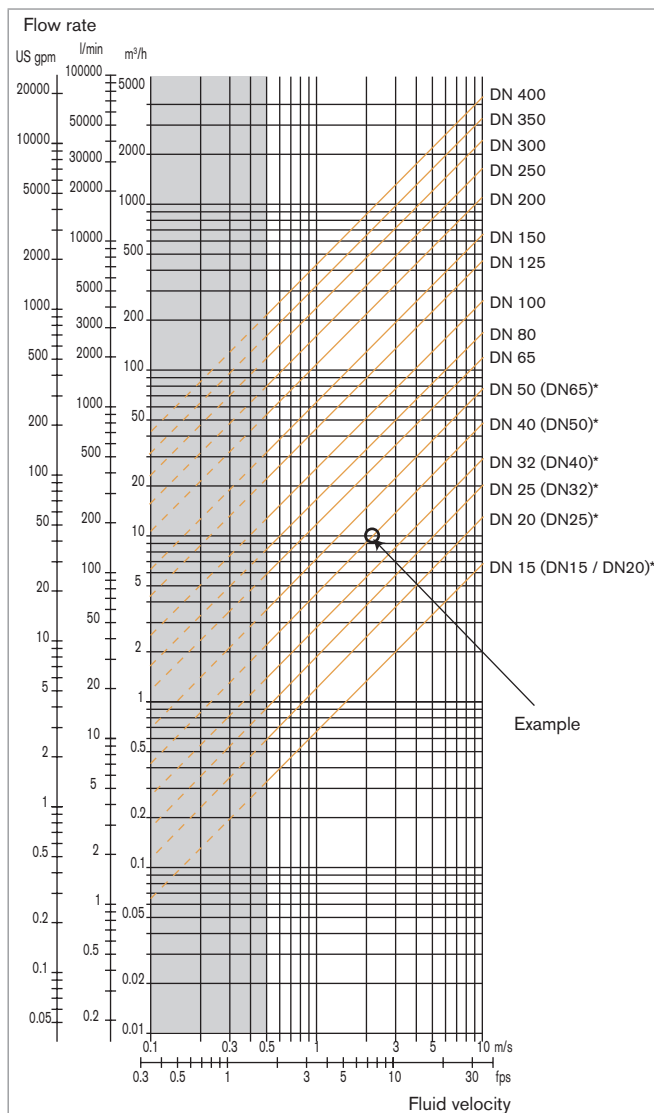
Protect this device against electromagnetic interference, ultraviolet rays and, when installed outdoors, the effects of the climatic conditions.

7.2 Installation of a 8025 Batch, compact version

The dosing controller 8025 Batch has to be inserted into an S020 fitting mounted on a pipe.

7.2.1 Recommendations for installing the 8025 Batch, compact version, on the pipe

→ Choose an S020 fitting appropriate to the velocity of the fluid inside the pipe: refer to the graphs below.



Example:

- Specification:
 - nominal flow rate: 10 m³/h,
 - optimum flow velocity: between 2 and 3 m/s.
- Recommended diameter: DN40 (or DN50 for the asterisked fittings).

* For the fittings:

- with external thread connections acc. to SMS 1145,
- with welding end connections acc. to SMS 3008, BS 4825 / ASME BPE or DIN 11850 Rg 2,
- with Clamp connections acc. to SMS 3017 / ISO 2852, BS 4825 / ASME BPE or DIN 32676.

→ Observe the fluid temperature/pressure dependency depending on the material of fitting S020 used:

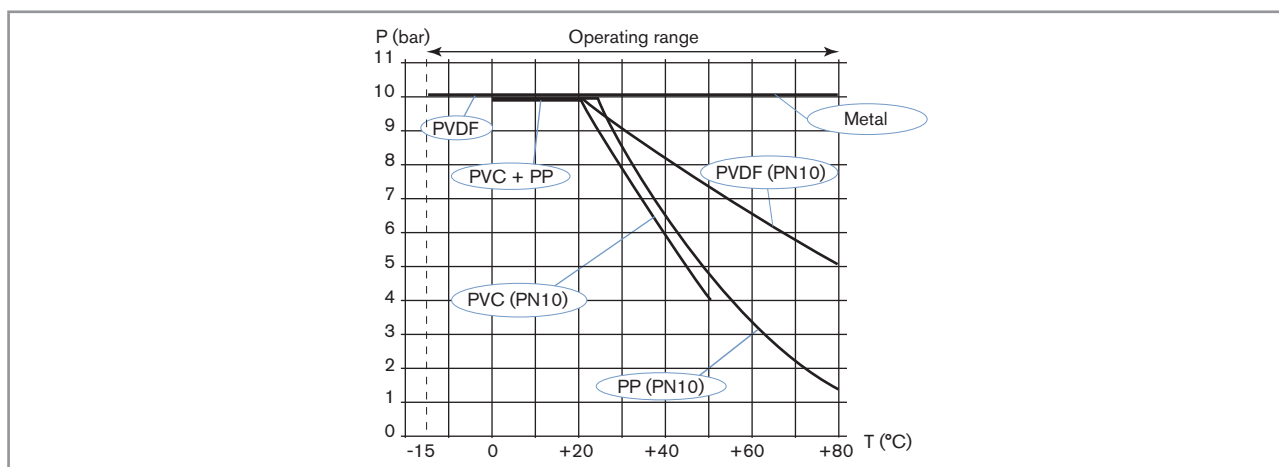


Figure 7: Fluid pressure / temperature dependency curves for a 8025 Batch, compact version, inserted into a fitting S020 in metal, PVDF, PP or PVC

→ Install the device on the pipe in such a way that the upstream and downstream distances are respected according to the design of the pipes, refer to standard EN ISO 5167-1 and Figure 8 :

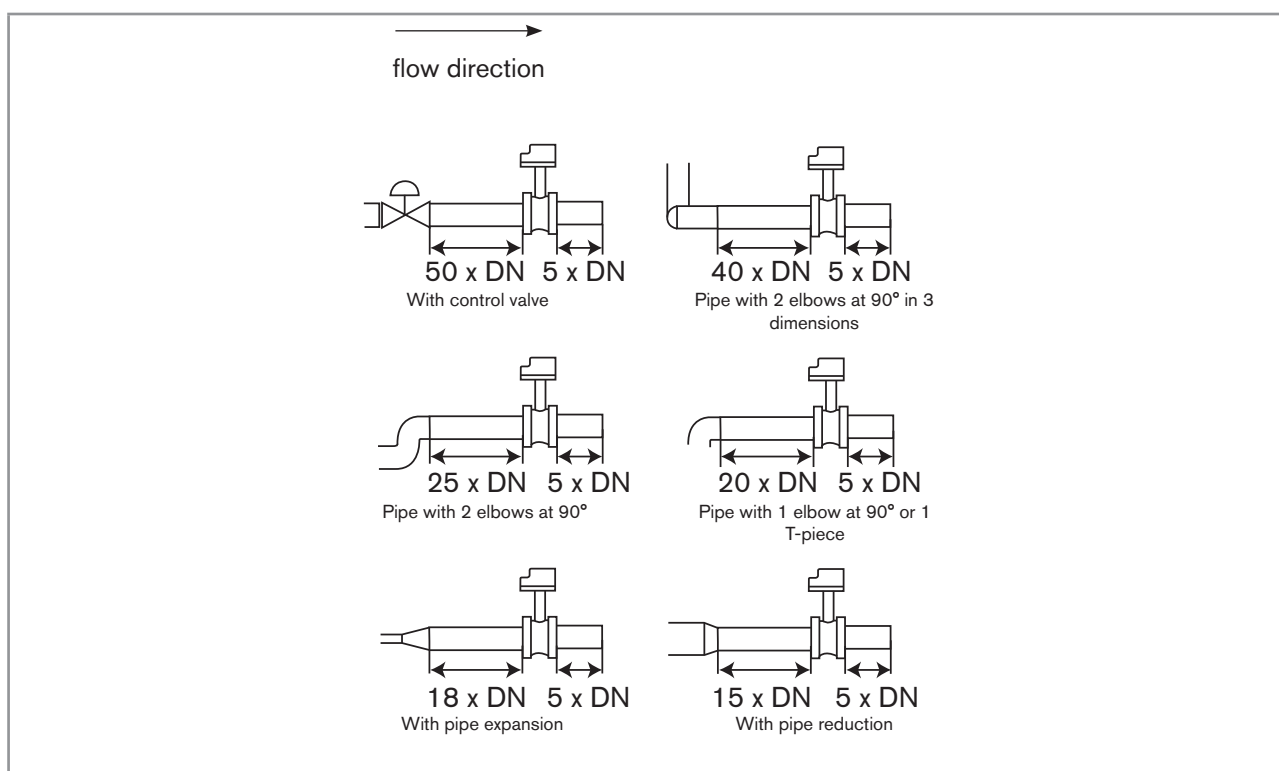


Figure 8: Upstream and downstream distances depending on the design of the pipes.

→ Respect the following additional mounting conditions to ensure that the measuring device operates correctly:

- Ensure that the pipe is always filled in the section around the device (see [Figure 9](#)).
- When mounting vertically ensure that the flow direction is in an upward direction (see [Figure 9](#)).

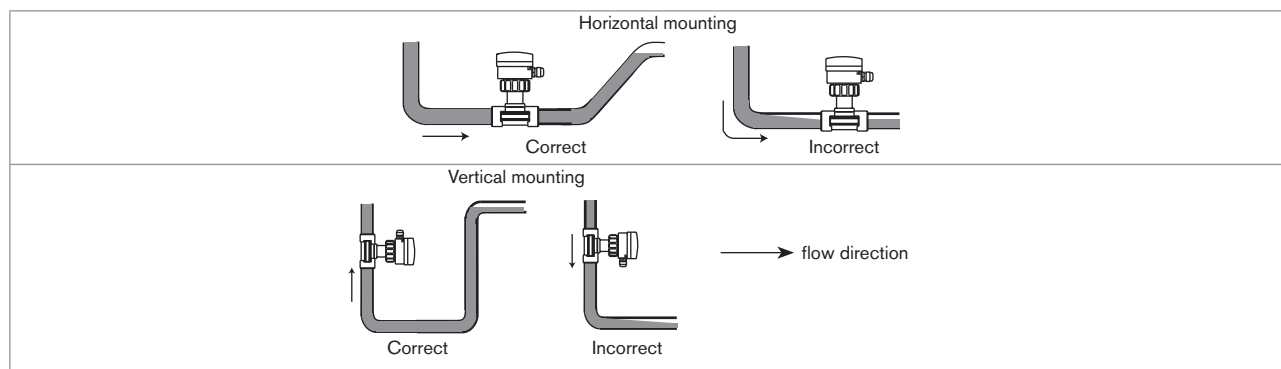


Figure 9: Filling of the pipe

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

7.2.2 Installation onto the pipe

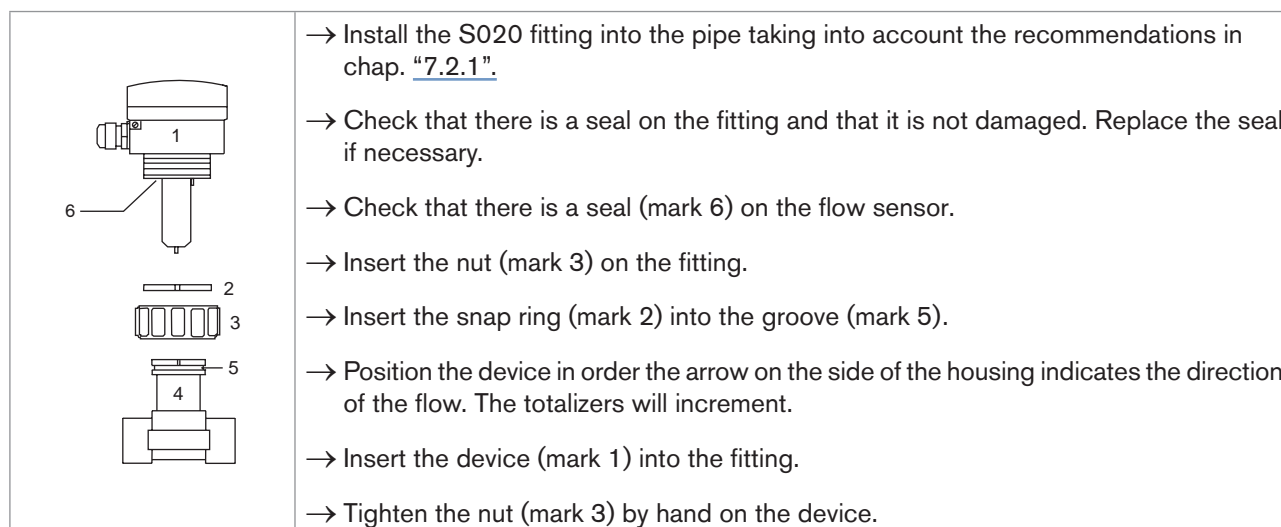


Figure 10: Installation of a 8025 Batch, compact version, into an S020 fitting

7.3 Installation of a 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.

→ To cut the opening in the cabinet door, use the supplied drilling jig, respecting the dimensions indicated in "Figure 11".

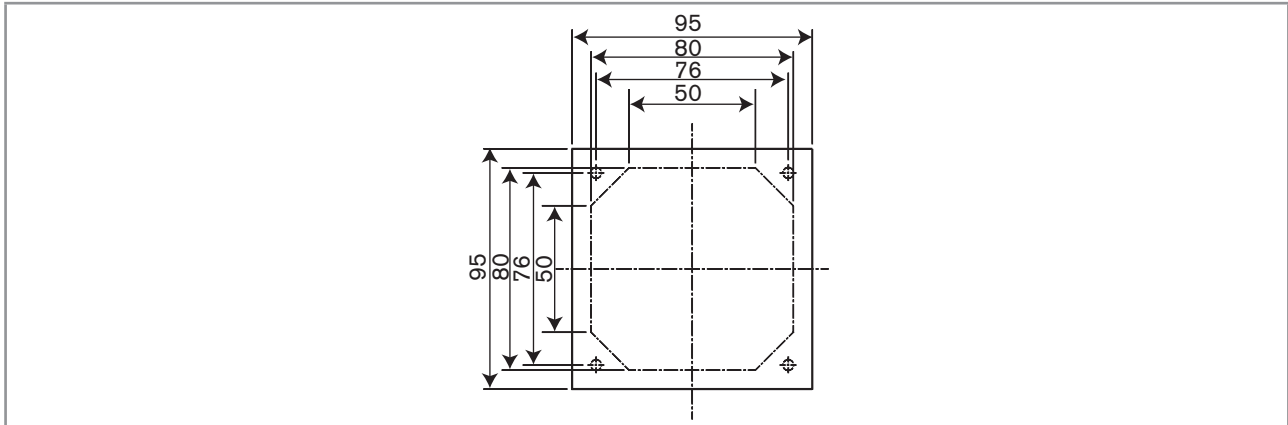


Figure 11: Dimensions of the drilling jig [mm]

- Insert the 4 screws in the housing (from the front).
- 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.

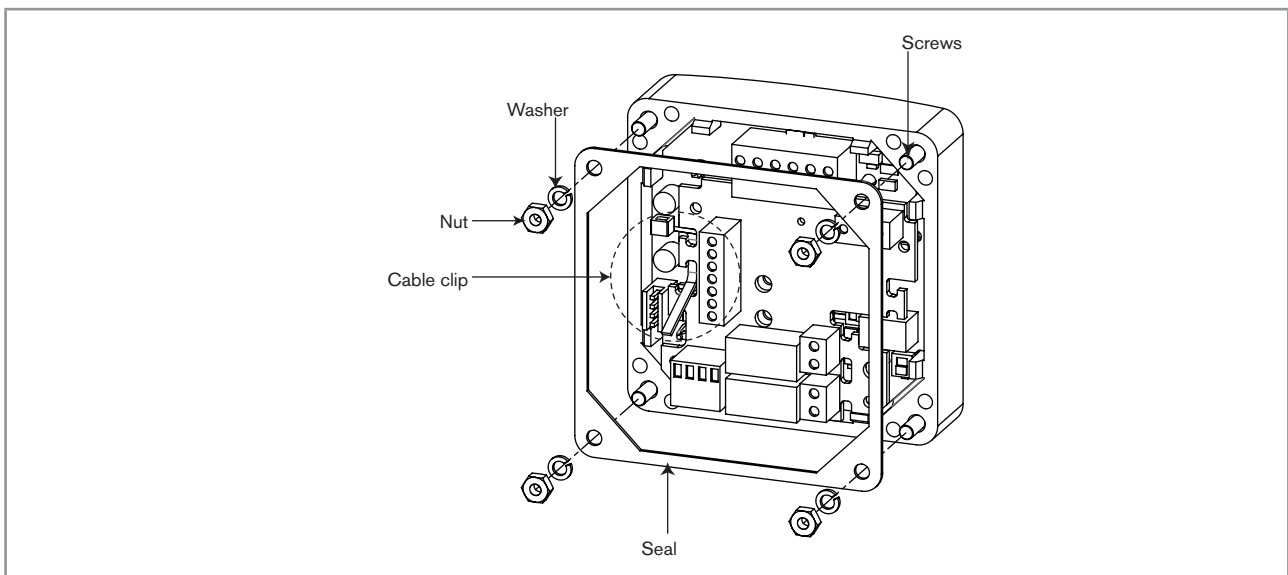


Figure 12: Installation of a 8025, panel version

7.4 Installation of a wall-mounted version

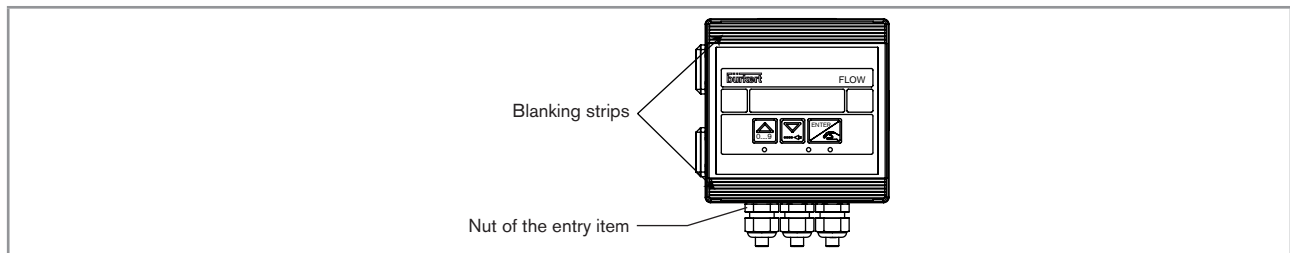
NOTE

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 device in a wall-mounted version has 4 holes in the bottom of the housing.

→ Remove the blanking strips covering the screws.



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

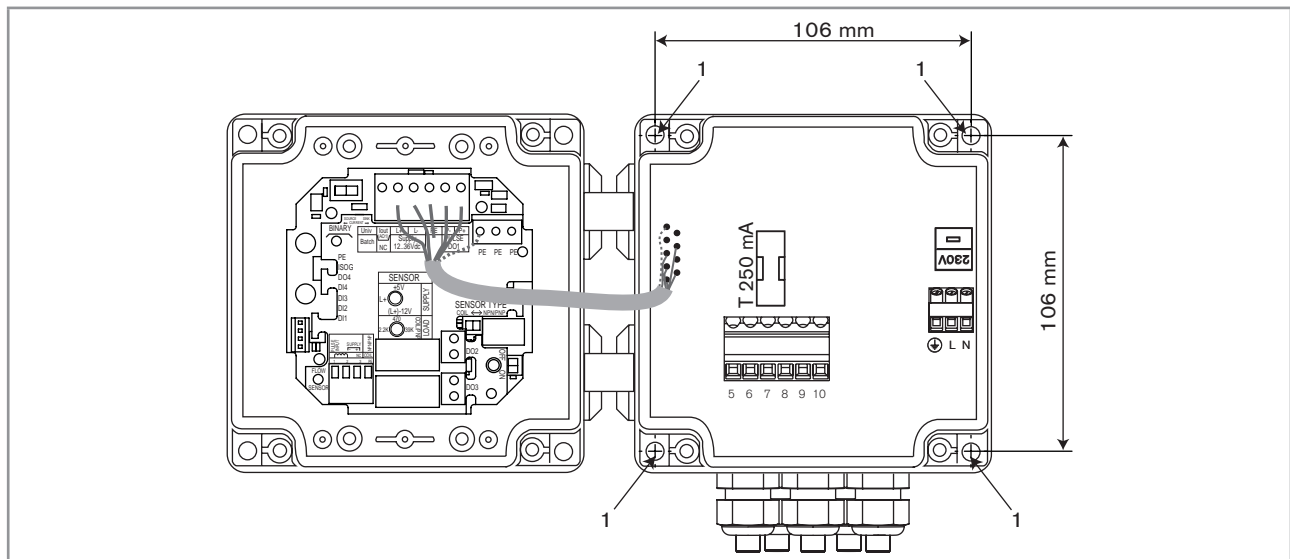


Figure 13: Installation of a wall-mounted version

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

→ Wire acc. to instructions in chap. "7.6".

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

7.5 Installation of a 8035 Batch

The electronic module SE35 Batch can be installed on a pipe by using a sensor-fitting S030.

→ Observe the fluid temperature/pressure dependency depending on the material of the sensor-fitting S030 used:

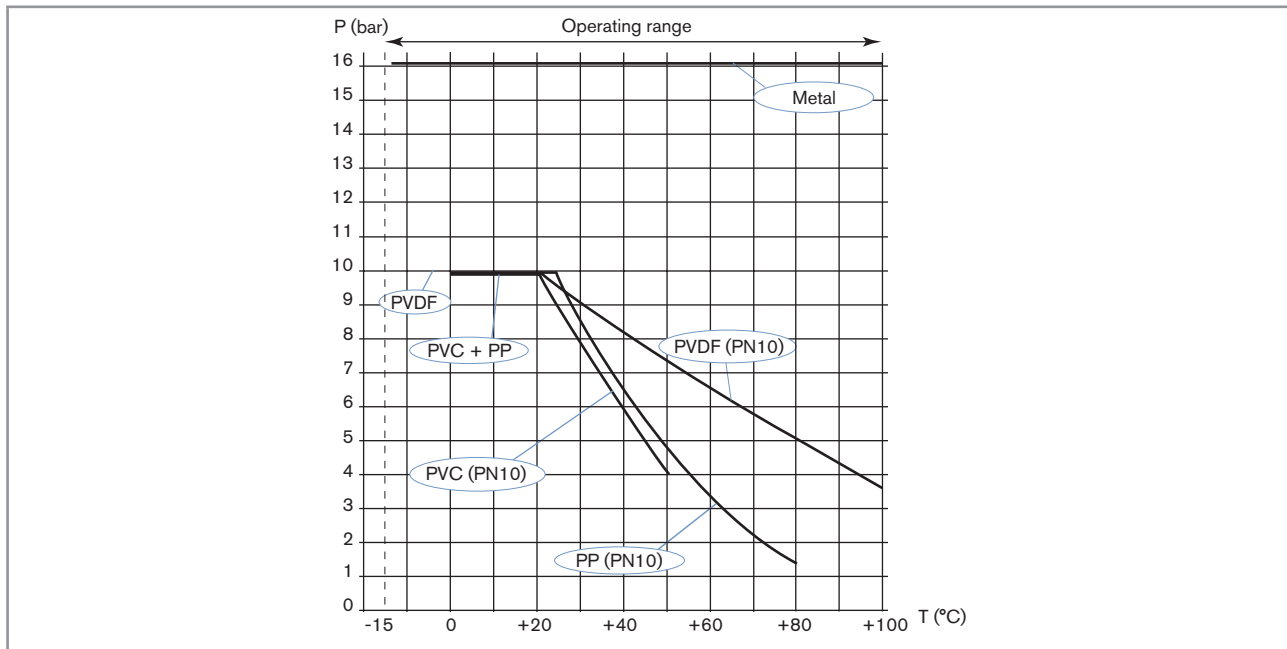
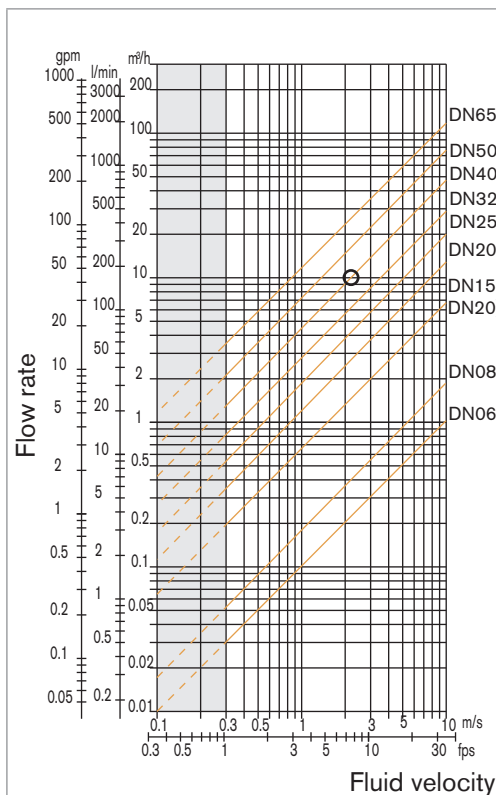


Figure 14: Fluid pressure / temperature dependency curves for an SE35 Batch mounted on a sensor-fitting S030 in metal, PVDF, PP or PVC

→ Choose an S030 fitting appropriate to the velocity of the fluid inside the pipe: refer to the graphs below.



Example:

- Specification:
 - nominal flow rate: 10 m³/h,
 - optimum flow velocity: between 2 and 3 m/s.
- Recommended diameter: DN40 (or DN50 for the asterisked fittings).

* For the fittings:

- with external thread connections acc. to SMS 1145,
- with welding end connections acc. to SMS 3008, BS 4825 / ASME BPE or DIN 11850 Rg 2,
- with Clamp connections acc. to SMS 3017 / ISO 2852, BS 4825 / ASME BPE or DIN 32676.

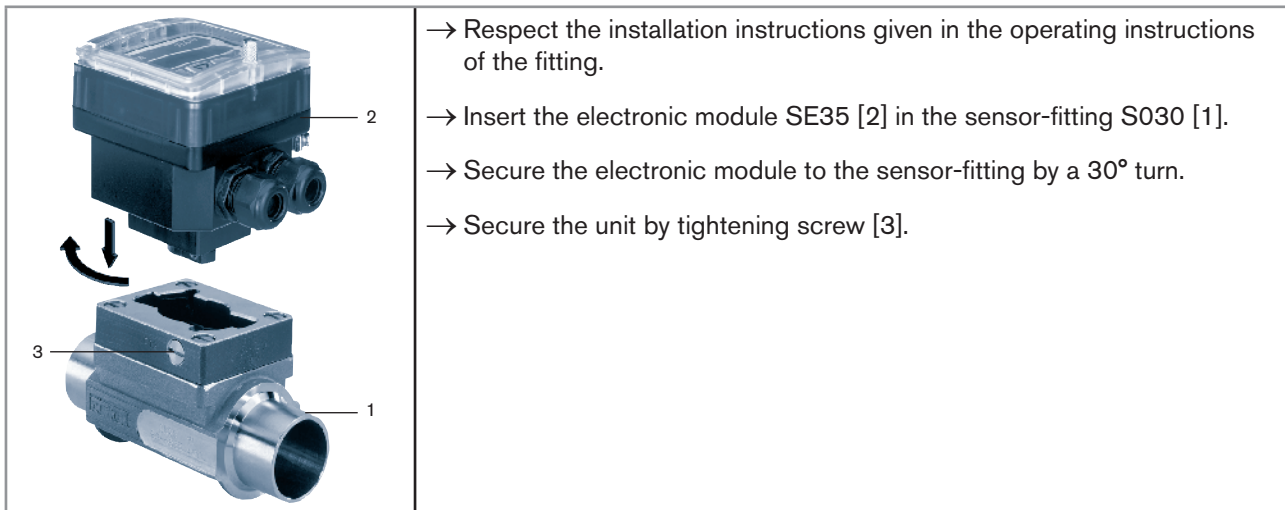


Figure 15: Installation of a 8035 Batch

7.6 Wiring



DANGER

Risk of injury 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.



Insert the supplied stopper gaskets into the unused cable glands of a compact or wall-mounted version to ensure the tightness of the device.



Only move the selectors when the power supply is off.



- Use a filtered and regulated 12-36 V DC power supply.
- Make sure the installation is equipotential. See chap. [“7.6.1”](#).
- Use shielded cables with a temperature limit of 80 °C minimum.
- Do not install the cables near high voltage or high frequency cables; If this cannot be avoided, observe a min. distance of 30 cm.
- Protect the device power supply by means of a 300 mA fuse and a switch.
- Protect the power supply of each transistor output by means of a 125 mA fuse.
- 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.

7.6.1 Equipotentiality of the installation

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 earths.
- 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 there is no direct earthing 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 the device and connect these parts to the same earth. The earth rings must be in contact with the fluid.

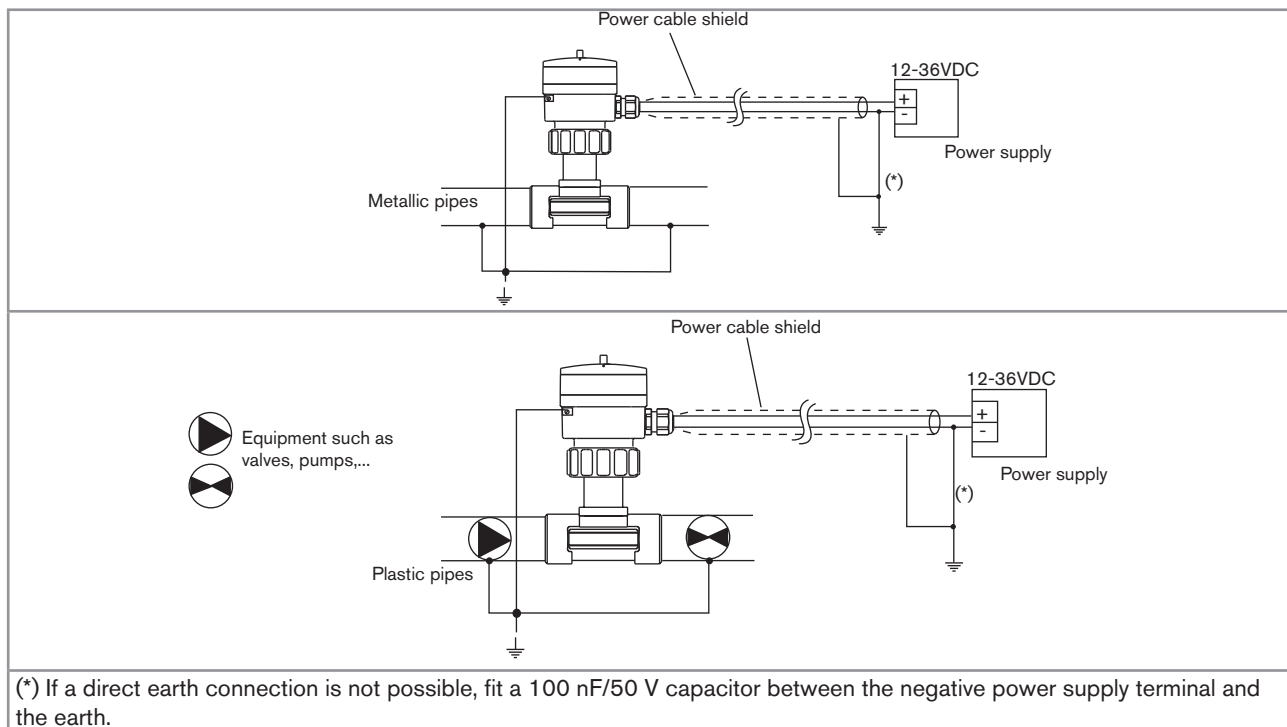


Figure 16: 8025 compact version and 8035, equipotentiality skeleton diagrams

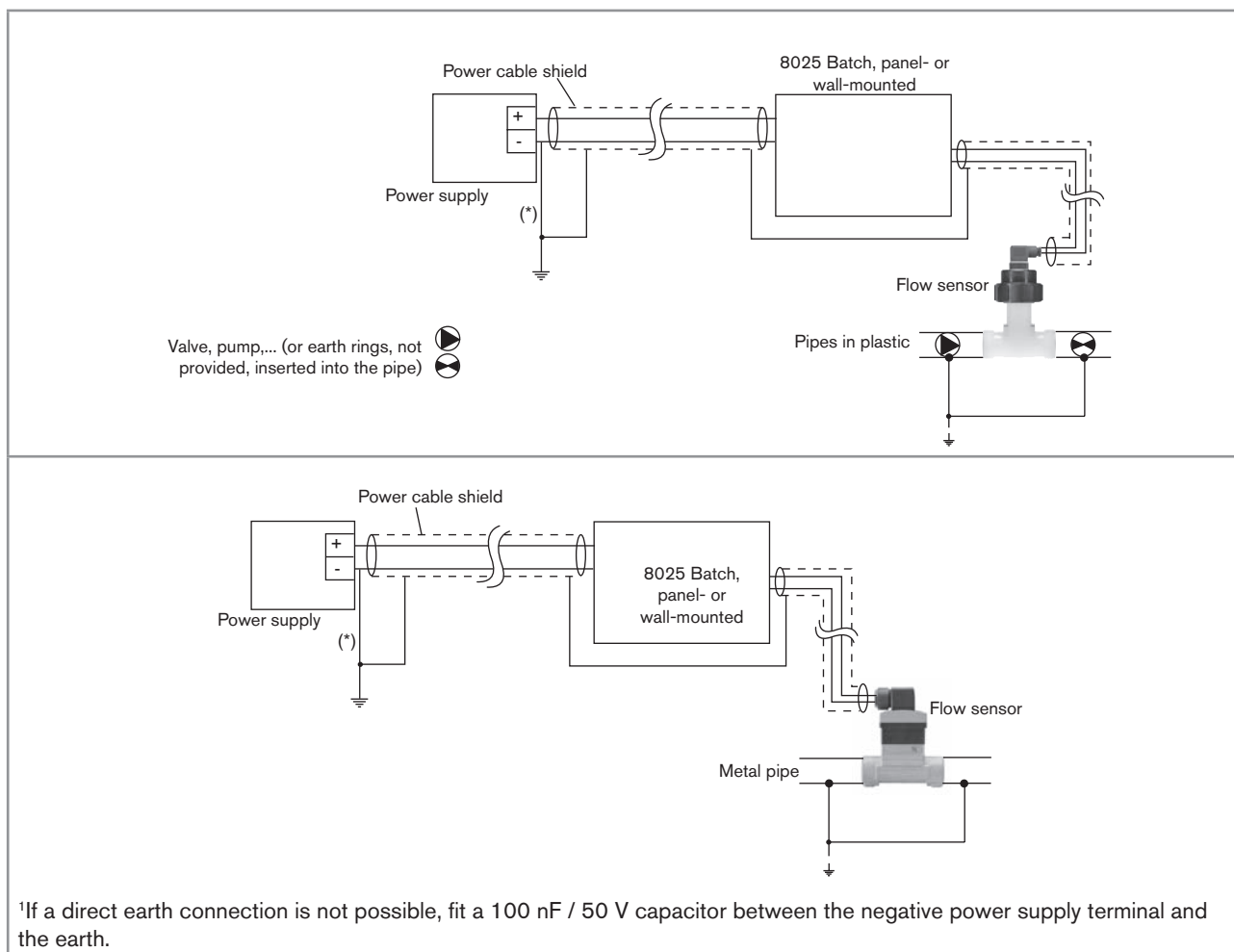


Figure 17: 8025 Batch, panel-mounted or wall-mounted version, equipotentiality skeleton diagram

7.6.2 Default position of the selectors

Table 3: Default positions of selectors "SENSOR SUPPLY", "LOAD" and "SENSOR TYPE"

Selector	Default position
SENSOR SUPPLY (A)	L+
LOAD (B)	2.2KOhms
SENSOR TYPE (C)	NPN/PNP

7.6.3 Terminal assignment and use of the selectors

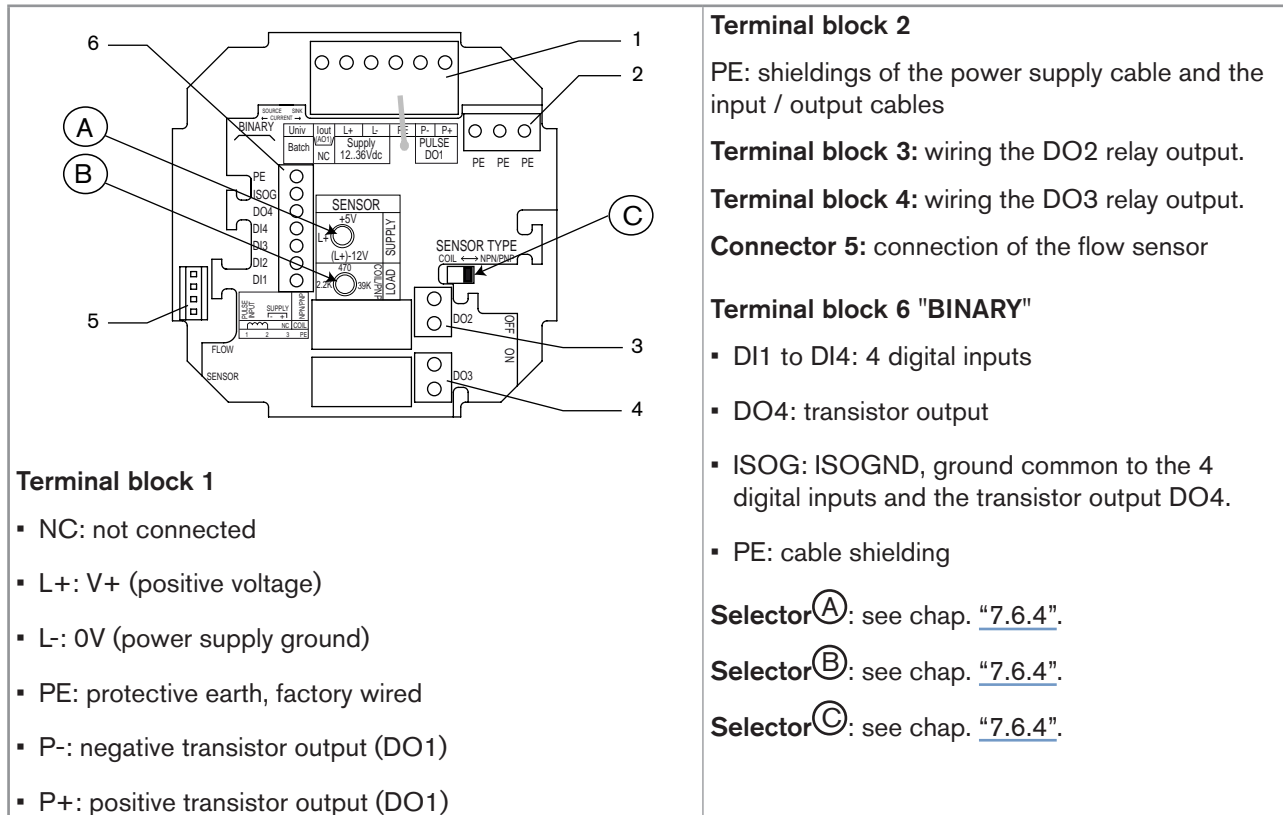
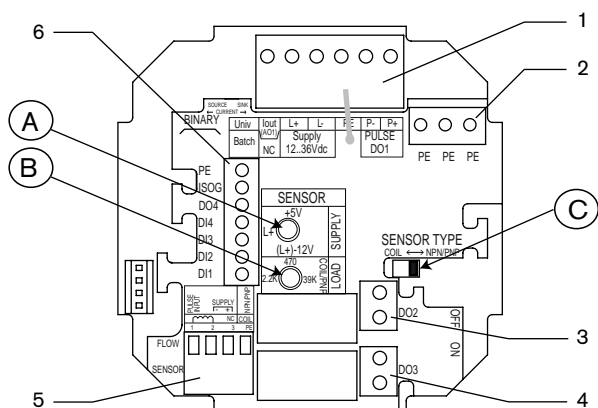


Figure 18: Terminal assignment of a 12-36 V DC fed compact version



Terminal block 1

- NC: not connected
- L+: V+ (positive voltage)
- L-: 0V (power supply ground)
- PE: protective earth, factory wired
- P-: negative transistor output (DO1)
- P+: positive transistor output (DO1)

Terminal block 2

PE: shieldings of the power supply cable and the input / output cables

Terminal block 3: wiring the DO2 relay output.

