bürkert
FLUID CONTROL SYSTEMS

Type 8619
multiCELL

Modular transmitter/controller

Operating Instructions

MAN 1000139642 EN Version: E Status: RL (released | freigegeben) printed: 12.06.2014

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Operating Instructions 1404/4_EU-ML 00561096 Original_FR

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1 GENERAL INFORMATION

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1.1 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.

1.1.1 Symbols used

DANGER

Warns against an imminent danger.

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

WARNING

Warns against a potentially dangerous situation.

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

CAUTION

Warns against a possible risk.

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

NOTE:

Warns against material damage.

Important advice or recommendations.

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

→ Indicates a procedure to be carried out.

1.1.2 Definition of the word "device"

The word "device" used within this manual refers to the controller/transmitter type 8619.

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1.2 Intended use

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

- The device is intended, depending on the modules fitted and the measurement sensors connected, for the acquisition, processing, transmission and regulation of physical parameters such as pH, conductivity, temperature or flow rate... .
- 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.

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1.3 Basic safety information

This safety information does not take into account:

- any contingencies or occurrences that may arise during assembly, use and maintenance of the device.
- the local safety regulations that the operator must ensure the staff in charge of installation and maintenance observe.

Danger due to electrical voltage.

- If a 12-36 V DC version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

Various dangerous situations.

To avoid injury take care:

- to prevent any unintentional power supply switch-on.
- to carry out the installation and maintenance work by qualified and skilled staff with the appropriate tools.
- to guarantee a set 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 user manual.
- to observe the general technical rules during the planning and use of the device.
- not to use this device in explosive atmospheres.
- not to use this device in an environment incompatible with the materials from which it is made.
- not to subject the device to any mechanical stresses (for example by placing objects on top of it or using it as a step).
- not to make any external modifications to the device such as for instance painting or varnishing any part of 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 standards EN 61340-5-1 and 5-2.
- Also ensure that you do not touch any of the live electrical components.

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1.4 General information

1.4.1 Manufacturer's address and international contacts

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

Burkert SAS

Rue du Giessen

BP 21

F-67220 TRIEMBACH-AU-VAL

You may also contact your local Burkert sales office.

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

1.4.2 Warranty conditions

The condition governing the legal warranty is the conforming use of the multiCELL 8619 in observance of the operating conditions specified in this manual.

1.4.3 Information on the internet

You can find the operating instructions and technical data sheets regarding the type 8619 at: www.burkert.com

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2 PRODUCT DESCRIPTION

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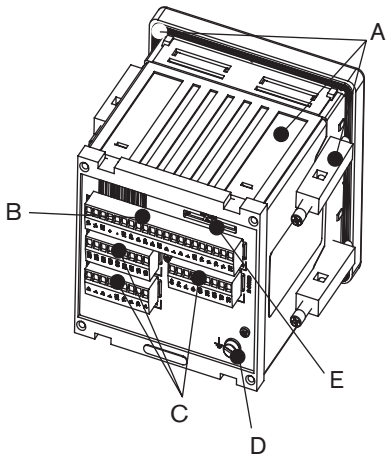
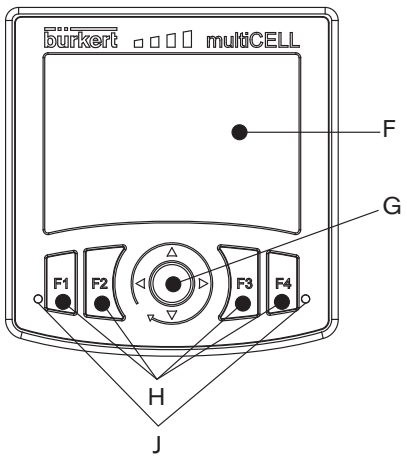
2.1 Area of application

The 8619 multiCELL is a multifunction device intended to display, transmit and regulate various physical parameters. It can be used, for example, to manage a water treatment system (a boiler, a cooling tower or a reverse osmosis system).

2.2 Construction of a panel-mounting version





A: standardised 1/4 DIN housing (92x92 mm) with seal, to be mounted in the door of the electrical enclosure or cabinet and attached using 4 fasteners.

B: a main board (identified by "M0" on the rear plate):

- To connect the electrical power source of the multiCELL;
- to power another device, e.g. a flow-rate sensor;
- offering 2 digital inputs (identified by "DI", digital input), two 4-20 mA current outputs (identified by "AO", analogue output) and 2 digital outputs (identified by "DO", digital output).

C: 1 to 6 slots for placing the following connection modules:

- module with light grey connector for connection of a pH sensor or oxidation reduction potential sensor and/or a temperature sensor
- module with green connector for connection of a conductivity sensor and/or a temperature sensor
- module with black connector with two 4-20 mA current outputs and 2 digital outputs.
- module with orange connector with two analogue inputs and 2 digital inputs.

D: functional earth screw (connected internally to all "FE" terminals on the main board and additional modules).

E: memory card (SD type) reader/recorder

F: display with backlight.

G: navigation button (4 directions).

H: 4 dynamic keys

J: 2 LEDs

Fig. 1 : Construction of a panel-mounting version of the 8619

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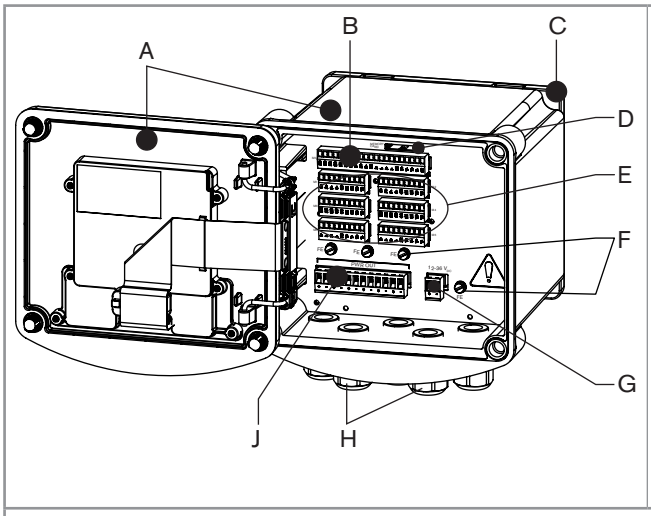
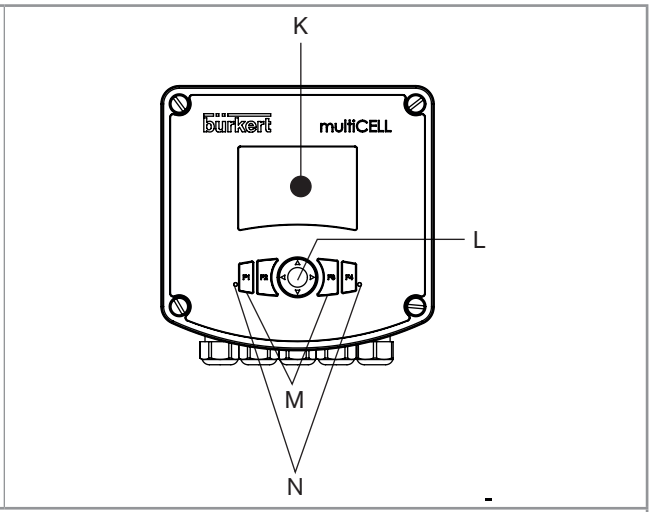
2.3 Construction of a wall-mounting version, 12-36 V DC





A: Wall-mounting housing; Cover with seal, closed by 4 screws; Display with navigation components and LEDs.
B: main board (identified by "M0" on the plate) with two digital inputs (identified by "DI", digital input), two 4-20 mA current outputs (identified by "AO", analogue output) and two digital outputs (identified by "DO", digital output).
C: Wall-mounting plate, removable
D: memory card (SD type) reader/recorder
E: 6 slots for placing the following connection modules: ▪ module with light grey connector for connection of a pH sensor or oxidation reduction potential sensor and/or a temperature sensor; ▪ module with green connector for connection of a conductivity sensor and/or a temperature sensor; ▪ module with black connector with two 4-20 mA current outputs and two digital outputs; ▪ module with orange connector with two analogue inputs and two digital inputs. If a slot is unused, a cap blanks off the opening
F: functional earth screw (connected internally to all "FE" terminals on the main board and additional modules).
G: Connection terminal board for the 12-36 V DC power supply
H: 5 M20 x 1.5 cable glands
J: supply and distribution board
K: display with backlight.
L: navigation button (4 directions).
M: 4 dynamic keys
N: 2 LEDs

Fig. 2 : Construction of a wall-mounting version of the 8619, 12-36 V DC

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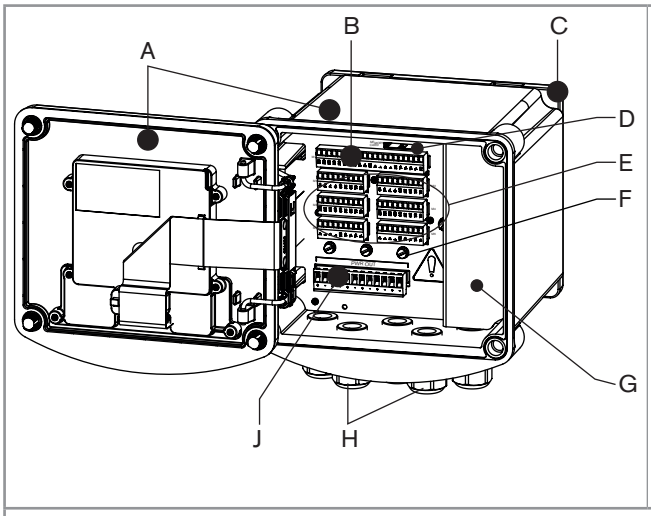
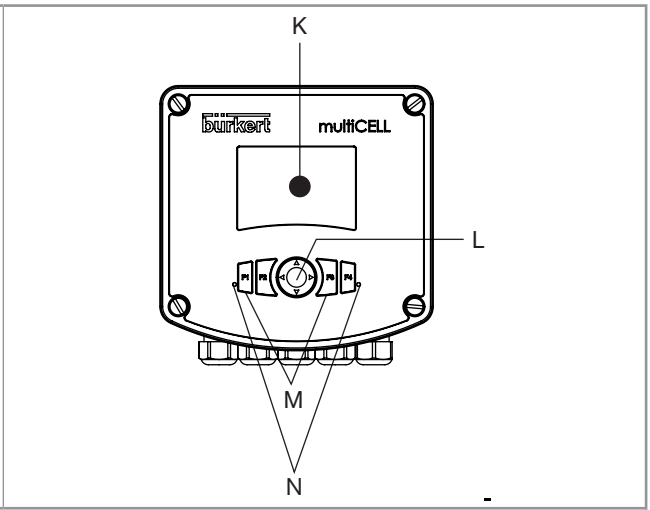
2.4 Construction of a wall-mounting version, 110-240 V AC