Terminal block 4: wiring the DO3 relay output.

Terminal block 5 "FLOW SENSOR": Wiring the remote flow sensor. The wiring depends on the type of output signal originating from the flow sensor: See chap. ["7.6.7"](#).

Terminal block 6 "BINARY"

- DI1 to DI4: 4 digital inputs
- DO4: transistor output
- ISOG: ISOGND, ground common to the 4 digital inputs and the transistor output DO4.
- PE: cable shielding

Selector A: see chap. ["7.6.7"](#).

Selector B: see ["Table 5"](#), page 40

Selector C: see chap. ["7.6.7"](#).

Figure 19: Terminal assignment of a 12-36 V DC fed panel-mounted or wall-mounted version

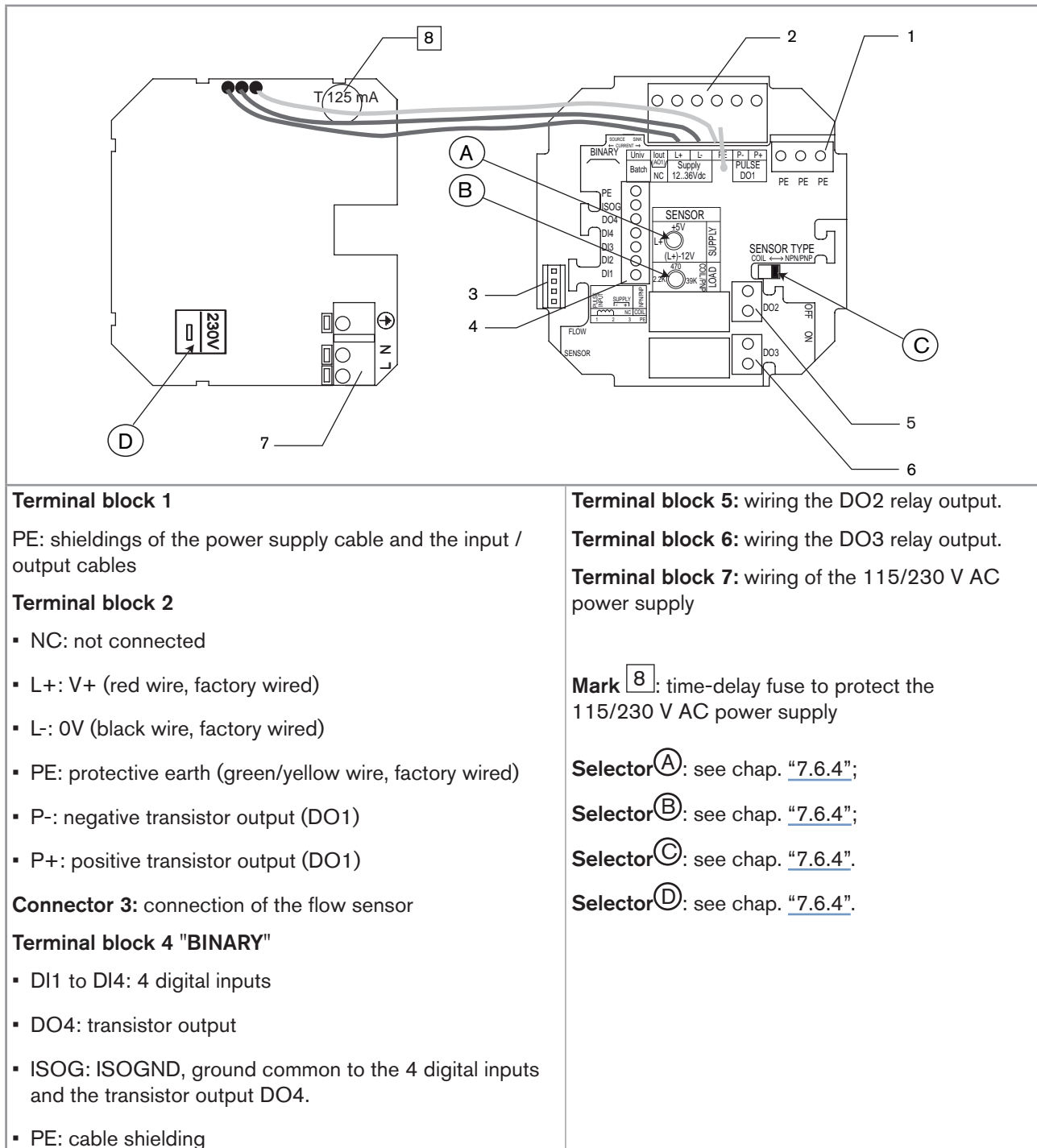


Figure 20: Terminal assignment of a 115/230 V AC fed compact version

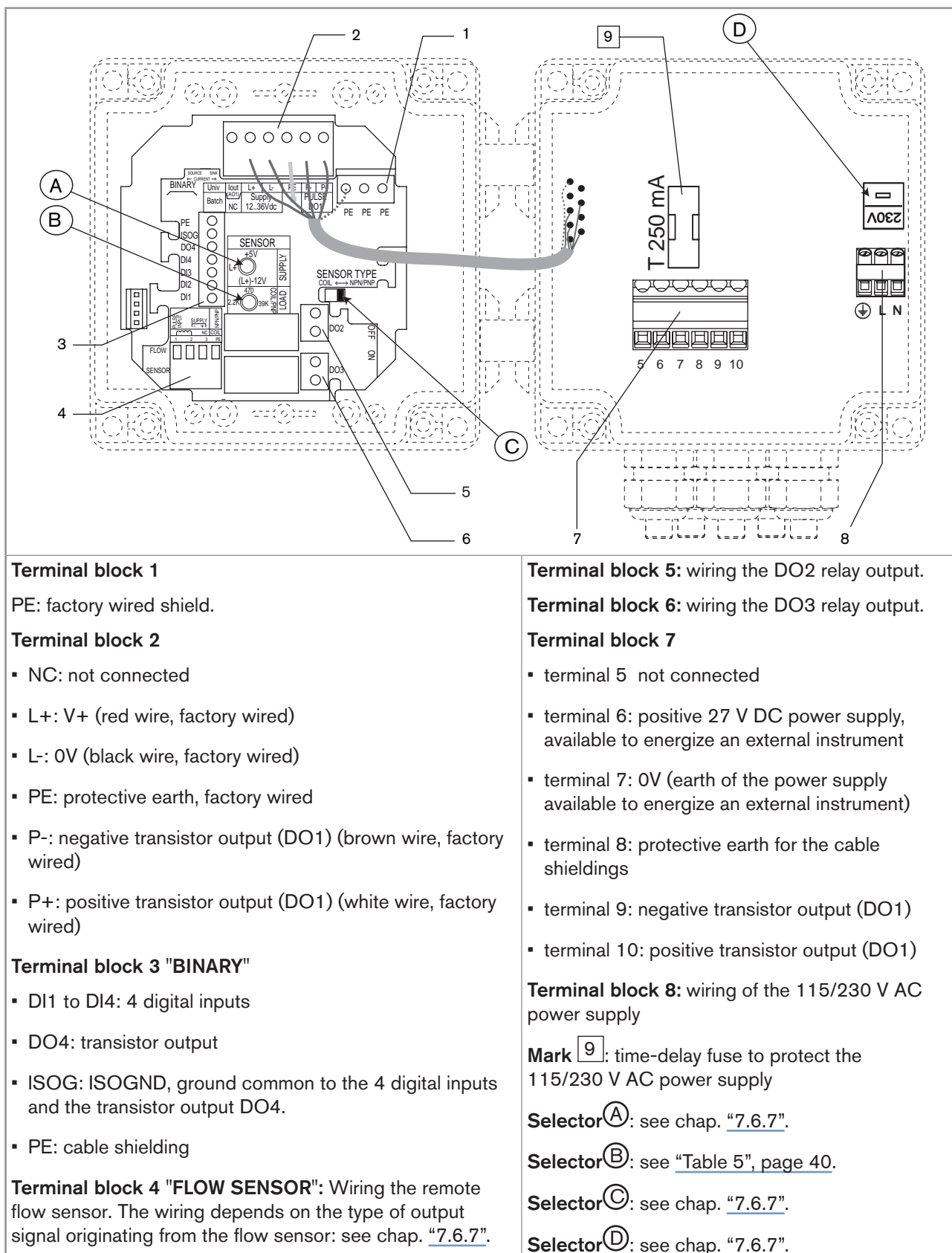


Figure 21: Terminal assignment of a wall-mounted version, 115/230 V AC

7.6.4 Wiring a compact version



Only move the selectors when the power supply is off.




Insert the supplied stopper gasket into the unused cable gland to ensure the tightness of the device.

- Unscrew the unused cable gland.
- Remove the transparent disk.
- Insert the supplied stopper gasket.
- Screw the nut of the cable gland.

→ Set the selector "SENSOR TYPE" on "NPN/PNP". See ["Figure 22"](#).



Never set selector "SENSOR TYPE" on the left on a compact version.

Selector  makes it possible to configure the type of signal received from the flow sensor.

SENSOR TYPE
COIL ↔ NPN/PNP





SENSOR TYPE
COIL ↔ NPN/PNP



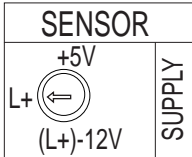
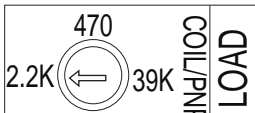
→ On a compact version, set the selector on the right (default position).

Figure 22: Using selector "SENSOR TYPE" on a compact version

→ Set selector "SENSOR SUPPLY" depending on the value of the power supply of the dosing controller. See ["Table 4"](#).

→ Set selector "LOAD": See ["Table 4"](#).

Table 4: Position of selectors "SENSOR TYPE", "SENSOR SUPPLY" and "LOAD" on a compact version

Selector "SENSOR TYPE" (C)	Selector "SENSOR SUPPLY" A 	Selector "LOAD" B 
→ Set the selector on "NPN/PNP" ("Figure 22")	<p>The flow sensor of the compact version needs a minimum voltage supply of 5 V DC :</p> <ul style="list-style-type: none"> → If the device is fed with a voltage ≥ 12 V DC and < 17 V DC, set the voltage selector "SENSOR SUPPLY" on "5V" or "L+". → If the device is fed with a voltage ≥ 17 V DC, the voltage selector "SENSOR SUPPLY" can be set to any position. → If the device is fed with a 115/230V AC voltage, set the voltage selector "SENSOR SUPPLY" on "L+". 	<p>→ Set selector "LOAD":</p> <ul style="list-style-type: none"> ▪ either on "2.2k": the load resistance R is then 2,2 kΩ ▪ either on "470": the load resistance R is then 470 Ω

→ If the compact version of the 8025 Batch is energized with a 115/230 V AC power supply, set selector D as shown in "Figure 23".

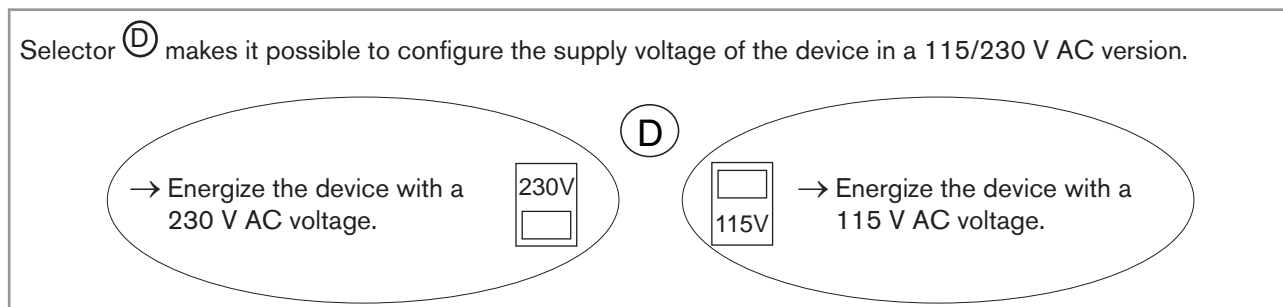


Figure 23: Selector of the supply voltage on a 115/230 V AC version

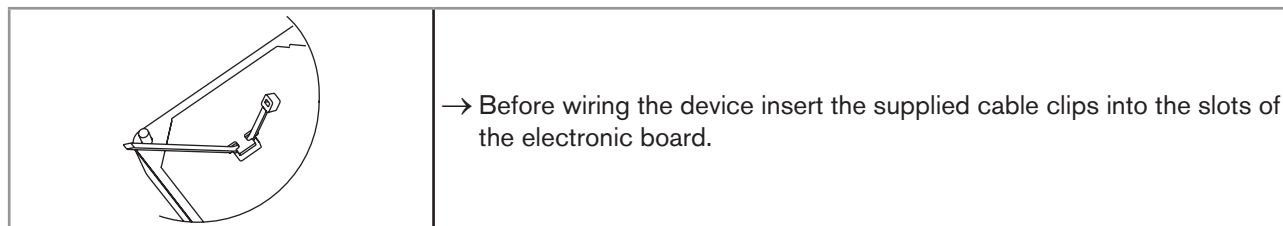


Figure 24: Inserting the cable clips

- Install the device as described in chap. "7.2" or "7.5".
- Wire acc. to chap. "7.6.9", "7.6.12" and "9.6".
- Secure the power supply cable and the relay connection cables, with the cable clips.
- Close the housing and tighten the 4 screws of the cover.

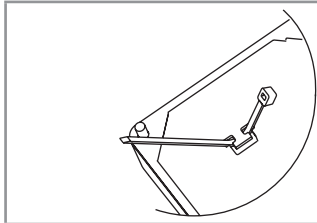
7.6.5 Wiring a panel version



Only move the selectors when the power supply is off.

→ Install the device as described in chap. ["7.3"](#).

→ Set the selectors "SENSOR TYPE", "SENSOR SUPPLY" and "LOAD": see chap. ["7.6.7"](#).



→ Before wiring the device insert the supplied cable clips into the slots of the electronic board.

Figure 25: Inserting the cable clips

→ Wire acc. to chap. ["7.6.7"](#), ["7.6.9"](#), ["7.6.12"](#) and ["9.6"](#).

→ Secure the power supply cable, the flow sensor connection cable and the relay connection cables, with the cable clips.

7.6.6 Wiring a wall-mounted version



Only move the selectors when the power supply is off.



Insert the supplied stopper gaskets into the unused cable glands to ensure the tightness of the device.

- Unscrew the unused cable gland.
- Remove the transparent disk.
- Insert the supplied stopper gasket.
- Screw the nut of the cable gland.

→ Install the device as described in chap. ["7.4"](#).

→ Set the selectors "SENSOR TYPE", "SENSOR SUPPLY" and "LOAD": see chap. ["7.6.7"](#).

→ If the wall-mounted version is energized with a 115/230 V AC power supply, set selector **D** as shown in ["Figure 26"](#).

Selector **D** makes it possible to configure the supply voltage of the device in a 115/230 V AC version.

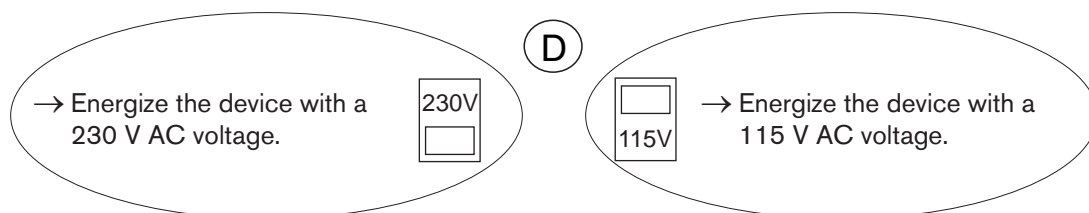


Figure 26: Selector of the supply voltage on a 115/230 V AC version

→ Loosen the nuts of the cable glands.

→ Insert each cable through a nut than through the cable gland, using the cable glands as shown in "Figure 27".

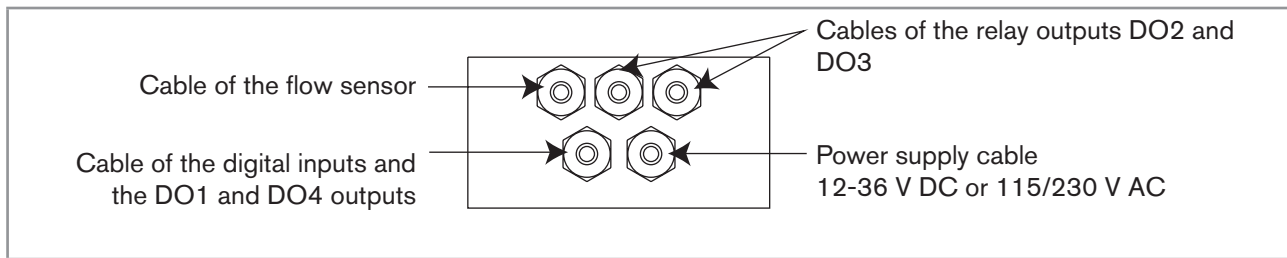
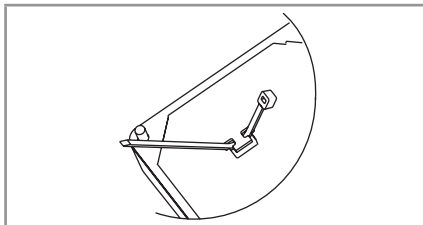


Figure 27: Using the cable glands on a wall-mounted version

→ On a 115/230 V AC fed wall-mounted version, remove both terminal blocks (marked 7 and 8 in "Figure 21") from the housing.



→ Before wiring the device insert the supplied cable clips into the slots of the electronic board and of the 115/230 V AC power supply board if the device has such a board.

Figure 28: Inserting the cable clips

→ Depending on the operating voltage of the device, wire according to chap. "7.6.7", "7.6.9" to "7.6.12" and "9.6".

→ Insert the two terminal blocks (marked 7 and 8 in "Figure 21") into their original position.

→ Letting the housing stay completely open, secure the power supply cable, the flow sensor connection cable and the relay connection cables, with the cable clips.

→ 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.

7.6.7 Connecting the remote flow sensor to a panel-mounted or wall-mounted version



Only move the selectors when the power supply is off.




Insert the supplied stopper gaskets into the unused cable glands to ensure the tightness of the device.

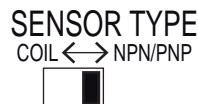
- Unscrew the unused cable gland.
- Remove the transparent disk.
- Insert the supplied stopper gasket.
- Screw the nut of the cable gland.



Before connecting the flow sensor to the dosing controller 8025 Batch, in a panel-mounted or a wall-mounted version:

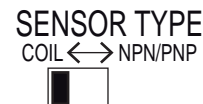
- Set selector "SENSOR TYPE" depending on the output signal originating from the flow sensor. See "Figure 29" and "Table 5", page 40.
- If selector "SENSOR TYPE" is set on "NPN/PNP", set selector "SENSOR SUPPLY" depending on the dosing controller supply voltage. See "Figure 30" and "Table 5", page 40.
- Set selector "LOAD" depending on the type of signal sent out by the flow sensor and on the load wanted on terminal 1 "PULSE INPUT" of terminal block "FLOW SENSOR". See "Table 5", page 40.

Selector  makes it possible to configure the type of signal the 8025 Batch, panel- or wall-mounted version, receives from the remote flow sensor.




→ Set the selector on the right (default position) when the signal from the flow sensor which is connected to the 8025 Batch is either:

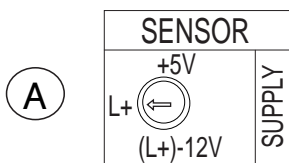
- a pulse signal, NPN or PNP
- an "on/off" signal (Reed relay for example)
- a 0-5 V DC standard voltage signal (TTL, for example)



→ Set the selector on the left when the signal from the flow sensor which is connected to the 8025 Batch is a sine-wave signal (coil).

Figure 29: Using selector "SENSOR TYPE" on a panel- or wall-mounted version

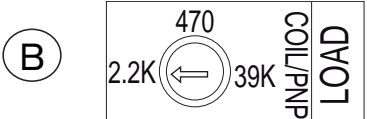
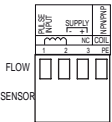
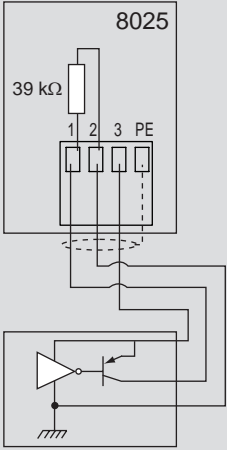
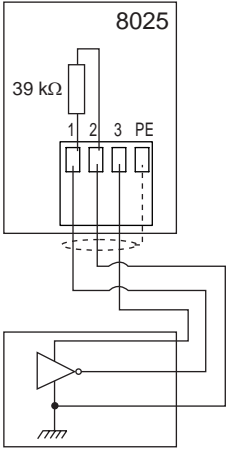
When selector "SENSOR TYPE" above is set on "NPN/PNP", selector  makes it possible to configure the supply voltage for the remote flow sensor.

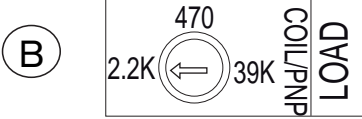
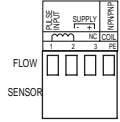
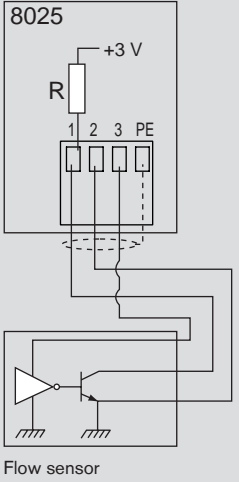
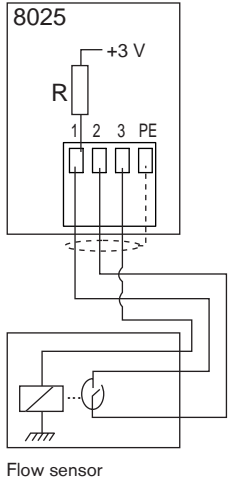


- If the device is energized with a 115/230 V AC power supply, set selector "SENSOR SUPPLY" on "L+" (default position).
- If the device is energized with a 12-36 V DC power supply, set the voltage selector "SENSOR SUPPLY" depending on the voltage supply needed by the remote flow sensor: "+5V", "L+" or "(L+)-12V" (default position).

Figure 30: Using selector "SENSOR SUPPLY" on a panel- or wall-mounted version

Table 5: Position of selectors "SENSOR TYPE" and "LOAD" of a panel- or wall-mounted version, and terminal assignment of terminal block "FLOW SENSOR" depending on the signal emitted by the remote flow sensor

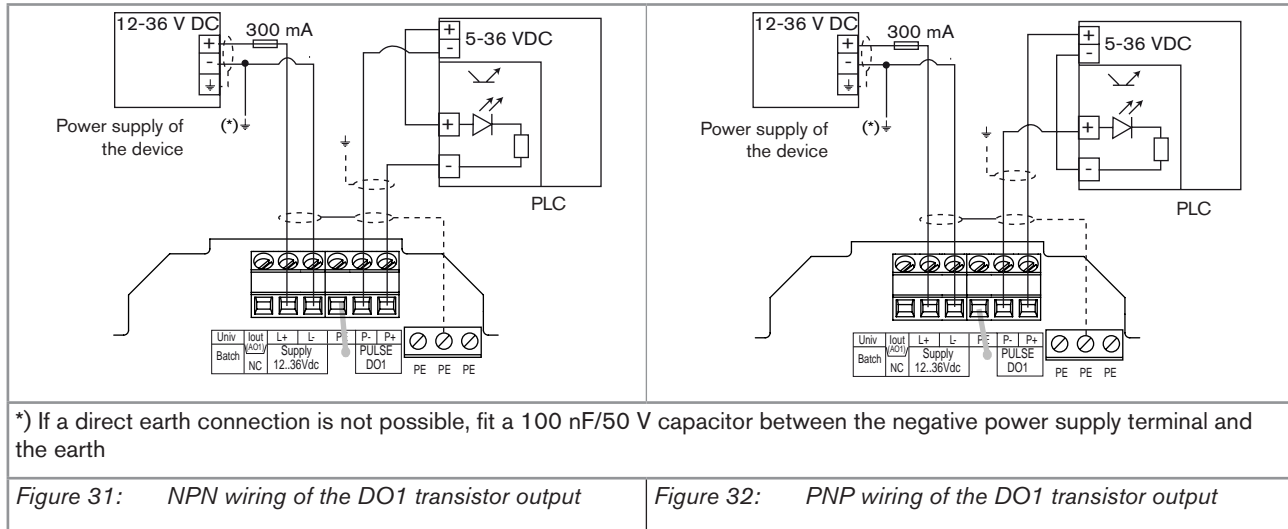
Type of signal emitted by the remote flow sensor	Selector "SENSOR TYPE" (C)	Selector "SENSOR SUPPLY" (A)	Selector "LOAD" (B)	Terminal assignment of terminal block "FLOW SENSOR"
sine-wave (coil)	→ Set the selector on "COIL" ("Figure 29")	→ Any position.		
pulse, PNP	→ Set the selector on "NPN/PNP" ("Figure 29")	→ Set the selector as shown in "Figure 30".	→ Set selector "LOAD" on "39K": the input impedance on terminals 1 and 2 of terminal block "FLOW SENSOR" will then be 39 kΩ	
0-5 V DC standard voltage signal (TTL, for example)	→ Set the selector on "NPN/PNP" ("Figure 29")	→ Set the selector as shown in "Figure 30".	→ Set selector "LOAD" on "39K": the input impedance on terminals 1 and 2 of terminal block "FLOW SENSOR" will then be 39 kΩ	

Type of signal emitted by the remote flow sensor	Selector "SENSOR TYPE" (C)	Selector "SENSOR SUPPLY" (A)	Selector "LOAD" (B)	Terminal assignment of terminal block "FLOW SENSOR"
				
pulse, NPN	→ Set the selector on "NPN/PNP" ("Figure 29")	→ Set the selector as shown in "Figure 30".	→ Set selector "LOAD": <ul style="list-style-type: none"> ▪ either on "2.2k": the load resistance R is then 2,2 kΩ ▪ either on "470": the load resistance R is then 470 Ω 	 <p>Flow sensor</p>
"on/off" signal (Reed relay for example)	→ Set the selector on "NPN/PNP" ("Figure 29")	→ Set the selector as shown in "Figure 30".	→ Set selector "LOAD": <ul style="list-style-type: none"> ▪ either on "2.2k": the load resistance R is then 2,2 kΩ ▪ either on "470": the load resistance R is then 470 Ω 	 <p>Flow sensor</p>

7.6.8 Wiring the digital inputs DI1 to DI4 and the transistor output DO4

Wiring of the digital inputs DI1 to DI4 and wiring of the transistor output DO4 are described in chap. "9.6.1" to "9.6.7", because they depend on the dosing mode configured.

7.6.9 Wiring the DO1 transistor output of a compact, a panel-mounted or a wall-mounted version, 12-36 V DC



→ Configure transistor output DO1 acc. to chap. [“9.7.19”](#) to [“9.7.23”](#).

7.6.10 Wiring the DO1 transistor output of a compact version, 115/230 V AC

→ Wire the transistor output DO1 as described in chap. [“7.6.9”](#).

→ Configure transistor output DO1 acc. to chap. [“9.7.19”](#) to [“9.7.23”](#).

7.6.11 Wiring the DO1 transistor output of a wall-mounted version, 115/230 V AC

! Only move the selectors when the power supply is off.

! Position selector **D** depending on the value of the power supply.

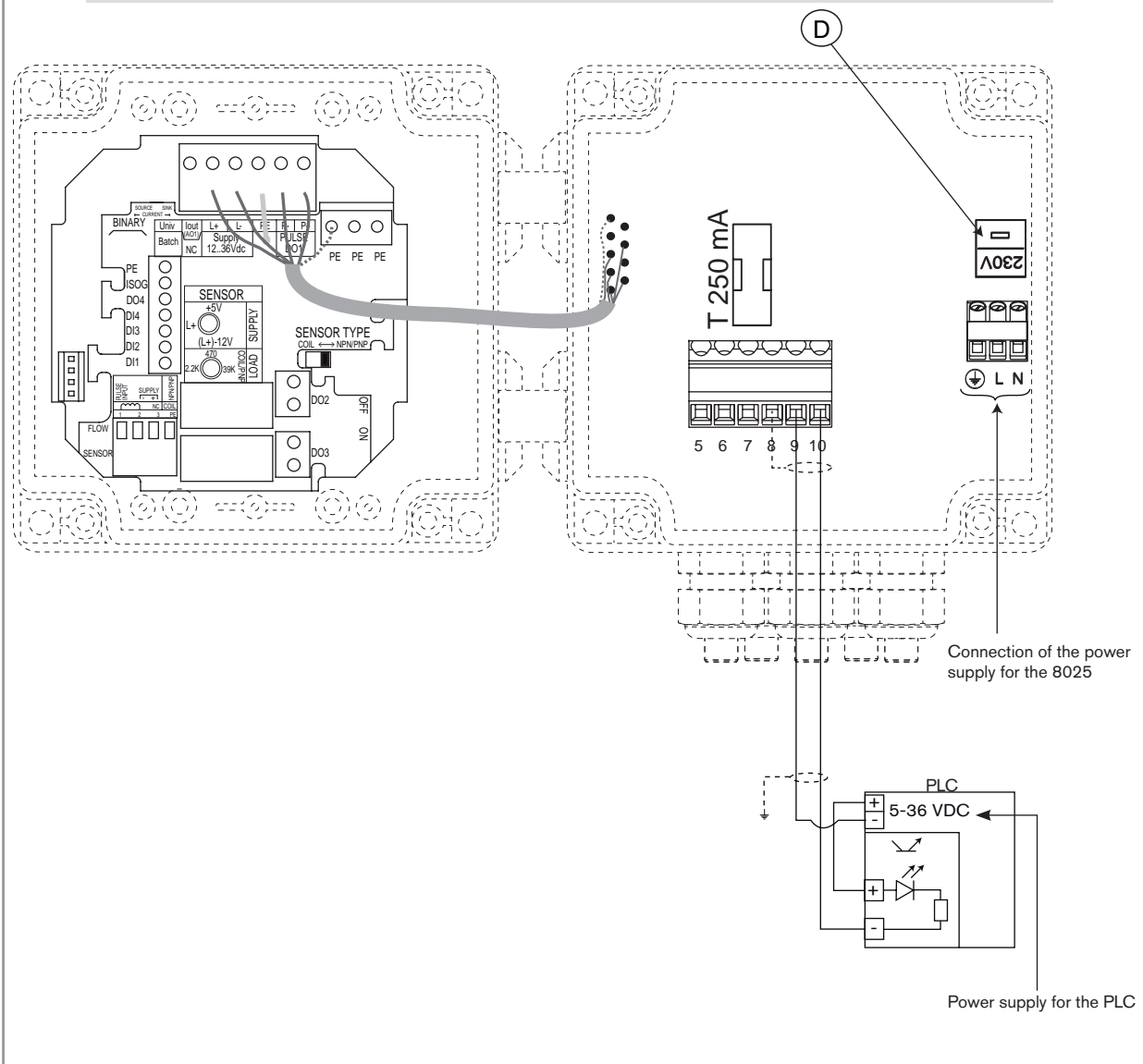


Figure 33: NPN wiring of the DO1 transistor output of a wall-mounted version, 115/230 V AC

→ Configure transistor output DO1 acc. to chap. [“9.7.19”](#) to [“9.7.23”](#).

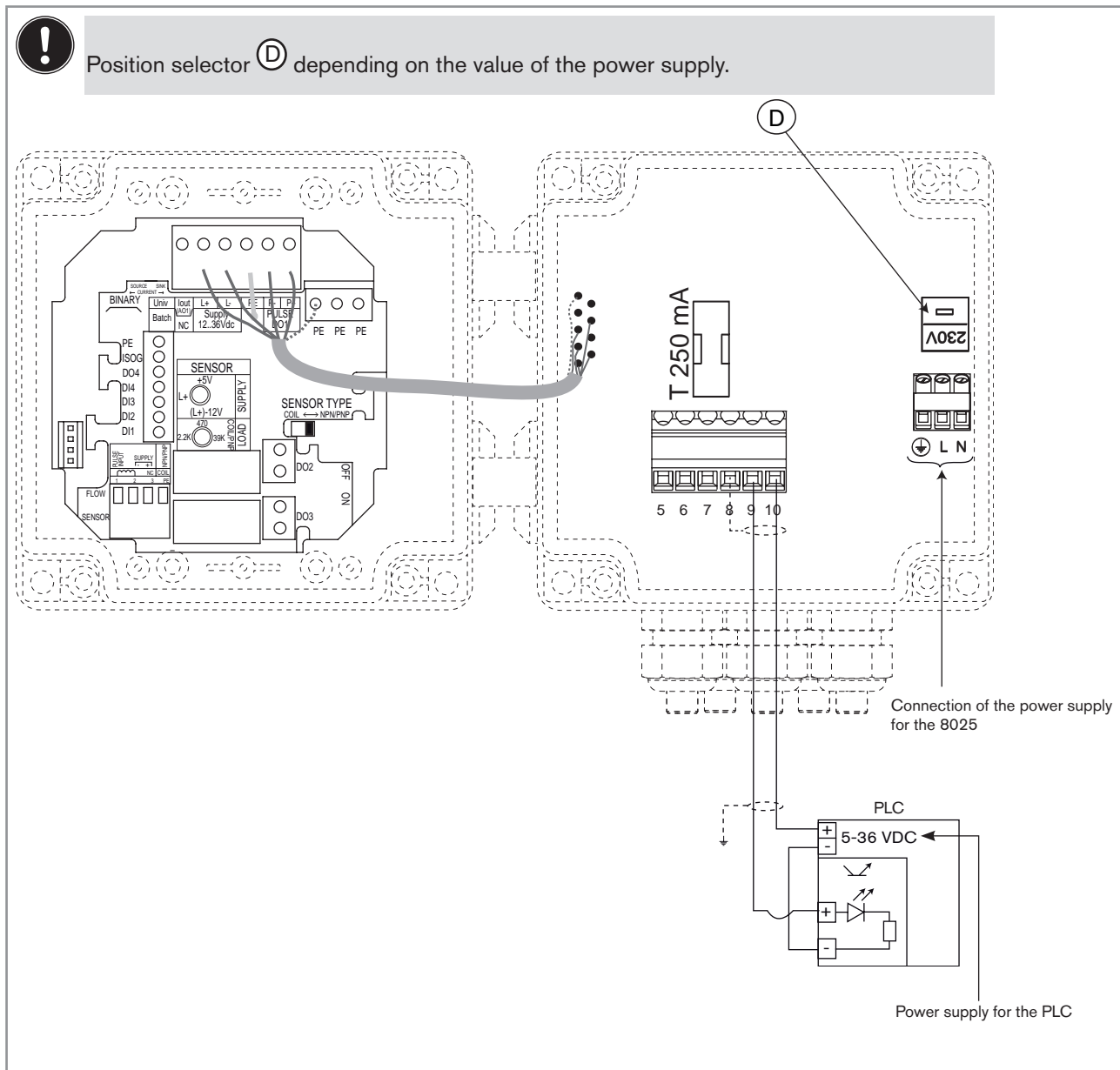


Figure 34: PNP wiring of the DO1 transistor output of a wall-mounted version, 115/230 V AC

→ Configure transistor output DO1 acc. to chap. [“9.7.19”](#) to [“9.7.23”](#).

7.6.12 Wiring the relay outputs DO2 and DO3 of a compact, a panel-mounted or a wall-mounted version

! To do a dosing, connect a valve to the relay output DO2.

The device can control:

- either a dosing with a single valve connected to the relay output DO2.
- or a dosing with 2 valves connected to the relay outputs DO2 and DO3. In this case, connect the main valve (for the highest flow rates) to output DO2 and the auxiliary valve (for low flow rates) to output DO3.

If a single valve is used, connect a load to relay output DO3 suited for the configuration of the output.

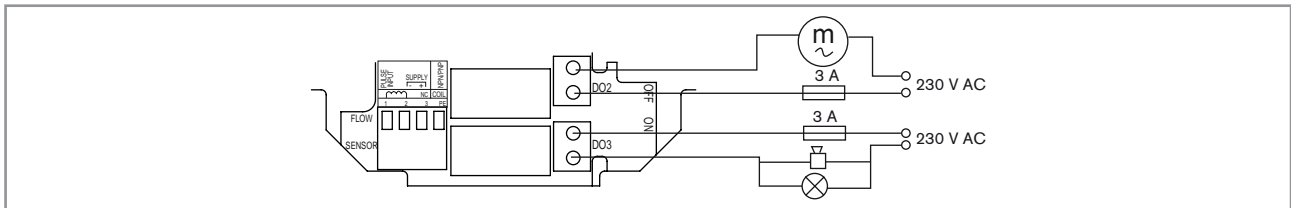


Figure 35: Wiring of the DO2 and DO3 relay outputs

→ To configure relay output DO2, see chap. [“9.7.24”](#).

→ To configure relay output DO3, see chap. [“9.7.18”](#).

8 COMMISSIONING

8.1 Safety instructions



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.



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

8.2 Commissioning procedure

Before commissioning the device:

- Enter the K factor of the fitting used. See chap. ["9.7.3"](#).
- Wire the device depending on the desired dosing mode. See chap. ["7.6"](#) and chap. ["9.6.1"](#) to ["9.6.7"](#).
- If the digital inputs are used, place DI4 in the off-position before energizing the device.
- Set the dosing mode. See chap. ["9.7.5"](#).

9 OPERATING AND FUNCTIONS

9.1 Safety instructions



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.



WARNING

Risk of injury due to non-conforming 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.

9.2 Operating levels of the device

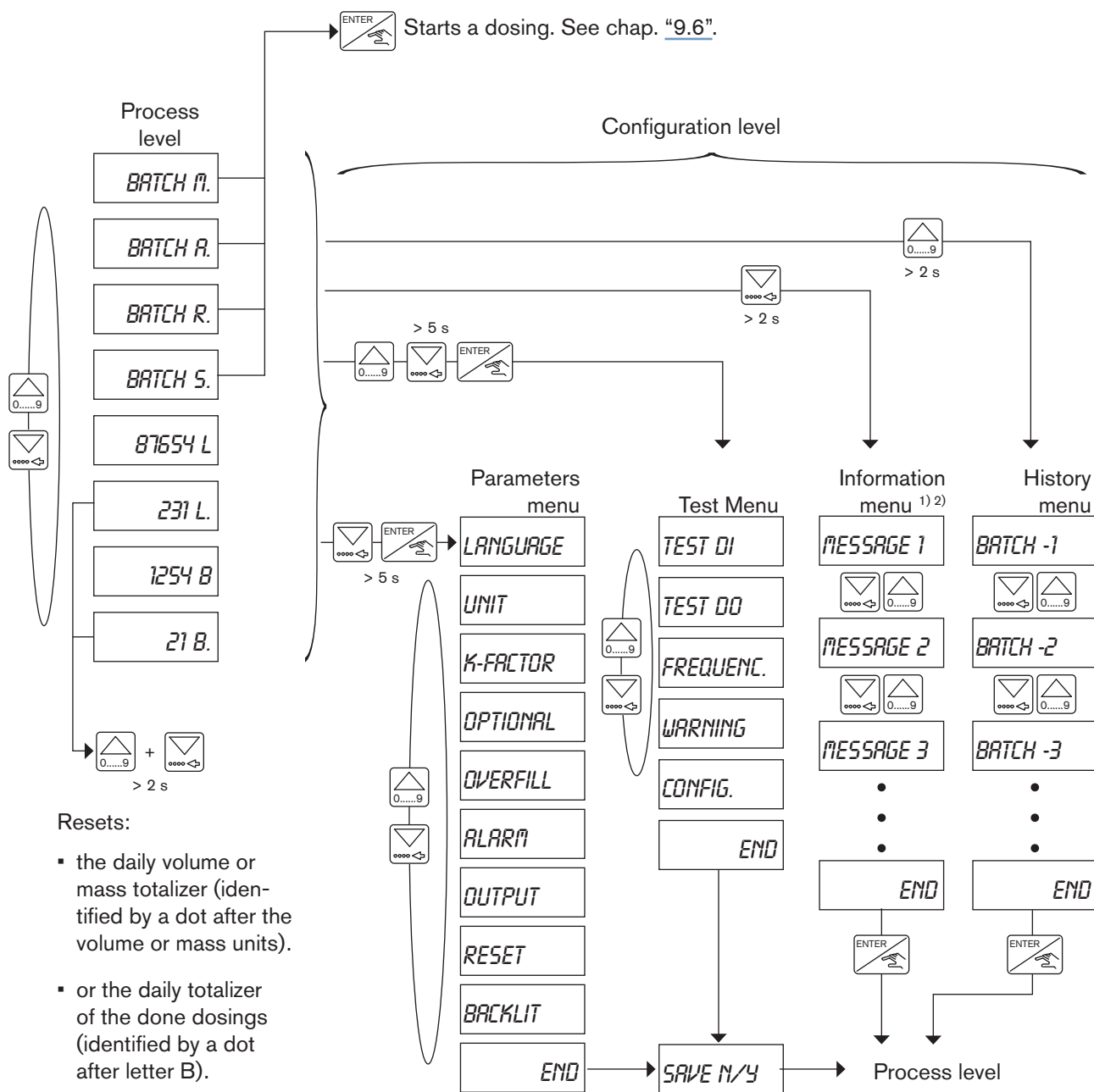
The device has two operating levels: the Process level and the Configuration level.

The Process level allows for:

- starting a dosing.
- reading the values of the main and daily totalizers of the quantity of fluid counted since the last reset.
- reading the values of the main and daily totalizers of the done dosings since the last reset.
- resetting the daily volume or mass totalizer:
- resetting the daily totalizer of the done dosings.
- accessing the Configuration level.

The Configuration level comprises four menus (Parameters, Test, Information and History) and allow for:

- setting the device parameters.
- setting the dosing mode on the device.
- doing the Teach-In of the quantity to be dosed (only if dosing modes "LOC. REP" or "EXT. REP" are active on the device).
- testing the inputs and the outputs of the device.
- reading and confirming, when the device state LED is orange or red and when no dosing is being done, the warning and fault messages generated by the device.
- consulting the history of the last 10 dosings.

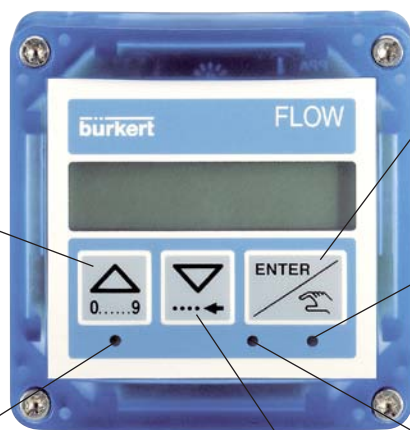


¹⁾ Accessible when the device state LED is orange or red and when no dosing is being done (see chap. "9.3").

²⁾ The warning messages of the menu can also be remotely consulted and confirmed: see chap. "9.11".

9.3 Description of the navigation keys and the state LEDs

- Scrolling up the parameters
- Incrementing the figure selected
- Consulting the history of dosings





- Selecting the displayed parameter
- Confirming the settings

State LED of relay output DO3
(LED ON = contact closed)




















State LED of relay output DO2
(LED ON = contact closed)

Device state LED: see following table.

- Reading the messages
- Scrolling through the parameters
- Selecting the figure on the left

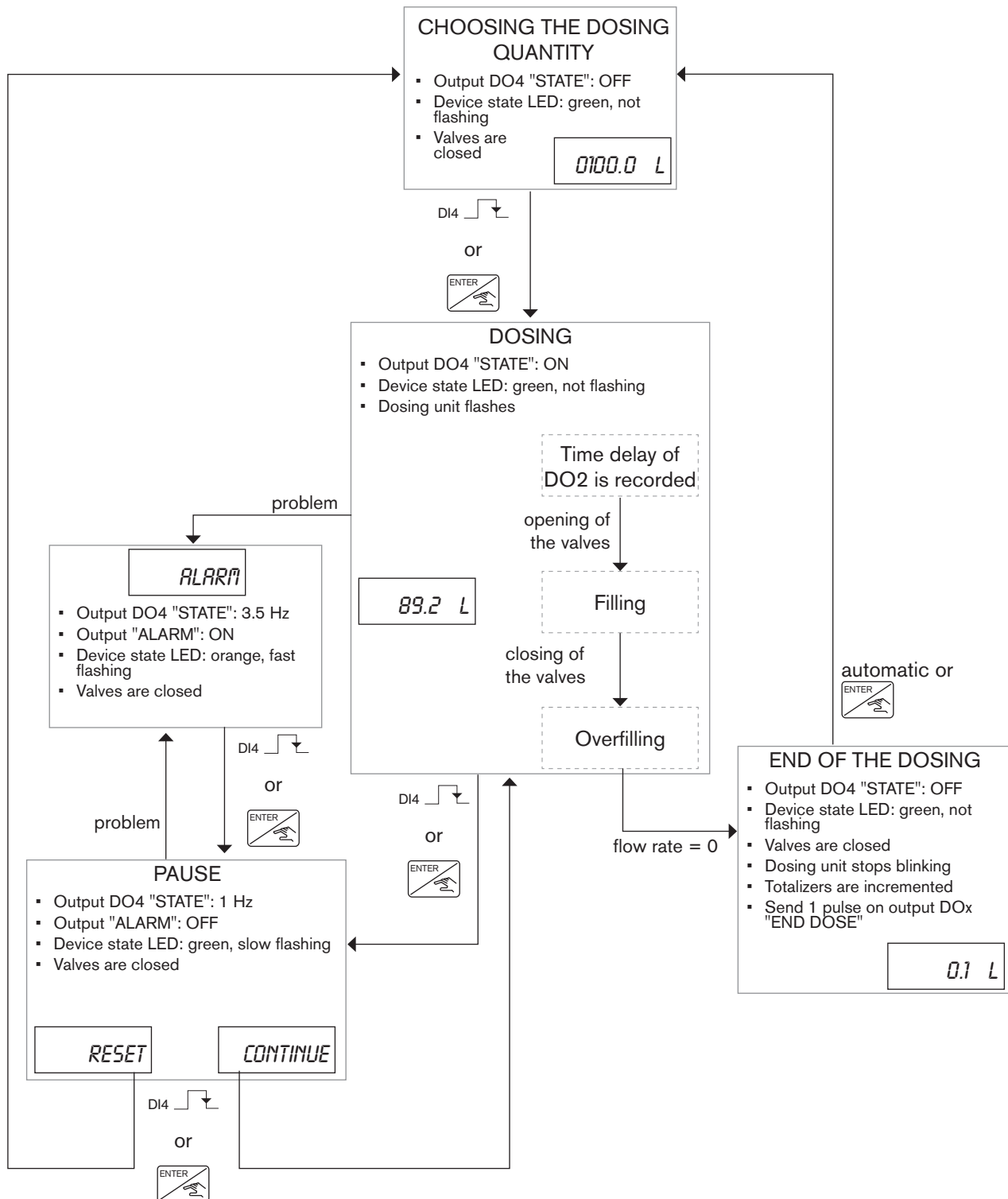
Device state LED	State of the device
Green	The device operates correctly.
Orange	<p>An alarm related to the dosing and/or a warning message has been generated.</p> <p>→ Press the  key for 2 seconds in the Process level to access the message if no dosing is being done. See chap. "10.3" for the meaning of the message.</p> <p>Furthermore, output DO1, DO3 or DO4 switches if configured with the function "ALARM" (see chap. "9.7.19") or with the function "WARNING" (see chap. "9.7.20")</p>
Red	<p>An error message has been generated.</p> <p>The transistor output DO4 sends out a 10 Hz frequency, if parameter "ERR. 10HZ" is set to "10HZ ON". See chap. "9.7.26".</p> <p>→ Press the  key for 2 seconds in the Process level to access the message if no dosing is being done. See chap. "10.3" for the meaning of the message.</p>
flashing, whatever the colour	<ul style="list-style-type: none"> ▪ Slow flashing: the dosing has been interrupted. ▪ Fast flashing, during a dosing: an alarm related to the dosing has been generated. ▪ Fast flashing when no dosing is being done: the Information menu is being remotely consulted (via the digital inputs, see chap. "9.11") or the function of the digital inputs or of the outputs is being checked (see chap. 9.8.1 or 9.8.2).

9.4 Using the navigation keys

You want to...	Press...
move between parameters within a level or a menu.	<ul style="list-style-type: none">  to go to the next parameter.  to go to the previous parameter.
access the Parameters menu.	 +  simultaneously for 5 s, in the Process level, if no dosing has been started.
access the Test menu.	 +  +  simultaneously for 5 s, in the Process level, if no dosing has been started.
access the Information menu.	 for 2 s, in the Process level, when the device state LED is orange or red and no dosing has been started.
access the History menu.	 for 2 s, in the Process level, if no dosing has been started.
reset the daily volume or mass totalizer, from the Process level.	 +  simultaneously for 2 s, when the daily volume or mass totalizer is displayed in the Process level
reset the daily totalizer of the done dosings, from the Process level.	 +  simultaneously for 2 s, when the daily totalizer of the done dosings is displayed in the Process level
select the displayed parameter.	
confirm the displayed value.	
modify a numerical value.	<ul style="list-style-type: none">  to increase the blinking digit.  to select the digit at the left of the blinking digit.  +  to move the decimal point.

→ To start a dosing, see chap. [“9.6”](#).

9.5 Principle of a dosing and PLC scenarios



→ The different dosing modi are described in chap. "9.7.5".

Table 6: Scenario of a dosing with no problem nor pause

Event	state, output DO4
no dosing	OFF
dosing	ON
end of the dosing	OFF

Table 7: Scenario of a dosing with pause

Event	state, output DO4
no dosing	OFF
dosing	ON
dosing interrupted	1Hz
dosing continued	<ul style="list-style-type: none"> ON if the dosing is not finished OFF if the dosing finished during the pause
or reset the dosing	OFF

Table 8: Scenario of a dosing with alarm

Event	state, output DO4
no dosing	OFF
dosing	ON
ALARM	3.5 Hz
confirm the alarm	<ul style="list-style-type: none"> OFF if the dosing finished during the alarm 1Hz if the dosing is not finished: the dosing has been interrupted. See "Table 7".

Table 9: Scenario of a dosing with pause and alarm during the pause

Event	state, output DO4
no dosing	OFF
dosing	ON
dosing interrupted	1Hz
ALARM	3.5 Hz
confirm the alarm	<ul style="list-style-type: none"> OFF if the dosing finished during the alarm 3.5 Hz if the dosing is not finished: the dosing has been interrupted. See "Table 7".

Table 10: Scenario of a dosing with ERROR[T]

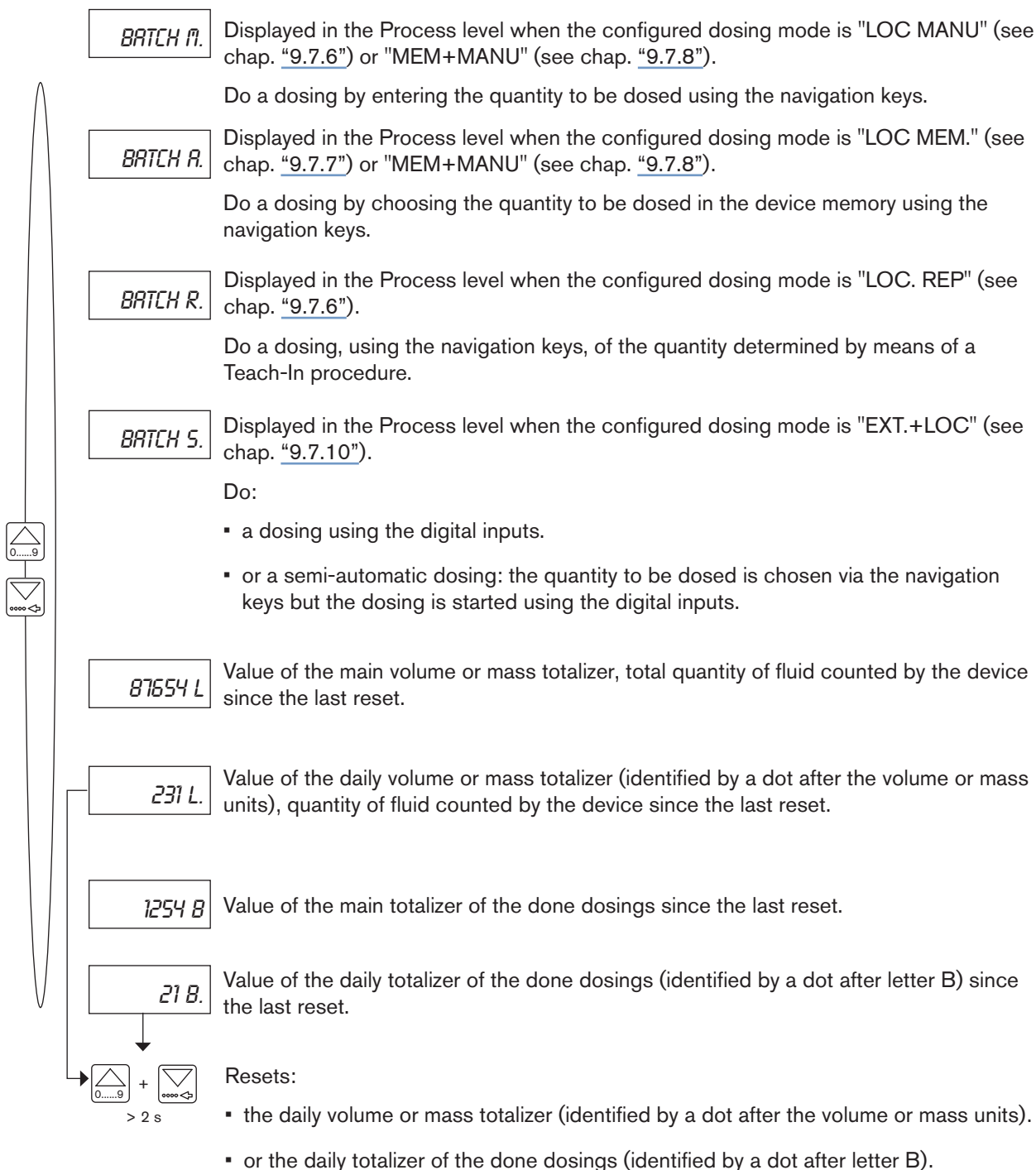
Event	state, output DO4
no dosing	OFF
dosing	ON
ERROR[T]	3.5 Hz
confirm the alarm	OFF (no pulse sent out on DOx output configured with function "END DOSE")

9.6 Details of the Process level

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



If the power supply of the device is shut down while a dosing is being done, the dosing has been interrupted when the power supply is restored: to continue or abort the dosing depending on the dosing mode that is active on the device, see chap. "9.6.1" to "9.6.7".



9.6.1 Doing a dosing in dosing mode "LOC. MANU." or "MEM.+MANU."

Dosing mode "LOC. MANU." allows for entering a dosing quantity and starting the dosing, via the navigation keys.

Dosing mode "MEM.+MANU." allows for:

- either entering a dosing quantity and starting the dosing, via the navigation keys,
- or starting the dosing, via the navigation keys, of a quantity saved in the memory.



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.

→ Connect the valves to the DO2 and DO3 outputs: see chap. “7.6.12”.

→ Wire the output DO4 as described in “Figure 36”.

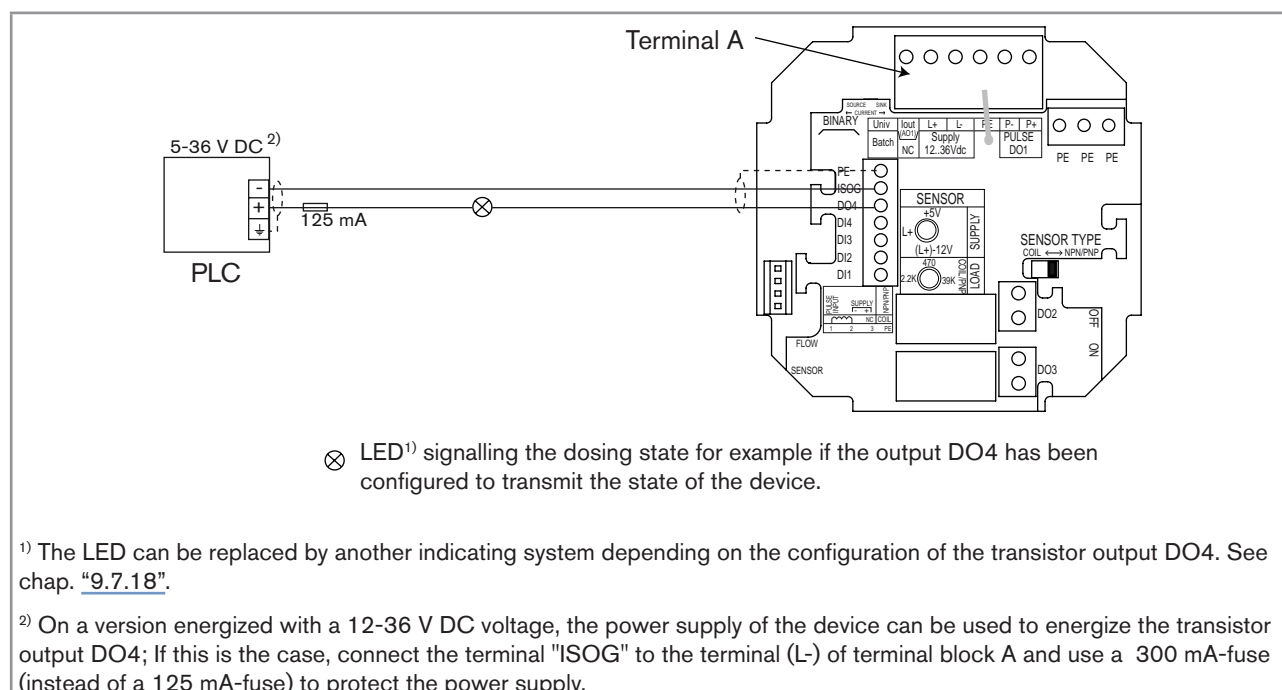


Figure 36: Electrical connection of the transistor output DO4 in the dosing modes "LOC. MANU", "LOC. MEM", "MEM+MANU" or "LOC. REP"

→ Start the device again.

→ Configure the device with the dosing mode "LOC. MANU." or "MEM.+MANU.": see chap. "9.7.6" or "9.7.8".

→ Do a dosing as shown in “Figure 37”.



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. "9.7.16"), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. "10.3.4" to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. "9.7.17"), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. "10.3.4" to solve the problem.

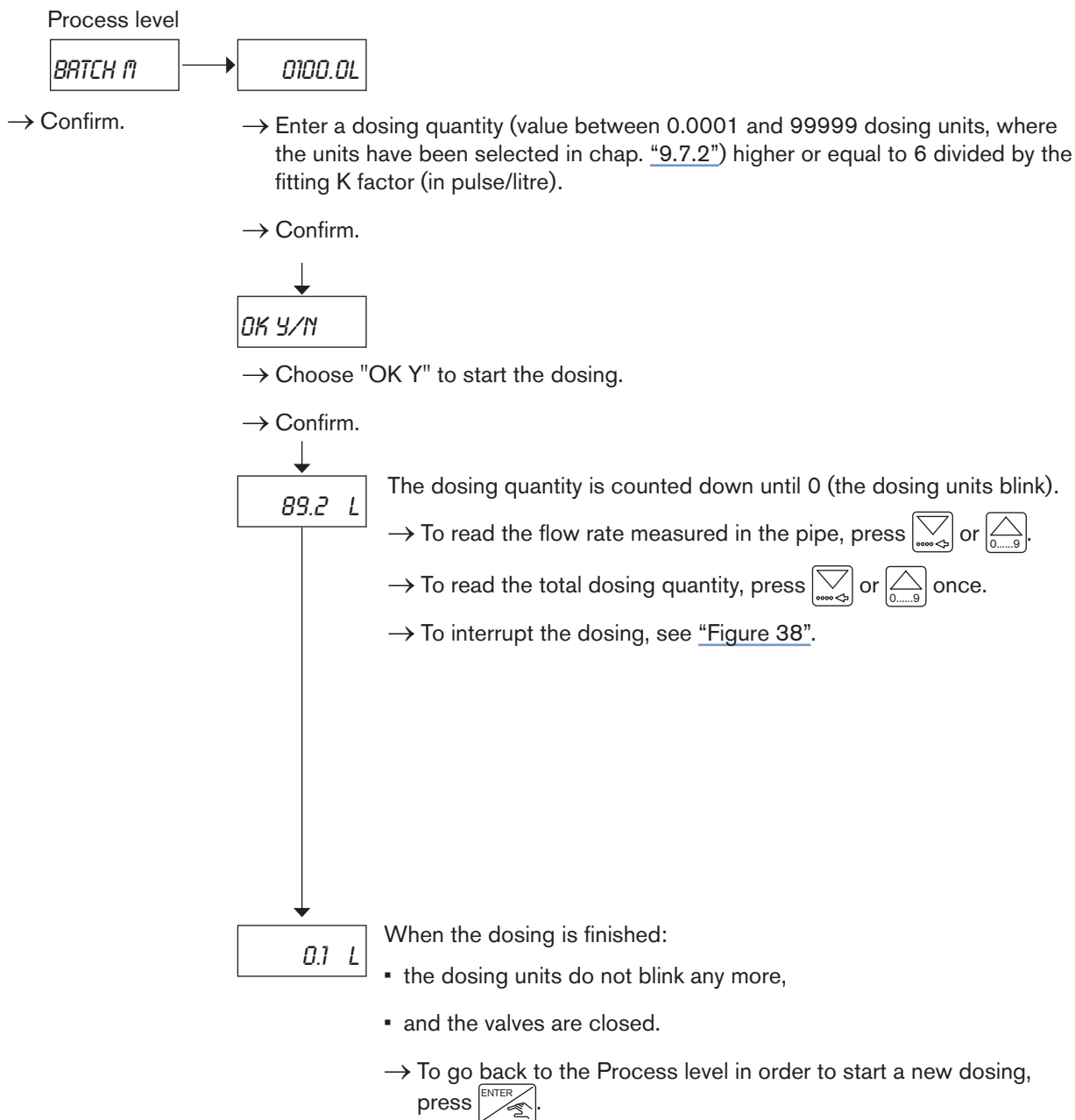


Figure 37: Doing a manual dosing in dosing modes "LOC. MANU." or "MEM.+MANU."

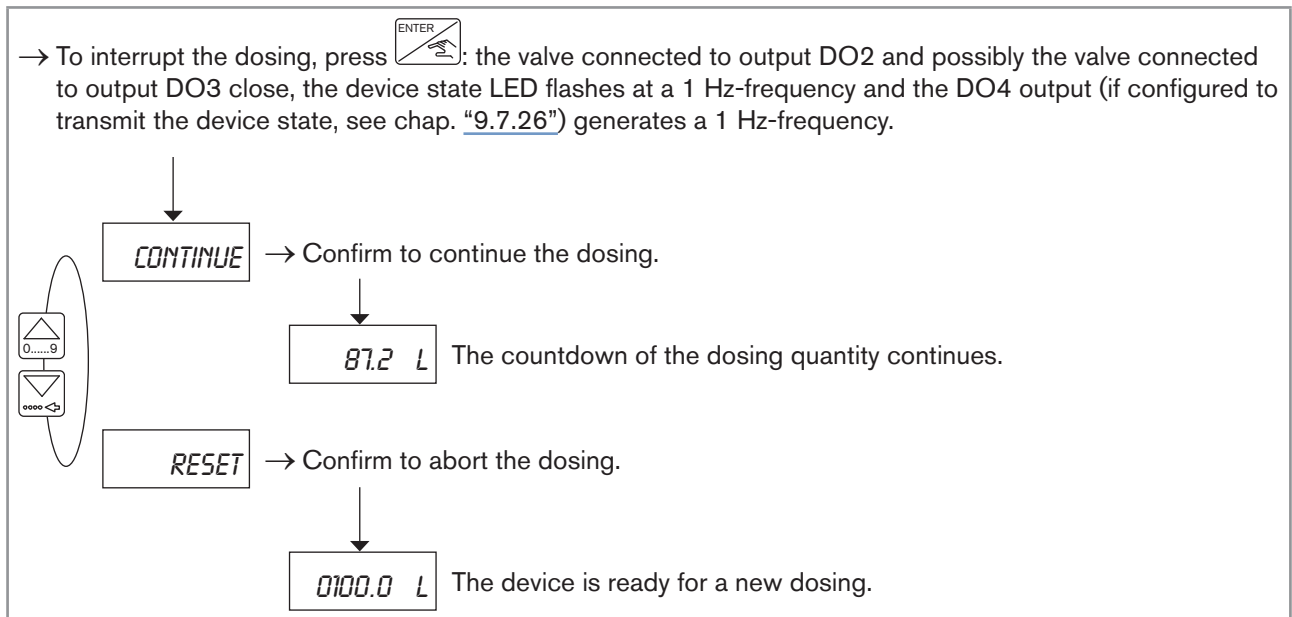


Figure 38: Interrupting the dosing in dosing modes "LOC. MANU." or "MEM.+MANU."

9.6.2 Doing a dosing in dosing mode "LOC. MEM." or "MEM.+MANU."

Dosing mode "LOC. MEM." allows for starting the dosing, via the navigation keys, of a quantity saved in the memory.

Dosing mode "MEM.+MANU." allows for:

- either entering a dosing quantity and starting the dosing, via the navigation keys,
- or selecting a dosing quantity from the memory and starting the dosing, via the navigation keys,



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.

→ Connect the valves to the DO2 and DO3 outputs: see chap. 7.6.12.

→ Wire the output DO4 as described in "Figure 36", chap. "9.6.1".

→ Start the device again.

→ Configure the device with the dosing mode "LOC. MEM." or "MEM.+MANU.": see chap. "9.7.7" or "9.7.8".

→ Do a dosing as shown in "Figure 39".



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. "9.7.16"), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. "10.3.4" to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. "9.7.17"), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. "10.3.4" to solve the problem.

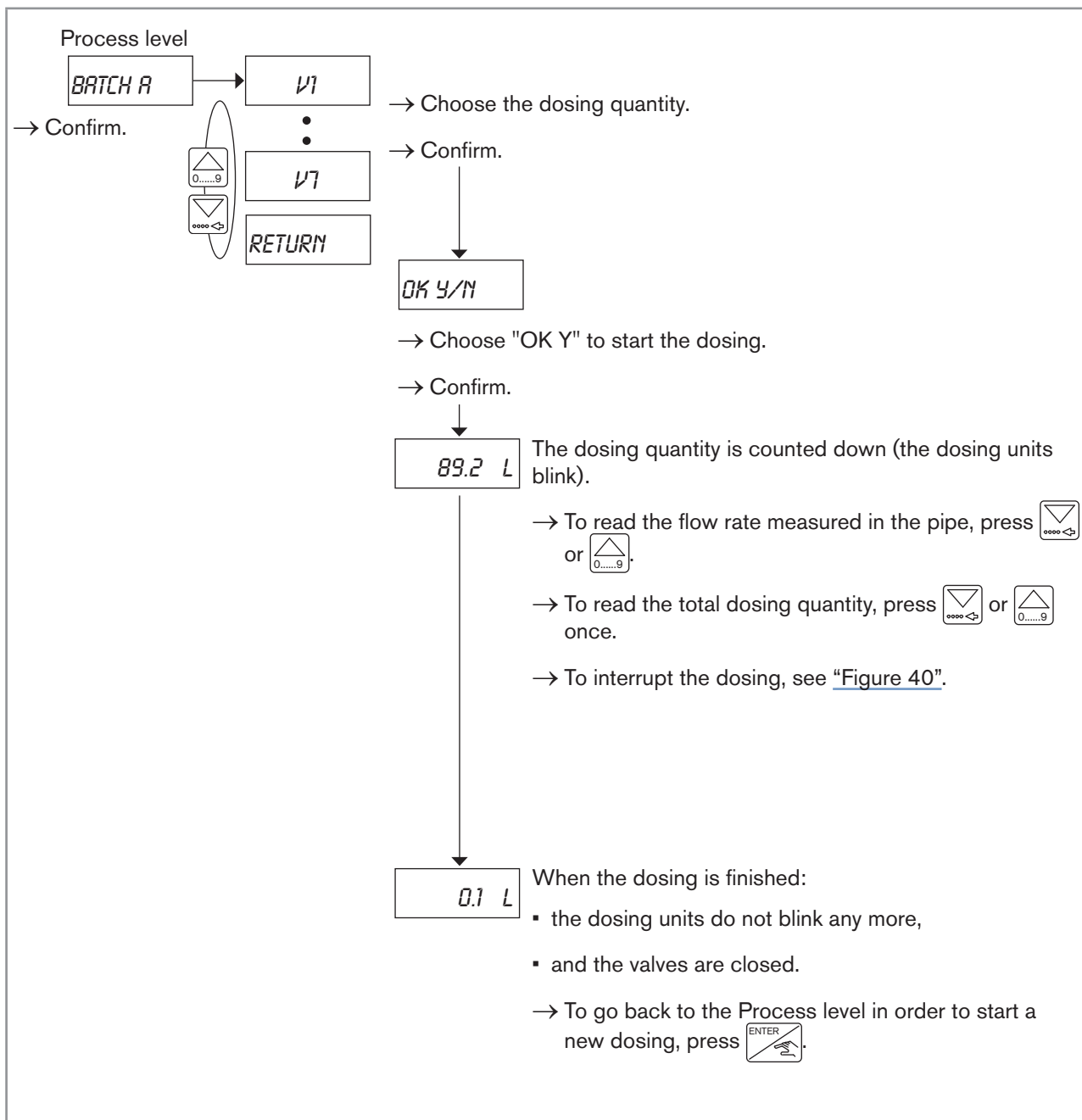


Figure 39: Doing a dosing in dosing modes "LOC. MEM." or "MEM.+MANU."

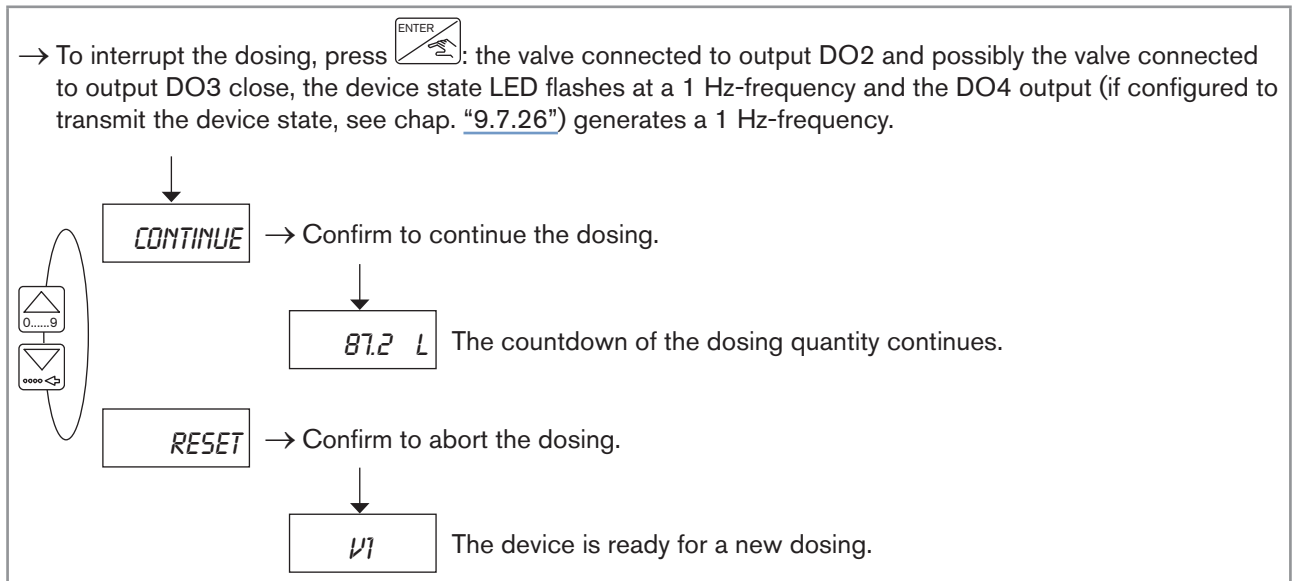


Figure 40: Interrupting the dosing in dosing modes "LOC. MEM." or "MEM.+MANU."

9.6.3 Doing a dosing in dosing mode "EXT. MEM."

Dosing mode "EXT. MEM" allows for selecting a dosing quantity from the device memory and starting the dosing, via the digital inputs.



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.

→ Connect the valves to the DO2 and DO3 outputs: see chap. 7.6.12.

→ Wire the output DO4 and the digital inputs DI1 to DI4 as described in "Figure 41" and depending on the following requirements:

- the transistor output DO4 allows for transmitting the dosing state if the output DO4 is configured with the function "STATE" (see chap. "9.7.26").
- the digital input DI4 allows for starting, interrupting, continuing or aborting a dosing. It also allows for confirming an alarm, if the generation of alarms has been activated on the device (see chap. "9.7.16" and "9.7.17").
- the digital inputs DI1 to DI3 allow for selecting one of the 7 dosing quantities stored in the memory of the device. If all the 7 dosing quantities are not used, only connect the necessary inputs. When a dosing has been interrupted, the digital inputs allow for the navigation within the pause menu, between the function "CONTINUE" and the function "RESET".

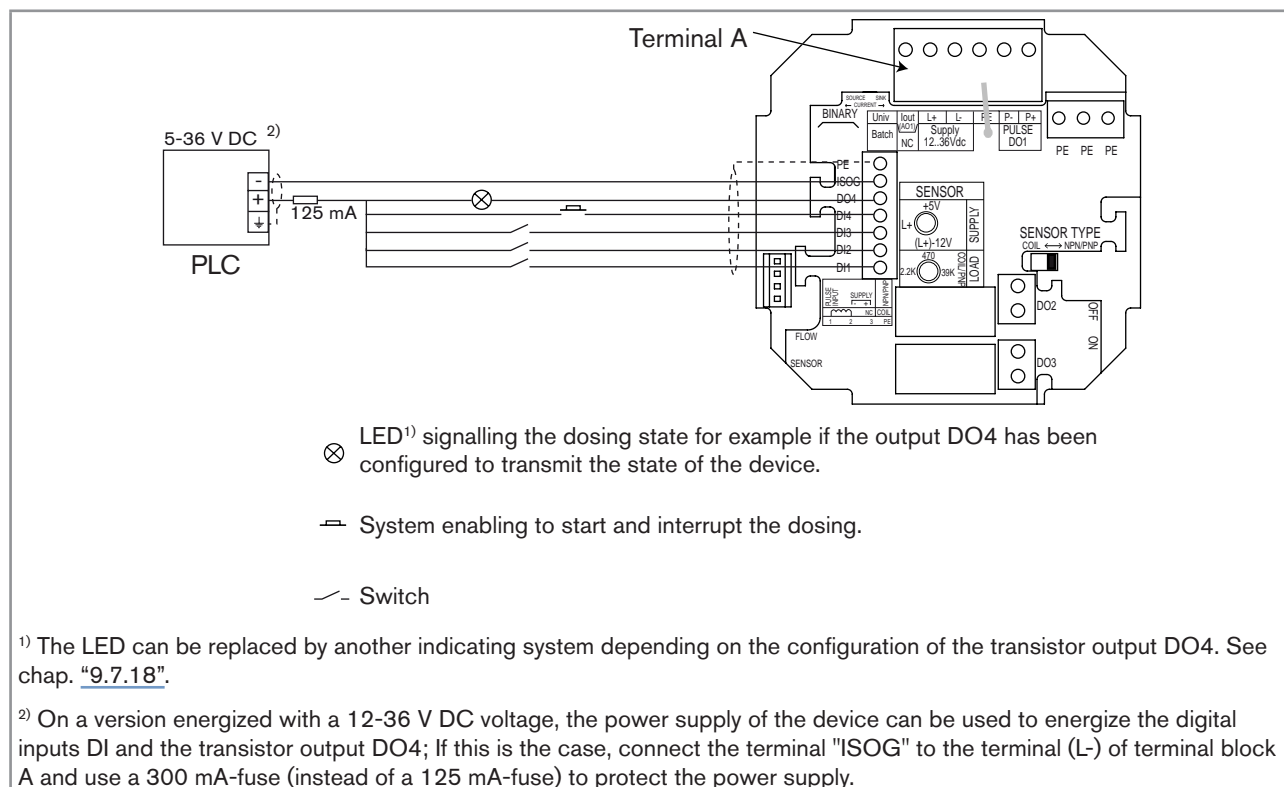


Figure 41: Electrical connection of the digital inputs DI and of the transistor output DO4 in dosing modes "EXT. MEM", "EXT. +LOC" or "EXT. [T]"

→ Restart the device:

- If the DI4 input is at the low level (not powered) when energizing the device, the four digital inputs will be active at high level.
- If the DI4 input is at the high level (not powered) when energizing the device, the four digital inputs will be active at low level.

→ Configure the device with this dosing mode: see chap. “9.7.9”.

→ Do a dosing as shown in "Figure 42".

- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. ["9.7.16"](#)), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. ["10.3.4"](#) to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. ["9.7.17"](#)), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. ["10.3.4"](#) to solve the problem.