A: Wall-mounting housing; Cover with seal, closed by 4 screws; Display with navigation components and LEDs.
B: main board (identified by "M0" on the plate) with two digital inputs (identified by "DI", digital input), two 4-20 mA current outputs (identified by "AO", analogue output) and two digital outputs (identified by "DO", digital output).
C: Wall-mounting fastening plate, removable
D: Memory card (SD type) reader/recorder
E: 6 slots for placing the following connection modules: ▪ module with light grey connector for connection of a pH sensor or oxidation reduction potential sensor and/or a temperature sensor; ▪ module with green connector for connection of a conductivity sensor and/or a temperature sensor; ▪ module with black connector with two 4-20 mA current outputs and two digital outputs. ▪ module with orange connector with two analogue inputs and two digital inputs. If a slot is unused, a cap blanks off the opening
F: functional earth screw (connected internally to all "FE" terminals on the main board and additional modules).
G: Protective cap for the 110-240 V AC power supply terminal board
H: 5 M20 x 1.5 cable glands
J: supply and distribution board
K: display with backlight.
L: navigation button (4 directions).
M: 4 dynamic keys
N: 2 LEDs

Fig. 3 : Construction of a wall-mounting version of the 8619, 110-240 V AC

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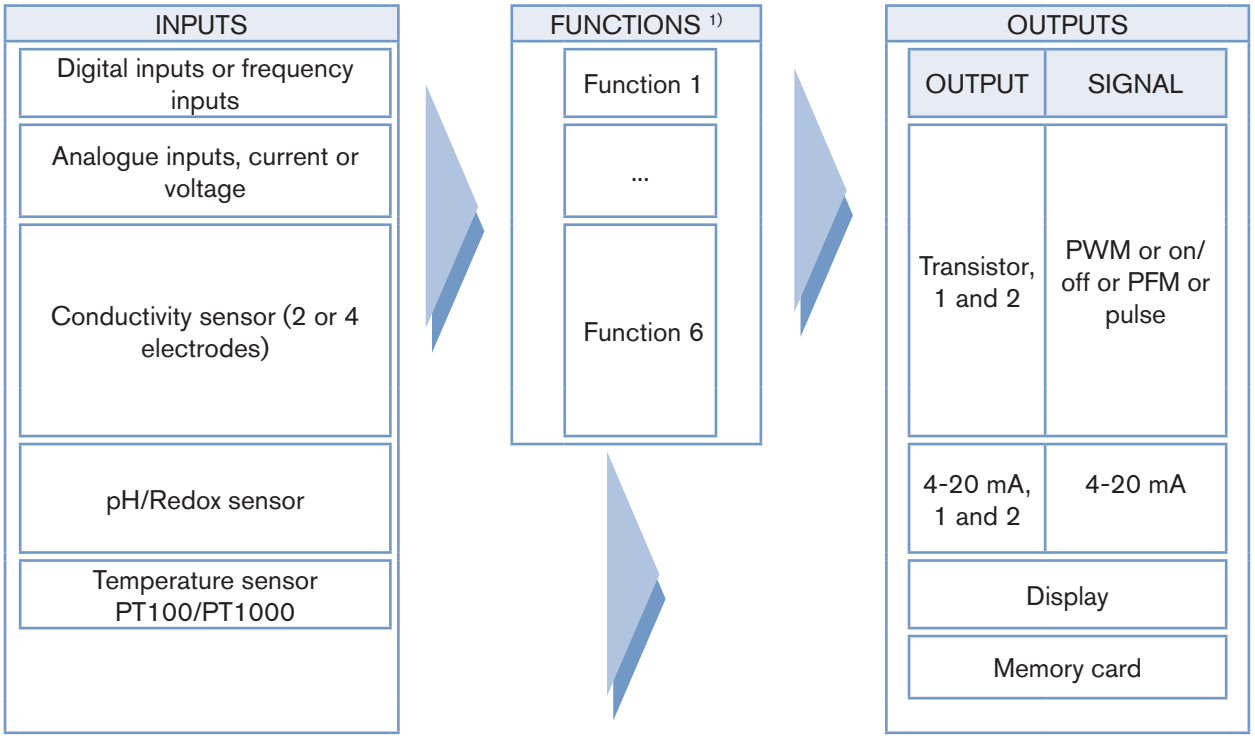
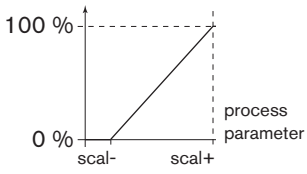
2.5 Functional diagram



1) simultaneously active

2.6 Functional description

The multiCELL assigns each input to a function (such as dosing, for example) which is entirely configurable by the user. According to the model selected, the following are offered as basic or optional functions:

Function	Availability	Formula	Use
Arithmetic	Standard on all models	A+B, A-B, A/B	Arithmetic operation between two values having the same units. A or B may be the result of another function.
PASS	Standard on all models	A/B x 100%	Calculation of the passage rate.
REJECT	Standard on all models	(1 - A/B) x 100 %	Calculation of the rejection rate.
DEVIAT	Standard on all models	(A/B - 1) x 100 %	Calculation of the deviation rate.
PROP (proportional)	Standard on all models		Calculation of an output proportional to a bounded input.
ON/OFF	Standard on all models	ON/OFF control	For all input types.

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Function	Availability	Formula	Use
Flow rate measurement	▪ Standard on models 560205, 560213, 565984 à 565987 ▪ Optional (see section 5.10.4) on all other models		Each digital input can be used to measure the flow rate.
PID	Optional (see section 5.10.4)	Continuous regulation	For all input types; with internal or external setpoint.
Time dosing	Optional (see section 5.10.4)		In a cooling tower, for example; used to dose 2 products at fixed intervals or for twice daily dosing scheduled over one week. The time dosing function can be combined with an ON/OFF function on a conductivity measurement only, in order to ensure pre-purging of the system. The "ON/OFF" function must be configured and activated before the time dosing function.
Volume dosing	Optional (see section 5.10.4)		dedicated to the cooling towers. Metering of a specific volume of water and activation of an actuator during a specific period in order to add a product and, finally, reset of the water volume to zero.
Concentration	Optional (see section 5.10.4)		The concentration graphs for certain compounds such as NaCl and H_2SO_4 are memorised for use over the entire concentration range.
Datalogger on memory card	Optional (see section 5.10.4)		Option to memorise the variations in 1 to 16 values in a given time interval.

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2.7 Description of the name plate

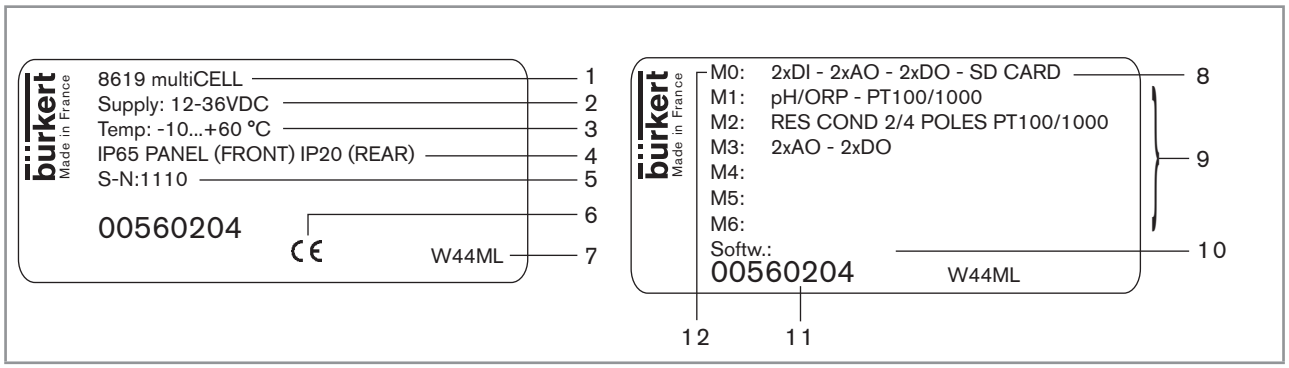

Fig. 4 : Example of a name plate

1. Type of device
2. Electrical power supply
3. Ambient temperature range
4. Protection rating
5. Serial number
6. Conformity logo
7. Construction code
8. Device fitted with a memory card reader
9. Characteristics of the connection modules
10. Software options
11. Order code
12. Properties of the main "M0" board

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3 TECHNICAL DATA

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3.1 Conditions of use of the panel-mounting version, 12-36 V DC

Ambient temperature ▪ without connection module [1)] ▪ with connection module [1)]	 ▪ -10 to +70 °C ▪ -10 to +60 °C
Air humidity	< 85 %, not condensing
Height above sea level	max. 2000 m
Protection rating	▪ IP65 and NEMA4X on front, once mounted, and electrical enclosure closed ▪ IP20 for the parts inside the electrical enclosure
Pollution degree	Degree 2 according to UL 61010-1
Category of installation	Category 1 according to UL 61010-1

[1)] with a memory card available as an accessory (order reference 564072). If a different memory card is used, observe the operating temperatures given by the manufacturer of the memory card.

3.2 Conditions of use, wall-mounting version, 12-36 V DC

Ambient temperature ▪ without connection module [1)] ▪ with connection module [1)]	 ▪ -10 to +75 °C ▪ -10 to +60 °C
Air humidity	< 85 %, not condensing
Height above sea level	max. 2000 m
Protection rating	IP65, IP67 and NEMA4X, if the following conditions are met: ▪ Body of the cable glands tightened with a torque of 5.5 Nm ± 20 % at the factory. ▪ Cable glands blanked off or wired. ▪ Screws of the cable glands tightened with a torque of 4.5 Nm ± 20 %. ▪ Housing closed. ▪ The 4 screws for the cover are tightened crosswise with a torque of 1.4 Nm ± 20 %.
Pollution degree	Degree 2 according to UL 61010-1
Category of installation	Category I according to UL 61010-1

[1)] with a memory card available as an accessory (order reference 564072). If a different memory card is used, observe the operating temperatures given by the manufacturer of the memory card.

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3.3 Conditions of use, wall-mounting version, 110-240 V AC

Observe the maximum permissible load as a function of the ambient temperature. See the derating curves Fig. 9, section 3.9.

Ambient temperature	-10 to +70 °C [1]
Air humidity	< 85 %, not condensing
Height above sea level	max. 2000 m
Protection rating, panel-mounting version	IP65, IP67 and NEMA4X, if the following conditions are met: ▪ Body of the cable glands tightened with a torque of 5.5 Nm ± 20 % at the factory. ▪ Cable glands blanked off or wired. ▪ Screws of the cable glands tightened with a torque of 4.5 Nm ± 20 %. ▪ Housing closed. ▪ The 4 screws for the cover are tightened crosswise with a torque of 1.4 Nm ± 20 %.
Pollution degree	Degree 2 according to UL 61010-1
Category of installation	Category II according to UL 61010-1

[1] with a memory card available as an accessory (order reference 564072). If a different memory card is used, observe the operating temperatures given by the manufacturer of the memory card.