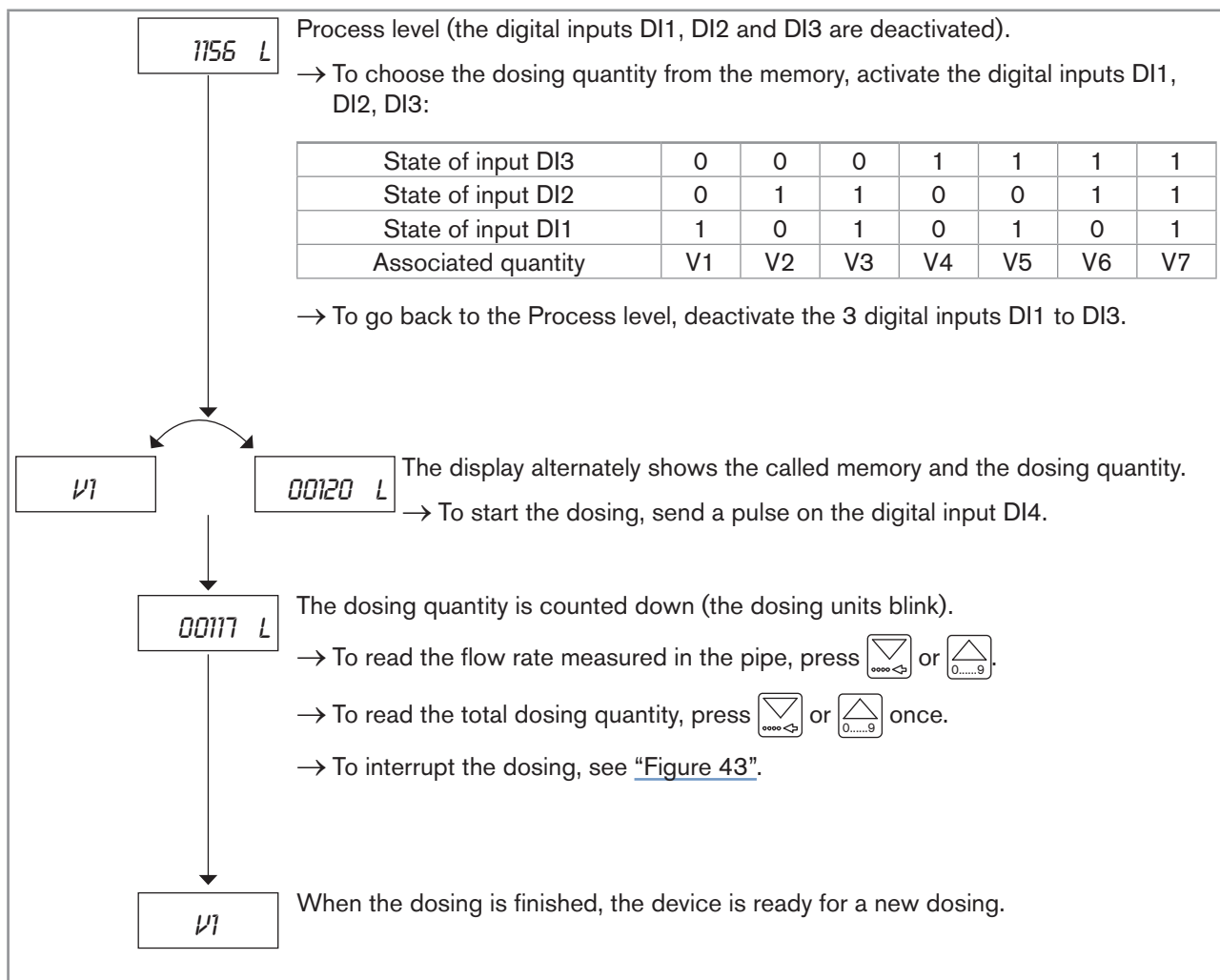



Figure 42: Doing a dosing of a quantity from the memory, in dosing mode "EXT. MEM."

→ To interrupt the dosing, press : the valve connected to output DO2 and possibly the valve connected to output DO3 close, the device state LED flashes at a 1 Hz-frequency and the DO4 output (if configured to transmit the device state, see chap. "9.7.26") generates a 1 Hz-frequency.

↓
CONTINUE

→ To continue the dosing via the digital inputs:

- let at least one of the 3 digital inputs, DI1, DI2 or DI3, activated
- then send a pulse on DI4.

→ To continue the dosing via the navigation keys, if at least one of the 3 digital inputs, DI1, DI2 or DI3 is activated:

- display "CONTINUE" by pressing key  or ,
- then press key .

↓
113 L

The countdown of the dosing quantity continues.

RESET

→ To abort the dosing via the digital inputs:

- deactivate the 3 digital inputs, DI1, DI2 and DI3,
- then send a pulse on DI4.

→ To abort the dosing via the navigation keys, if at least one of the 3 digital inputs, DI1, DI2 or DI3 is activated:

- display "RESET" by pressing key  or ,
- then press key .

↓
1/1

The device is ready for a new dosing.

Figure 43: Interrupting the dosing, in dosing mode "EXT. MEM."

9.6.4 Doing a dosing in dosing mode "EXT.+LOC."

Dosing mode "EXT.+LOC." allows for:

- selecting a dosing quantity from the memory of the device, via the navigation keys or the digital inputs,
- then starting the dosing via the digital input DI4 (only).



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.

→ Connect the valves to the DO2 and DO3 outputs: see chap. [7.6.12](#).

→ Wire the output DO4 and the digital inputs DI as described in ["Figure 41"](#), chap. ["9.6.3"](#), and depending on the following requirements:

- the transistor output DO4 allows for transmitting the dosing state.
- the digital input DI4 allows for starting, interrupting, continuing or aborting a dosing. It also allows for confirming an alarm, if the generation of alarms has been activated on the device (see chap. ["9.7.16"](#) and ["9.7.17"](#)).
- the digital inputs DI1 to DI3 allow for selecting one of the 7 dosing quantities, entered into the device memory (see ["Figure 42"](#), chap. ["9.6.3"](#)). If all the 7 dosing quantities are not used, only connect the necessary inputs. When a dosing has been interrupted, the digital inputs allow for the navigation within the pause menu, between the function "CONTINUE" and the function "RESET". If the dosing quantity is selected via the navigation keys and no dosing will be remotely aborted, inputs DI1 to DI3 can be left unconnected.

→ Restart the device:

- If the DI4 input is at the low level (not powered) when energizing the device, the four digital inputs will be active at high level.
- If the DI4 input is at the high level (not powered) when energizing the device, the four digital inputs will be active at low level.

→ Configure the device with this dosing mode: see chap. ["9.7.10"](#).

→ Do the dosing of a quantity stored in the memory and selected with the navigation keys, see ["Figure 44"](#).

→ Do the dosing of a quantity stored in the memory via the digital inputs, see ["Figure 45"](#).



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. ["9.7.16"](#)), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. ["10.3.4"](#) to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. ["9.7.17"](#)), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. ["10.3.4"](#) to solve the problem.



- To select the dosing quantity via the navigation keys, deactivate the 3 digital inputs DI1 to DI3.
- If a warning message is generated by the device and no dosing is being done, a long pulse (> 2 seconds) on DI4 allows for remotely accessing to the Information menu, whatever the state of the inputs DI1 to DI3. See chap. "9.11".

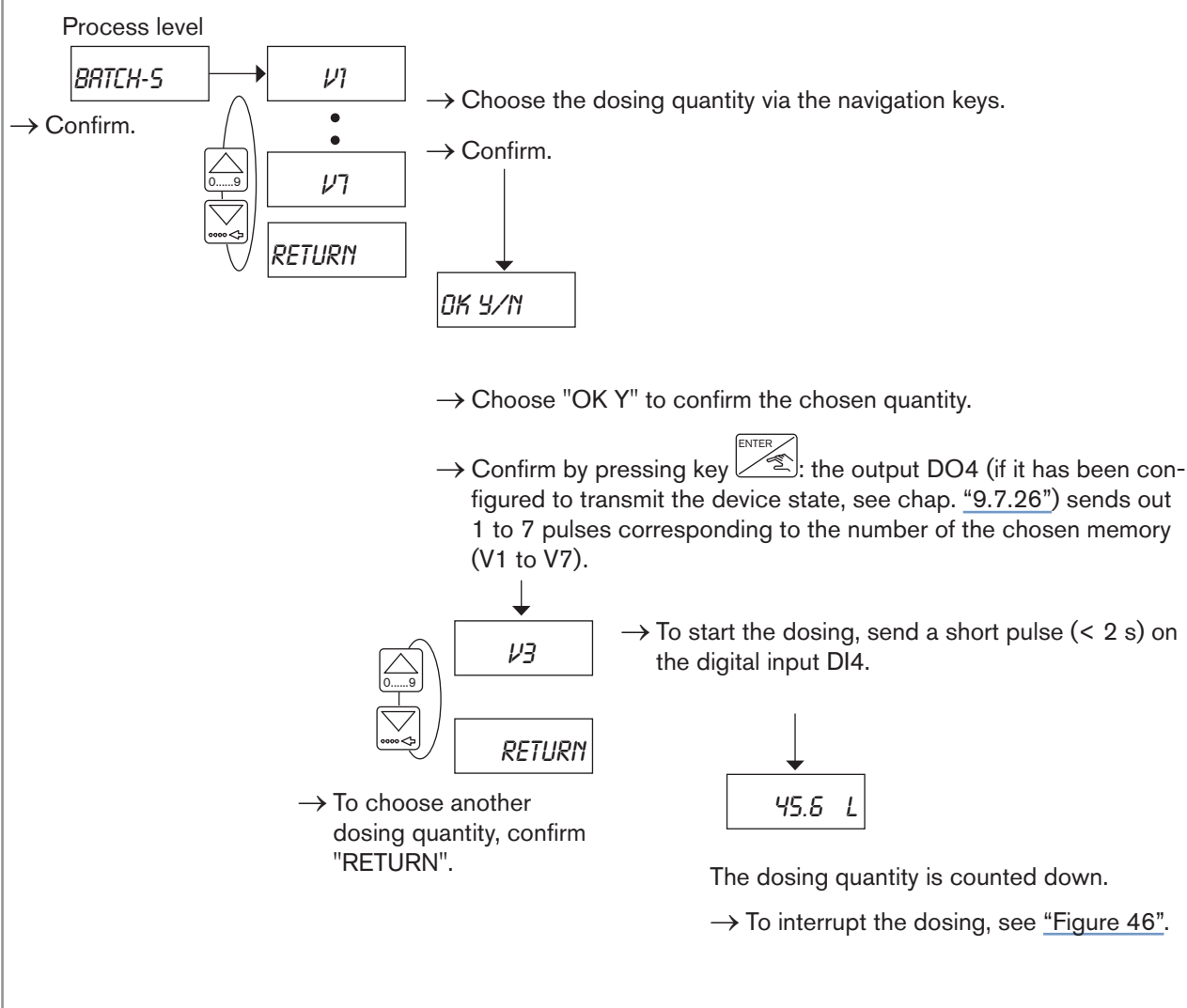


Figure 44: Doing the dosing of a quantity from the device memory via the navigation keys and the digital input DI4, in dosing mode "EXT.+LOC."

! If a warning message is generated by the device and no dosing is being done, a long pulse (> 2 seconds) on DI4 allows for remotely accessing to the Information menu, whatever the state of the inputs DI1 to DI3. See chap. "9.11".

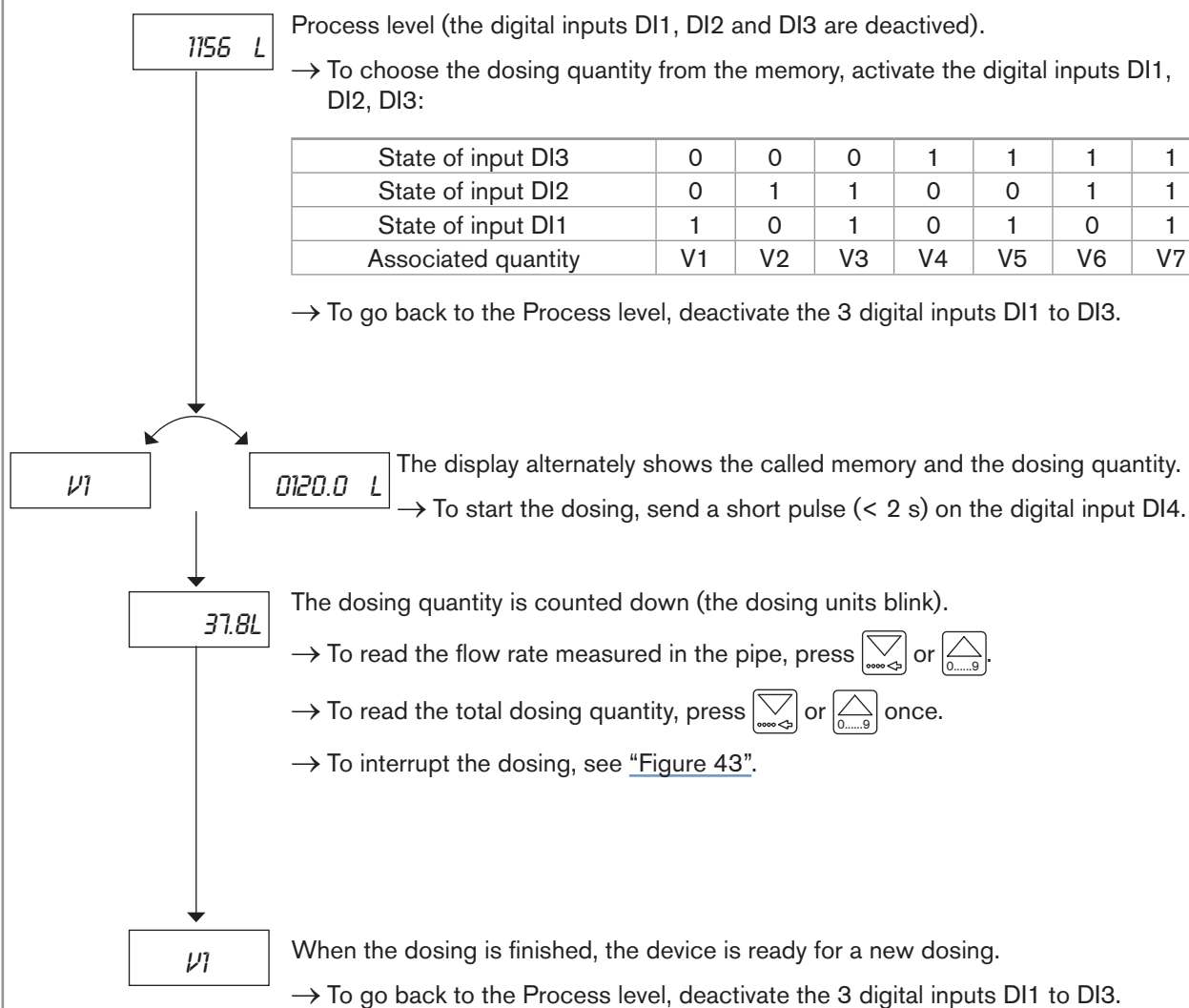



Figure 45: Doing a dosing of a quantity from the memory via the digital inputs, in dosing mode "EXT.+LOC."

→ To interrupt the dosing, press : the valve connected to output DO2 and possibly the valve connected to output DO3 close, the device state LED flashes at a 1 Hz-frequency and the DO4 output (if configured to transmit the device state, see chap. "9.7.26") generates a 1 Hz-frequency.

CONTINUE

→ To continue the dosing via the digital inputs:

- let at least one of the 3 digital inputs, DI1, DI2 or DI3, activated
- then send a pulse on DI4.

→ To continue the dosing via the navigation keys:

- display "CONTINUE" by pressing key  or ,
- then press key .

37.8 L

The countdown of the dosing quantity continues.

RESET

→ To abort the dosing via the digital inputs:

- activate then deactivate one of the 3 digital inputs, DI1, DI2 or DI3, to make sure that "RESET" is displayed,
- then send a pulse on DI4.

→ To abort the dosing via the navigation keys:

- display "RESET" by pressing key  or ,
- then press key .

µl

The device is ready for a new dosing.

Figure 46: Interrupting the dosing, in dosing mode "EXT.+LOC."

9.6.5 Doing a dosing in dosing mode "EXT. [T]"



In this mode, the dosing starts as soon as the digital input DI1 is switched.

The dosing mode "EXT. [T]" allows for starting the dosing of a quantity proportional to the duration the digital input DI1 is activated.



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.

→ Connect the valves to the DO2 and DO3 outputs: see chap. [7.6.12](#).

→ Wire the output DO4 and the digital inputs DI as described in ["Figure 41"](#), chap. ["9.6.3"](#), and depending on the following requirements:

- the transistor output DO4 allows for transmitting the dosing state.
- the digital input DI1 allows for starting a dosing whose dosing quantity is proportional to the activation duration of DI1.
- the digital input DI4 allows for interrupting or continuing a dosing. It also allows for confirming an alarm, if the generation of alarms has been activated on the device (see chap. ["9.7.16"](#) and ["9.7.17"](#)).
- when a dosing has been interrupted, the digital inputs DI2 and/or DI3 allow for the navigation within the pause menu, between the function "CONTINUE" and the function "RESET".

→ Restart the device:

- If the DI4 input is at the low level (not powered) when energizing the device, the four digital inputs will be active at high level.
- If the DI4 input is at the high level (not powered) when energizing the device, the four digital inputs will be active at low level.

→ Configure the device with this dosing mode: see chap. ["9.7.11"](#).

→ Do a dosing as shown in ["Figure 47"](#).



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. ["9.7.16"](#)), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. ["10.3.4"](#) to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. ["9.7.17"](#)), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. ["10.3.4"](#) to solve the problem.

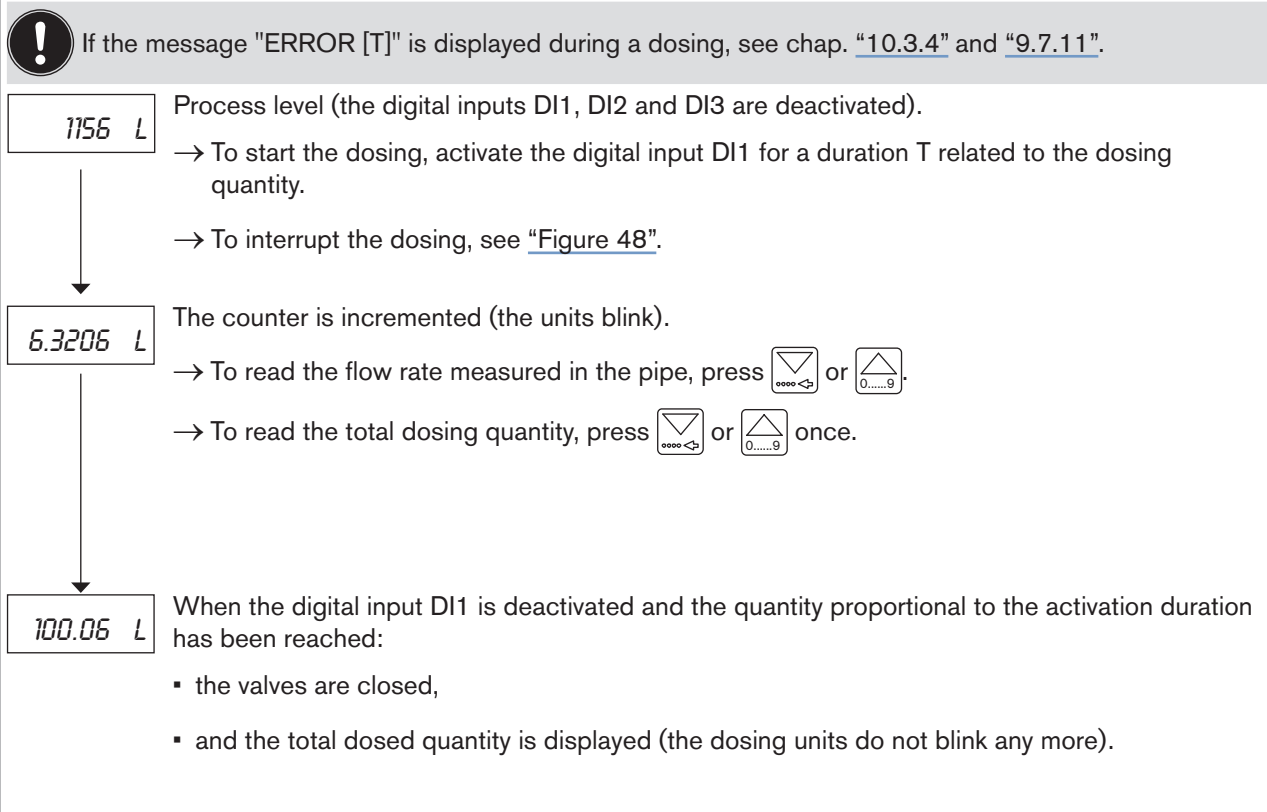



Figure 47: Doing a dosing, in dosing mode "EXT. [T]"



The activation duration of the digital input DI1 is counted even if the dosing has been interrupted.

→ To interrupt the dosing, press : the valve connected to output DO2 and possibly the valve connected to output DO3 close, the device state LED flashes at a 1 Hz-frequency and the DO4 output (if configured to transmit the device state, see chap. "9.7.26") generates a 1 Hz-frequency.

CONTINUE

→ To continue the dosing via the digital inputs:

- let the digital inputs DI2 and DI3 deactivated,
- then send a pulse on DI4.

→ To continue the dosing via the navigation keys, when the digital inputs DI2 and DI3 are deactivated:

- display "CONTINUE" by pressing key  or ,
- then press key .

113 L

The counting of the dosing quantity continues.

RESET

→ To abort the dosing via the digital inputs:

- activate one of the digital inputs DI2 or DI3,
- then send a pulse on DI4.

→ To abort the dosing via the navigation keys, when the inputs DI2 and DI3 are deactivated:

- display "RESET" by pressing key  or ,
- then press key .

Process level: the device is ready for a new dosing.

Figure 48: Interrupting the dosing, in dosing mode "EXT. [T]"

9.6.6 Doing a dosing in dosing mode "EXT. REP."

The dosing mode "EXT. REP." allows for starting, via the digital inputs, the dosing of the quantity determined by a Teach-In procedure.



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.

→ Connect the valves to the DO2 and DO3 outputs: see chap. 7.6.12.

→ Wire the output DO4 and the digital inputs as described in "Figure 49" and depending on the following requirements:

- the transistor output DO4 allows for transmitting the dosing state.
- when a dosing has been interrupted, the digital input DI1 allows for the navigation within the pause menu, between the function "CONTINUE" and the function "RESET".
- the digital input DI4 allows for interrupting or continuing a dosing, when the digital input DI1 is active. It also allows for confirming an alarm, if the generation of alarms has been activated on the device (see chap. "9.7.16" and "9.7.17").

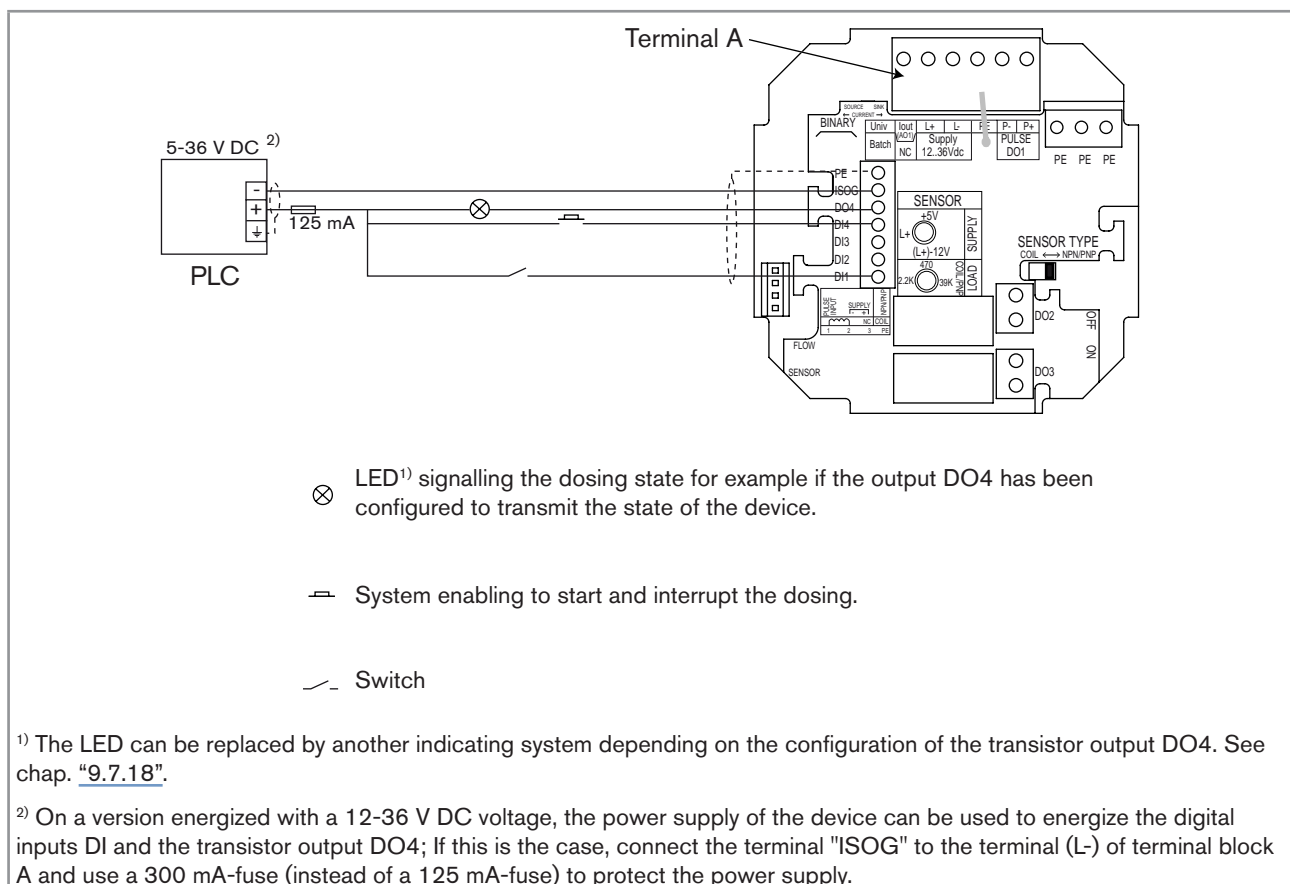


Figure 49: Electrical connection of the digital inputs DI and of the transistor output DO4 in the dosing mode "EXT. REP"

→ Restart the device:

- If the DI4 input is at the low level (not powered) when energizing the device, the four digital inputs will be active at high level.
- If the DI4 input is at the high level (not powered) when energizing the device, the four digital inputs will be active at low level.

→ Configure the device with this dosing mode, see chap. "9.7.12".

→ Do a dosing as shown in "Figure 50".



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. "9.7.16"), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. "10.3.4" to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. "9.7.17"), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. "10.3.4" to solve the problem.
- If the digital input DI1 is active, no dosing has been started and no warning message has been generated by the device, a long pulse (> 2 s) on DI4 allows for accessing to the Information menu. See chap. "9.11".

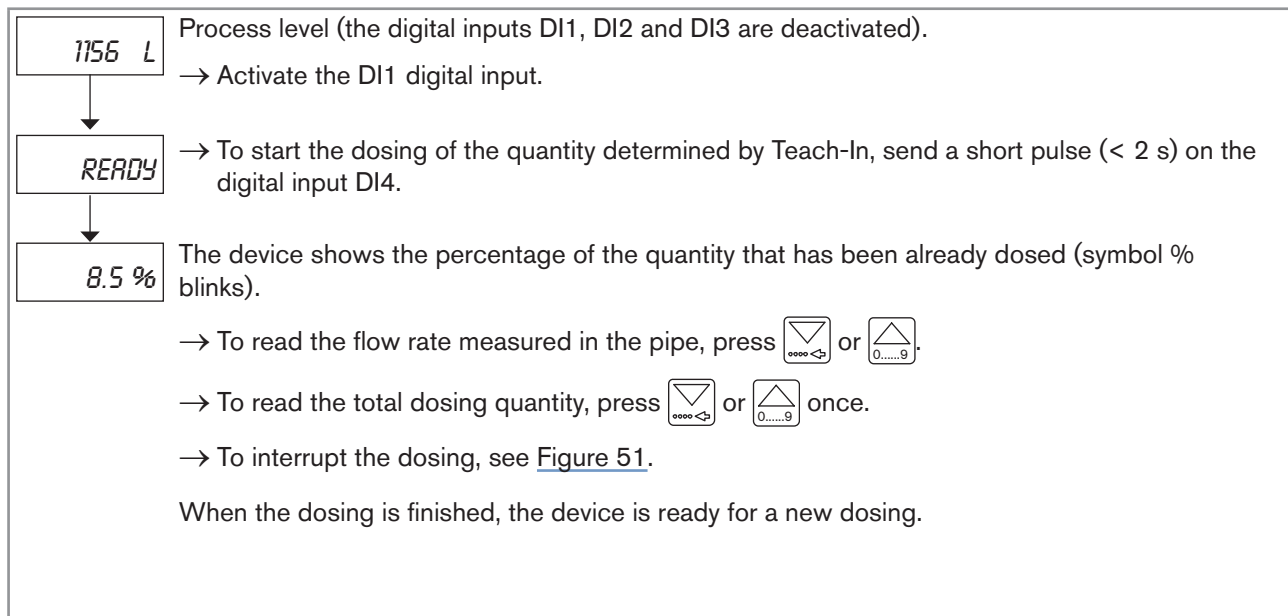



Figure 50: Doing a dosing, in dosing mode "EXT. REP."

→ To interrupt the dosing, press : the valve connected to output DO2 and possibly the valve connected to output DO3 close, the device state LED flashes at a 1 Hz-frequency and the DO4 output (if configured to transmit the device state, see chap. "9.7.26") generates a 1 Hz-frequency.

↓
CONTINUE → To continue the dosing via the digital inputs:

- Let the DI1 digital input activated.
- then send a pulse on DI4.

→ To continue the dosing via the navigation keys, when the digital input DI1 is activated:

- display "CONTINUE" by pressing key  or ,
- then press key .

↓
10.5 % The counting of the dosing quantity continues.

RESET → To abort the dosing via the digital inputs:

- Deactivate the DI1 digital input.
- then send a pulse on DI4.

→ To abort the dosing via the navigation keys, when the digital input DI1 is activated:

- display "RESET" by pressing key  or ,
- then press key .

↓
Process level: the device is ready for a new dosing.

Figure 51: Interrupting the dosing, in dosing mode "EXT. REP."

9.6.7 Doing a dosing in dosing mode "LOC. REP."

The dosing mode "LOC. REP." allows for starting, via the navigation keys, the dosing of the quantity determined by a Teach-In procedure.



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.

→ Wire the output DO4 as described in ["Figure 36"](#).

→ Connect the valves to the DO2 and DO3 outputs: see chap. [7.6.12](#).

→ Start the device again.

→ Configure the device with this dosing mode: see chap. [9.7.13](#).

→ Do a dosing as shown in ["Figure 52"](#).



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. ["9.7.16"](#)), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. ["10.3.4"](#) to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. ["9.7.17"](#)), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. ["10.3.4"](#) to solve the problem.

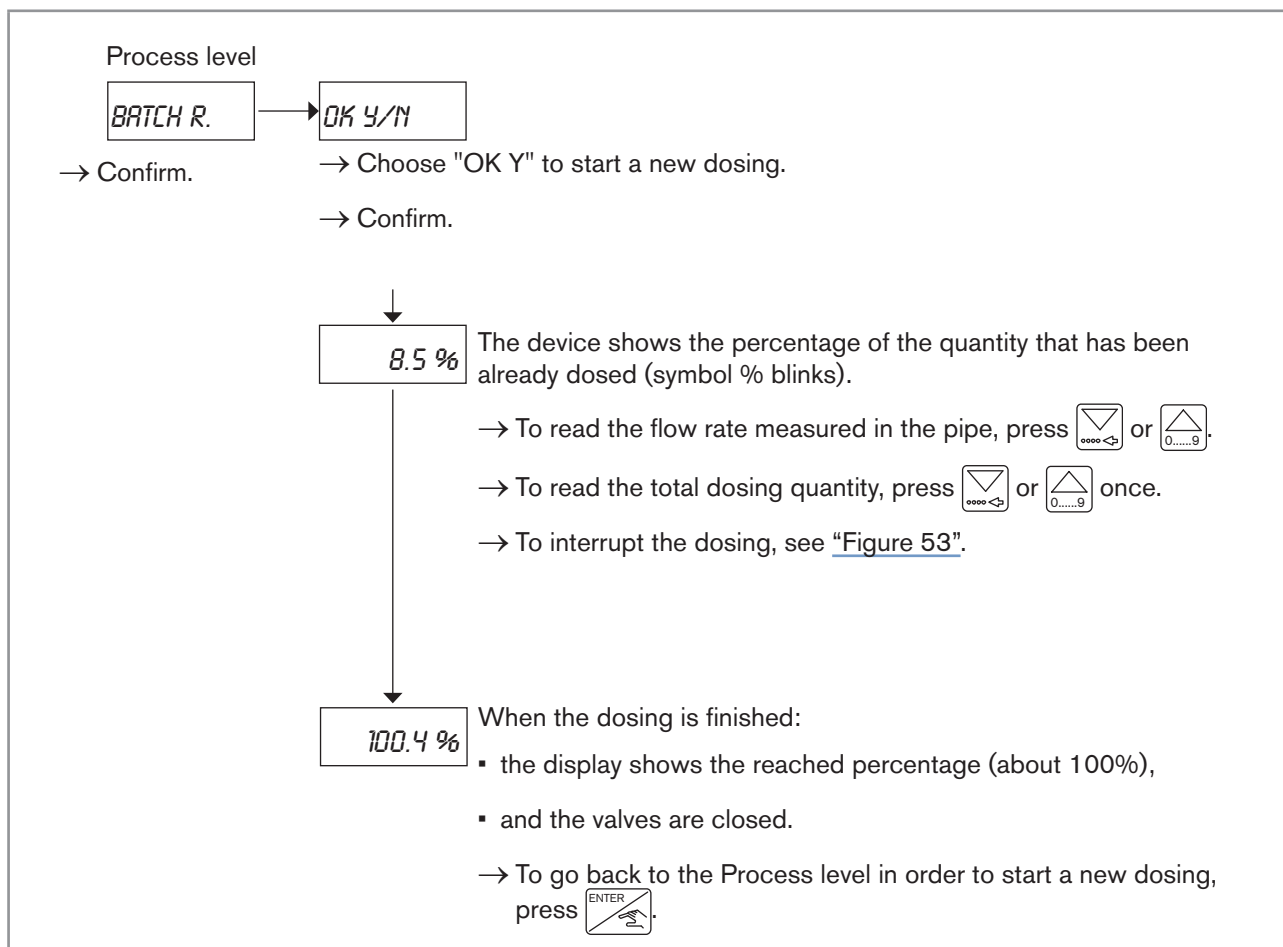


Figure 52: Doing a dosing, in dosing mode "LOC. REP."

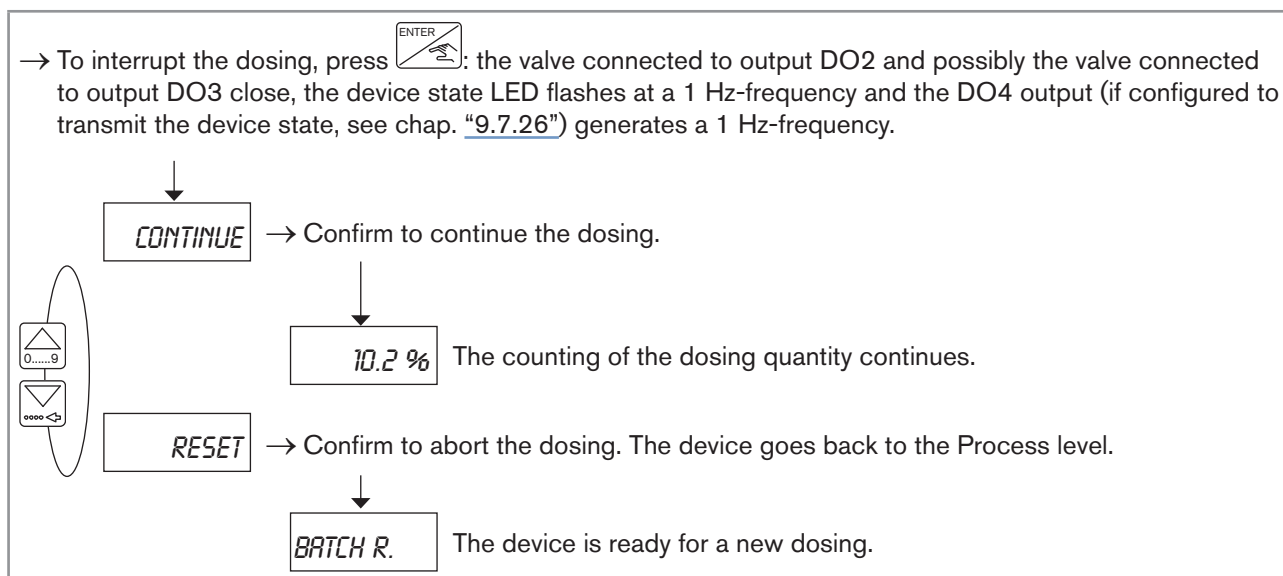




Figure 53: Interrupting the dosing, in dosing mode "LOC. REP."

9.7 Details of the Parameters menu

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

This menu comprises the following configurable parameters:

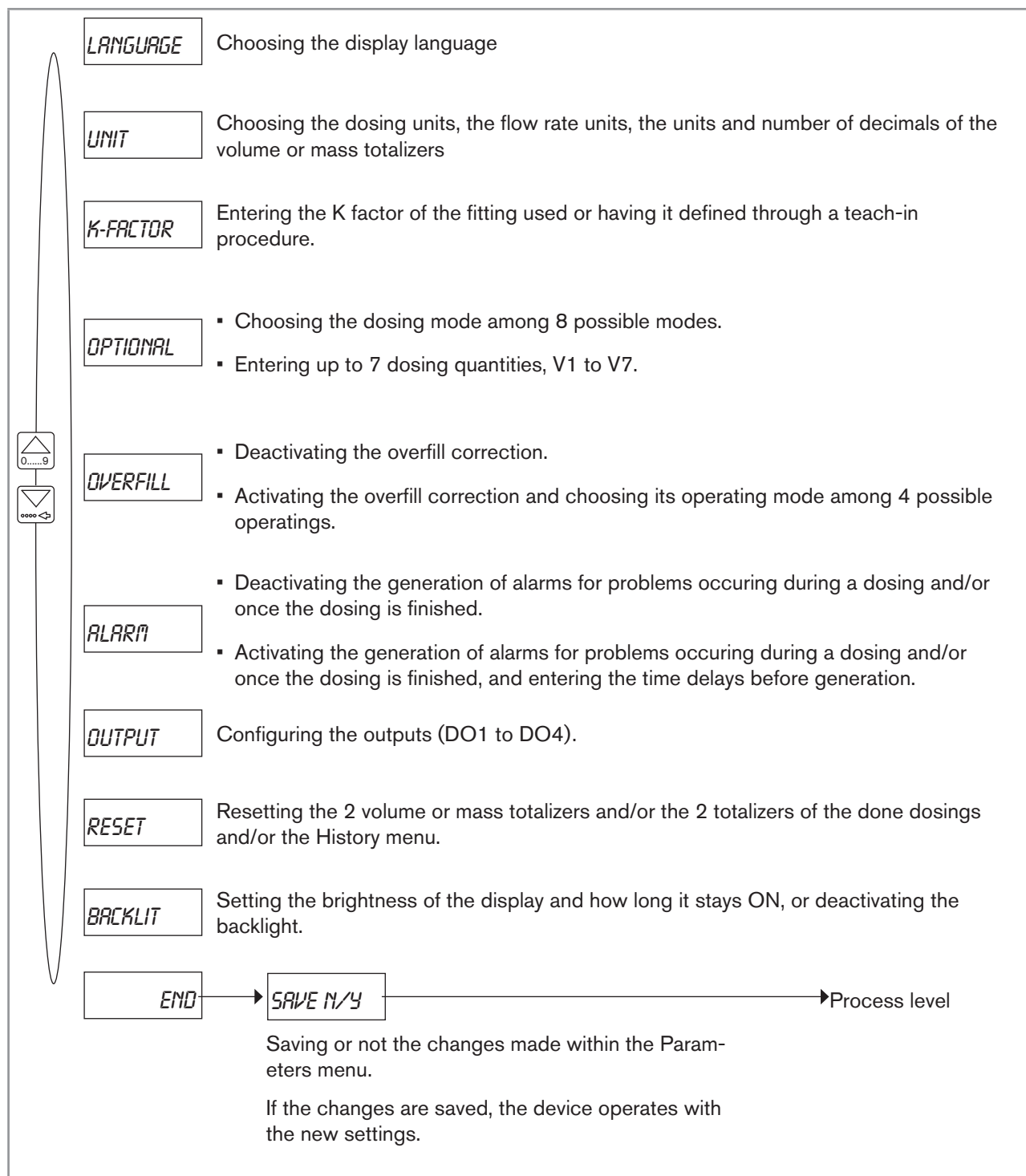


Figure 54: Diagram of the Parameters menu

9.7.1 Choosing the display language

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

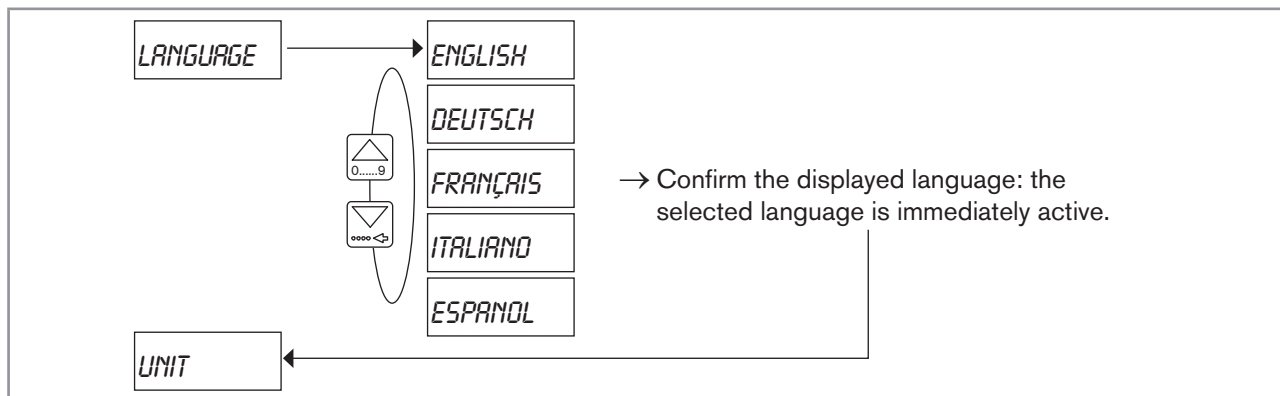



Figure 55: Diagram of the "LANGUAGE" parameter of the Parameters menu

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

9.7.2 Choosing the dosing units, the flow rate units, the units and number of decimals of the volume or mass totalizers

When the units of the dosing quantities are changed:

- Reset both totalizers.
- Manually convert the volume or mass values in the different settings.



If, furthermore, the unit changes from "metric" to "gallon" and vice versa, convert the K factor using following formulae:

- K factor in pulse/US Gallon = K factor in pulse/l x 3,785
- K factor in pulse/IMP Gallon = K factor in pulse/l x 4,546



If the dosing units chosen is a mass unit, convert the K factor depending on the density of the fluid to measure.



The number of decimals of a dosing quantity is chosen when entering the quantity.

The "UNIT" parameter allows for choosing:

- the volume or mass units of the dosing quantities.
- the flow rate units (only used to display the flow measured during a dosing).
- the units of the volume totalizers if the dosing units previously chosen is in litres, millilitres or cubic-meters.
- a number of decimals (choice 0, 1 or 2) to display the volume or mass totalizers in the Process level.

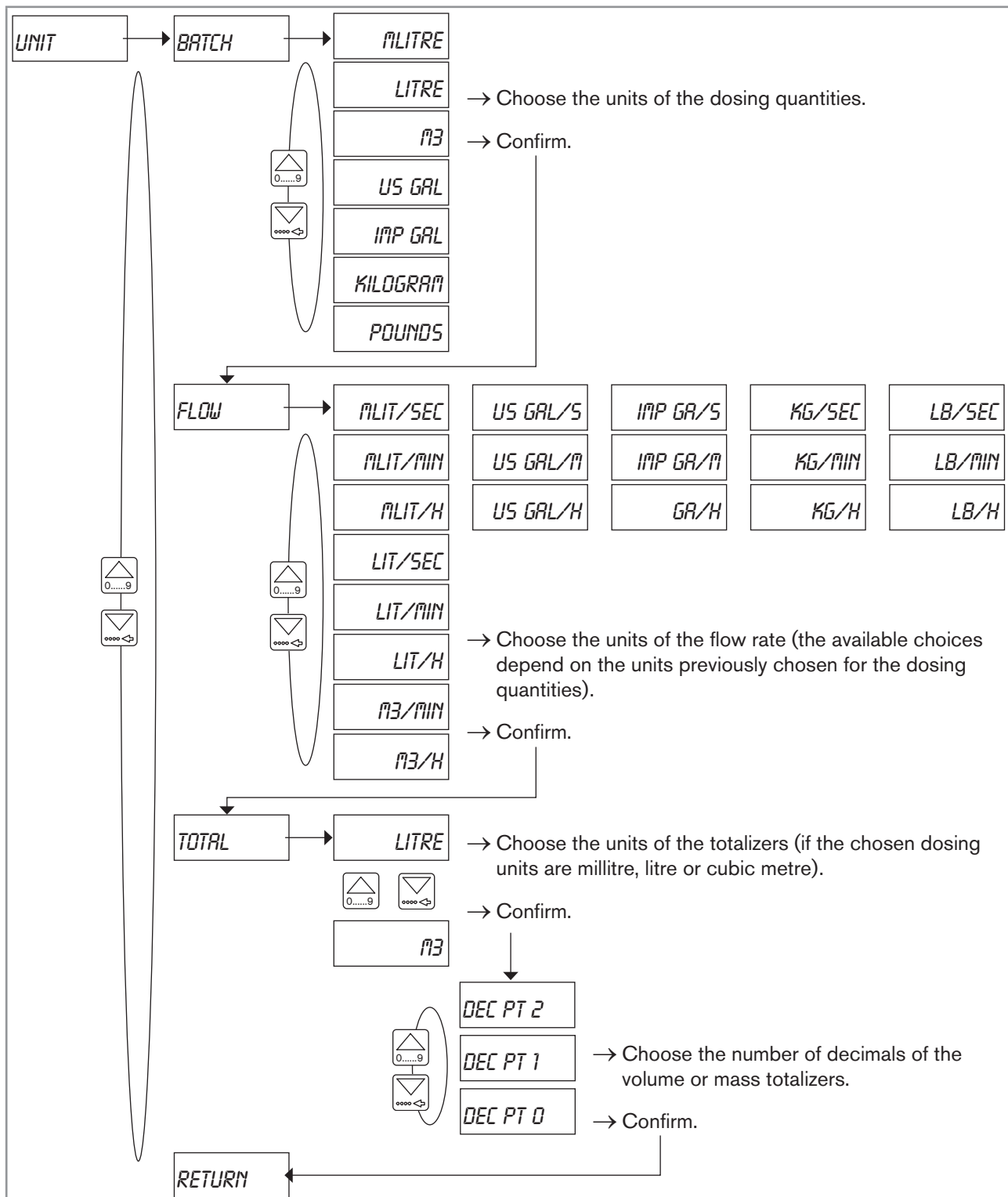



Figure 56: Diagram of the "UNIT" parameter of the Parameters menu

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

9.7.3 Entering the K factor of the fitting used

The device determines the quantity of fluid that flows through 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 chap. "9.7.4".



The device uses the new K factor as soon as "SAVE YES" is confirmed when leaving the Parameters menu.



The K factor of the fitting used can be found within the operating instructions of the fitting.

The operating instructions of the Bürkert fittings can be found on the CD delivered with the device or on the internet at www.burkert.com.

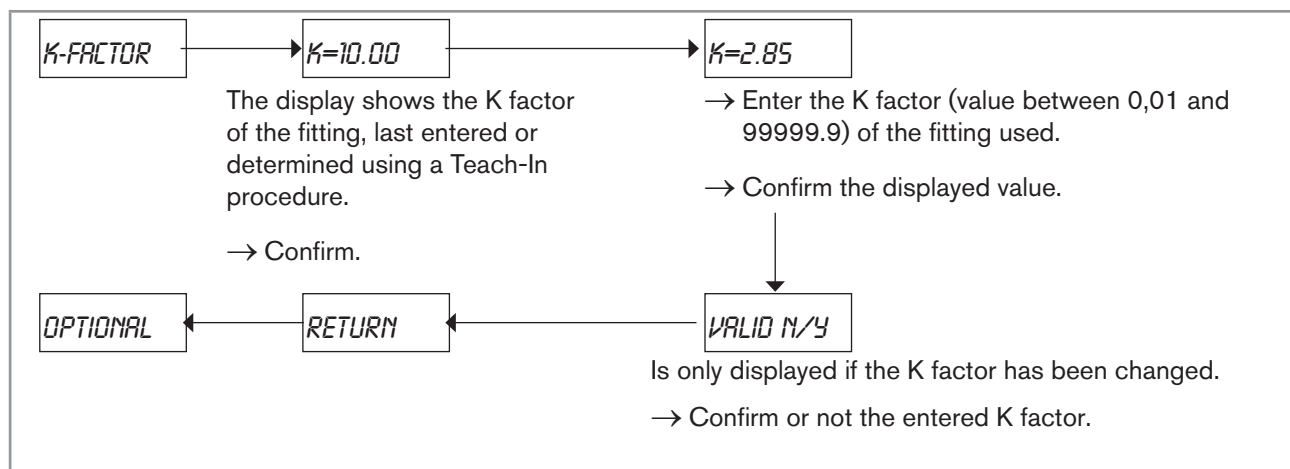


Figure 57: Entering the K factor of the fitting used

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.4 Determining the fitting K factor using a teach-in procedure

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

The "TEACH V." or "TEACH F." parameter allows the device to determine the fitting K factor using a Teach-In procedure. The K factor may also be directly entered: see chap. "9.7.3".

The teach-in can be done either depending on a known volume ("TEACH V.") or depending on the flow rate ("TEACH F.") in the pipe, measured by a reference instrument.

Determining the fitting K factor using a teach-in procedure depending on a volume ("TEACH V.")



- Before starting the Teach-In procedure, connect a valve to the relay output DO2.
- The device uses the new K factor as soon as "SAVE YES" is confirmed when leaving the Parameters menu.

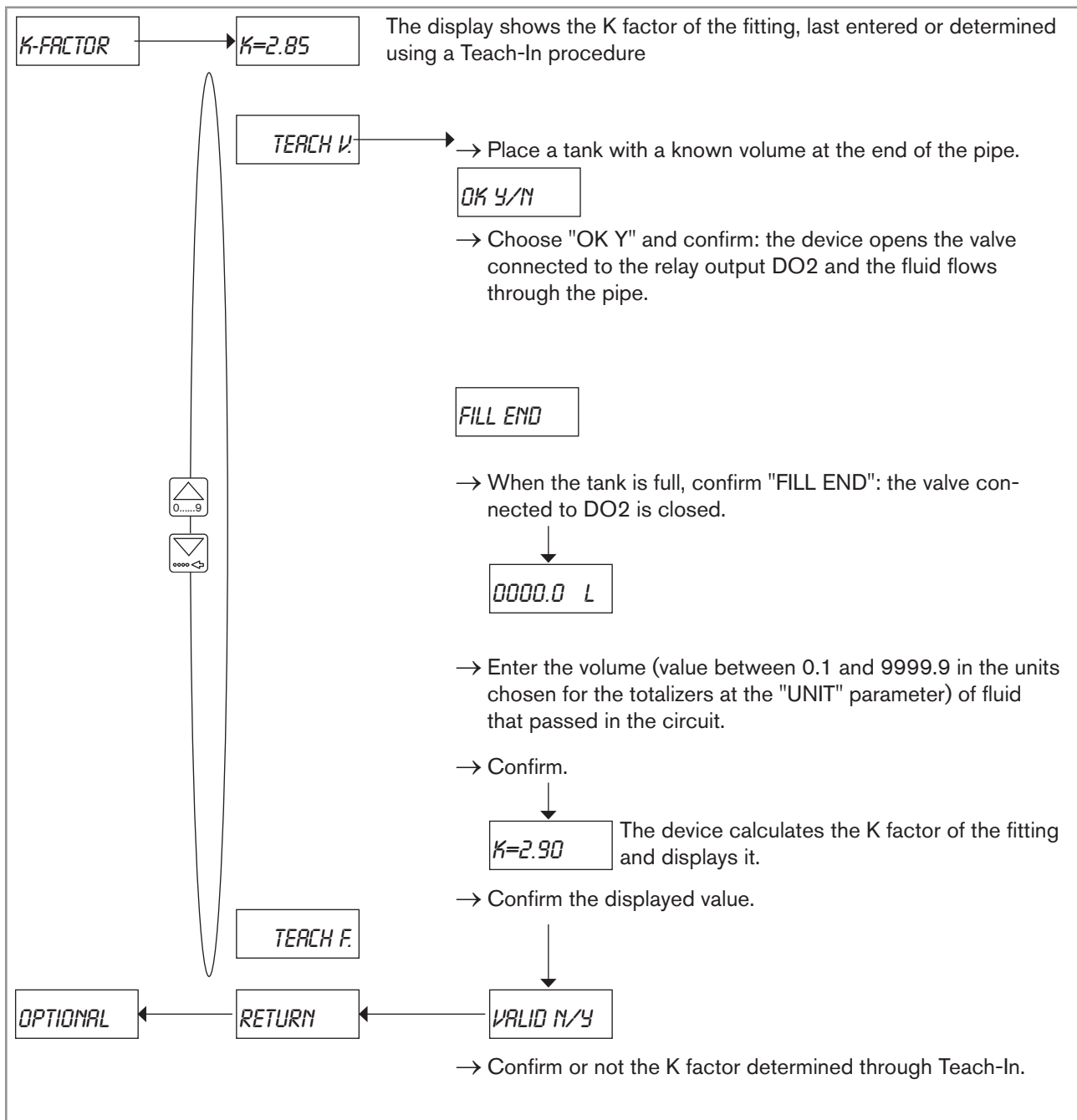



Figure 58: Teach-in procedure depending on a volume

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

Determining the fitting K factor using a teach-in procedure depending on a flow rate ("TEACH F.")



The device uses the new K factor as soon as "SAVE YES" is confirmed when leaving the Parameters menu.

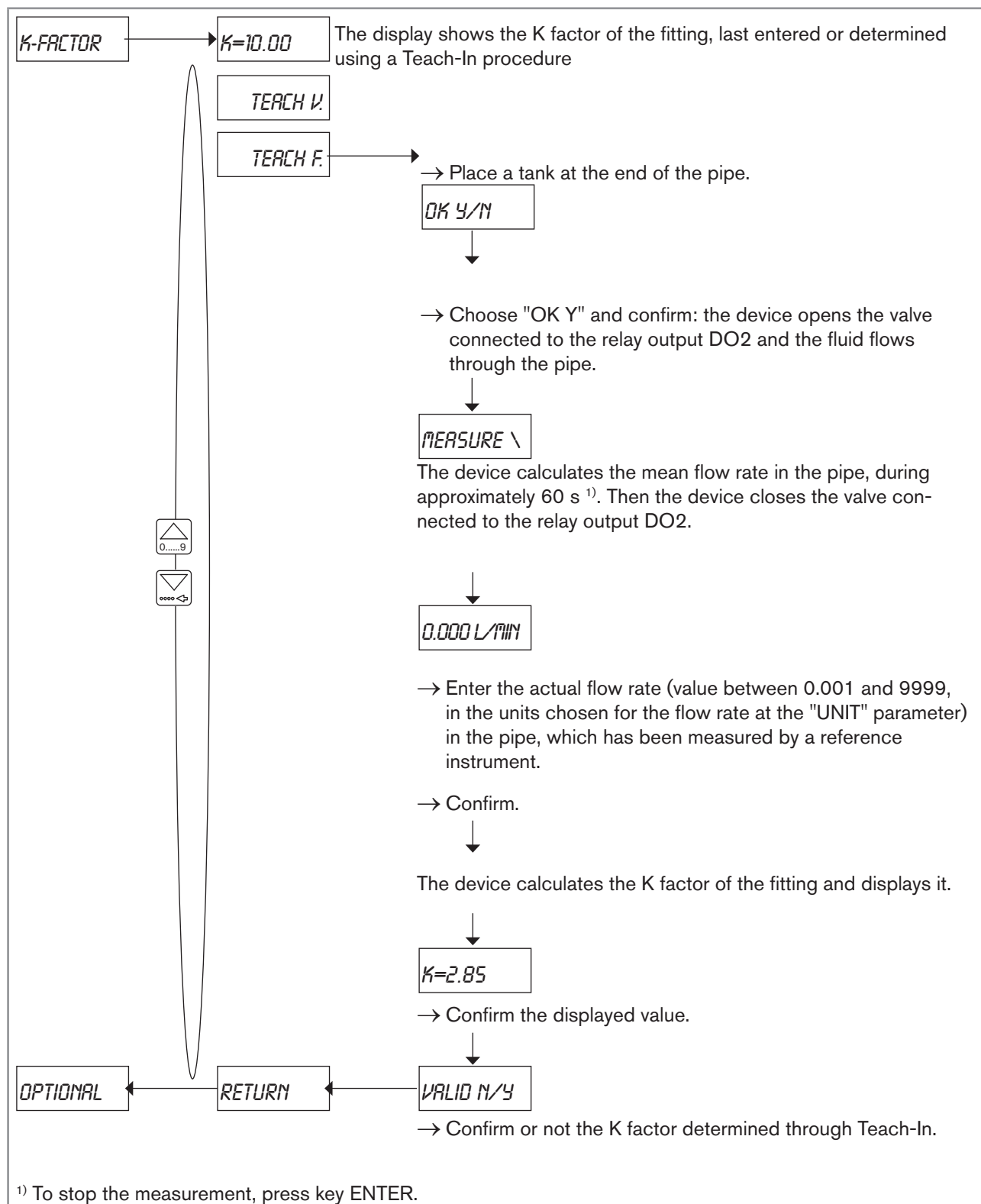



Figure 59: Teach-in procedure depending on the flow rate

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

9.7.5 Configuring the dosing mode (general diagram)

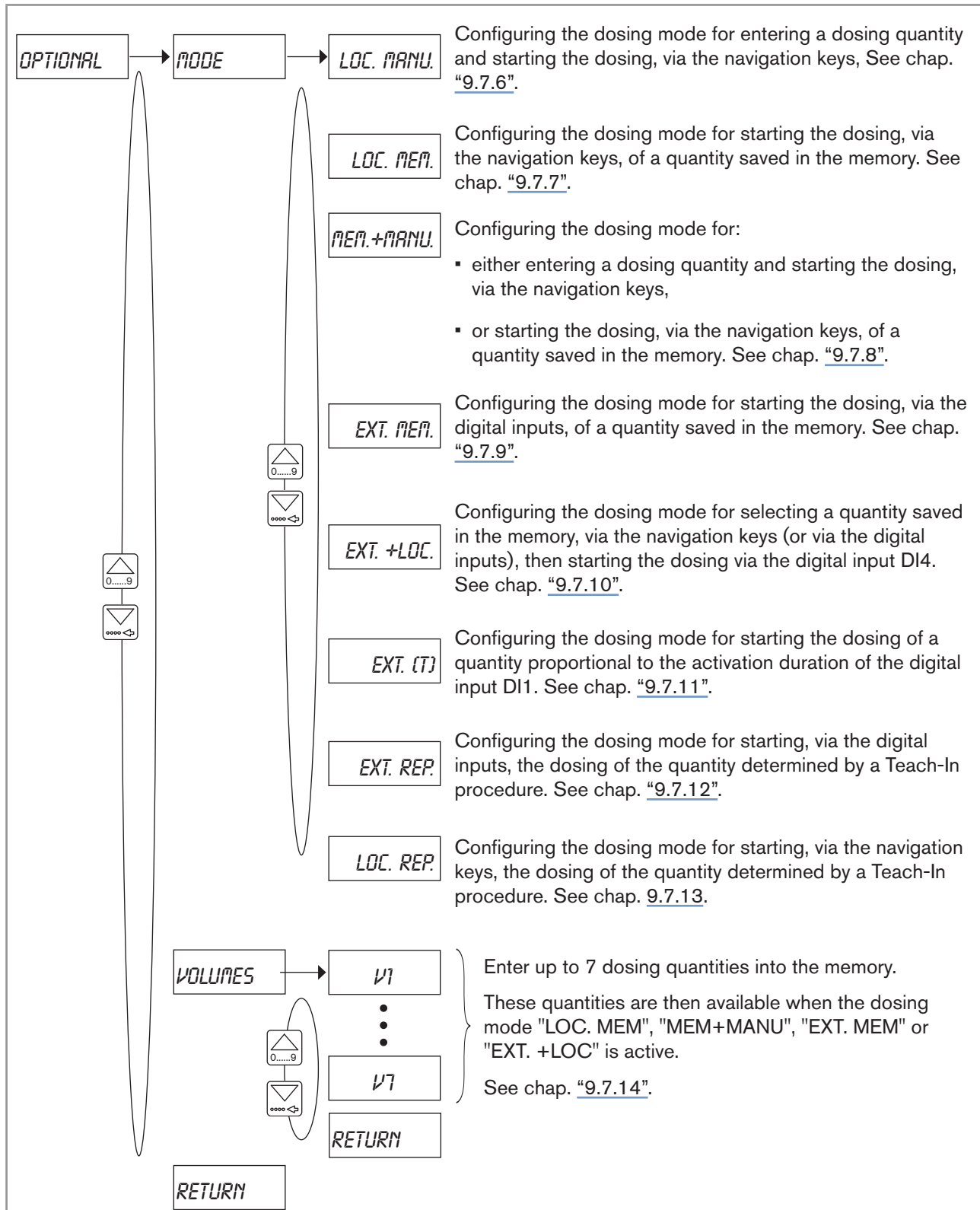


Figure 60: Diagram of the "OPTIONAL" parameter of the Parameters menu

9.7.6 Configuring the dosing mode "LOC. MANU."

This dosing mode allows for entering a dosing quantity and starting the dosing, via the navigation keys.

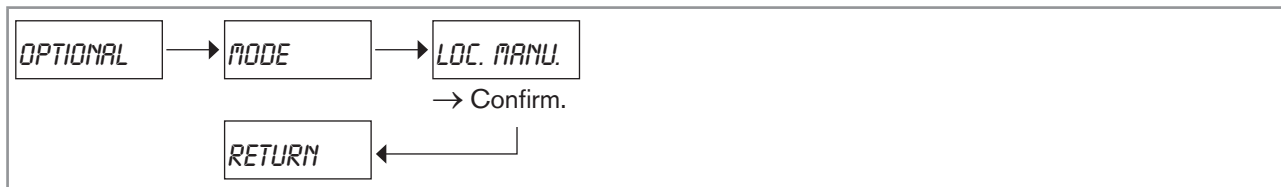



Figure 61: Configuring the dosing mode "LOC. MANU."

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

9.7.7 Configuring the dosing mode "LOC. MEM."

This dosing mode allows for starting the dosing, via the navigation keys, of a quantity saved in the memory.

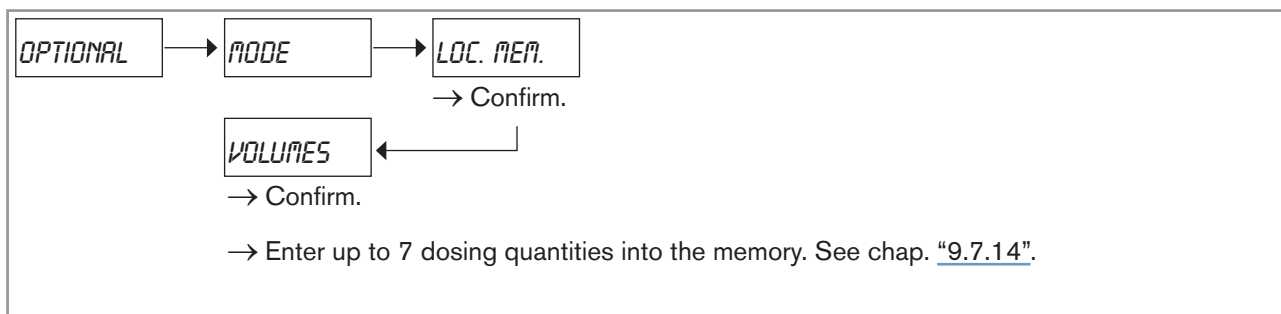



Figure 62: Configuring the dosing mode "LOC. MEM."

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

9.7.8 Configuring the dosing mode "MEM+MANU"

This dosing mode allows for:

- either entering a dosing quantity and starting the dosing, via the navigation keys,
- or starting the dosing, via the navigation keys, of a quantity saved in the memory.

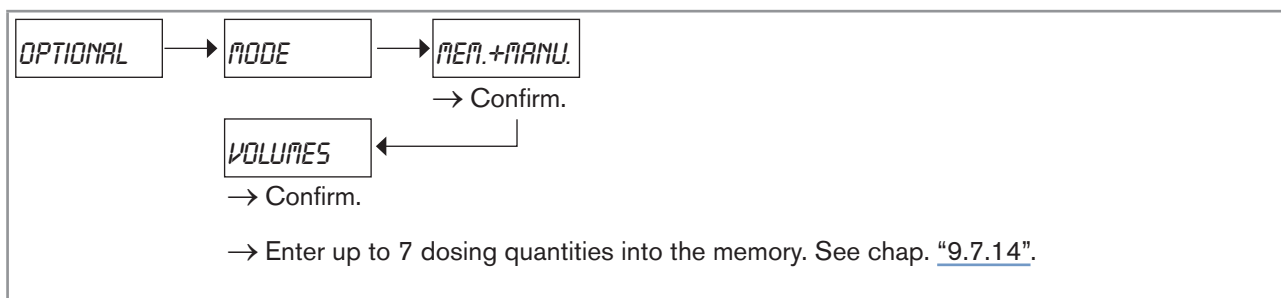



Figure 63: Configuring the dosing mode "MEM+MANU"

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

9.7.9 Configuring the dosing mode "EXT. MEM."

This dosing mode allows for starting the dosing, via the digital inputs, of a quantity saved in the memory.

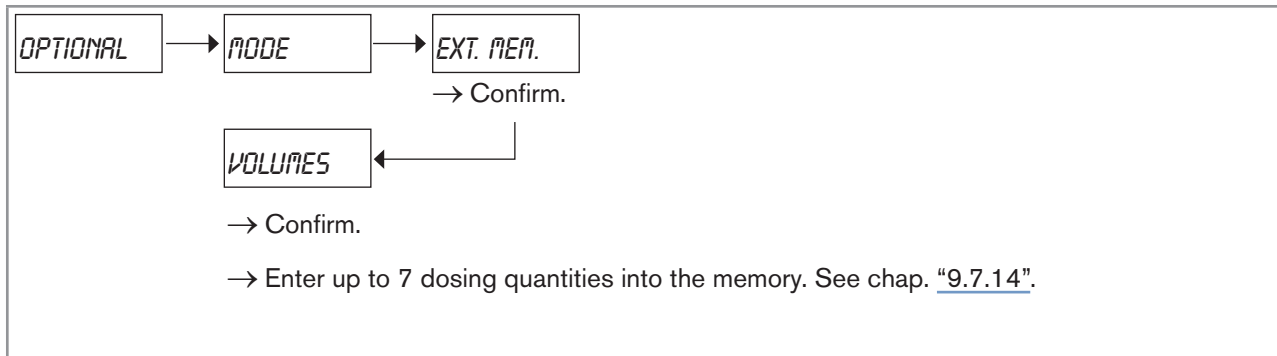



Figure 64: Configuring the dosing mode "EXT. MEM."

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

9.7.10 Configuring the dosing mode "EXT. +LOC"

This dosing mode allows for selecting a quantity saved in the memory, via the navigation keys (or via the digital inputs), then starting the dosing via the digital input DI4.

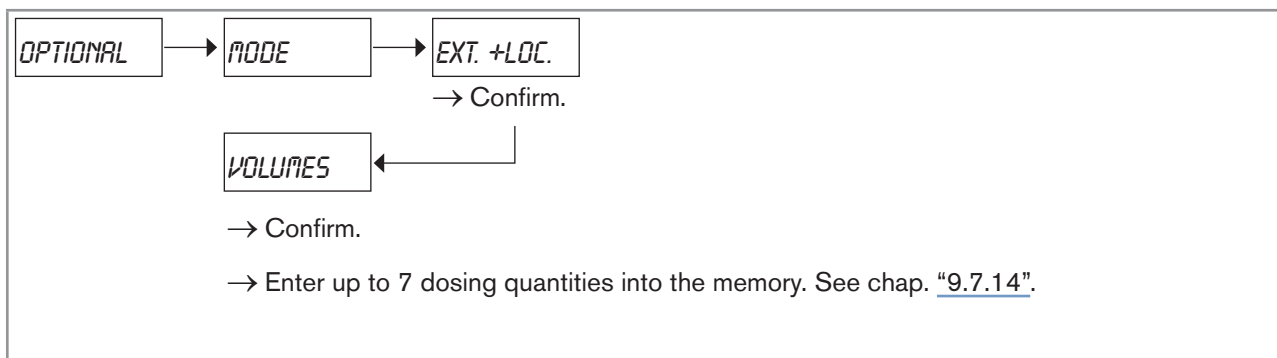



Figure 65: Configuring the dosing mode "EXT. +LOC."

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

9.7.11 Configuring the dosing mode "EXT. [T]"



- In this mode, the dosing starts as soon as the digital input DI1 is switched.
- If the conditions for calculating A and B are not respected, an alarm ERROR [T] will be generated and the device will abort the current dosing.

This dosing mode allows for starting the dosing of a quantity proportional to the activation duration of the digital input DI1, according to the formula:

$$X = A \cdot T + B$$

- where A is the proportionality factor in dosing units per second,
- B is the offset in dosing units,
- X is the dosing quantity, in dosing units,
- and T is the activation duration of the digital input DI1, in seconds with a resolution of 5 ms.

→ Calculate constants A and B (see example in "Table 11") in order:

- the activation duration "T" is within a time interval related to the process,
- the activation duration "T" is lower than the real filling duration, taking into account the flow rate in the pipe,
- $(A \cdot T + B)$ is always lower than 100 000 dosing units,
- $(A \cdot T + B)$ is higher than or equal to 6 divided by the set K factor (in pulse/litre),
- the minimum activation duration (100 ms) is observed,
- the maximum activation duration (300 s) is observed,

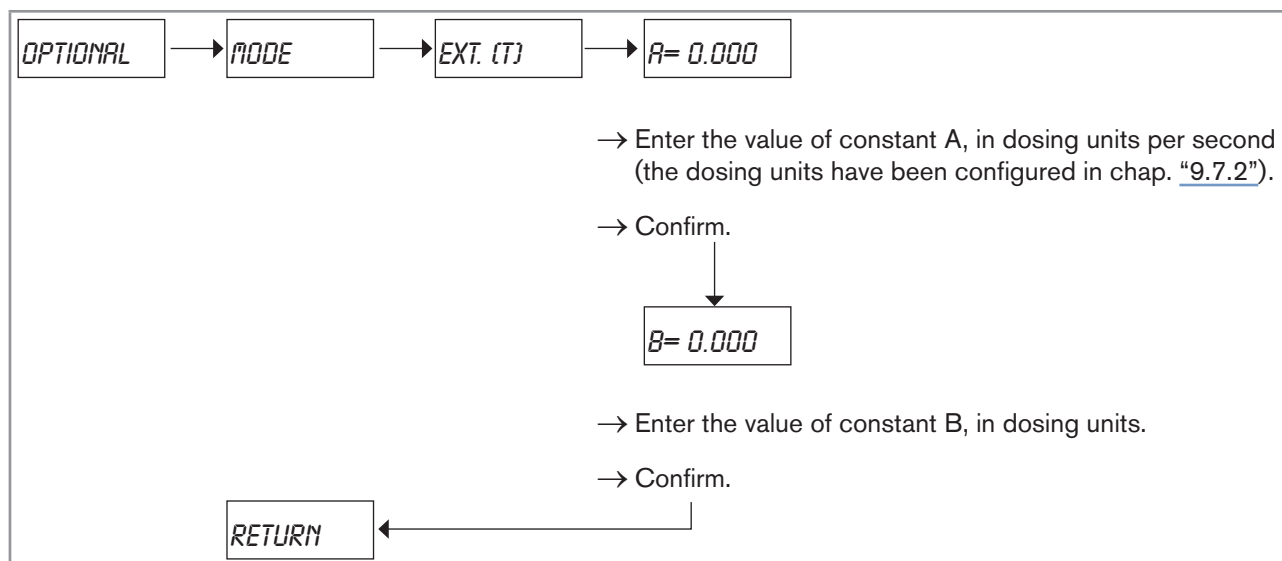


Figure 66: Configuring the dosing mode "EXT. [T]"

Table 11: Calculation example of constants A and B

Dosing quantities	Required activation durations "T"	Value of constant A	Value of constant B
110 litres	2 seconds	5 l/s	100 litres
120 litres	4 seconds		
130 litres	6 seconds		
150 litres	10 seconds		

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.12 Configuring the dosing mode "EXT. REP"

The dosing mode allows for starting, via the digital inputs, the dosing of the quantity determined by a Teach-In procedure.

Teach-In of the dosing quantity can be done either via the digital inputs or using the navigation keys.

With the Teach-In, the device automatically determines:

- the dosing quantity for each dosing made in dosing mode "EXT.REP." or "LOC. REP".
- the overfilling value to be corrected. If the overfill correction function is deactivated before the Teach-In is started, it will be automatically activated with the "DIRECT" option at the end of the Teach-In.
- the ratio of fluid that passes through each valve, if two valves are used.



Before starting the Teach-In procedure:

- Connect the valves to the DO2 and DO3 outputs: see chap. [7.6.12](#).
- Parameter the operating of and the time delay before the valve connected to the DO2 output is opened: see chap. [9.7.24](#).
- If two valves are used, configure output DO3 with the function "valve" and parameter the operating of the valve connected to the DO3 output: see chap. [9.7.25](#).



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. [9.7.16](#)), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. [10.3.4](#) to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. [9.7.17](#)), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. [10.3.4](#) to solve the problem.
- Do not anticipate the quantity of liquid that flows after the valves have been closed. Their closing must be controlled once the exact dosing quantity has been reached. The liquid surplus is measured and will be corrected in the next dosings.

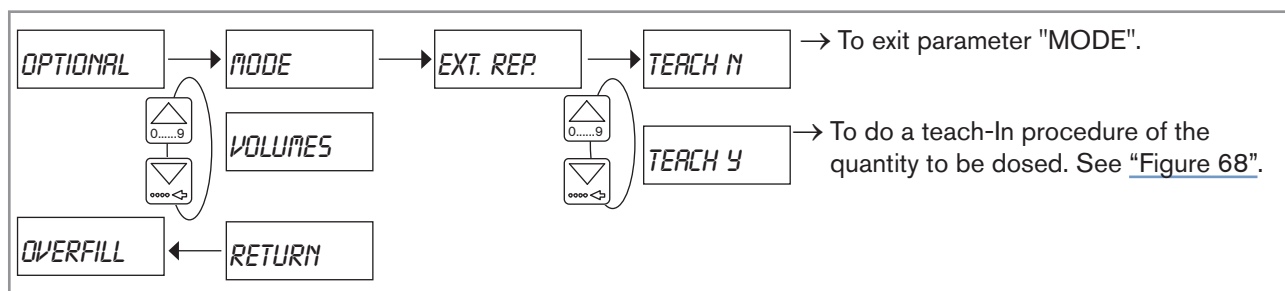


Figure 67: Configuring the dosing mode "EXT. REP."

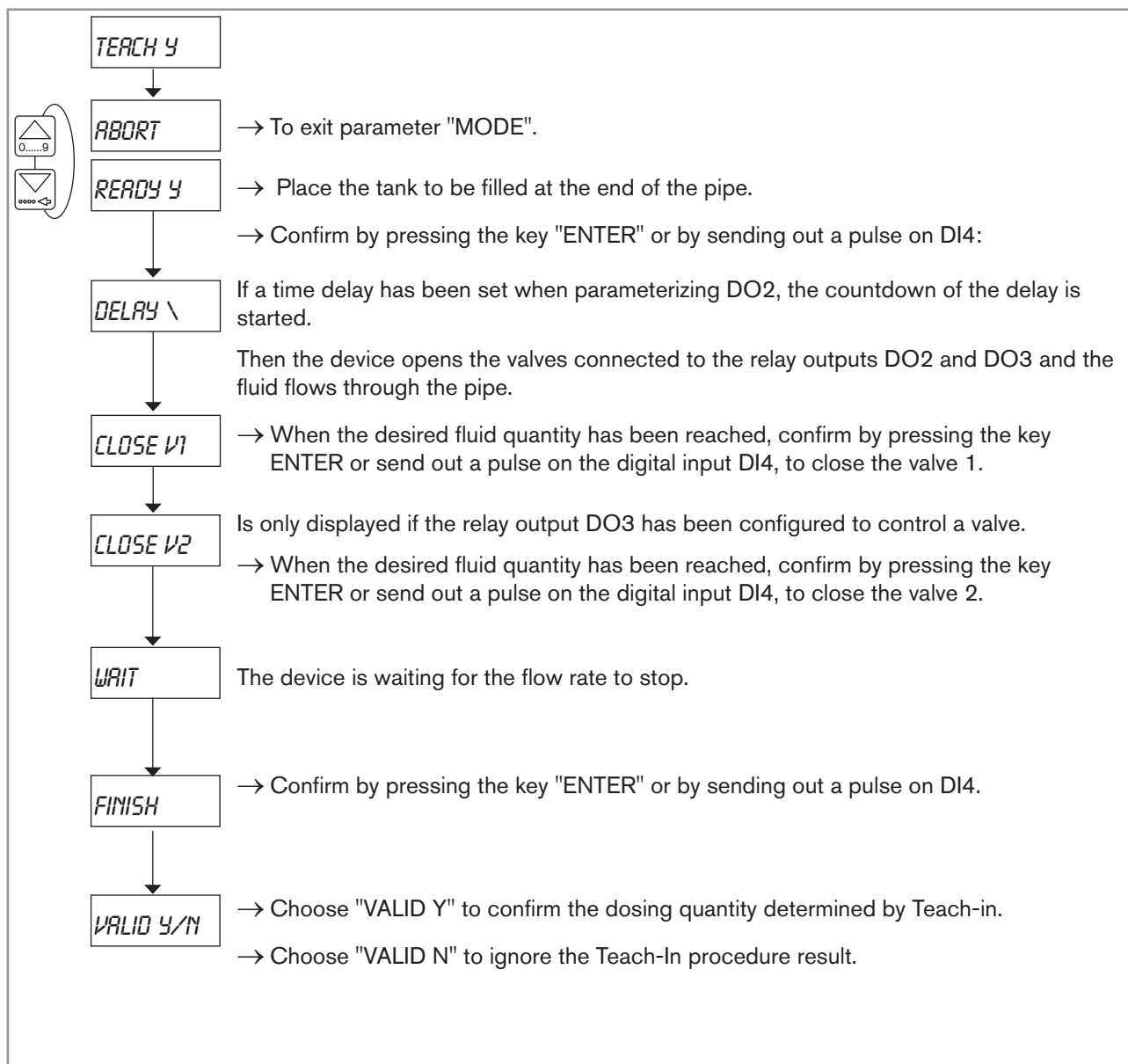


Figure 68: Determination of the dosing quantity using a Teach-In procedure

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.13 Configuring the dosing mode "LOC. REP."