3.4 Compliance to standards and directives

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

- EMC: EN 61000-6-2, EN 61000-6-3
- Resistance to vibrations EN 60068-2-6
- Resistance to shocks: EN 60068-2-27
- For the wall-mounting version, 110-240 V AC: Low voltage directive

The UL devices with command key PE72 (identified by the logo c UL us) and the UL devices with command key PU02 (identified by the logo c UL us), for the United States and Canada, comply with the following standards:

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

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3.5 Mechanical data

Tab. 1 : Materials in contact with the ambient air

Component	Material	
	Panel-mounting version	Wall-mounting version
Panel-mounting housing and fastener	PPO	-
Wall-mounting housing, wall-mounting fastening plate, cable glands, protective cap (for LCD display), protective blank (for a slot without connection terminal), hinge stiffener.	-	PA66
Seal	Silicone	
Front panel and keys	PC/silicone	
Terminal support plate	Stainless steel 304	
Terminal blocks	PBT, contacts in gold-plated copper alloy	
Ground screw + spring washer	Stainless steel 316 (A4)	
Protective cap for the 110-240 V AC power supply terminal board	-	Stainless steel 304
4 cover screws	-	PVC

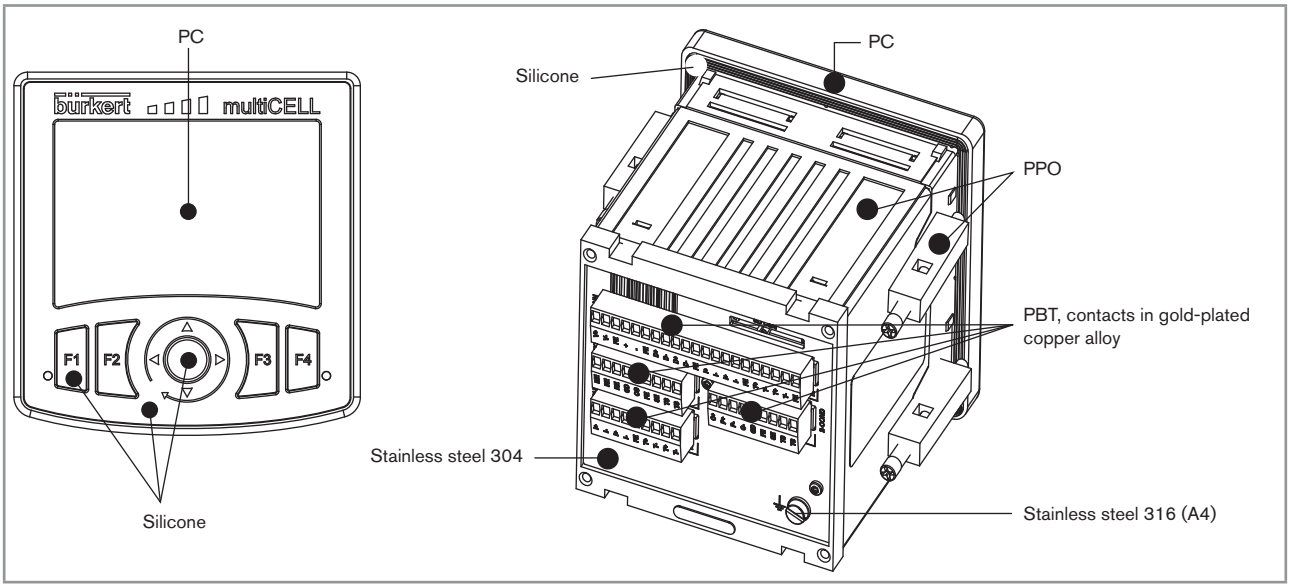

Fig. 5 : Component materials of the panel-mounting version of the multiCELL

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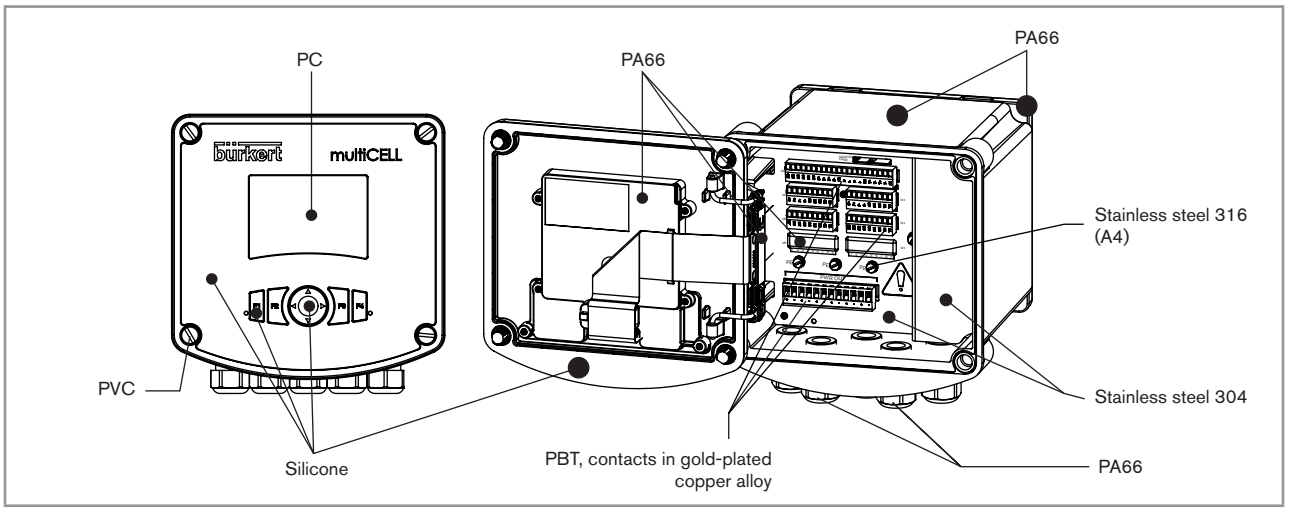

Fig. 6 : Component materials of the wall-mounting version of the multiCELL

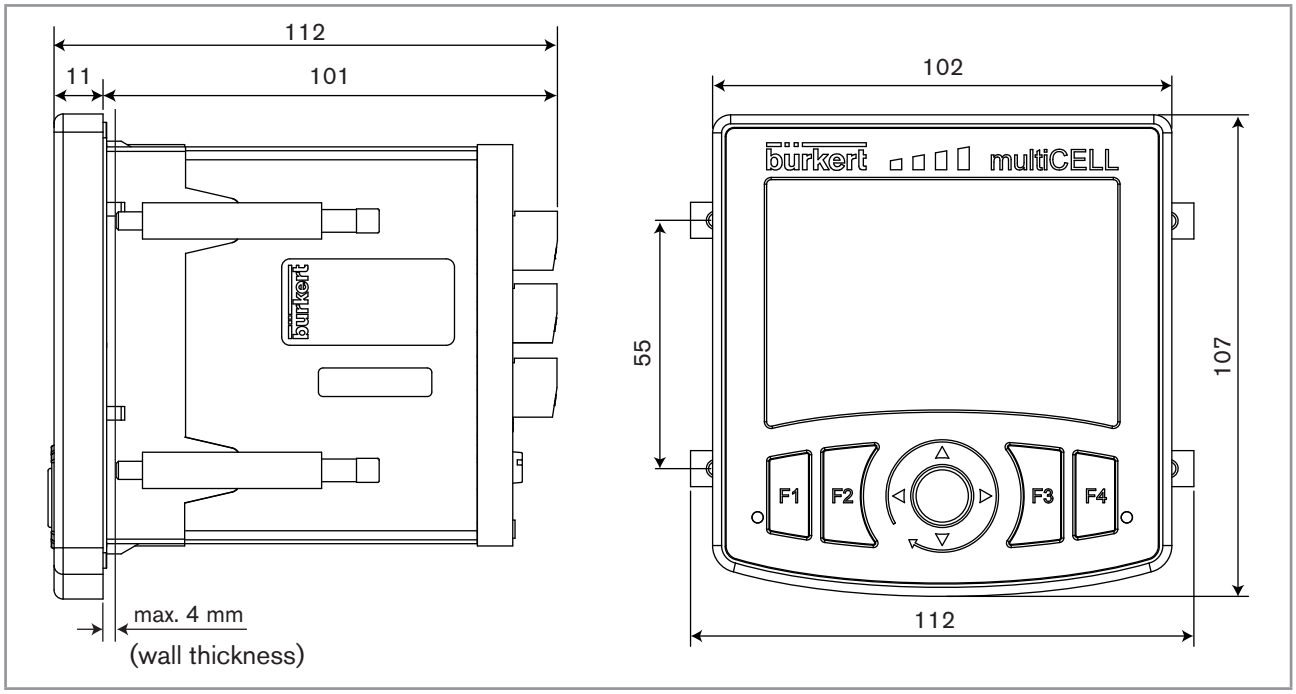

Fig. 7 : Dimensions for the panel-mounting version of the multiCELL [mm]

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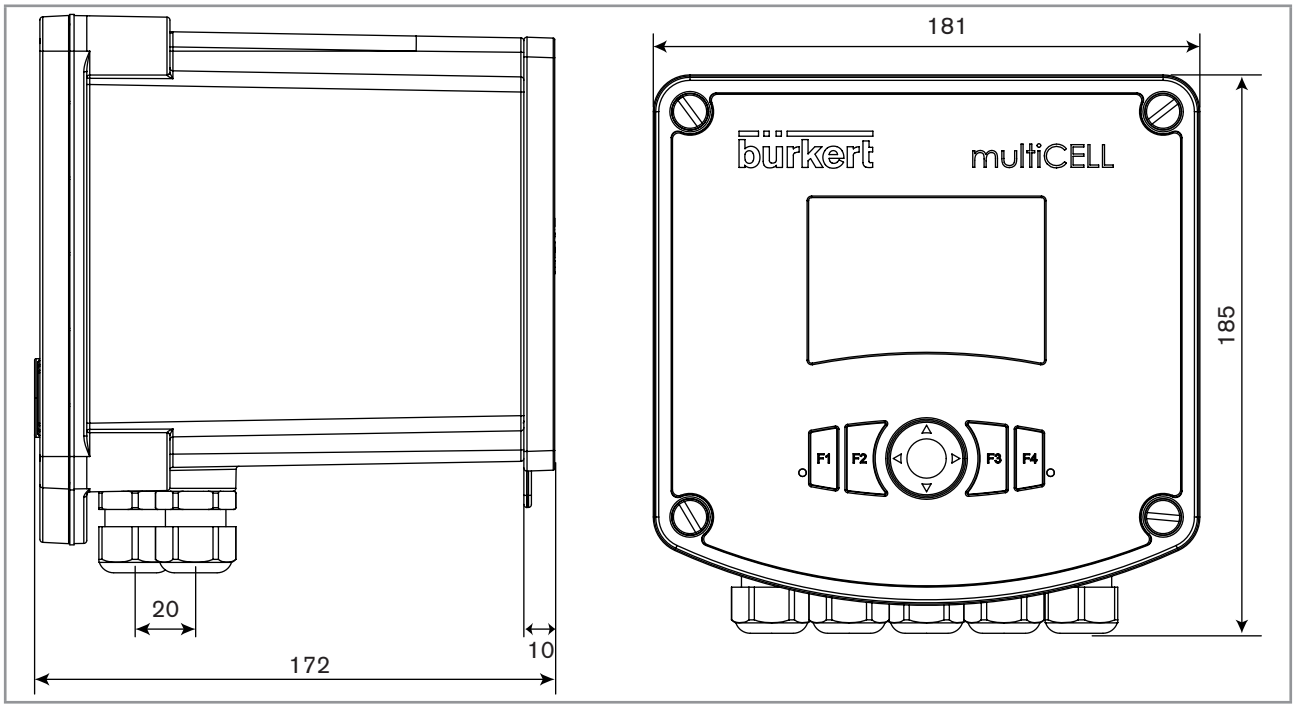