The dosing mode allows for starting, via the navigation keys, the dosing of the quantity determined by a Teach-In procedure.

Teach-In of the dosing quantity can be done either via the digital inputs or using the navigation keys.

With the Teach-In, the device automatically determines:

- the dosing quantity for each dosing made in dosing mode "EXT.REP." or "LOC. REP".
- the overfilling value to be corrected. If the overfill correction function is deactivated before the Teach-In is started, it will be automatically activated with the "DIRECT" option at the end of the Teach-In.
- the ratio of fluid that passes through each valve, if two valves are used.



Before starting the Teach-In procedure:

- Connect the valves to the DO2 and DO3 outputs: see chap. [7.6.12](#).
- Parameter the operating of and the time delay before the valve connected to the DO2 output is opened: see chap. [9.7.24](#).
- If two valves are used, configure output DO3 with the function "valve" and parameter the operating of the valve connected to the DO3 output: see chap. [9.7.25](#).



- If the generation of alarms (alarm "DURING") for problems occurring during a dosing has been activated (see chap. [9.7.16](#)), an alarm is generated if there is no flow rate measured in the pipe whereas the valves are open. See chap. [10.3.4](#) to solve the problem.
- If the generation of alarms (alarm "AFTER") for problems occurring at the end of the dosing has been activated (see chap. [9.7.17](#)), an alarm is generated if there is still flow in the pipe whereas the valves are closed. See chap. [10.3.4](#) to solve the problem.
- Do not anticipate the quantity of liquid that flows after the valves have been closed. Their closing must be controlled once the exact dosing quantity has been reached. The liquid surplus is measured and will be corrected in the next dosings.

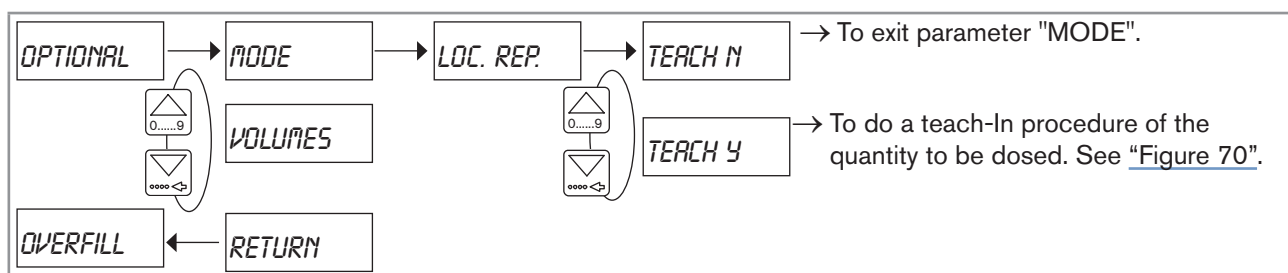


Figure 69: Configuring the dosing mode "LOC. REP."

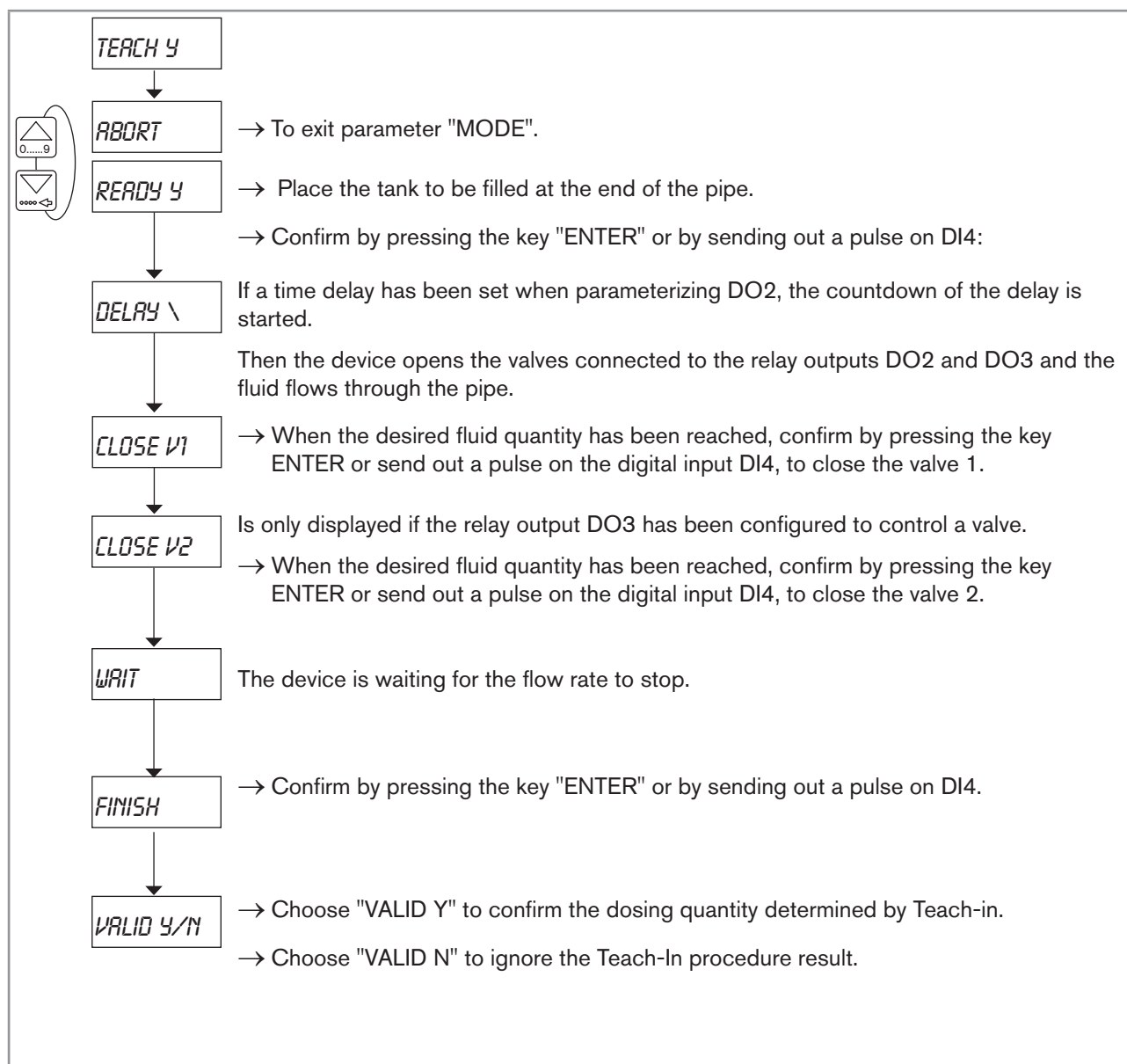


Figure 70: Determination of the dosing quantity using a Teach-In procedure

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.14 Entering the dosing quantities in the device memory

The parameter "VOLUMES" of the sub-menu "OPTIONAL" allows for entering up to 7 dosing quantities in the device memory.

These quantities are then available when the dosing modes "LOC. MEM", "MEM+MANU", "EXT. MEM" or "EXT. +LOC" is active.

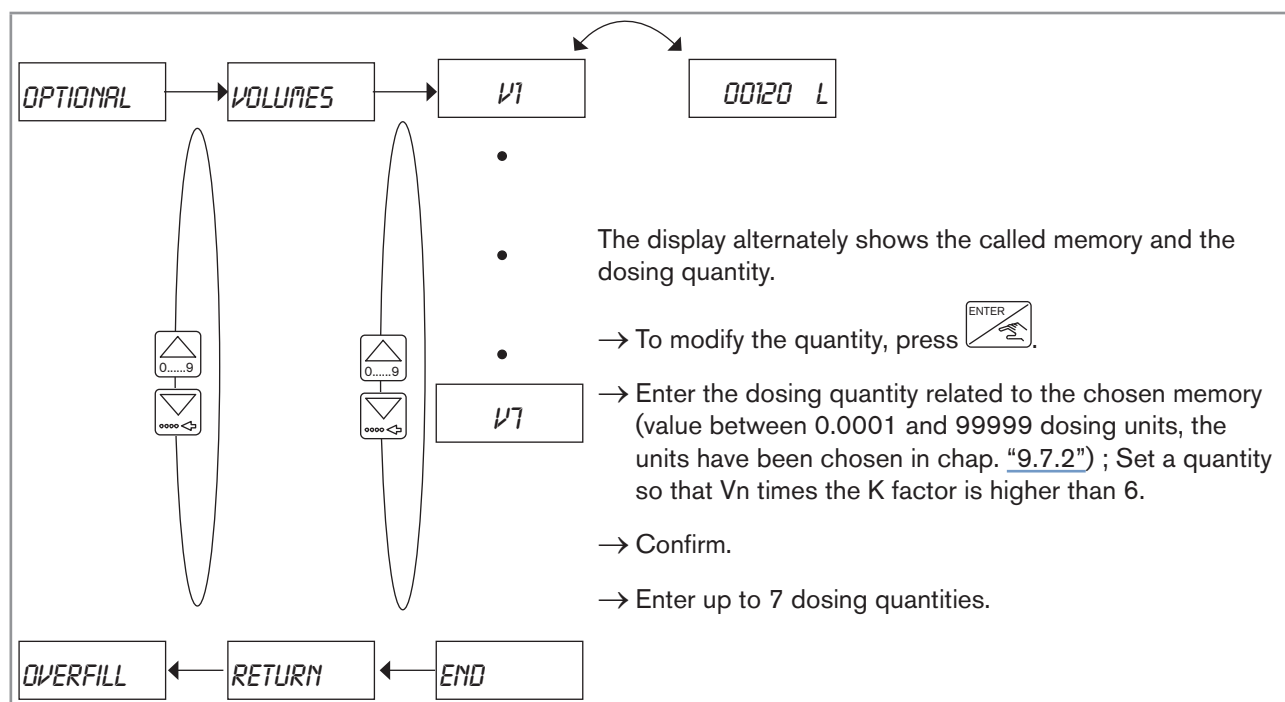


Figure 71: Configuring the dosing quantities

9.7.15 Configuring the overfill correction or deactivating it

When a dosing is finished, the device controls the closing of the main valve (or of the auxiliary valve).

The overfilling is the quantity of liquid that has been counted by the device once the valve is closed.

When the overfill correction is active, the overfilling of a dosing is deducted from the next dosing(s).

The overfill correction can be either:

- direct: the overfilling is deducted from the next dosing.
- or smoothed: the device smoothes (with a "low", "medium" or "high" effect) the overfillings of the last x dosings and deducts the calculated value from the next dosing.

Tolerance of the overfilling:

A tolerance for the overfilling value can be furthermore entered: if the overfilling of a dosing exceeds the tolerance, that overfilling value will not be taken into account in the next smoothing calculations and the warning message "W. OVER." is generated by the device. See chap. "10.3.3" to solve the problem.

To avoid a false dosing after a modification in the process, reset the table of the overfill correction values before restarting the process. See "Figure 72".

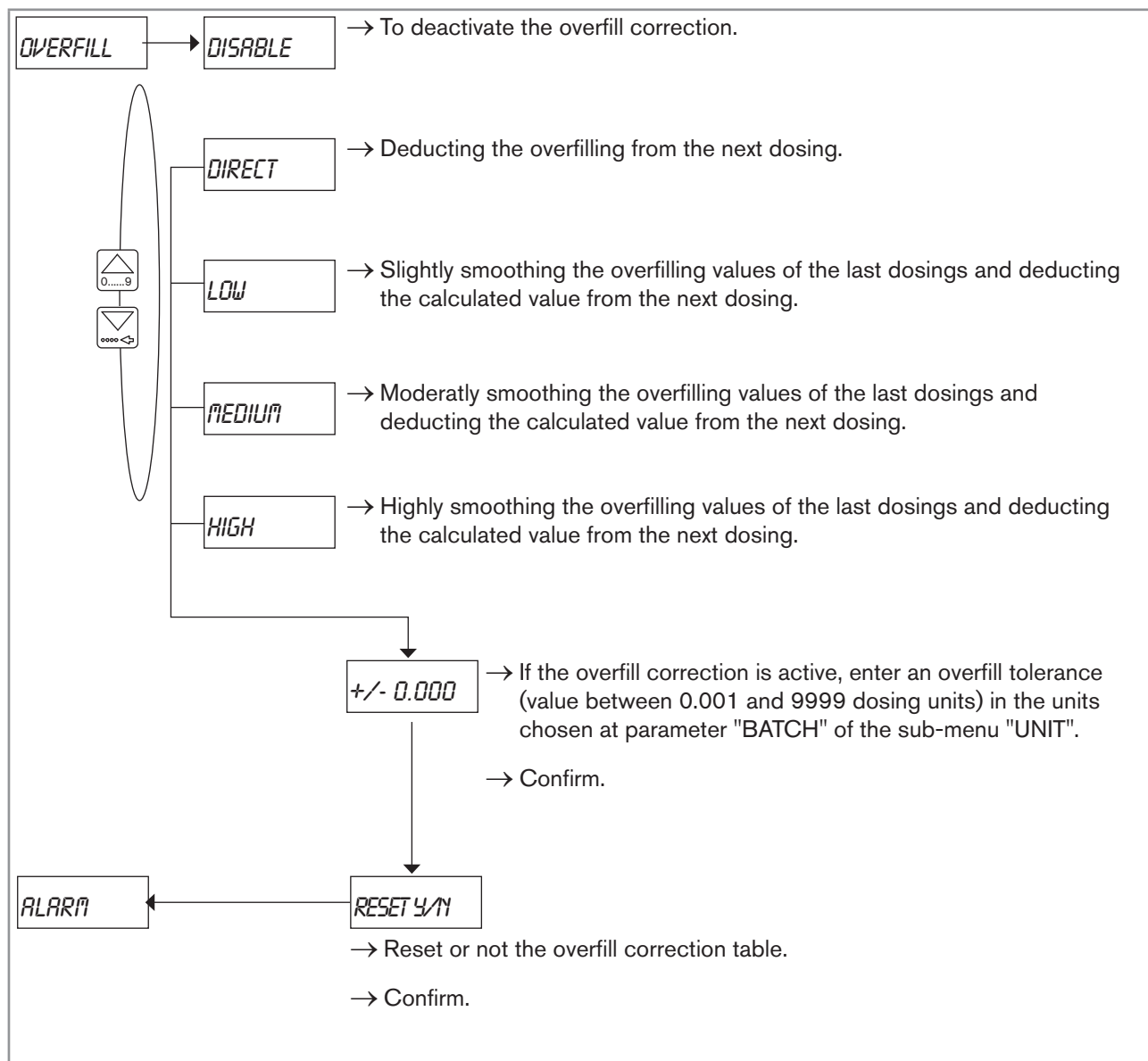



Figure 72: Configuring the overfill correction

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

9.7.16 Activating / deactivating the generation of alarms for problems occurring during a dosing

The following problems can occur during a dosing:

- no flow in the pipe whereas the valves are open.
- a flow is measured in the pipe whereas the valves are closed.

These problems can be signalled by the generation of an alarm.

When an alarm is generated, the device stops the process:

- the valves connected to the relay outputs DO2 and DO3 are closed,
- the device state LED becomes orange and flashes fast,
- a 3,5 Hz-frequency is generated on the transistor output DO4 if it is configured to transmit the state of the device (see chap. "9.7.26"),
- the outputs configured with the function "ALARM" are switched (see chap. 9.7.19),
- the message "ALARM" is displayed.

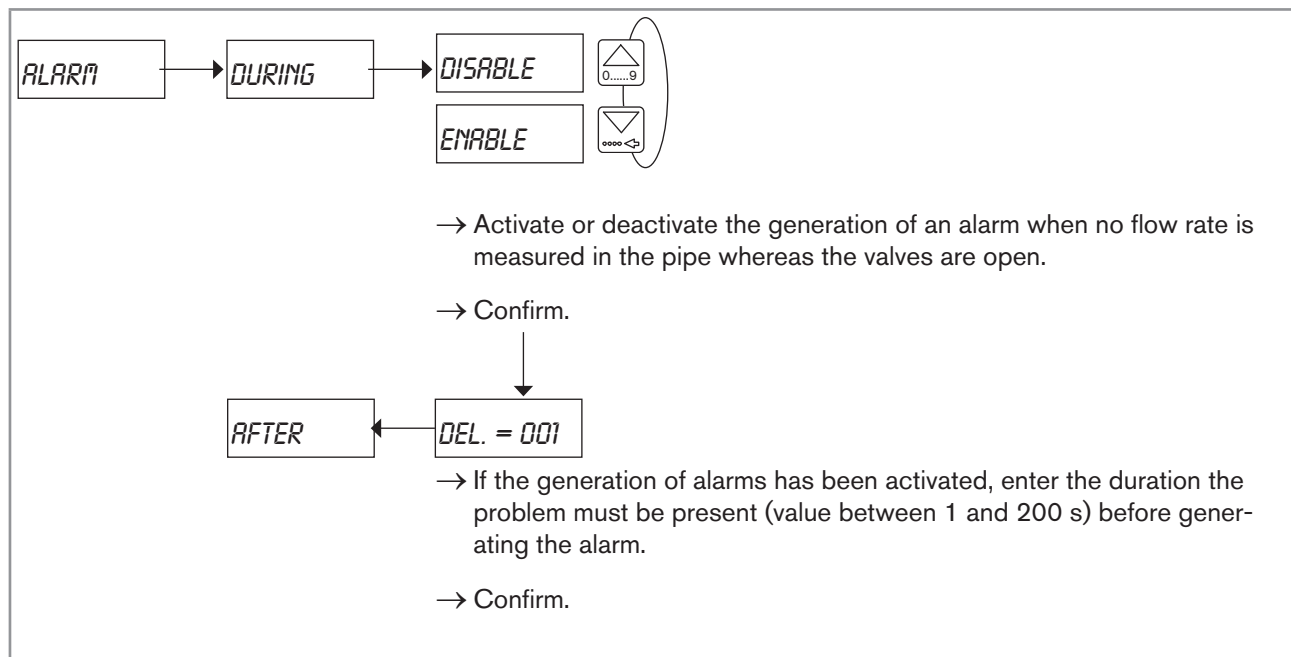


Figure 73: Activating / deactivating the generation of alarms for problems occurring during a dosing

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.17 Activating / deactivating the generation of alarms for problems occurring at the end of a dosing

When the following 3 criteria are fulfilled the dosing is finished:

- no flow rate measured in the pipe,
- the valves are closed,
- and the quantity has entirely been dosed.

If a flow rate is measured in the pipe whereas the valves should be closed (once the dosing is finished or when a dosing has been interrupted), an alarm can be generated.

When an alarm is generated, the device stops the process:

- the valves connected to the relay outputs DO2 and DO3 are closed,
- the device state LED becomes orange and flashes fast,
- a 3,5 Hz-frequency is generated on the transistor output DO4 if it is configured to transmit the state of the device (see chap. "9.7.26"),
- the outputs configured with the function "ALARM" are switched (see chap. 9.7.19),
- the message "ALARM" is displayed.

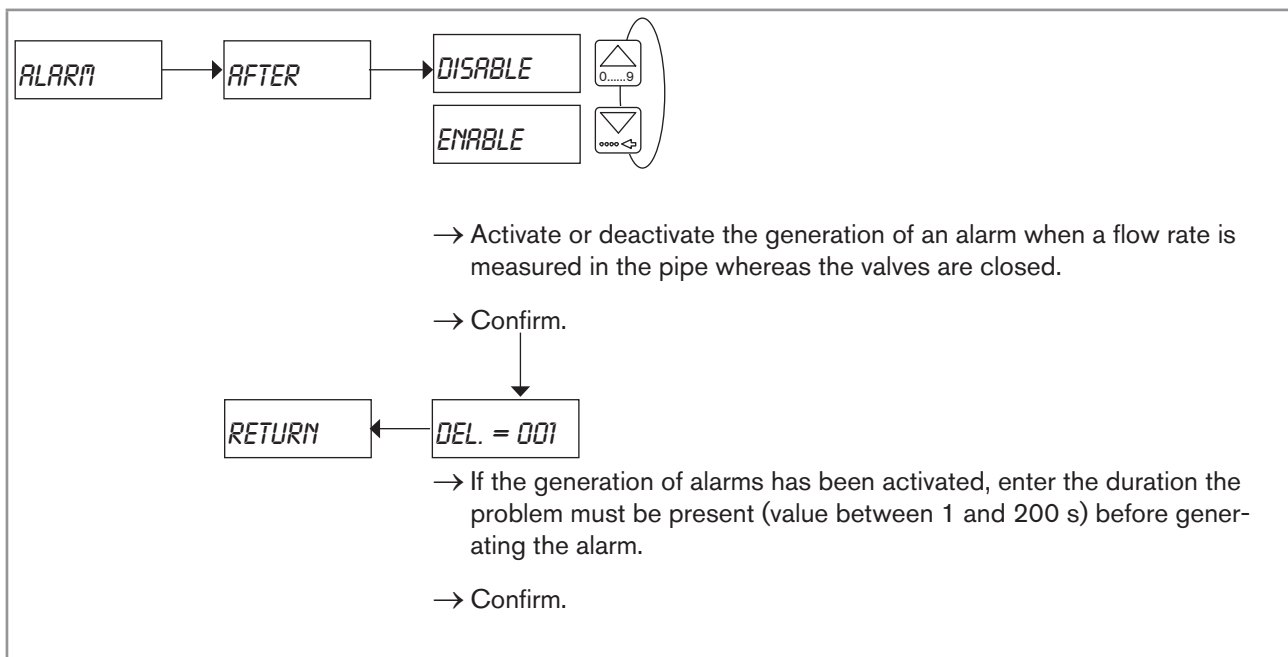



Figure 74: Activating / deactivating the generation of alarms for problems occurring at the end of a dosing

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

9.7.18 Configuring the outputs (general diagram)

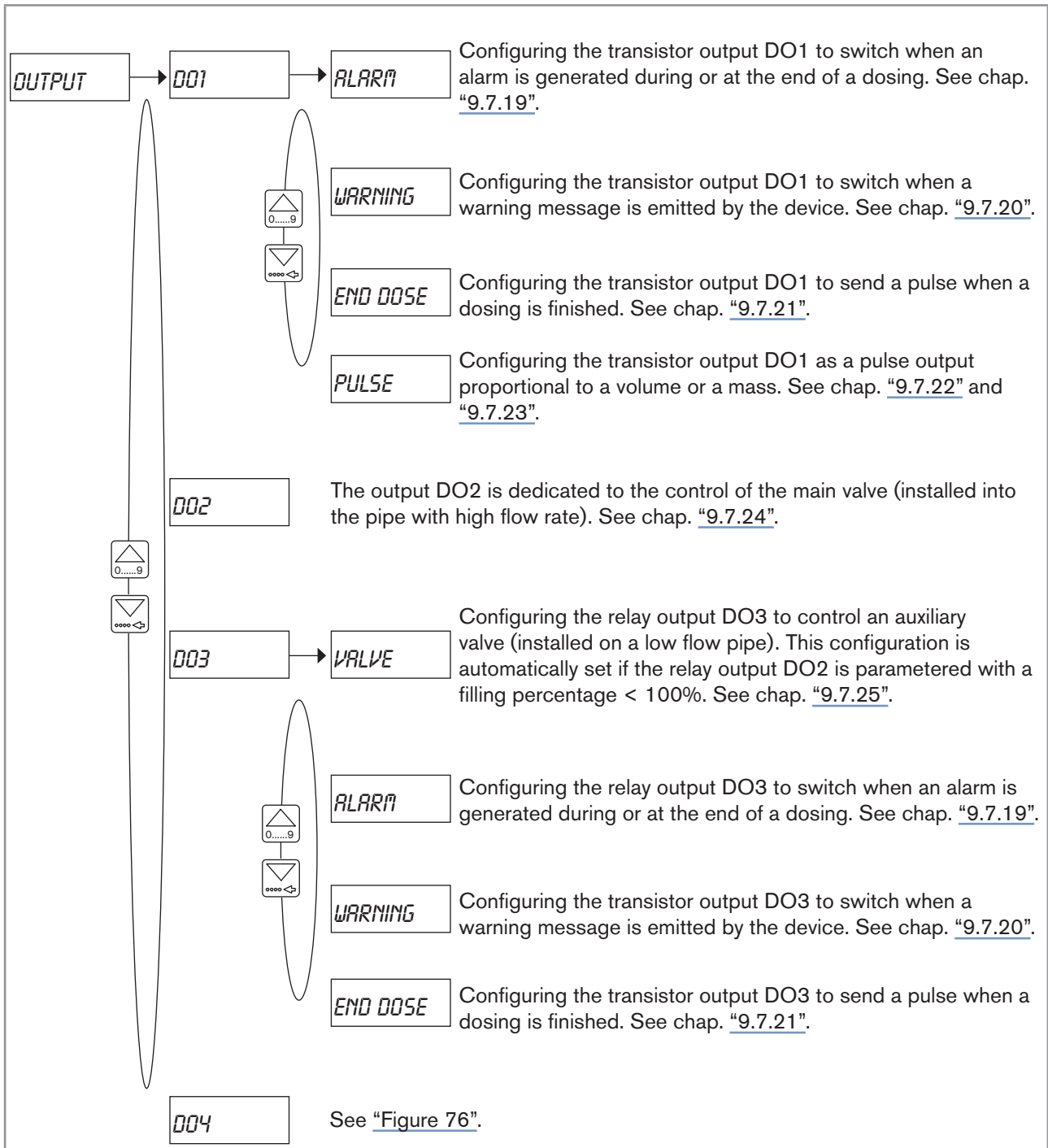


Figure 75: Diagram 1/2 of the "OUTPUT" parameter of the Parameters menu

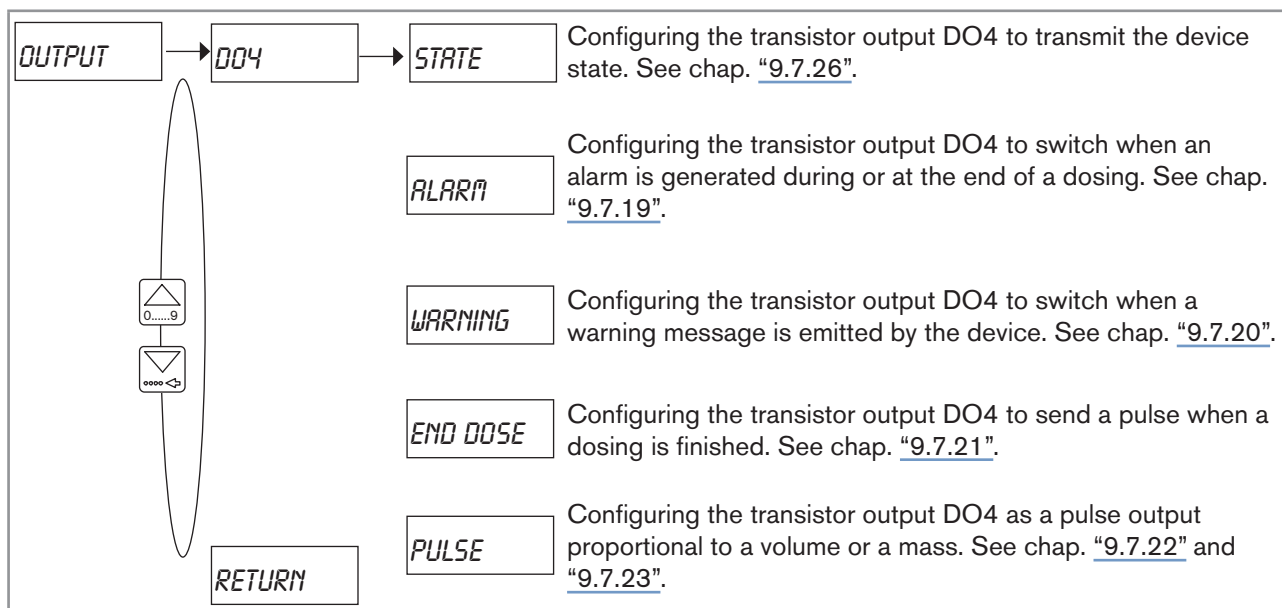


Figure 76: Diagram 2/2 of the "OUTPUT" parameter of the Parameters menu

9.7.19 Configuring the transistor output DO1 or DO4 or the relay output DO3 to switch when an alarm is generated during or at the end of a dosing

An alarm is generated during or at the end of a dosing (can be parametered, see chap. ["9.7.16"](#) et ["9.7.17"](#)).

The generation of an alarm can be signalled by the switching of the output DO1 and/or DO3 and/or DO4.



The relay output DO3 can be configured to switch when an alarm is generated during or at the end of a dosing, if the output is not configured to control an auxiliary valve. See chap. ["9.7.25"](#).

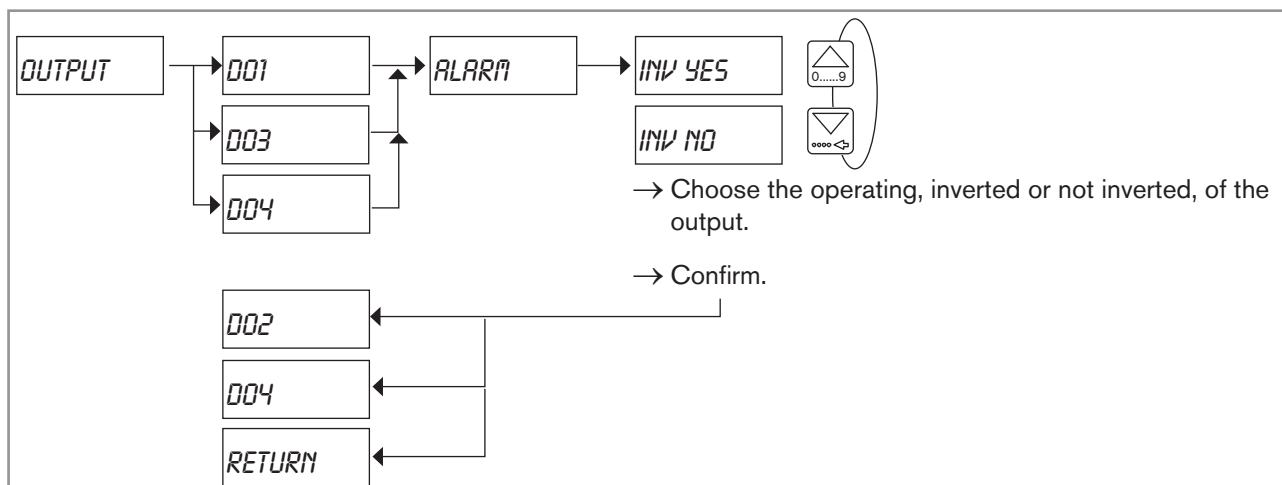


Figure 77: Configuring the output DO1 or DO3 or DO4 to signal the generation of an alarm during or at the end of a dosing

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.20 Configuring the transistor output DO1 or DO4 or the relay output DO3 to switch when a warning message is emitted by the device

When the device generates a warning message, the device state LED is orange.

The generation of a warning message can be indicated by the switching of the output DO1 and/or DO3 and/or DO4.



The relay output DO3 can be configured to switch when a warning message is generated by the device, if the output is not configured to control an auxiliary valve. See chap. "9.7.25".

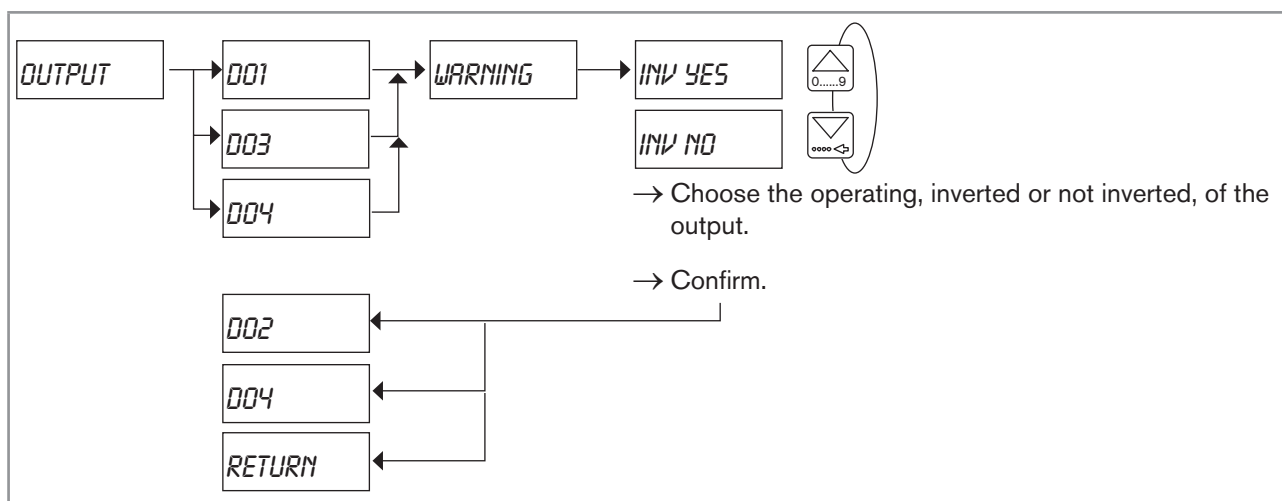



Figure 78: Configuring the output DO1 or DO3 or DO4 to indicate the generation of a warning message

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

9.7.21 Configuring the transistor output DO1 or DO4 or the relay output DO3 to signal the end of the dosing

When the 3 following criteria are fulfilled the dosing is finished:

- the valves are closed (with the exception of a dosing being interrupted),
- no flow rate measured in the pipe,
- and the quantity has entirely been dosed.

The end of a dosing can be signalled by the generation of a 200 ms pulse on the output DO1 and/or DO3 and/or DO4, if the dosing has not been aborted on purpose or interrupted by the generation of an "ERROR [T]" alarm.



The relay output DO3 can be configured to signal the end of the dosing, if the output is not configured to control an auxiliary valve. See chap. "9.7.25".

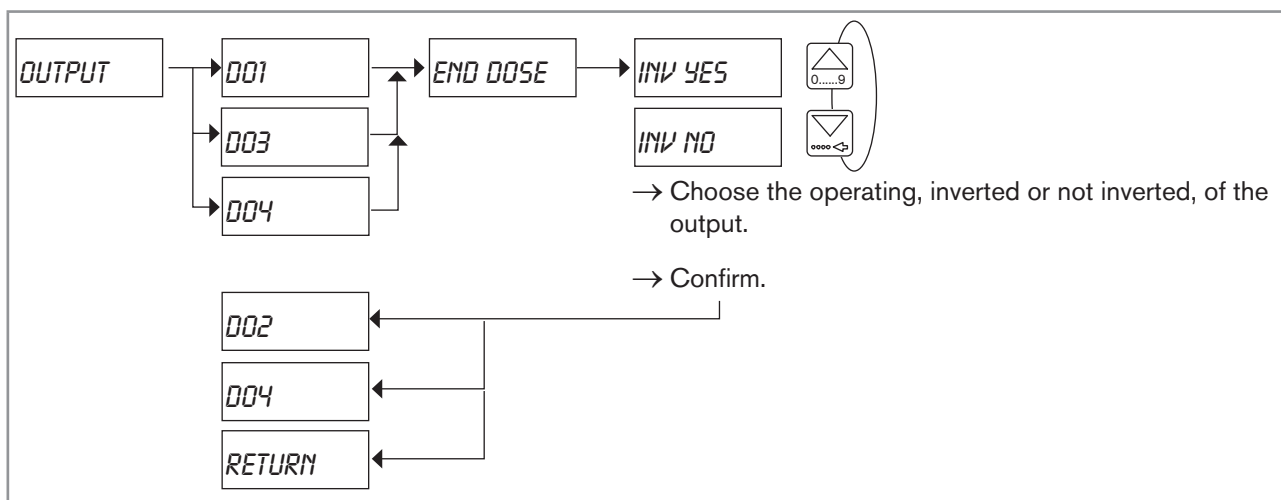



Figure 79: Configuring the output DO1 or DO3 or DO4 to signal the end of the dosing

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

9.7.22 Configuring the transistor output DO1 or DO4 as a pulse output proportional to a volume or a mass

When the DO1 or DO4 transistor output is configured as a pulse output proportional to a volume or a mass, a pulse is transmitted on the output each time the parametered volume or mass of fluid has been measured by the device.



- When the frequency emitted on the pulse output is between 0,6 and 300 Hz, the duty cycle of the signal is between 45% and 60%.
- When the frequency emitted on the pulse output is between 300 and 1500 Hz, the duty cycle of the signal is between 40% and 50%.
- When the frequency emitted on the pulse output is between 1500 and 2200 Hz, detection on a pulse edge is possible.

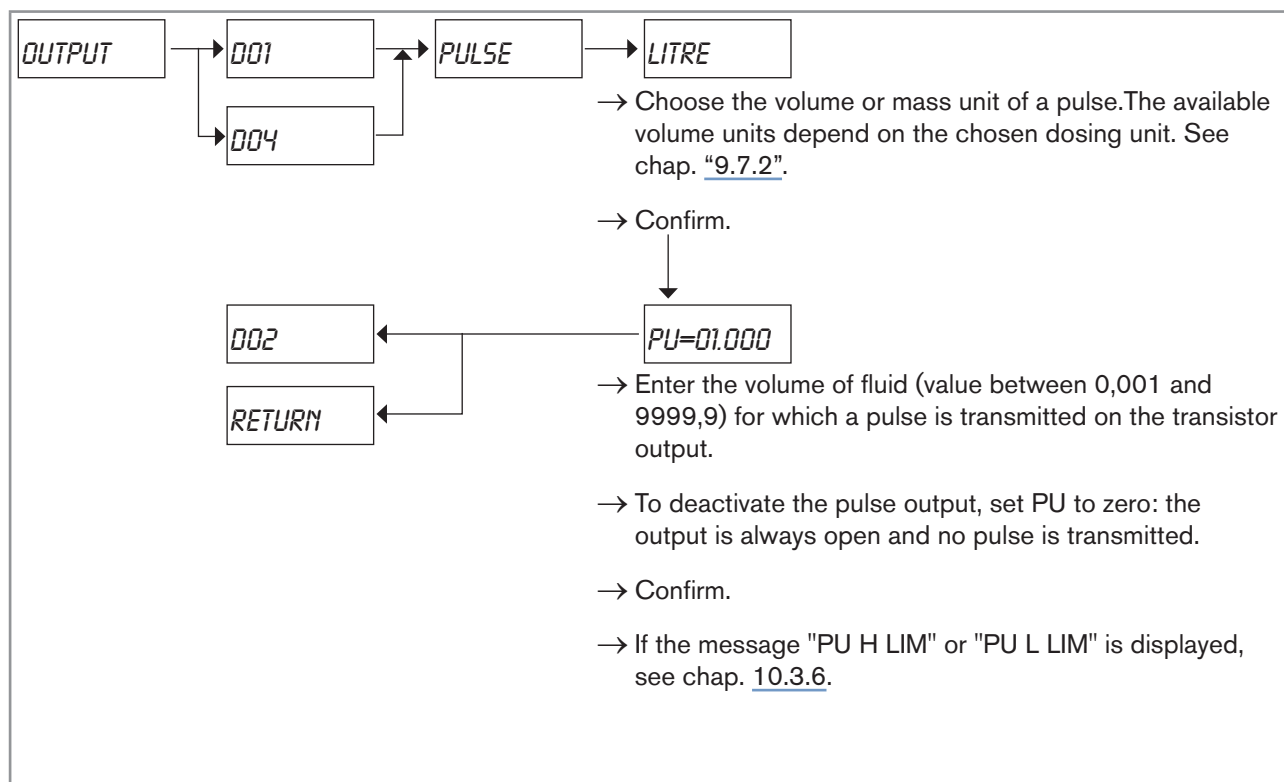


Figure 80: Configuring the transistor output DO1 or DO4 as a pulse output proportional to a volume or a mass

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.23 Configuring the transistor output DO1 or DO4 to transmit the rotational frequency of the paddle wheel

When the transistor output DO1 or DO4 is configured with the function "PULSE" and the units "HERTZ", each pulse from the paddle wheel flow sensor is transmitted to the transistor output DO1 or DO4. The frequency generated by this output then equals the rotational frequency of the paddle wheel (this value can be read from the parameter "FREQUENC" in the Test menu).

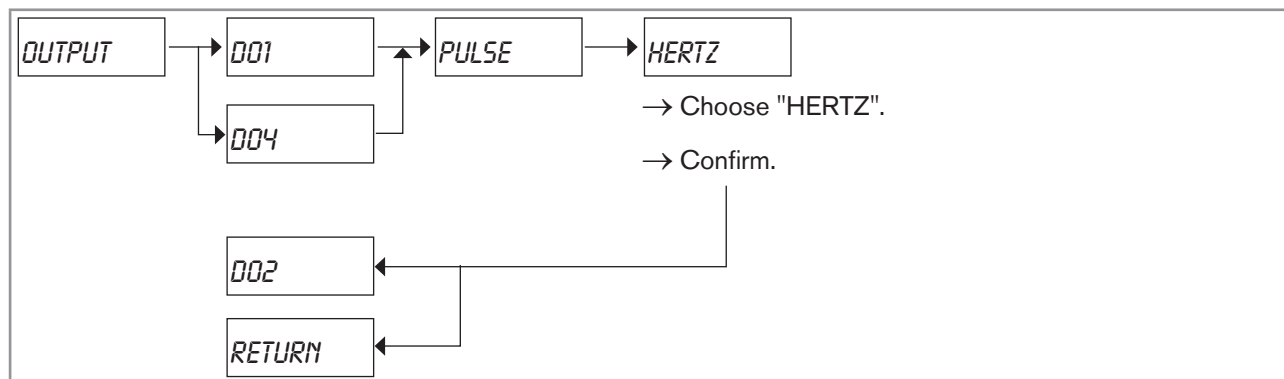


Figure 81: Configuring the transistor output DO1 or DO4 as a pulse output proportional to the rotational frequency of the paddle wheel

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.24 Configuring the relay output DO2



Connect the main valve (installed into the pipe with high flow rate) to the relay output DO2. See chap. "7.6.12".

The output DO2 is dedicated to the control of the main valve (installed into the pipe with high flow rate).

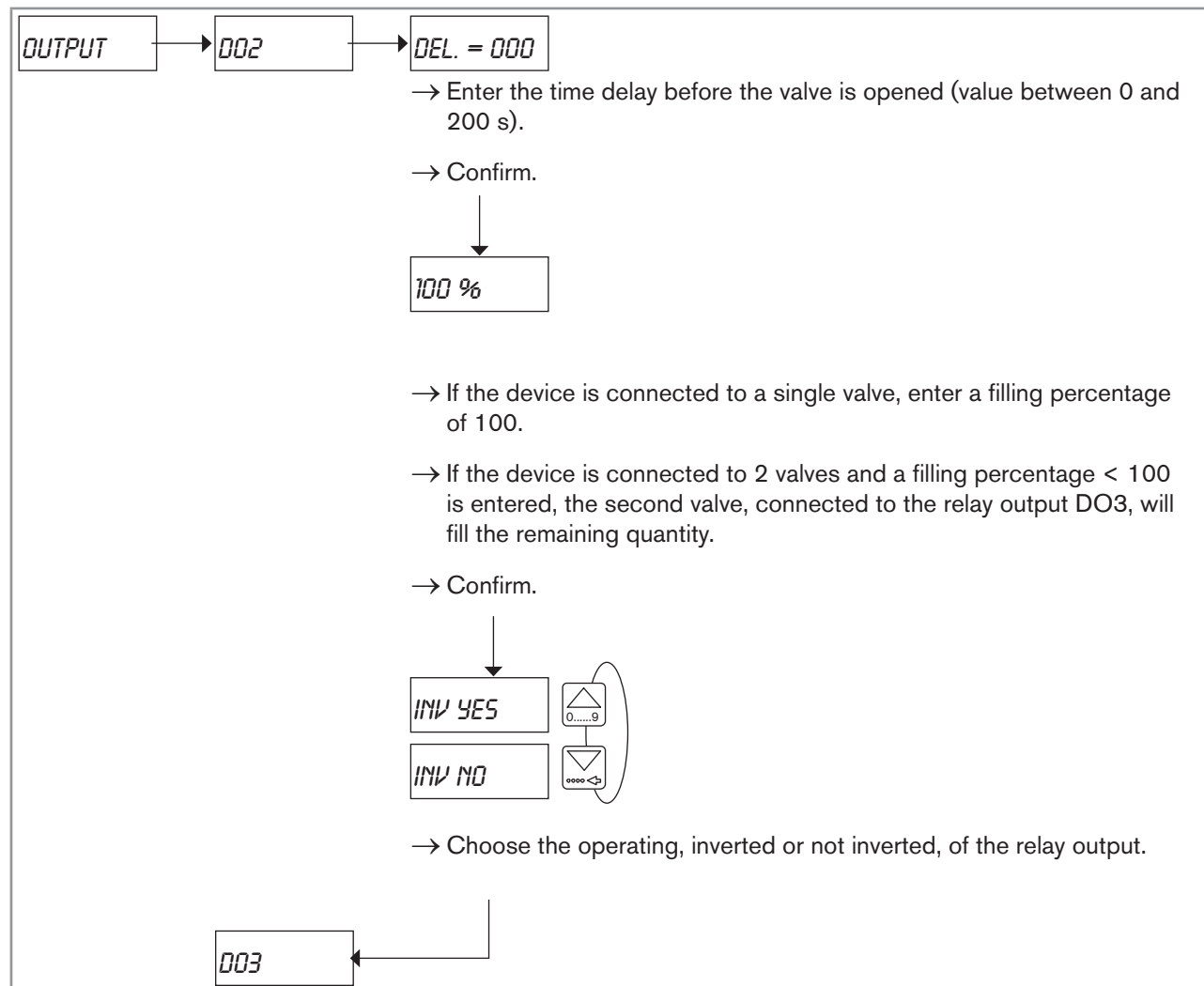


Figure 82: Configuring the DO2 relay output

→ If you do not want to adjust another parameter, go to the "END" parameter of the Parameters menu and press



to save the settings or not and go back to the Process level.

9.7.25 Configuring the relay output DO3 to control an auxiliary valve



- Connect the auxiliary valve (installed into the pipe with low flow rate) to the relay output DO3. See chap. "7.6.12".
- The time delay before opening the auxiliary valve is the same as the time delay before opening the main valve.
- If no auxiliary valve is necessary, enter a filling rate of 100 in the settings of the relay output DO2.

If the filling rate associated to the relay output DO2 is < 100, the relay output DO3 is automatically configured to control the auxiliary valve that completes the filling up to 100.

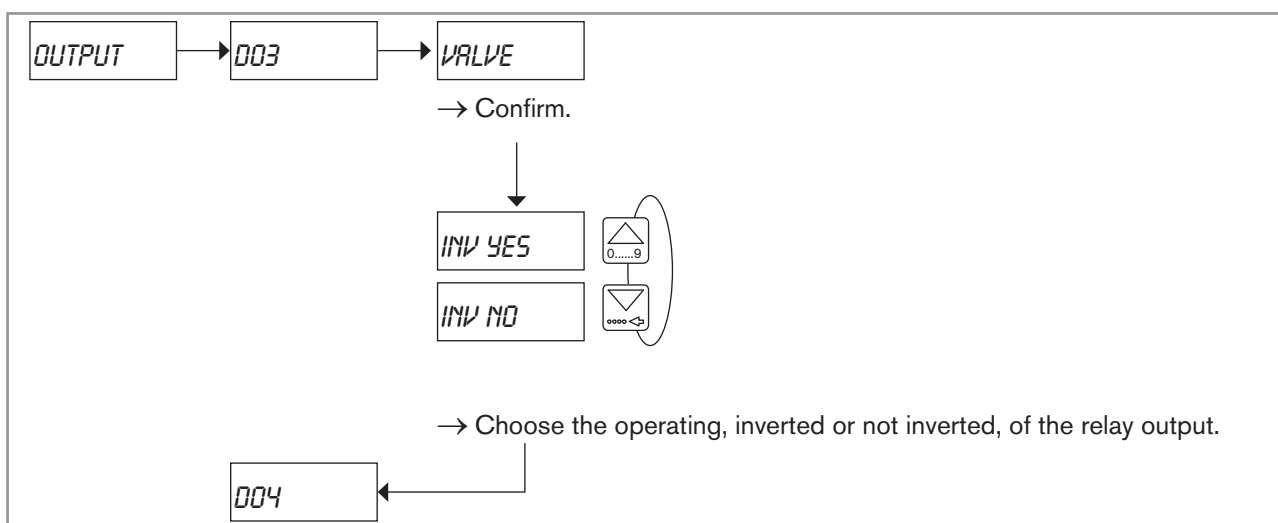



Figure 83: Configuring the relay output DO3 to control an auxiliary valve

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

9.7.26 Configuring the transistor output DO4 to transmit the device state and activating / deactivating the generation of a 10 Hz frequency when an error message is generated by the device

The transistor output DO4 can be configured to transmit the device state to a LED or a remote instrument (PLC for example).

If, furthermore, the device signals an operating error (see chap. "10.3.2"), the transistor output DO4 can be configured to generate a 10 Hz-frequency.

The following states are transmitted:

State of the device	State of the the transistor output DO4
No dosing being done	OFF
Dosing being done	ON
Dosing interrupted	1 Hz-frequency

State of the device	State of the the transistor output DO4
Problem which occurs during or at the end of a dosing: <ul style="list-style-type: none"> ▪ no flow in the pipe whereas the valves are open. ▪ a flow is measured in the pipe whereas the valves are closed. ▪ when the dosing mode "EXT [T]" is active on the device, the activation duration of the digital input DI1 does not respect the conditions described in chap. 9.7.11. 	3,5 Hz-frequency
An error message has been generated by the device. See chap. "10.3"	10 Hz-frequency, if the function is active on the device: see "Figure 84"
The power supply has been cut during a dosing	10 Hz-frequency for 2 seconds when the device is started, if the function is active on the device: see "Figure 84"
Selected quantity Vn, when the dosing mode "EXT. +LOC" is active (see Figure 44, chap. 9.6.4)	n pulses generated at a 50 Hz-frequency

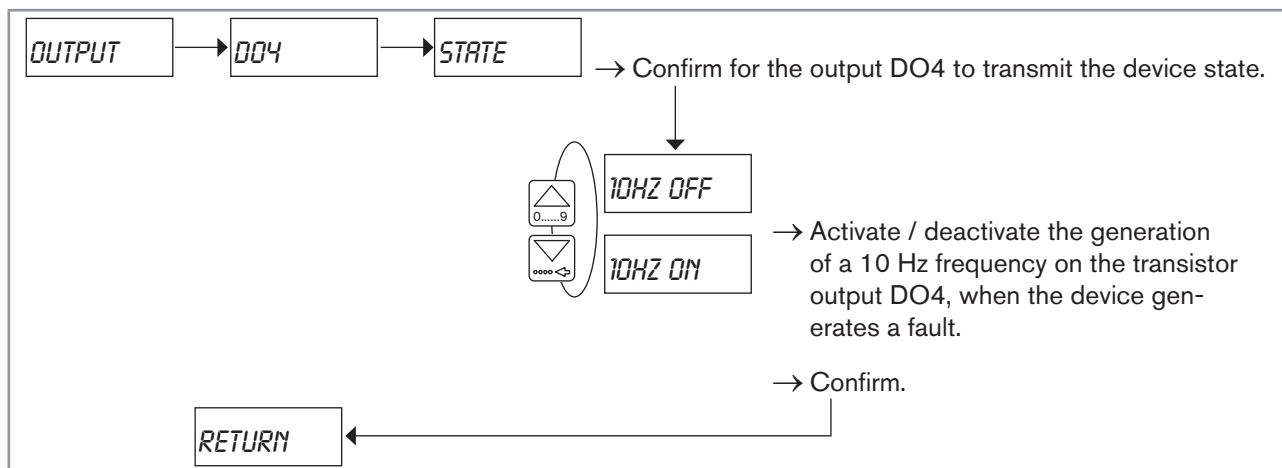



Figure 84: Configuring the transistor output DO4 to transmit the device state

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

9.7.27 General diagram of the "RESET" sub-menu

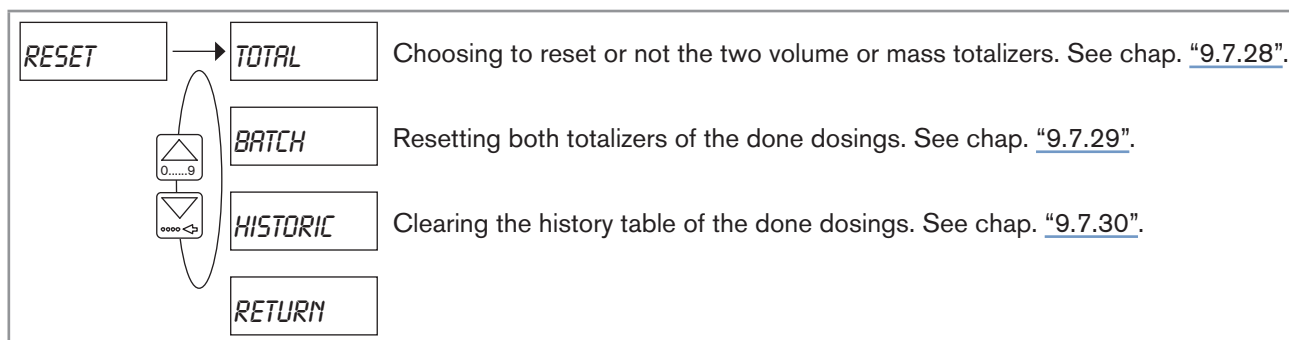


Figure 85: General diagram of the "RESET" sub-menu

9.7.28 Resetting the two volume or mass totalizers

The function allows for resetting the two volume or mass totalizers.

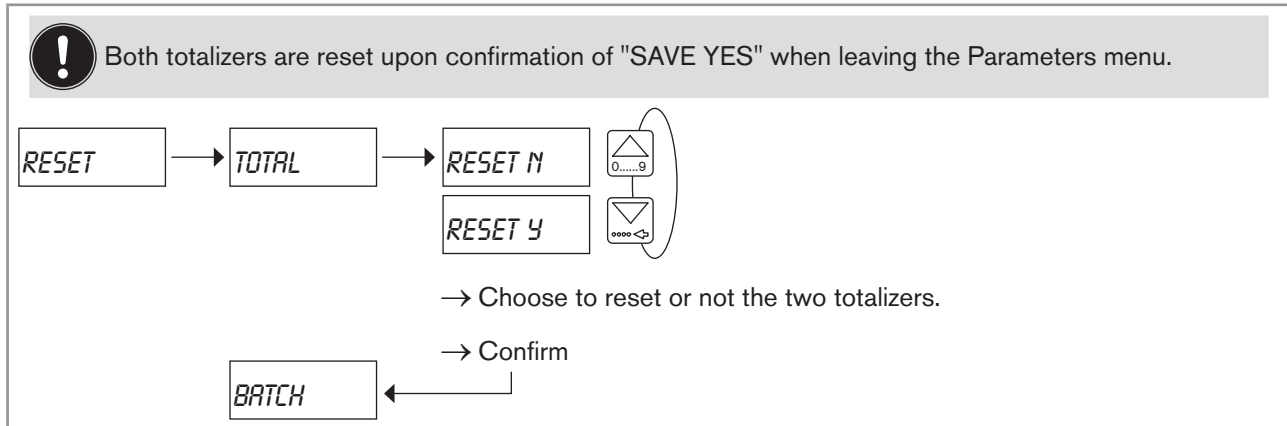




Figure 86: Diagram of the "TOTAL" parameter of the sub-menu "RESET"

 The daily totalizer can be reset from the Process level. See chap. ["9.6"](#).

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

9.7.29 Resetting the two totalizers of the done dosings

The function allows for resetting the two totalizers of the done dosings.

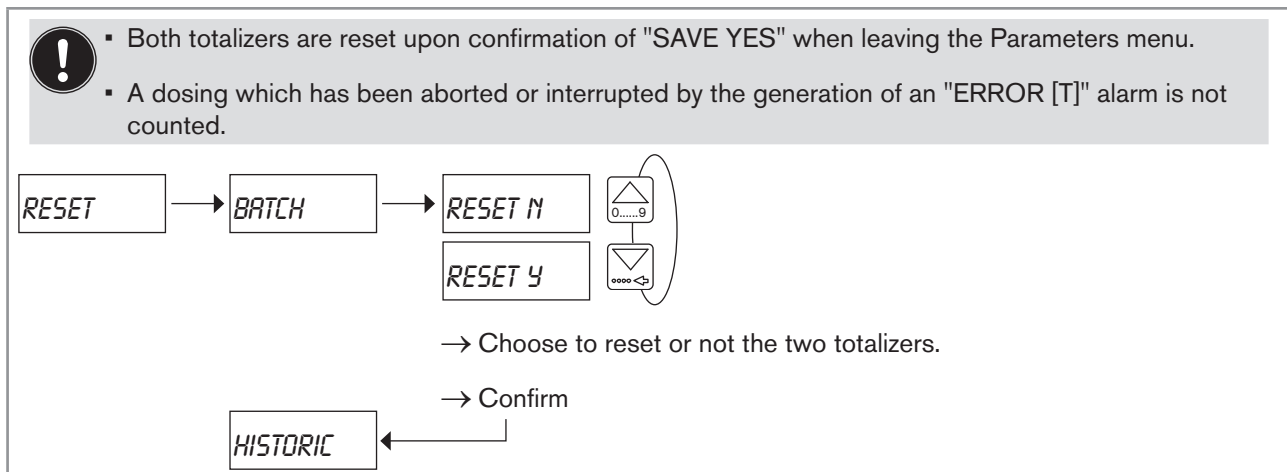




Figure 87: Diagram of the "BATCH" parameter of the sub-menu "RESET"

 The daily totalizer can be reset from the Process level. See chap. ["9.6"](#).

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

9.7.30 Clearing the history table of the done dosings

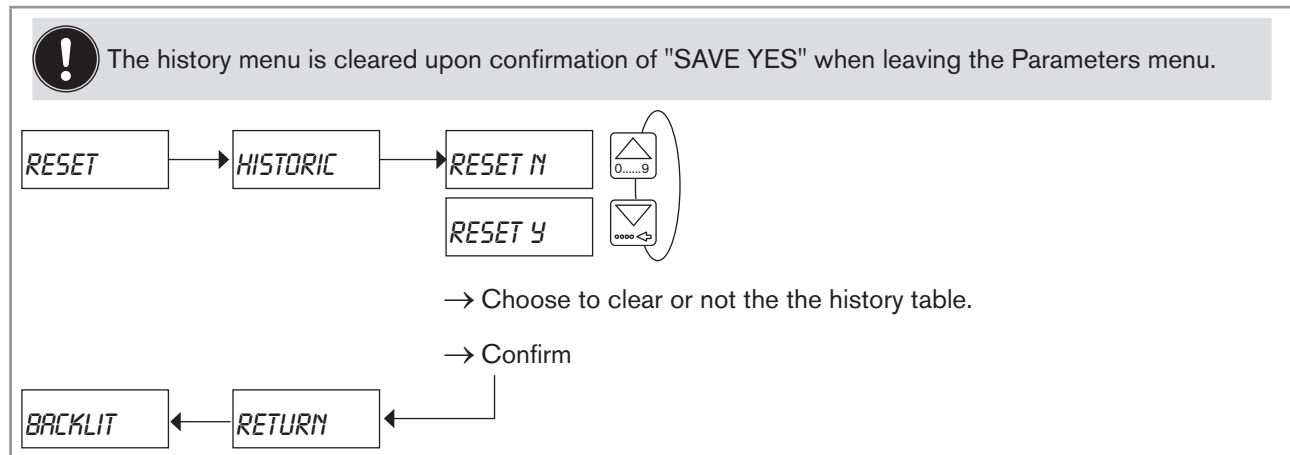



Figure 88: Diagram of the "HISTORIC" parameter of the sub-menu "RESET"

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

9.7.31 Setting the brightness of the display and how long it stays ON, or deactivating the backlight

This parameter makes it possible:

- to adjust the brightness of the display and how long the display is backlit after a key press.
- to deactivate the backlight.

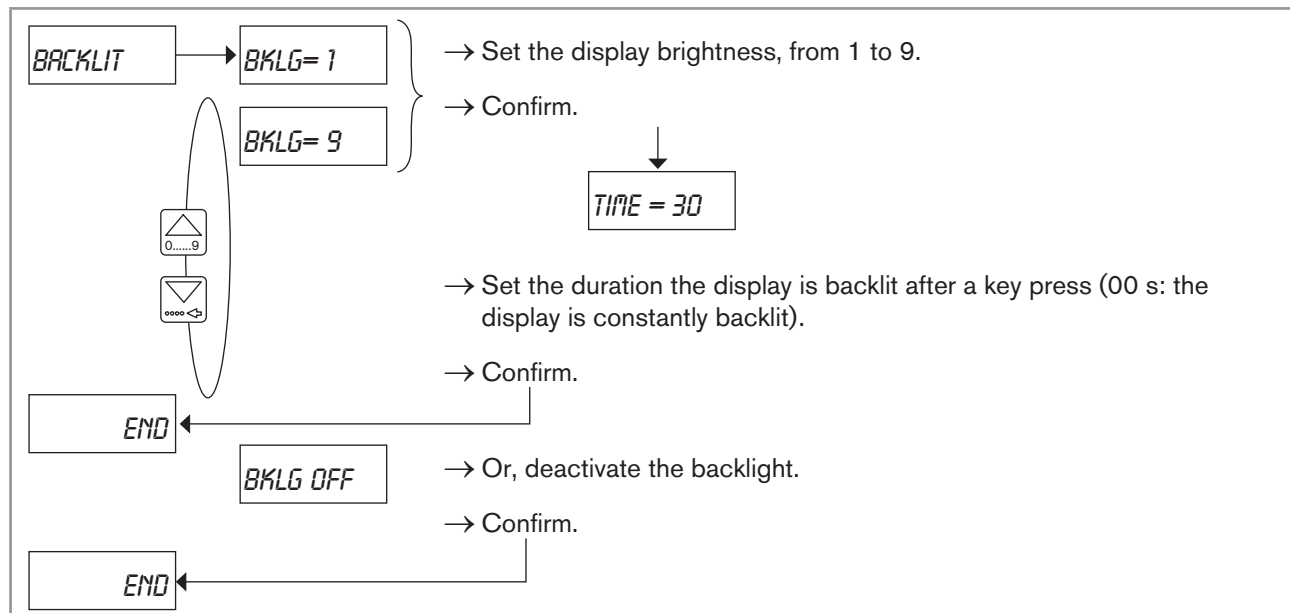





Figure 89: Diagram of the "BACKLIT" parameter of the Parameters menu

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.8 Details of the Test menu

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

This menu comprises the following configurable parameters:

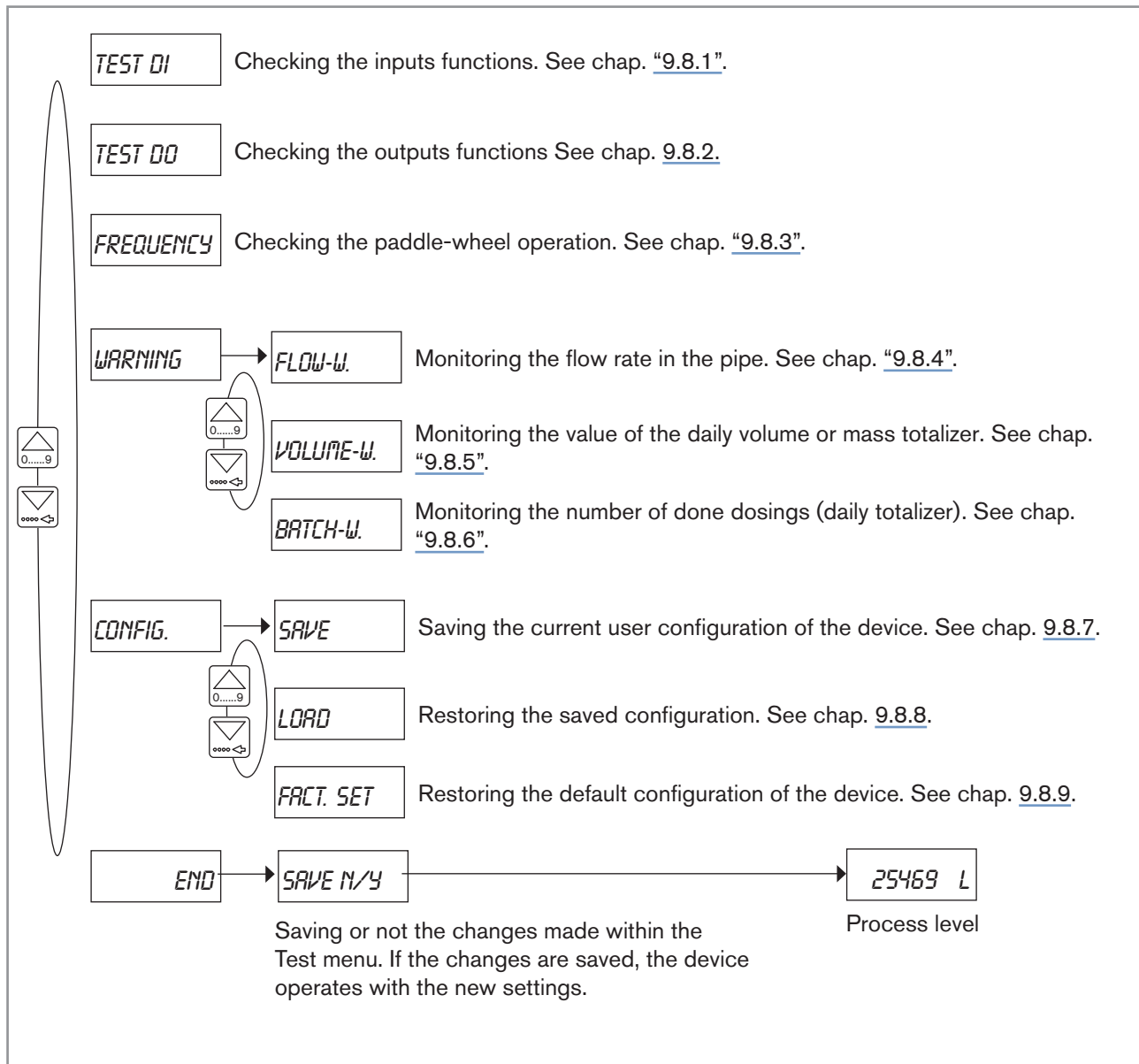


Figure 90: Diagram of the Test menu

9.8.1 Checking the inputs functions

The function allows for checking the correct working of the digital inputs.



The device state LED flashes during the running check of the input working.

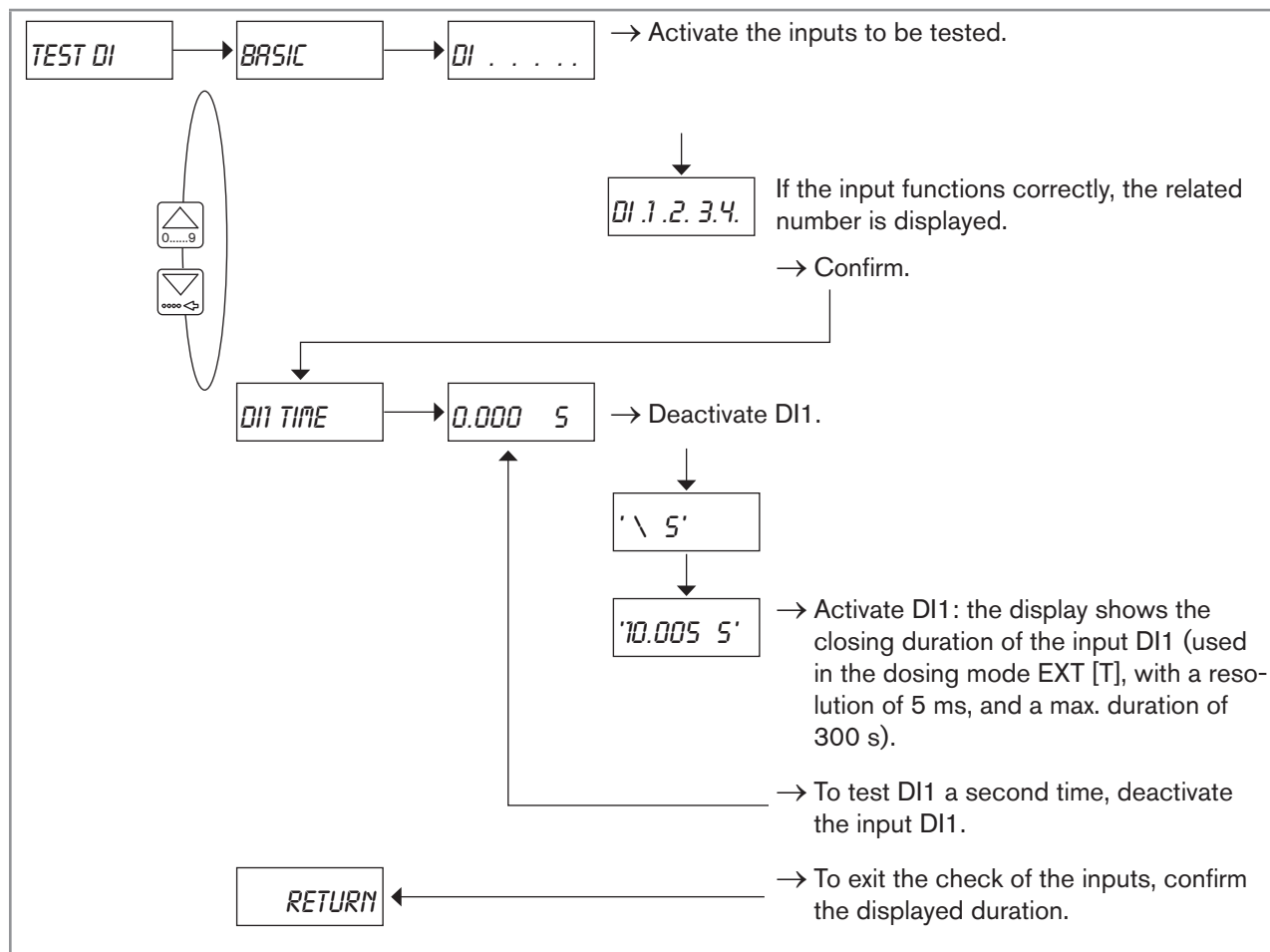



Figure 91: Diagram of the "TEST DI" parameter of the Test menu

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

9.8.2 Checking the outputs functions



If a valve is connected to the output DO2 or DO3, this function will open the valve.

The function allows for checking the correct working of the outputs.



- The device state LED flashes during the running check of the output working.
- After having confirmed the output to be checked, the display shows the current state of the output ("DOx ON" or "DOx OFF").

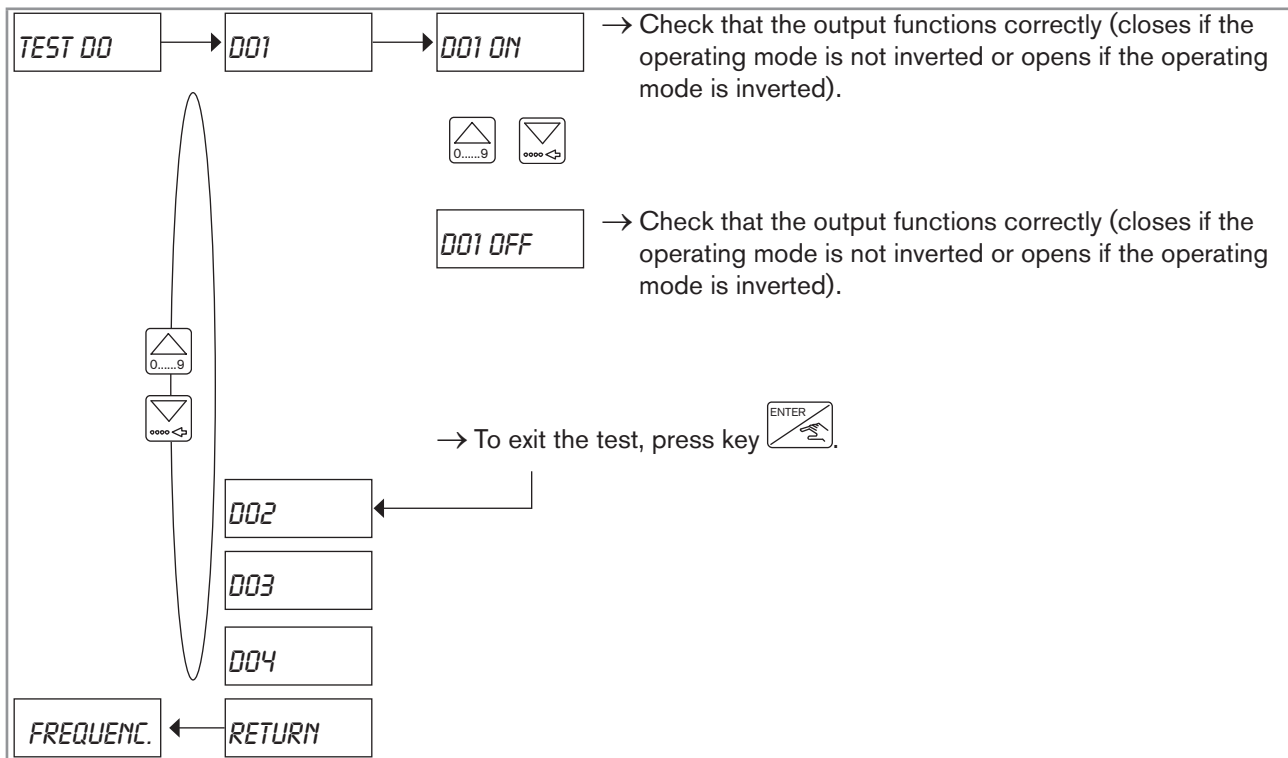



Figure 92: Diagram of the "TEST DO" parameter of the Test menu

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

9.8.3 Checking the paddle-wheel operation



Risk of disrupting the process due to accidental opening of the valves.

- Before confirming the parameter "FREQUENC" and thus opening the valves, make sure there is no risk for the process.

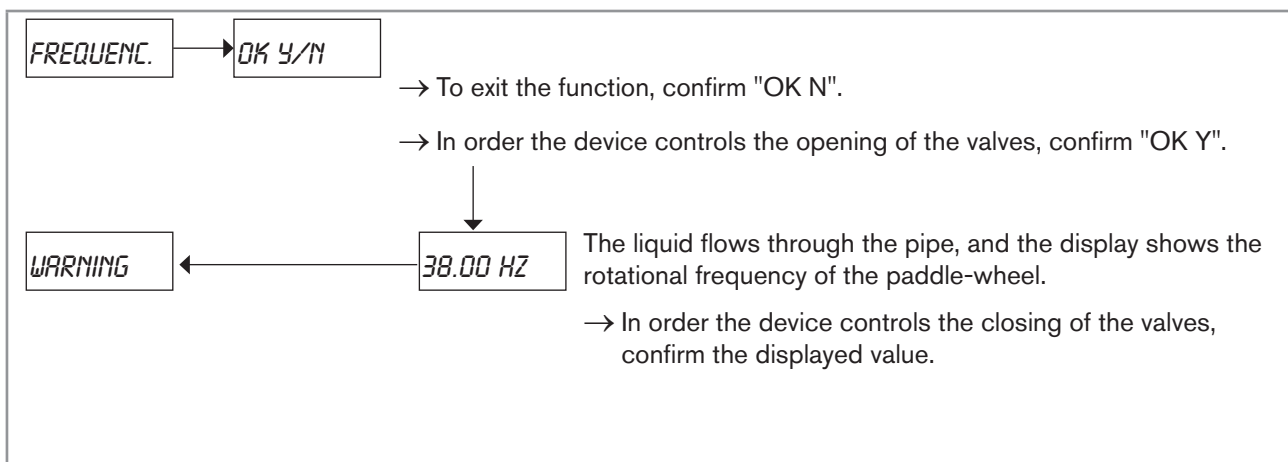



Figure 93: Diagram of the "FREQUENC." parameter of the Test menu



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

9.8.4 Monitoring the flow rate in the pipe

A malfunction in your process or in the flow sensor may be indicated either by too low or too high a flow rate.

The parameter "FLOW-W." makes it possible to monitor the flow rate.



- To disable the flow rate monitoring, set $W^- = W^+ = 0$.
- To disable one of the limits, set it to 0.
- When the warning message "WARN. LO" or "WARN. HI" is generated, access to the information menu, go to the message and confirm the message by simultaneously pressing the keys  and  for 2 seconds.