Fig. 8 : Dimensions for the wall-mounting version of the multiCELL [mm]

3.6 Specifications of the "M0" main board, panel-mounting version

Electrical supply 12-36 V DC	▪ filtered and regulated ▪ SELV circuit, at a non-hazardous energy level ▪ Tolerance: ±10 %
Specifications of the 12-36 V DC power source (not provided) of the UL devices, with variable key PE72	▪ Limited power source (in accordance with section 9.3 of the UL 61010-1 standard) ▪ or class 2 type power source (according to the 1310/1585 and 60950-1 standards)
Own consumption (without connection module, outputs not connected)	1.5 VA
Power distribution ("PWR OUT")	▪ 12-36 V DC, 1.8 A max. ▪ Protected against polarity reversal
All digital inputs ("DI")	▪ Switching threshold V_{on}: 5 to 32 V DC ▪ Switching threshold V_{off}: < 2 V DC ▪ Input impedance: 3 kΩ ▪ Galvanically isolated ▪ Protected against polarity reversal and voltage spikes ▪ Frequency: 0.5 to 2500 Hz

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All analogue outputs ("AO")	▪ 4-20 mA current ▪ Any connection mode, in sink or source mode ▪ Galvanically isolated ▪ Protected against polarity reversal ▪ Max. loop impedance 1100 Ω to 36 V DC, 610 Ω to 24 V DC, 100 Ω to 12 V DC
All digital outputs ("DO")	▪ Transistor ▪ Any connection mode, in NPN or PNP mode ▪ Galvanically isolated ▪ Protected against short circuits ▪ Max. voltage: 36 V DC ▪ Max. 700 mA per transistor; total of max. 1A if both transistors are connected ▪ Max. frequency 2000 Hz
Flow rate measurement	Refer to the user manual for the flow sensor connected to the 8619

3.7 Specifications of the "M0" main board, wall-mounting version

All digital inputs ("DI")	▪ Switching threshold V_{on}: 5 to 32 V DC ▪ Switching threshold V_{off}: < 2 V DC ▪ Input impedance: 3 kΩ ▪ Galvanically isolated ▪ Protected against polarity reversal and voltage spikes ▪ Frequency: 0.5 to 2500 Hz
All analogue outputs ("AO")	▪ 4-20 mA current ▪ Any connection mode, in sink or source mode ▪ Galvanically isolated ▪ Protected against polarity reversal ▪ Max. loop impedance 1100 Ω to 36 V DC, 610 Ω to 24 V DC, 100 Ω to 12 V DC

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All digital outputs ("DO")	▪ Transistor ▪ Any connection mode, in NPN or PNP mode ▪ Galvanically isolated ▪ Protected against short circuits ▪ Max. voltage: 36 V DC ▪ Max. 700 mA per transistor; total of max. 1A if both transistors are connected ▪ Max. frequency 2000 Hz
Flow rate measurement (software option)	Refer to the user manual for the flow sensor connected to the 8619

3.8 Specifications of the power supply board, wall-mounting version

Electrical supply 12-36 V DC	▪ filtered and regulated ▪ SELV circuit, at a non-hazardous energy level ▪ Tolerance: ±10 %
Specifications of the 12-36 V DC power source (not provided) of the UL devices, with variable key PU02	▪ Limited power source (in accordance with section 9.3 of the UL 61010-1 standard) ▪ or class 2 type power source (according to the 1310/1585 and 60950-1 standards)
Electrical supply 110-240 V AC ▪ Frequency ▪ Max. current ▪ integrated protection	 ▪ 50/60 Hz ▪ 500 mA ▪ delayed 3.15 A fuse
Own consumption (without connection module, outputs not connected)	2 VA

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3.9 Specifications of the "POWER OUT" power distribution board, wall-mounting version

Observe the maximum permissible load as a function of the ambient temperature. See the derating curves Fig. 9.

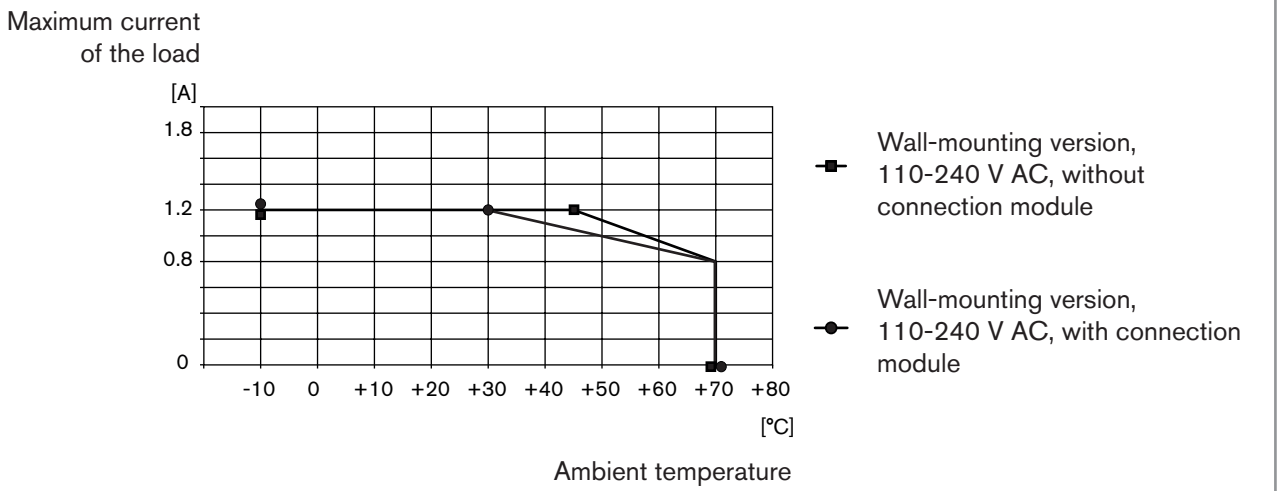

Fig. 9 : Derating curves of the maximum permissible current, depending on the ambient temperature

Power distribution ▪ 12-36 V DC version ▪ 110-240 V AC version	Protected against polarity reversal ▪ 12-36 V DC, 1.8 A max. ▪ 24 V DC, filtered and regulated, 1,2 A max.: see the curves in Fig. 9. SELV circuit, at a non-hazardous energy level

3.10 Specifications of the "Input" board

Power consumption	0.1 VA
Digital inputs ("DI")	▪ Switching threshold V_{on}: 5 to 32 V DC ▪ Switching threshold V_{off}: < 2 V DC ▪ Input impedance: 3 kΩ ▪ Galvanically isolated ▪ Protected against polarity reversal and voltage spikes ▪ Frequency: 0.5 to 2500 Hz

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Analogue inputs ("AI")	▪ Any connection mode, in sink or source mode ▪ Galvanically isolated ▪ Precision ±0.25 % ▪ Current: 0 - 22 mA or 3.5 - 22 mA. Max. voltage: 36 V DC. Impedance: 50 Ω. Resolution: 1.5 µA ▪ Voltage: 0 - 5 V DC or 0 - 10 V DC. Max. voltage: 36 V DC. Impedance: 110 kΩ. Resolution: 1 mV

3.11 Specifications of the memory card reader/recorder

▪ Memory card type	▪ SD (Secure Digital) or SDHC (Secure Digital High Capacity)
▪ Capacity	▪ 8 GB max.
▪ File system	▪ FAT32

3.12 Specifications of the outputs board "OUT"

Power consumption	0.1VA
All digital outputs ("DOx")	▪ Transistor ▪ Any connection mode, in NPN or PNP mode ▪ Galvanically isolated ▪ Protected against short circuits ▪ Max. voltage: 36 V DC ▪ Max. 700 mA per transistor; total of max. 1A if both transistors are connected ▪ Max. frequency 2000 Hz
All analogue outputs ("AOx")	▪ 4-20 mA current ▪ Any connection mode, in sink or source mode ▪ Galvanically isolated ▪ Protected against polarity reversal ▪ Max. loop impedance 1100 Ω to 36 V DC, 610 Ω to 24 V DC, 100 Ω to 12 V DC

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3.13 Specifications of the "pH/redox" module

pH measurement ▪ pH measurement range ▪ Resolution of pH measurement ▪ Systematic variation in the pH measurement ▪ Potential difference measurement range ▪ Resolution of the potential difference measurement ▪ Systematic variation in the potential difference measurement ▪ pH probe type	 ▪ -2.00...+16.00 pH ▪ 0.01pH ▪ ±0.02 pH + pH probe error ▪ -600...+600 mV ▪ 0.1 mV ▪ ±1 mV + pH probe error ▪ Electrochemical
Power consumption	0.1VA
Measurement of the oxidation reduction potential ▪ Oxidation reduction potential measurement range ▪ Resolution of the potential difference measurement ▪ Systematic variation in the potential difference measurement ▪ Oxidation reduction potential probe type	 ▪ -2000 ... +2000 mV ▪ 0.1 mV ▪ ±1 mV + ORP probe error ▪ Electrochemical
Temperature measurement ▪ Measurement range ▪ Measurement resolution ▪ Systematic variation in the measurement ▪ Temperature sensor type	 ▪ -25 °C ... +130 °C ▪ 0.1 °C ▪ ±1 °C + temperature probe error ▪ Pt100 or Pt1000, with 2 or 3 wires

3.14 Specifications of the "COND" conductivity module

Resistance measurement (without conductivity sensor connected)	5 Ω ... 1 MΩ
Power consumption	0.25VA
Conductivity cell type	With 2 or 4 electrodes; the specifications of Bürkert cells are described in the related operating instructions.