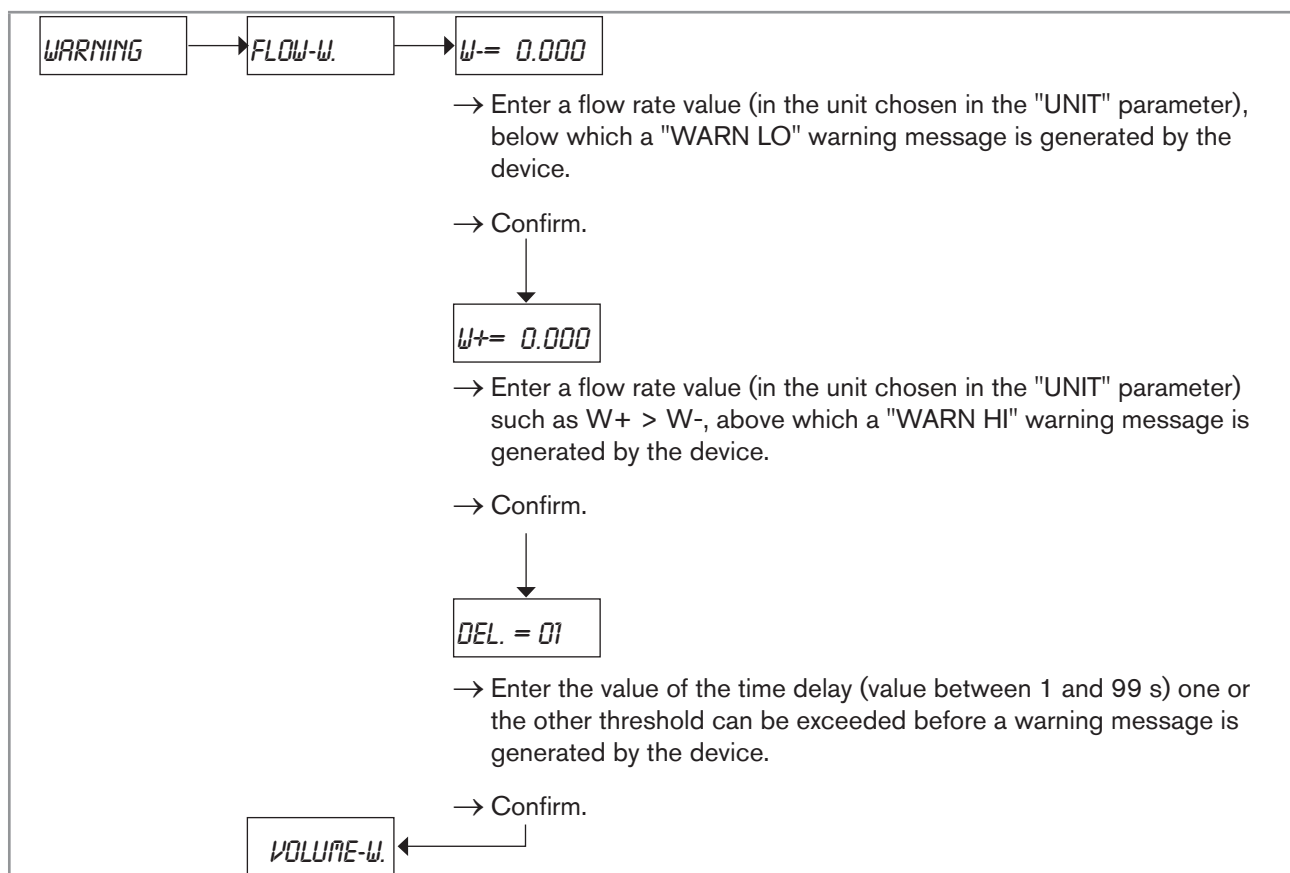


Figure 94: Diagram of the "FLOW-W." parameter of the sub-menu "WARNING"

To be warned when the flow rate is too low or too high, enter the flow rate range (in the units that have been chosen in the "UNIT" parameter of the Parameters menu), outside which the device generates a warning message, "WARN LO" or "WARN HI", and turns the device status LED to orange.

When a warning message, "WARN LO" or "WARN HI", is generated by the device:

- check the process.
- if the process is not faulty, check the flow sensor condition and clean it if necessary.
- if the flow rate measurement is still faulty, contact the Bürkert retailer.



- The transistor output DO1 or DO4 or the relay output DO3 can be configured to switch when a warning message is emitted by the device. See chap. [9.7.18](#).
- See also "If you encounter problems" in chap. ["10.3"](#)

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.8.5 Monitoring the value of the daily volume or mass totalizer

The parameter "VOLUME-W." makes it possible to monitor the value of the volume or mass daily totalizer. When the daily totalizer has reached the set value, a warning message is generated by the device.



- To deactivate the monitoring of the totalizer, set "VOLUME-W." to zero.
- When the warning message "WARN. VOL." is sent out, reset the daily volume or mass totalizer: see chap. ["9.6"](#) or ["9.7.28"](#).

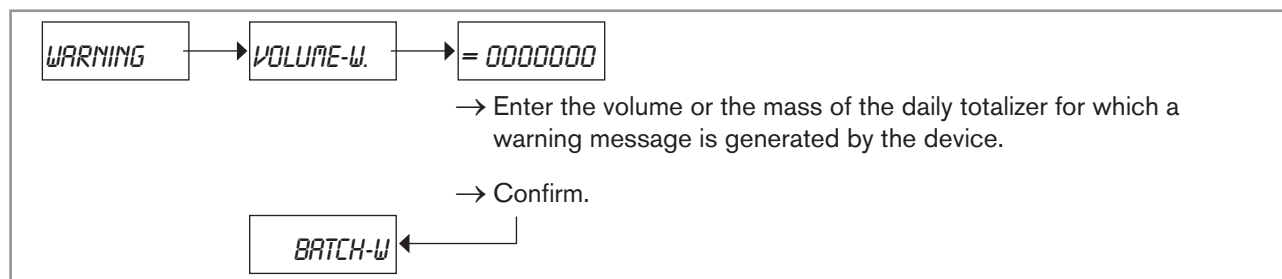


Figure 95: Diagram of the "VOLUME-W." parameter of the sub-menu "WARNING"



- The transistor output DO1 or DO4 or the relay output DO3 can be configured to switch when a warning message is emitted by the device. See chap. [9.7.18](#).
- See also "If you encounter problems" in chap. ["10.3"](#)

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.8.6 Monitoring the number of done dosings

The parameter "BATCH-W." makes it possible to monitor the value of the done dosings daily totalizer. When the daily totalizer has reached the set value, a warning message is generated by the device.



- To deactivate the monitoring of the number of done dosings, set "BATCH-W." to zero.
- When the warning message "W. BATCH" is sent out, reset the daily totalizer of the done dosings: see chap. ["9.6"](#) or ["9.7.28"](#).

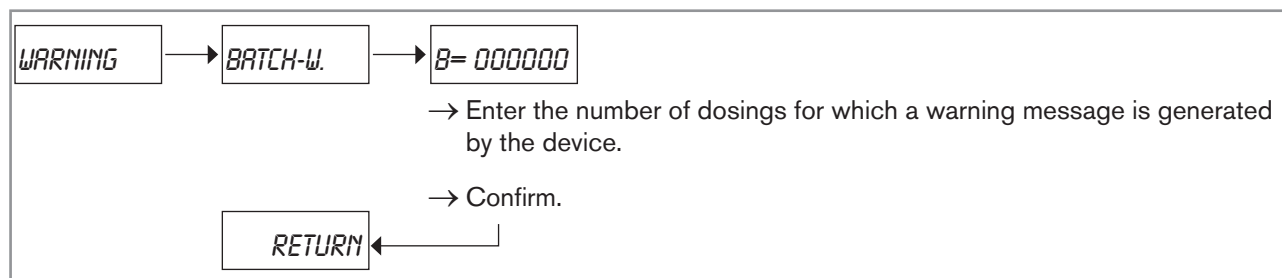


Figure 96: Diagram of the "BATCH-W." parameter of the sub-menu "WARNING"



- The transistor output DO1 or DO4 or the relay output DO3 can be configured to switch when a warning message is emitted by the device. See chap. 9.7.18.
- See also "If you encounter problems" in chap. "10.3"

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.8.7 Saving the user set configuration

You may save the current configuration of the device in order to restore it later.

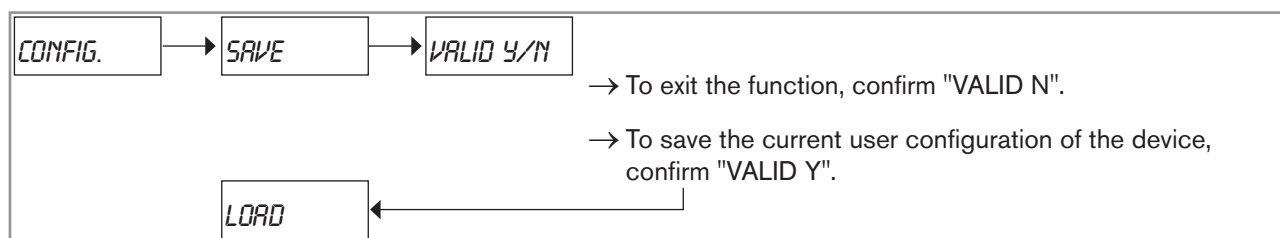


Figure 97: Saving the current user configuration

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.8.8 Restoring the saved configuration

You can restore the configuration of the device that has been previously saved (see chap. "9.8.7").



The device will use the restored configuration as soon as "SAVE YES" is confirmed when leaving the Test menu.

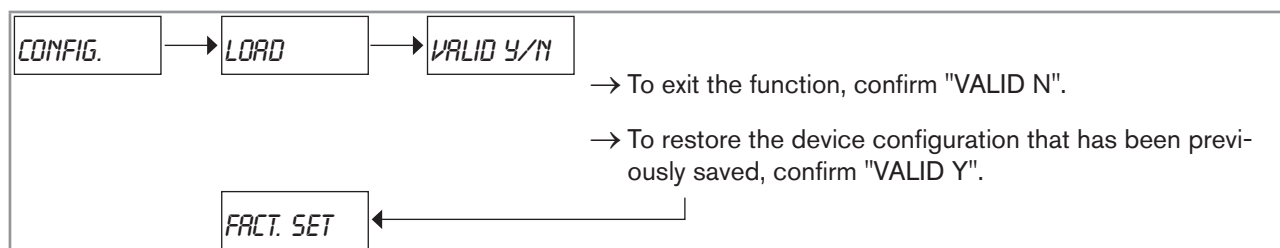


Figure 98: Restoring the configuration previously saved

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.8.9 Restoring the default configuration



The device will use the default configuration as soon as "SAVE YES" is confirmed when leaving the Test menu.

The parameter makes it possible to restore the default configuration of the device (Table 12).

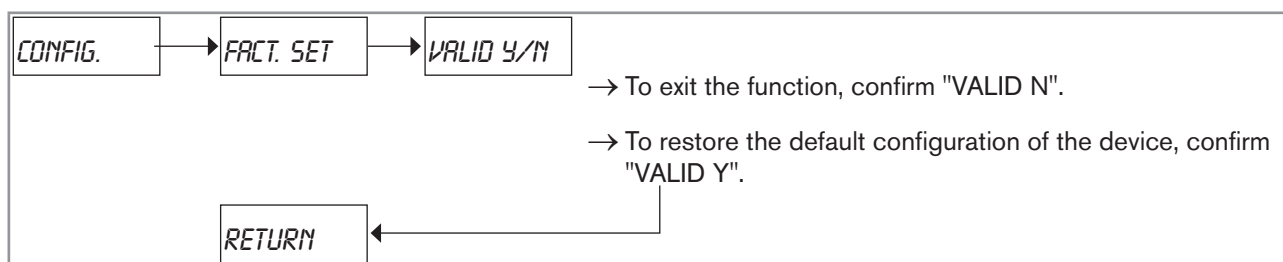


Figure 99: Restoring the default configuration of the device

Table 12: Default configuration of the device

Function	Default value
LANGUAGE	English
Dosing UNITS	litre
UNIT of the flow rate	l/s
UNIT of the totalizers	litre, 0 decimals
K FACTOR	1.00
OPTIONAL	dosing mode "LOC. MANU"
	V1 to V7=0.00
Parameters A and B for dosing mode "EXT. [T]"	0
Teach-In dosing quantity for dosing modes "EXT. REP." and "LOC. REP."	0
OVERFILL CORRECTION	yes, direct, tolerance 0
ALARME during dosing	no
	Time delay = 1 s
ALARME at the end of the dosing	no
	Time delay = 1 s
OUTPUT DO1	Pulse, PU=0.0
	Litre
OUTPUT DO2	Valve 100%, not inverted, time delay before opening = 0 s
OUTPUT DO3	Alarm, not inverted
OUTPUT DO4	State
	ERR10Hz inactive
BACKLIGHT	level 9, activated for 30s
FLOW-WARNING	W- = W+ = 0.000
	Time delay = 1 s
VOLUME-WARNING	0
BATCH-WARNING	0

→ If you do not want to adjust another parameter, confirm the "END" parameter to save the settings or not and go back to the Process level.

9.9 Details of the History menu

To access the History menu, press the  key for at least 2 s, in the Process level.

The menu makes it possible to consult the quantities dosed in the last 10 dosings done on the device.

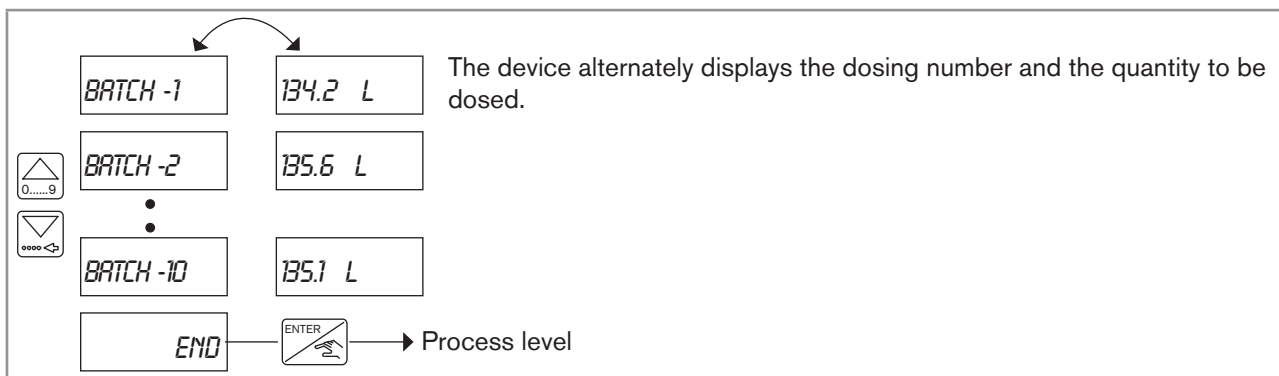




Figure 100: Diagram of the History menu

9.10 Details of the Information menu



- This menu is available when the device state LED is orange or red.
- For the meaning of a message, go to chap. [10.3](#).
- The messages "WARN. LOW", "WARN. HIG" and "W. OVER." can be confirmed in the Information menu by simultaneously pressing keys  and  for 2 seconds: the message "OK" is displayed.
- The messages "WARN. VOL" and "W. BATCH" are confirmed when the related totalizers are reset.

To access the Information menu, press the  key for at least 2 s, in the Process level.

In this menu read the fault and warning messages generated by the device.

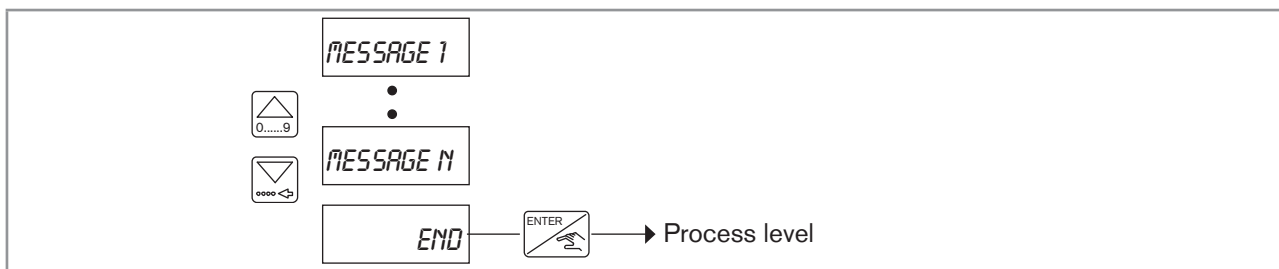


Figure 101: Diagram of the Information menu

→ To remotely consult and confirm the warning messages, see chap. ["9.11"](#).

9.11 Remote consultation and confirmation of the warning messages



If the power supply of the device is cut during the remote consultation, the device will generate for 2 s a few 10 Hz-pulses on the output DO4 configured with the function "STATE" and the Process level will be active when the power supply is restored.



When the remote consultation is active on the device:

- no dosing can be done.
- the digital inputs are only used for the consultation and the confirmation of the warning messages.
- the navigation keys are blocked, except to exit the consultation when "END" is displayed.
- the device state LED flashes.

Remote consultation and confirmation of the warning messages via the digital inputs is only possible:

- from the Process level,
- when no dosing is being done on the device.
- if at least 1 warning message has been generated (the output(s) configured with the function "WARNING" take the value 1).

To use the feature:

- Configure the device with the dosing mode "EXT. MEM", "EXT.+LOC", "EXT. [T]" or "EXT. REP".
- Connect the 4 digital inputs DI1 to DI4 to 4 outputs of the PLC.
- Configure DO1 or DO3 with the function "WARNING": see chap. ["9.7.20"](#).
- Connect the transistor output DO1 or the relay output DO3 to an input of the PLC.
- In order for the PLC to be informed that the remote consultation has started or has finished, connect the transistor output DO4 to an input of the PLC and configure the output DO4 with the function "STATE": see chap. ["9.7.26"](#).

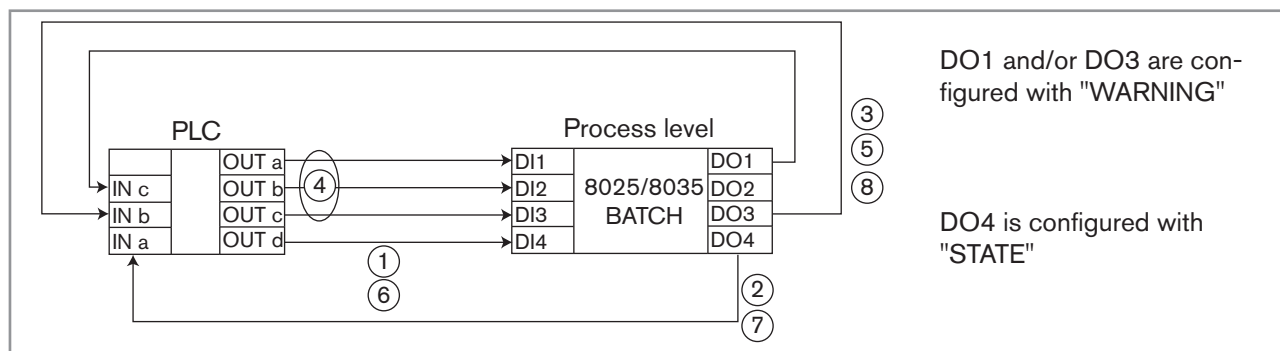


Figure 102: Remote consultation of the warning messages

1. To remotely access to the warning messages, the PLC sends out the code 000 on the digital inputs DI1 to DI3 then 1 pulse on DI4.
2. The device generates a 200 ms pulse on the output DO4 to confirm the access to the messages; The dosing feature cannot be accessed any more.

3. The output(s) configured with the function "WARNING" are switched to 0.
4. To identify which warning messages have been generated by the device, the PLC sends one after the other on the digital inputs DI1 to DI3 the codes related to the messages (see "Table 13").
5. When the PLC encounters a message that has been generated by the device, the output(s) configured with the function "WARNING" switch to 1.
6. To confirm the message, the PLC sends out one pulse on DI4 and, if the active message is "WARN. VOL." or "W. BATCH", the related daily totalizer is reset.
7. To exit the consultation, the PLC sends the code 000 on the digital inputs DI1 to DI3 then confirms "END" by sending out one pulse on DI4. Pressing the key ENTER also confirms "END".
8. The device generates a 200 ms pulse on the output DO4 to confirm the end of the message consultation; The dosing feature is available again.

Table 13: Code DI1/DI2/DI3 of the warning messages

DI1	DI2	DI3	Chosen message
0	0	0	END
1	0	0	WARN.LOW
0	1	0	WARN.HIG.
1	1	0	WARN. VOL.
0	0	1	W. BATCH
1	0	1	W.OVER

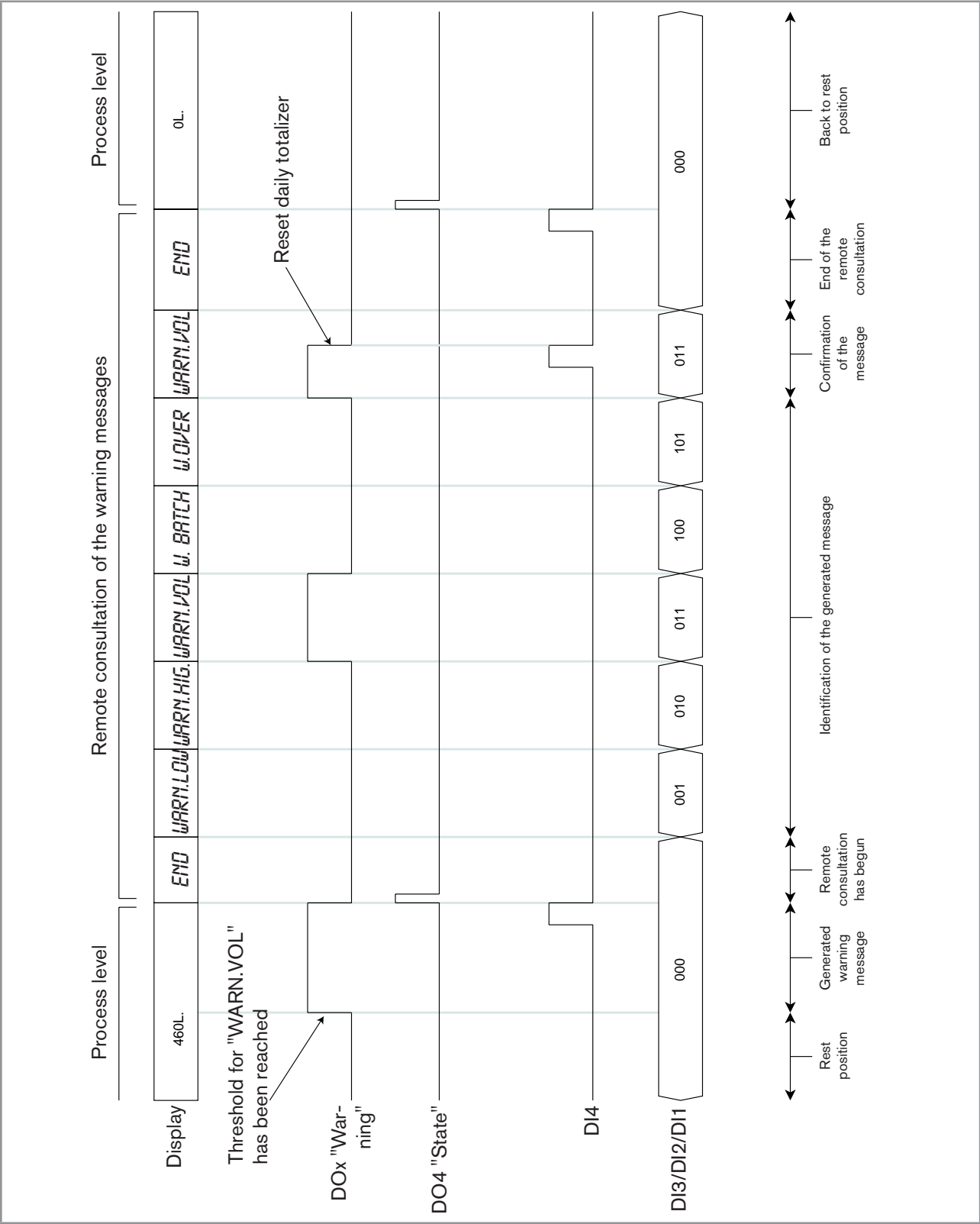


Figure 103: Timing chart for the remote consultation of the warning messages

10 MAINTENANCE AND TROUBLESHOOTING

10.1 Safety instructions



DANGER

Risk of injury 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.



WARNING

Risk of injury due to non-conforming maintenance.

- ▶ Maintenance must only be carried out by qualified and skilled staff with the appropriate tools.
- ▶ Ensure that the restart of the installation is controlled after any interventions.

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.

10.3 If you encounter problems

10.3.1 Resolution of problems when the device state LED is OFF

Device state LED	Output DO4	Output DO1 and/or DO2 and/or DO3	Possible cause	Recommended action
OFF	0 Hz	not switched	The device is not energized.	→ Check the wiring. → Check the fuse of the installation and replace it if necessary. → Check that the installation is not shut-down. → Check that the power source is working properly. → If the problem occurs again, take contact with the retailer.

10.3.2 Resolution of problems related to an error message and the device state LED is red

Device state LED	Output DO4	Output DO1 and/or DO2 and/or DO3	Message displayed	Possible cause	Recommended action
red	0 Hz	not switched	"PWRFAIL"	The supply voltage is too low. The device does not function.	→ Check that the supply voltage is between 12 and 36 V DC. → If the problem occurs again, take contact with the retailer.
red	0 Hz		"ERROR3"	The user parameters are lost.	→ Start the device again. → If the message persists, configure the device again. → If the problem occurs again, take contact with the retailer.
red	10 Hz ¹⁾		"ERROR4"	The totalizer values are lost. The values saved upon the next to last power down are retrieved.	→ Start the device again. → If the problem occurs again, take contact with the retailer.
red	0 Hz		"ERROR5"	Both "ERROR3" and "ERROR4".	→ Start the device again. → If the message persists, configure the device again. → If the problem occurs again, take contact with the retailer.
red	10 Hz ¹⁾		"ERROR6"	Totalizers definitely lost. The totalizers are reset.	→ Start the device again. → If the problem occurs again, take contact with the retailer.
red	0 Hz		"ERROR7"	Both "ERROR3" and "ERROR6".	→ Start the device again. → If the message persists, configure the device again. → If the problem occurs again, take contact with the retailer.
red	10 Hz ¹⁾		dosing being done...	The rotational frequency of the paddle wheel is > 2,2 kHz.	→ Check the flow rate in the pipe. → If necessary, adjust the flow rate. → If the problem occurs again, take contact with the retailer.

¹⁾ If parameter "ERR. 10HZ" is set to "ACTIVE". See chap. ["9.7.26"](#).

10.3.3 Resolution of problems related to a warning message and the device state LED is orange

Device state LED	Output DO1 and/or DO2 and/or DO3	Message displayed	Possible cause	Recommended action
orange	Switched ²⁾	"WARN. LOW"	During dosing, the measured flow rate has stayed under the minimum threshold for the set time delay. This message appears when the flow rate is monitored (see chap. 9.8.4).	<ul style="list-style-type: none"> → Check the flow rate in the pipe and its consequences on the process. → If necessary, clean the flow sensor. → When the dosing is finished, access the Information menu and confirm the message. See chap. "9.10". → Check the connection between the device and the flow sensor.
orange	Switched ²⁾	"WARN. HIG"	During a dosing, the measured flow rate has stayed above the maximum threshold for the set time delay. This message appears when the flow rate is monitored (see chap. 9.8.4).	<ul style="list-style-type: none"> → Check the flow rate in the pipe and its consequences on the process. → If necessary, clean the flow sensor. → When the dosing is finished, access the Information menu and confirm the message. See chap. "9.10".
orange	Switched ²⁾	"W.OVER"	The last dosing could not be correctly corrected and the dosed quantity has exceeded the threshold set in the overfill correction parameter (see chap. "9.7.15").	<ul style="list-style-type: none"> → Check the process, and especially for the flow rate being stable. → Check the last dosing (missing liquid or overfilling). → If the problem occurs again after several dosings, use the function to smoothen the overfill correction. See chap. "9.7.15". → Access the Information menu and confirm the message. See chap. "9.10".
orange	Switched ²⁾	"WARN. VOL."	The daily volume or mass totalizer has reached the value set in parameter "VOLUME-W." of the Test menu.	<ul style="list-style-type: none"> → Do the planned maintenance operation. → Reset the daily volume or mass totalizer: see chap. "9.6" or "9.7.28".

Device state LED	Output DO1 and/or DO2 and/or DO3	Message displayed	Possible cause	Recommended action
orange	Switched ²⁾	"W. BATCH"	The number of done dosings has reached the value set in parameter "BATCH-W." of the Test menu.	→ Do the planned maintenance operation. → Reset the daily totalizer of the done dosings: see chap. "9.6" or "9.7.29".

²⁾ If the output is configured to switch when a warning message is generated. See chap. "9.7.20".

10.3.4 Resolution of a problem occurring during a dosing

Device state LED	Output DO1 and/or DO2 and/or DO3	Output DO4 in "STATE" mode	Message displayed	Possible cause	Recommended action
orange, 3,5 Hz flashing	Switched ²⁾	3,5 Hz frequency	"ALARM"	The message can appear if the generation of alarms during dosing is active on the device. See chap. "9.7.16". The device has opened the valves but there is no flow.	→ Check the process. → Check the operation of the valves. → Check the wiring of the valves, for example via the TEST menu. See chap. "9.8.2". → Check the flow sensor. → To confirm the message, press the key "ENTER" or send out a pulse on DI4: the dosing has been interrupted. current dosing can be continued or aborted.
orange, 3,5 Hz flashing	Switched ²⁾	3,5 Hz-frequency	"ALARM"	The message can appear if the generation of alarms at the end of dosing is active on the device. See chap. "9.7.17". The device has closed the valves but there is still flow in the pipe.	→ Check the process. → Check the operation of the valves. → Check the wiring of the valves, for example via the TEST menu. See chap. "9.8.2". → Check the flow sensor. → To confirm the message, press the key "ENTER" or send out a pulse on DI4: if the dosing is finished, the device goes back to the Process level. Else, the dosing has been interrupted and can be continued or aborted.

Device state LED	Output DO1 and/or DO2 and/or DO3	Output DO4 in "STATE" mode	Message displayed	Possible cause	Recommended action
orange, 3,5 Hz flashing	Switched ²⁾	3,5 Hz-frequency	"ERROR [T]"	<p>The message can only appear if the dosing mode "EXT. [T]" is active.</p> <p>The dosing quantity is exceeded when the input DI1 has been deactivated.</p>	<p>→ Increase the values of the parameters A and B in order to reduce the activation time of the digital input DI1 and so that $A \cdot T + B < \text{flow rate times } T$.</p> <p>→ or set a time delay before the valves open. See chap. "9.7.24" and "9.7.25".</p> <p>→ or reduce the flow rate in the pipe.</p> <p>→ Confirm the message by pressing the key "ENTER" or by sending out a pulse on DI4: the current dosing is aborted.</p>
orange, 3,5 Hz flashing	Switched ²⁾	3,5 Hz-frequency	"ERROR [T]"	<p>The message can only appear if the dosing mode "EXT. [T]" is active.</p> <p>The dosing quantity, determined by the device depending on the activation duration of the digital input DI1, has exceeded the required thresholds.</p>	<p>→ Set the values of the parameters A and B and the value of the activation duration T so that $A \cdot T + B < 100\,000$ and $A \cdot T + B$ times the K factor of the fitting used is higher or equal to 6.</p> <p>→ Set an activation duration $T < 300$ s.</p> <p>→ Confirm the message by pressing the key "ENTER" or by sending out a pulse on DI4: the current dosing is aborted.</p>

²⁾ If the output is configured to switch when an alarm is generated. See chap. "9.7.18".

10.3.5 Resolution of problems without message generation and the device status LED is green

Device state LED	Possible cause	Recommended action
green	During a dosing, the displayed quantity is increased or decreased very slowly.	→ Check that the K factor corresponds to the fitting used. → Do a teach-in procedure to determine the K factor of the fitting used. → Check that the flow rate in the pipe is high enough.
green	The dosing does not start although the procedure has been correctly started:	
	<ul style="list-style-type: none"> ▪ Either the dosing quantity times the set K factor is lower than 6. 	→ Set a dosing quantity that is higher or equal to 6 divided by the set K factor.
	<ul style="list-style-type: none"> ▪ Either the pipe diameter is too high for the dosing of small quantities. 	→ Reduce the pipe diameter.
green	The display shows that the dosing has started (the units blink) but the valve connected to DO2 and/or DO3 does not open.	→ Check the value of the time delay before opening of the valves. → Check that the flow rate in the pipe is high enough.

10.3.6 Resolution of problems linked to warning messages not registered in the Information menu

Device state LED	Output DO4 in "STATE" mode	Message displayed	Possible cause	Recommended action
any colour	-	"PU L LIM"	The message is displayed after the pulse value has been entered (parameter "PU" of the transistor output DO1) or upon validation of the settings of the Parameters menu. The pulse value times the K factor of the device is > 1000000. The quantity entered for a pulse is too high.	→ Enter a lower quantity per pulse. See chap. "9.7.22" .

Device state LED	Output DO4 in "STATE" mode	Message displayed	Possible cause	Recommended action
any colour	-	"PU H LIM"	<p>The message is displayed after the pulse value has been entered (parameter "PU" of the transistor output DO1) or upon validation of the settings of the Parameters menu.</p> <p>The pulse value times the K factor of the device is < 1.</p> <p>The quantity entered for a pulse is too low.</p>	→ Enter a higher quantity per pulse. See chap. "9.7.22" .
any colour	flashes at a 10 Hz-frequency for 2 seconds after the device has been energized, then flashes at a 1 Hz-frequency	"CONTINUE"	<p>The power supply has been cut during a dosing</p> <p>the dosing has been interrupted.</p>	<p>→ Check the electrical installation.</p> <p>→ Abort the current dosing or continue the dosing: in that case check that the current dosing is correct.</p>
any colour	flashes at a 10 Hz-frequency for 2 s then flashes at a 1 Hz-frequency	Process level	The power supply has been cut during the consultation of the messages of the Information menu via the digital inputs.	→ Check that the PLC knows that the device has returned to the Process level.

11 SPARE PARTS AND ACCESSORIES



ATTENTION

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

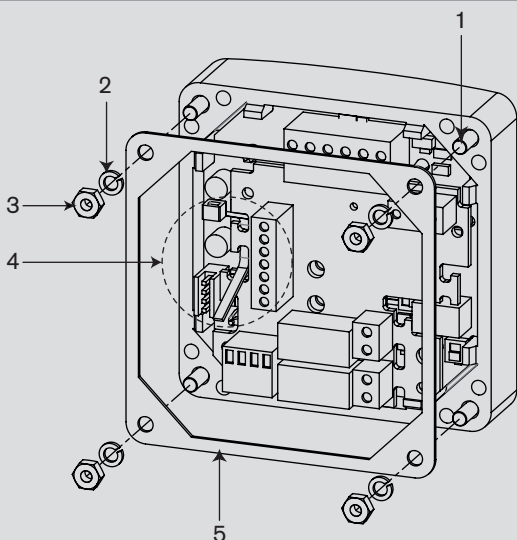

Incorrect accessories and unsuitable replacement parts may cause injuries and damage the device and the surrounding area.

► Use only original accessories and original replacement parts from Bürkert.

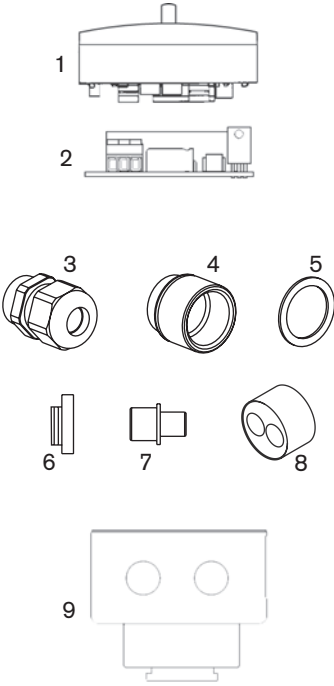


The damaged electronic board or housing can be replaced.

▪ Contact your local Bürkert sales office.

Spare part, panel version		Order code
	Mounting set (screws, washers, nuts, cable clips) (positions 1, 2, 3, 4)	554807
	Seal (position 5)	419350
	Set with 8 FLOW foils	553191
Spare part, wall-mounting version		Order code
	Power supply board 115/230 VAC + mounting instruction sheet	555722

Spare part, 8025 Batch compact version		Order code
	Electronic board mounted in the cover with lid, with window, foil and four screws (position 1)	425432
	Power supply board 115/230 VAC (position 2) + mounting instruction sheet	553168
	Set including:	449755
	▪ two M20x1,5 cable glands (position 3)	
	▪ two neoprene flat seals (position 5) for cable gland or screw plug	
	▪ two M20x1.5 screw plugs (position 6)	
	▪ two 2x6 mm multiway seals (position 8)	551782
	Set including:	
	▪ two M20x1,5 / NPT1/2" reductions (mounted o-ring seal) (position 4)	
	▪ two neoprene flat seals for plug (position 5)	
	▪ two M20x1.5 screw plugs (position 6)	551775
	Set including:	
	▪ one M20x1,5 cable gland stopper gasket (position 7)	
	▪ one multiway seal, 2x6 mm, for cable gland (position 8)	
	▪ one black EPDM seal (position 12) for the flow sensor	552111
	▪ one mounting instruction sheet	
	Housing (position 9) with snap ring and nut	
	Snap ring (position 10)	
	Nut (position 11)	418316
	Set including:	
	▪ one black EPDM seal (position 12) for the flow sensor	
	▪ one green FKM seal (position 12) for the flow sensor	
	Short flow sensor, Hall effect (position 13)	418324
	Long flow sensor, Hall effect (position 14)	
	Set with 8 FLOW foils	553191

Spare part 8035 Batch		Order code
	Electronic board mounted in the cover with lid, with window, foil and four screws (position 1)	425432
	Power supply board 115/230 VAC (position 2) + mounting instruction sheet	553168
	Set including: <ul style="list-style-type: none"> ▪ two M20x1,5 cable glands (position 3) ▪ two neoprene flat seals (position 5) for cable gland or screw plug ▪ two M20x1.5 screw plugs (position 6) ▪ two 2x6 mm multiway seals (position 8) 	449755
	Set including: <ul style="list-style-type: none"> ▪ two M20x1,5 / NPT1/2" reductions (mounted o-ring seal) (position 4) ▪ two neoprene flat seals for plug (position 5) ▪ two M20x1.5 screw plugs (position 6) 	551782
	Set including: <ul style="list-style-type: none"> ▪ one M20x1,5 cable gland stopper gasket (position 7) ▪ one multiway seal, 2x6 mm, for cable gland (position 8) ▪ one black EPDM seal (unused) ▪ one mounting instruction sheet 	551775
	Housing (position 9) with Hall effect flow sensor	425248
	Set with 8 FLOW foils	553191

12 PACKAGING, TRANSPORT

NOTE

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 that may exceed the admissible storage temperature range.
- ▶ Protect the electrical interfaces using protective plugs.

13 STORAGE

NOTE

Poor storage can damage the device.

- ▶ Store the device in a dry place away from dust.
- ▶ Storage temperature of the device: -10 to +60 °C.

14 DISPOSAL OF THE PRODUCT

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



note

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