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Conductivity measurement (with connected conductivity sensor)	
▪ Measurement range	▪ 0.000 µS/cm ... 2 S/cm (depends on the conductivity sensor)
▪ Measurement resolution	▪ 10^{-9} S/cm
▪ Systematic variation in the measurement	▪ ±0.5% of the measured value + conductivity sensor error
Resistivity measurement (with connected conductivity sensor)	
▪ Measurement range	▪ 0.500 Ω.cm ... 100 MΩ.cm (depends on the conductivity sensor)
▪ Measurement resolution	▪ 10^{-1} Ω.cm
▪ Systematic variation in the measurement (without sensor)	▪ ±0.5% of the measured value + conductivity sensor error
Temperature measurement	
▪ Measurement range	▪ -40 °C ... ±200 °C
▪ Measurement resolution	▪ ±0.1 °C
▪ Systematic variation in the measurement	▪ ±1 °C + temperature probe error
▪ Temperature sensor type	▪ Pt100 or Pt1000, with 2 or 3 wires

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4 INSTALLATION AND WIRING

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4.1 Safety instructions

DANGER

Risk of injury due to electrical voltage.

- If a 12-36 V DC version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

WARNING

Risk of injury due to nonconforming installation.

- Electrical installation can only be carried out by qualified and authorised personnel with the appropriate tools.
- Fit a circuit breaker or switch to the electrical installation of the building in which the device is installed.
- Install the circuit breaker or switch in an easily accessible place.
- Identify the circuit breaker or switch as the disconnecting component for the electrical power supply to the device.
- Install appropriate safety devices (correctly rated fuse and/or circuit-breaker).
- Do not power the 24 V DC version of the device with an AC voltage or with a DC voltage higher than 36V DC.
- Do not power the 100-240 V AC version with an DC voltage or with a AC voltage higher than 240 V DC.
- For a version powered by 110-240 V AC, insert an overload device between the live and the neutral.
- Observe standard NF C 15-100 / IEC 60634.
- The use of probes/sensors sold by Bürkert is preferable.
- Follow the instructions for installation and wiring of remote sensors connected to the multiCELL.

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

- Avoid unintentional activation of the installation.
- Guarantee a set or controlled restart of the process subsequent to the installation of the device.

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

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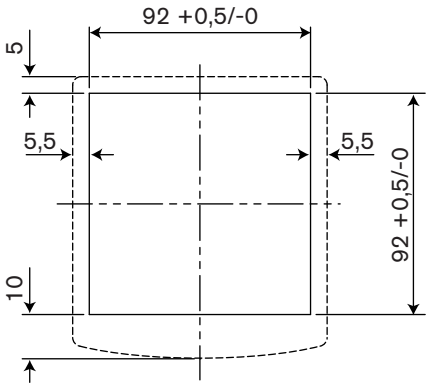
4.2 Installation procedure

1. To carry out mechanical installation: Depending on the version, follow the instructions in section 4.2.1 or 4.2.2.
2. To wire the device: Depending on the version, follow the instructions in section 4.3.

4.2.1 Installing a panel-mounting version on an enclosure or electrical cabinet

→ Follow the instructions below to mount the multiCELL, delivered fully assembled, onto an enclosure or cabinet.



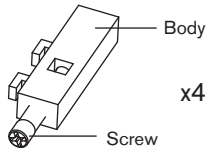
This diagram is not to scale. The dimensions are given in mm.

Step 1:

→ Check that the thickness of the door of the enclosure or cabinet is no more than 4 mm.

→ Ensure there will be sufficient space around the cut out hole and on the inside of the cabinet to easily accommodate the 4 fasteners.

→ Cut a hole in the door of the enclosure or electrical cabinet according to standard CEI 61554:1999 (DIN 43700).

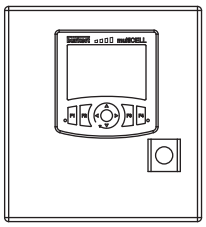


Step 2:

Prepare the 4 fasteners:

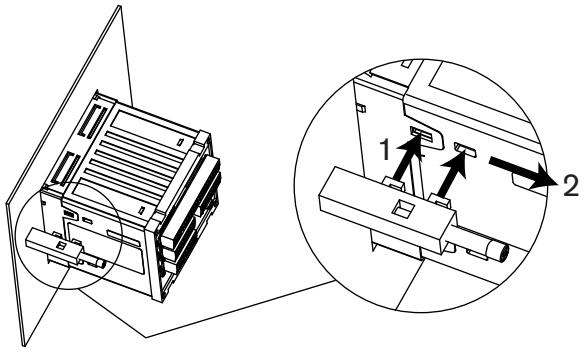
→ Insert a screw into each device.

→ Tighten the screw until the end of the shaft of the screw is flush with the device.



Step 3:

→ Slide the housing into the cut-out with the connectors to the back, until it can go no further.



Step 4:

→ Insert (1) the hooks on the first fastener into the slots on the housing.

→ Pull the fastener (2).

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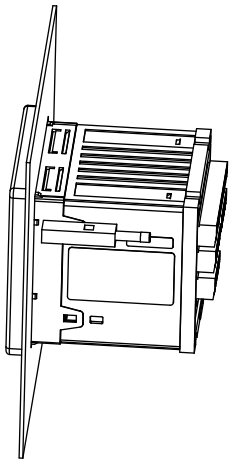
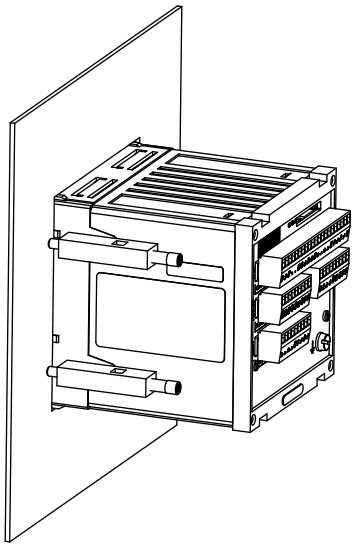
	Step 5: → Place the fastener flush against the multiCELL by hand, so that the hooks remain in place. Step 6: → Fully tighten the screws using an appropriate screwdriver.
	→ Repeat steps 4 to 6 to fit the remaining 3 fasteners.

Fig. 10 : Panel mounting of the 8619 on an enclosure or cabinet

4.2.2 Installing a wall-mounting version on a support

NOTE

Risk of material damage the cable glands are loosened. The body of the cable glands are screwed into the housing at the factory with a torque of 5.5 Nm

▸ Before installing the wall-mounting housing on its support, check that the bodies of the cable glands are tightened. If the bodies of the cable glands are loose, tighten them with a torque of 5.5 Nm ± 20 %.

The wall-mounting version is installed on a support using the wall-mounting fastening plate.

→ Choose a location such that:

- The surface is plane.
- The surface temperature of the support remains below 100 °C.
- The display is at eye level.
- There is sufficient space to open the housing by 180°.

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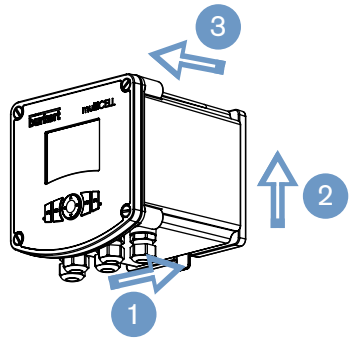
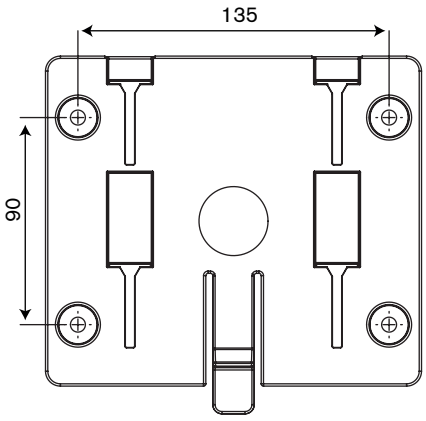
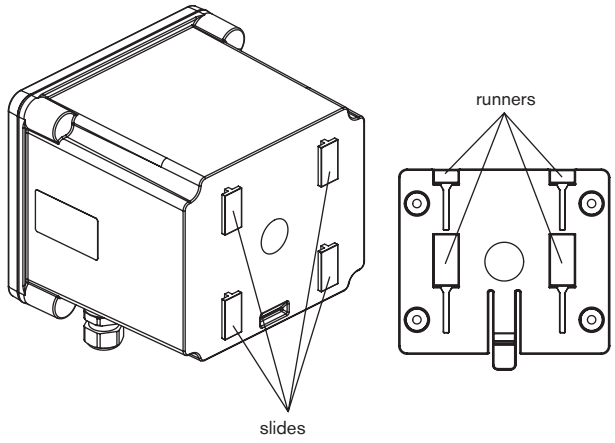
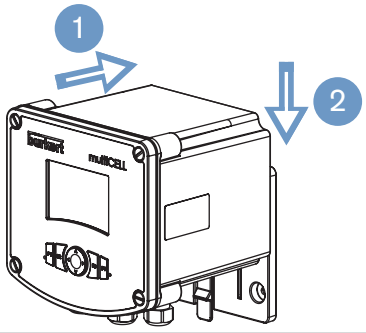
	Step 1: Removing the wall-mounting fastening plate from the device. 1. Press the tab to unlock the device. 2. Lift the device. 3. Separate the device from the wall-mounting fastening plate.
 This diagram is not to scale. The dimensions are given in mm.	Step 2: Installing the wall-mounting fastening plate on the support. The screws and washers are not provided. → Drill holes in the support according to the dimensions indicated on the diagram to the left. → Use 4 screws of 6 mm diameter, which will support the weight of the device and are suitable for the support. → Insert a washer for each screw. → Insert the 4 screws in the wall-mounting fastening plate and in the holes drilled in the support. → Tighten the 4 screws in a crosswise manner, with a maximum torque of 5.3 Nm.
	Step 3: Installing the device on the fastening plate. → Align the base of the slides with the height of the runners.
	→ Insert the 4 slides into the 4 runners until you hear a click.

Fig. 11 : Installation of a wall-mounting version on a support

4.3 Electrical wiring

DANGER

Risk of injury due to electrical voltage.

- If a 12-36 V DC version is installed either in a wet environment or outdoors, all the electrical voltages must be of max. 35 V DC.
- Disconnect the electrical power for all the conductors and isolate it before carrying out work on the system.
- Observe all applicable accident protection and safety regulations for electrical equipment.

4.3.1 Recommendations for wiring a wall-mounting version

NOTE

On a wall-mounting version, the ribbon cable which connects the display to the electronic board can be damaged.

- Open and close the cover of the housing with care.
- Do not pinch the ribbon cable.
- Do not pull the ribbon cable.
- Manipulate the ribbon cable with care.
- If the ribbon cable is disconnected, reconnect it with care.

NOTE

An unsealed wall-mounting version of the device may become damaged.

- Make sure the nuts of the unused cable glands are tightened (at the factory, a stopper gasket has been inserted in each cable gland).
- When the mechanical installation and wiring are completed, tighten the cable gland screws with a torque of 4.5 Nm ± 20 %.
- When the mechanical installation and wiring are completed, tighten the 4 screws of the cover in a crosswise manner with a torque of 1.4 Nm ± 20 %.

→ Before wiring the device, install it according to the instructions in section 4.2.1 or section 4.2.2.

4.3.2 Specifications of the connection cables

The electrical connections are carried out via terminal blocks:

- Directly, on a panel-mounting version.
- Via the cable glands, on a wall-mounting version.

→ Use shielded cables (not provided) with a maximum operating temperature greater than 80 °C.

→ Use cables and electric wires with dimensions that adhere to the specifications described in Tab. 2.

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Tab. 2 : Specifications of the cables and conductors

External diameter of the cable (wall-mounting versions)	6 to 12 mm (4 mm if using multiply drilled seals)
Cross-section of the local earth connection conductor (12-36 V DC versions)	0.75 ... 1.5 mm²
Rigid conductor cross-section H05(07) V-U	0.2 ... 1.5 mm², stripped over 7 mm
Flexible conductor cross-section H05(07) V-K	0.2 ... 1.5 mm², stripped over 7 mm
Cross-section of a conductor with a non-insulated lug	0.2 ... 1.5 mm², stripped over 7 mm
Cross-section of a conductor with an insulated lug	0.2 ... 0.75 mm², stripped over 7 mm

4.3.3 Wiring the 12-36 V DC electrical supply for a panel-mounting version

→ Use a filtered and regulated 12-36 V DC electrical power supply.

→ Wire the 12-36 V DC power supply on the "M0" terminal board of a panel-mounting version.

→ Connect the functional earth of the installation to the earth screw of the device (see section 2.2, Fig. 1) using a lug with an eyelet, suitable for the M4 earth screw and earth conductor. Tighten with a torque of 1 Nm ± 20 %.

→ Connect the shielding on each wire to an "FE" (functional earth) terminal to guarantee the equipotentiality of the installation.

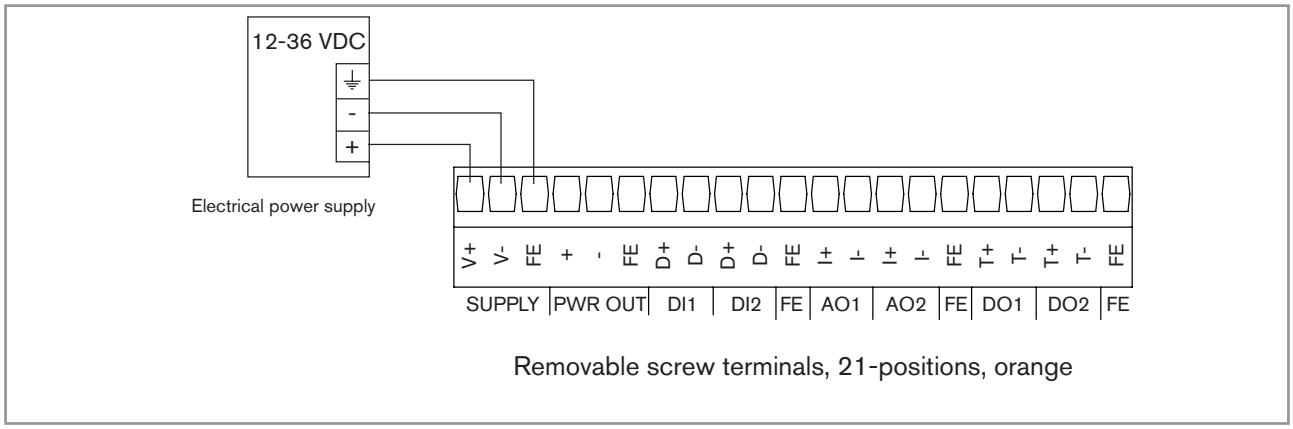

Fig. 12 : Wiring the 12-36 V DC electrical supply for a panel-mounting version

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4.3.4 Wiring the 12-36 V DC electrical supply for a wall-mounting version

→ Use a filtered and regulated 12-36 V DC electrical power supply.

→ Use the rightmost cable gland for the electrical power supply cable.

→ Wire the 12-36 V DC power supply for a wall-mounting version on a terminal block marked 12-36 V DC.

→ Connect the functional earth of the installation to the earth screw of the device (see section 2.3, Fig. 2) using a lug with an eyelet, suitable for the M4 earth screw and earth conductor. Tighten with a torque of 1 Nm ± 20 %.

→ Connect the shielding on each wire to an "FE" (functional earth) terminal to guarantee the equipotentiality of the installation.

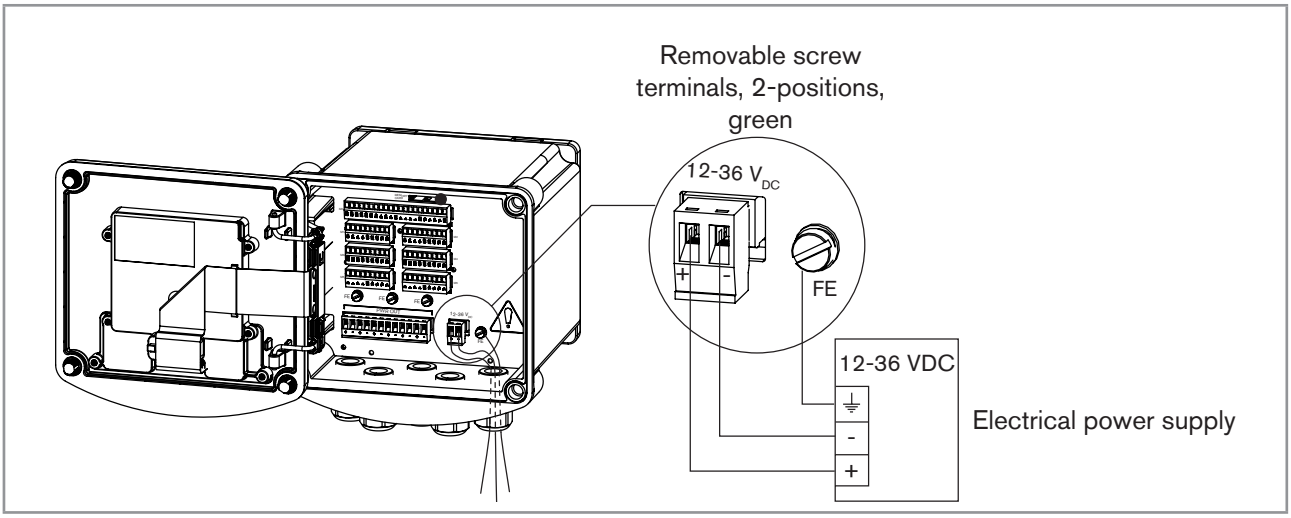
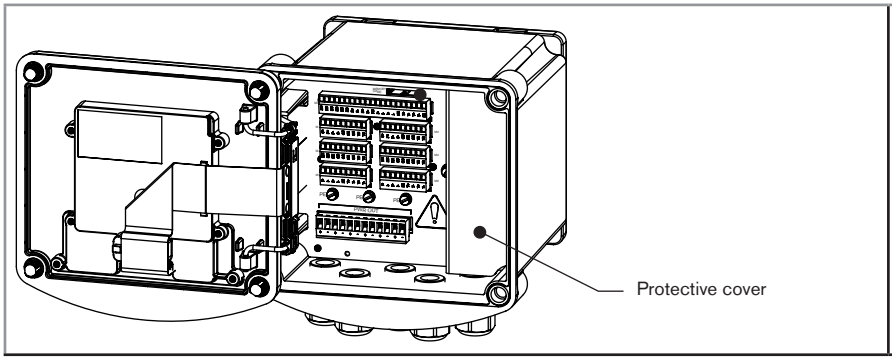


Fig. 13 : Wiring the 12-36 V DC electrical supply for a wall-mounting version

4.3.5 Wiring the 110-240 V AC electrical supply for a wall-mounting version



→ Unscrew and remove the protective cover of the power supply connection terminal block.

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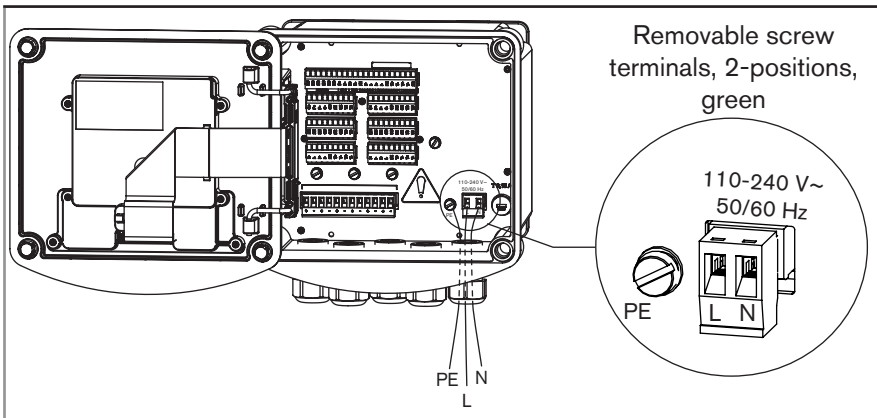

→ Use the rightmost cable gland for the electrical power supply cable.

→ Wire the 110-240 V AC power supply for a wall-mounting version on a terminal block marked 110-240 V AC.

→ Connect the protective earth of the installation to the earth screw of the device (see section 2.4, Fig. 3) using a lug with an eyelet, suitable for the M4 earth screw and earth conductor. Tighten with a torque of 1 Nm ± 20 %.

L: Live conductor

N: Neutral conductor

→ Put in place and screw on the protective cover.

Fig. 14 : Wiring the 110-240 V AC electrical supply for a wall-mounting version

4.3.6 Supplying an external instrument via a panel-mounting version

The device can be used to supply an external instrument, for example a flow sensor, with a voltage identical to the supply voltage of the 8619

The power supply is available on the "M0" terminal block of a panel-mounting version.

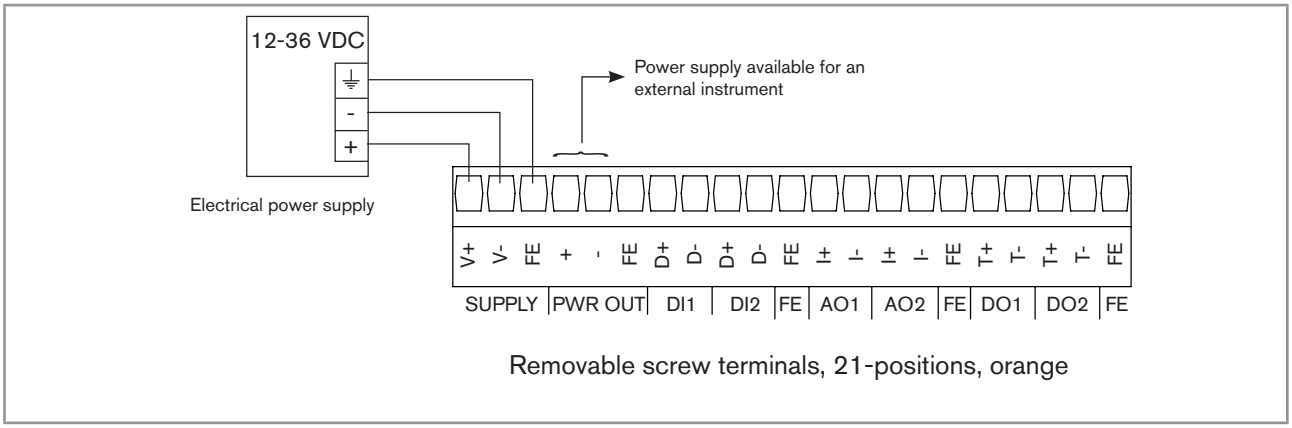

Fig. 15 : Supplying an external instrument via a panel-mounting version of the 8619

4.3.7 Supplying an external instrument via a wall-mounting version

The device can be used to supply power to several external instruments, such as flow sensors or conductivity sensors for example.

→ To supply power to an external instrument, connect it to a positive and negative terminal on the POWER OUT terminal block.

The voltage available on the POWER OUT terminal block of a wall-mounting version:

- is equal to the supply voltage of the 12-36 V DC version of the 8619.
- is equal to a voltage of 24 V DC on a version of the 8619 which is supplied with a voltage of 110-240 V AC.

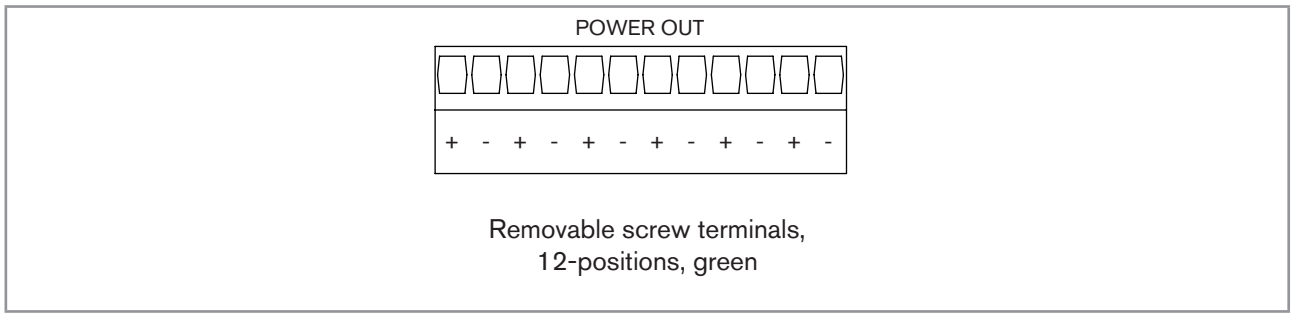

Fig. 16 : Supplying external instruments via a wall-mounting version of the 8619

4.3.8 Wire the inputs and outputs on the main board "M0"

The M0 board has:

- 2 digital inputs (marked DI1 and DI2), for connecting a flow sensor for example
- Two 4-20 mA analogue outputs (marked AO1 and AO2)
- 2 digital outputs (marked DO1 and DO2)

The inputs and outputs are galvanically insulated and therefore floating.

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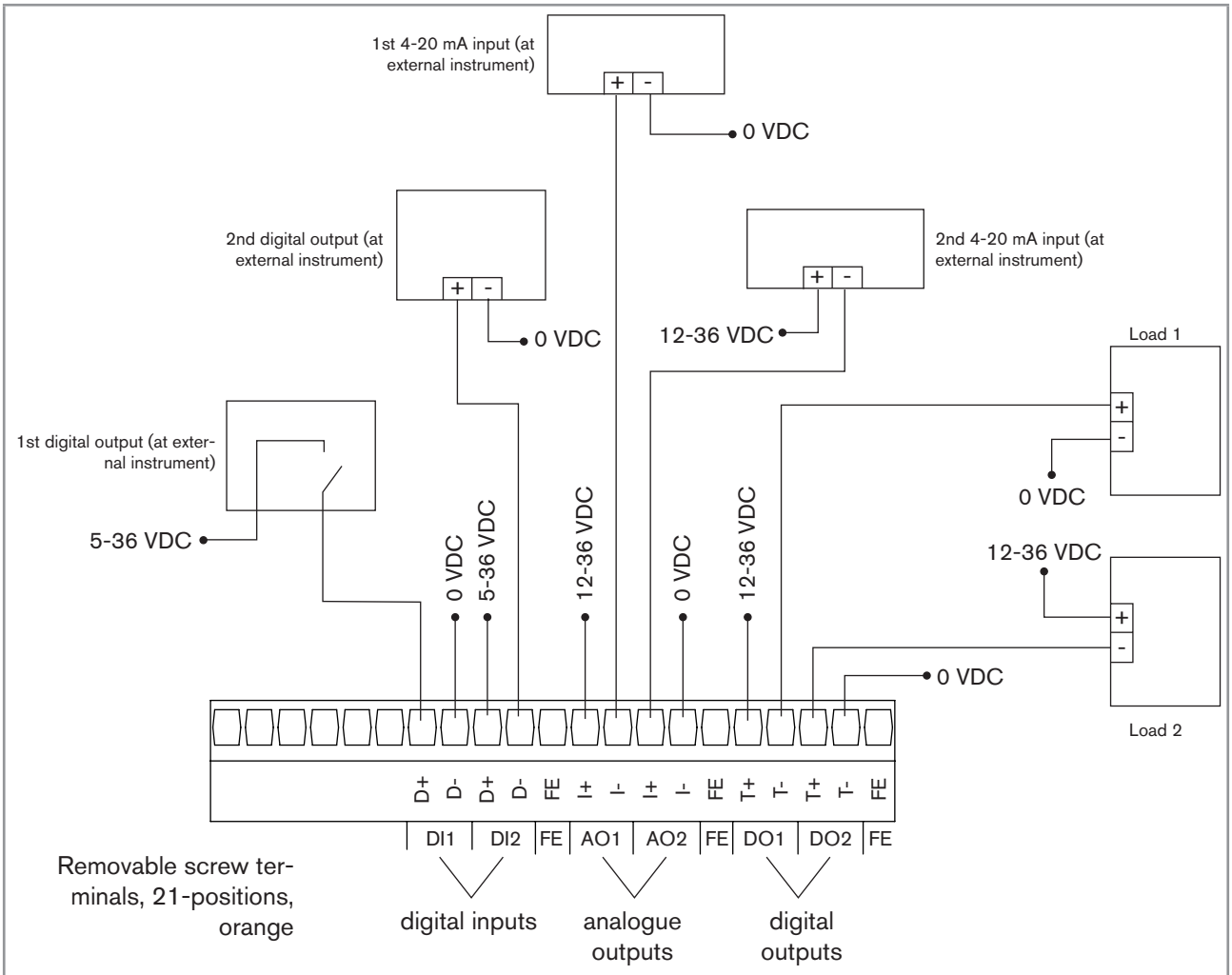

DI1, DI2, AO1, AO2, DO1 and DO2: designation in the configuration menus of the M0 main board.

FE = functional earth

Fig. 17 : Wiring the inputs and outputs on the main board "M0"

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4.3.9 Examples of the connection of flowmeters to a panel-mounting version

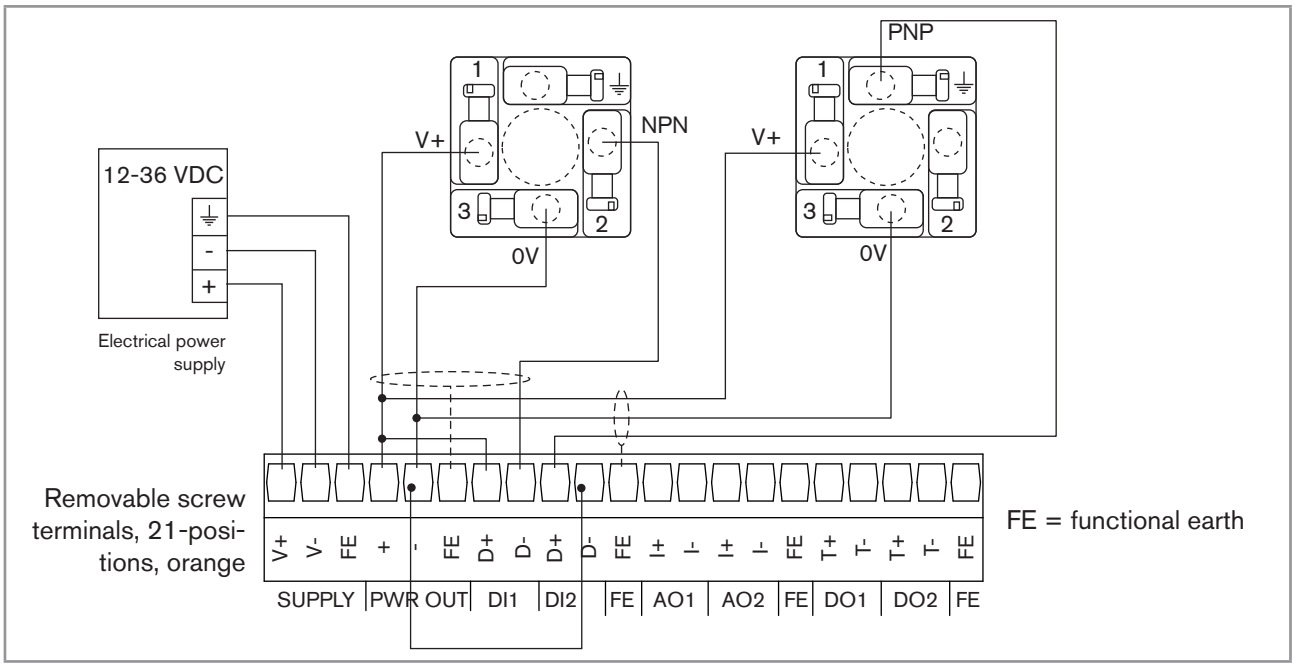

Fig. 18 : Wiring the 2 type 8030 flow sensors

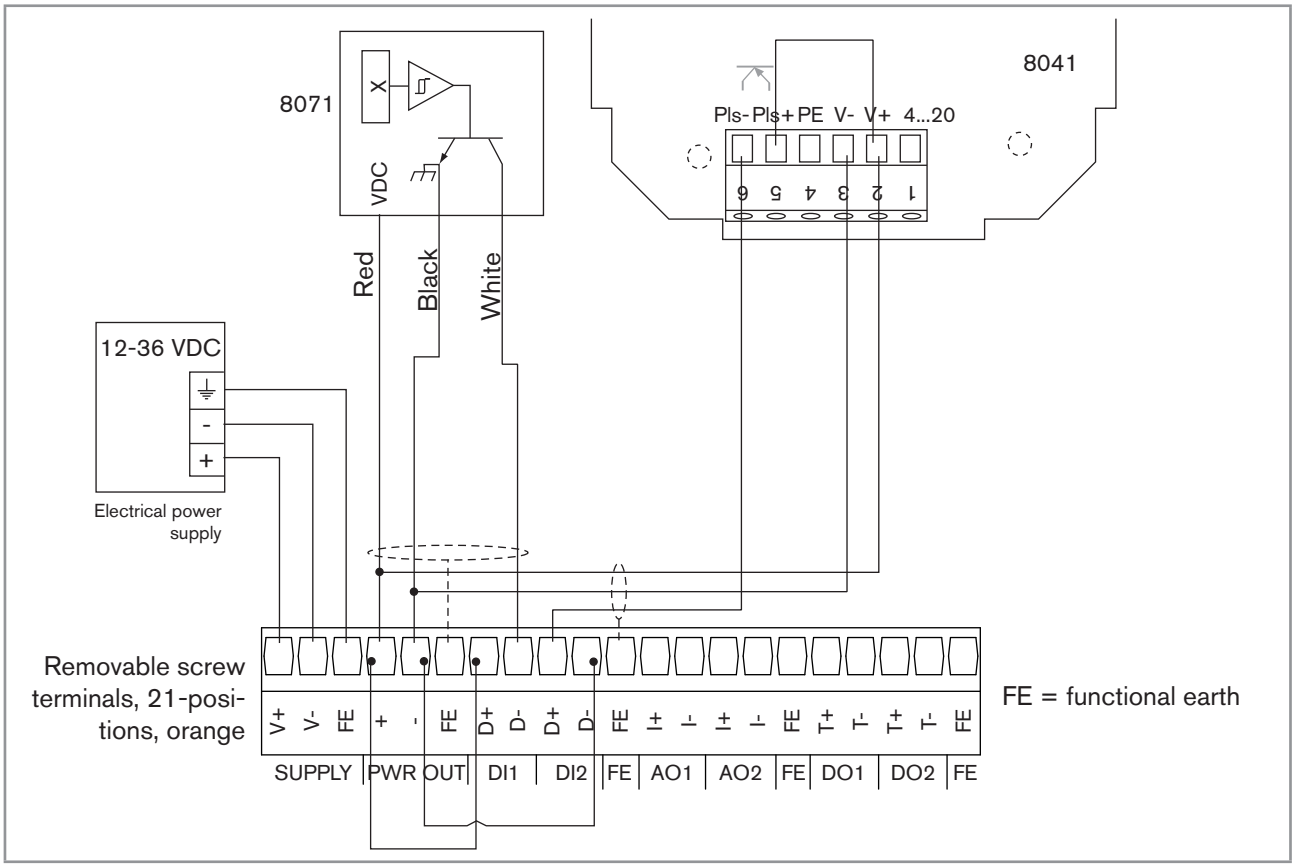

Fig. 19 : Wiring a type 8071 flow sensor and a type 8041 flow sensor

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4.3.10 Examples of the connection of a solenoid valve to a wall-mounting version

The solenoid valve can be connected to the 8619 via board "M0" or via the outputs module, "OUT".

→ If a solenoid valve is connected to the 8619, connect a flyback diode in parallel to the solenoid valve. If the solenoid valve is connected via a type 2508 connector, this connector is available with an integrated flyback diode.

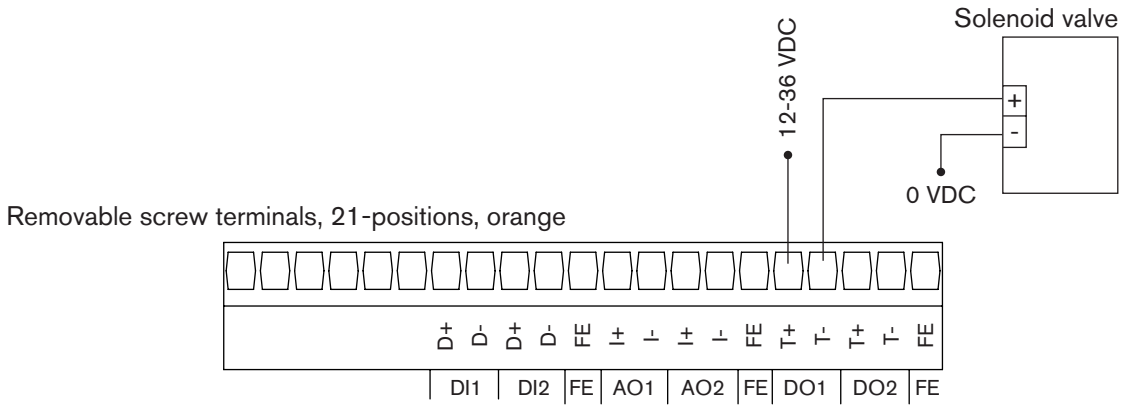

Fig. 20 : Wiring a solenoid valve to the "M0" board of the 8619

4.3.11 Identifying the pins on the connection modules

If you use terminal blocks other than those supplied with the device, these terminal blocks will not be marked.

Fig. 21 enables labelling of the terminals.

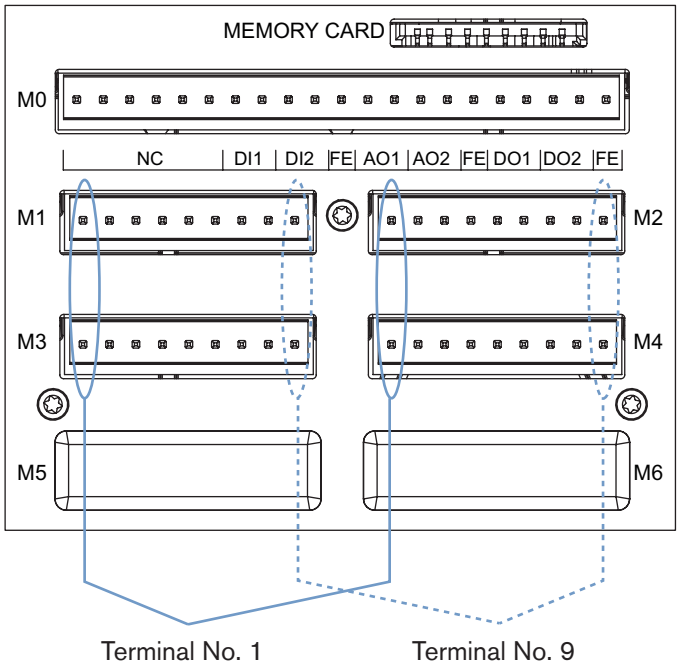

Fig. 21 : Identifying the pins on the connection modules

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4.3.12 Wiring the input module "INPUT"

The "INPUT" inputs module has:

- Two analogue inputs;
- Two digital inputs.

The inputs are galvanically insulated, and therefore floating.

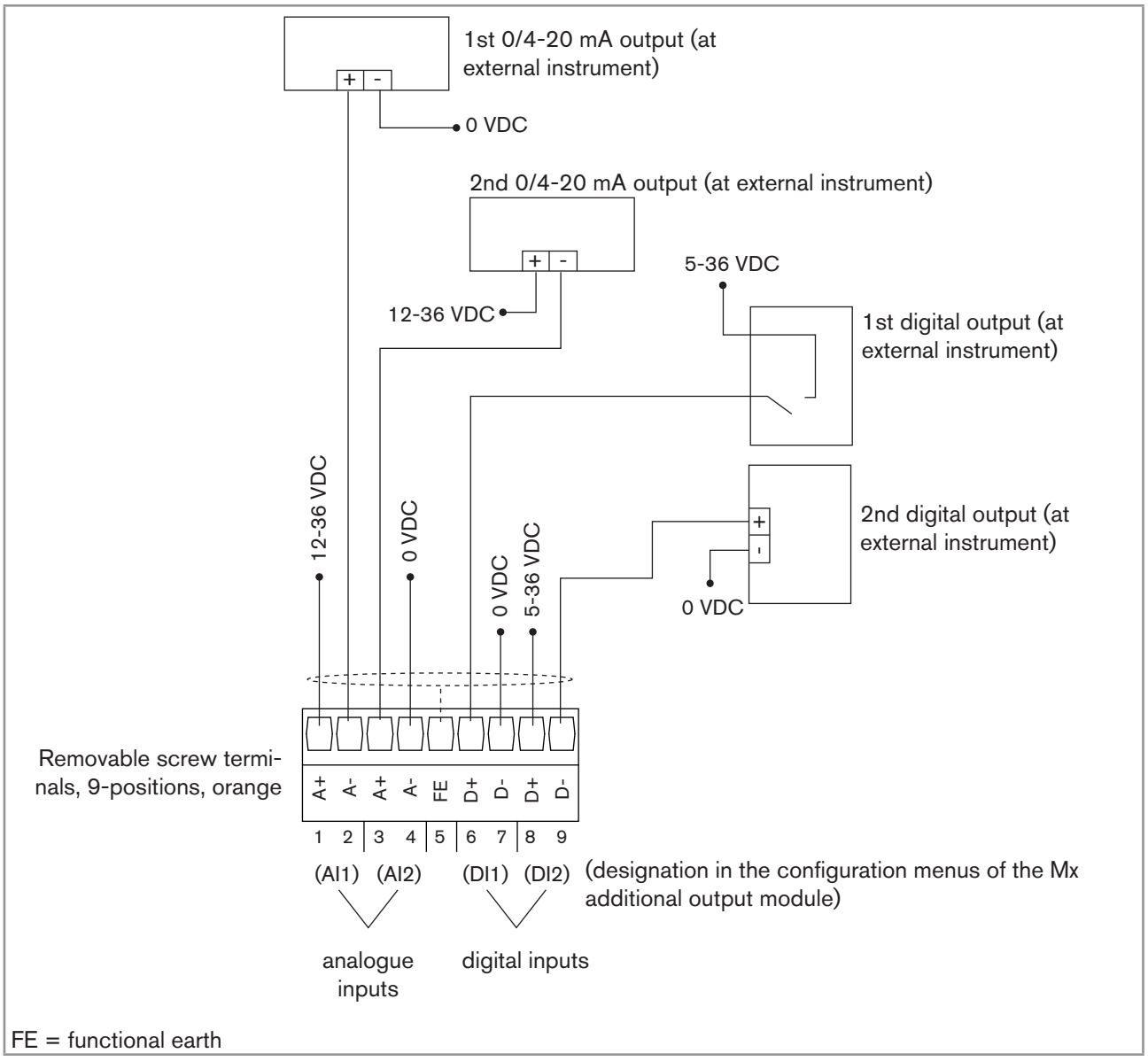

Fig. 22 : Connecting the analogue inputs to a 2-wire current transmitter and connecting the digital inputs of the input module

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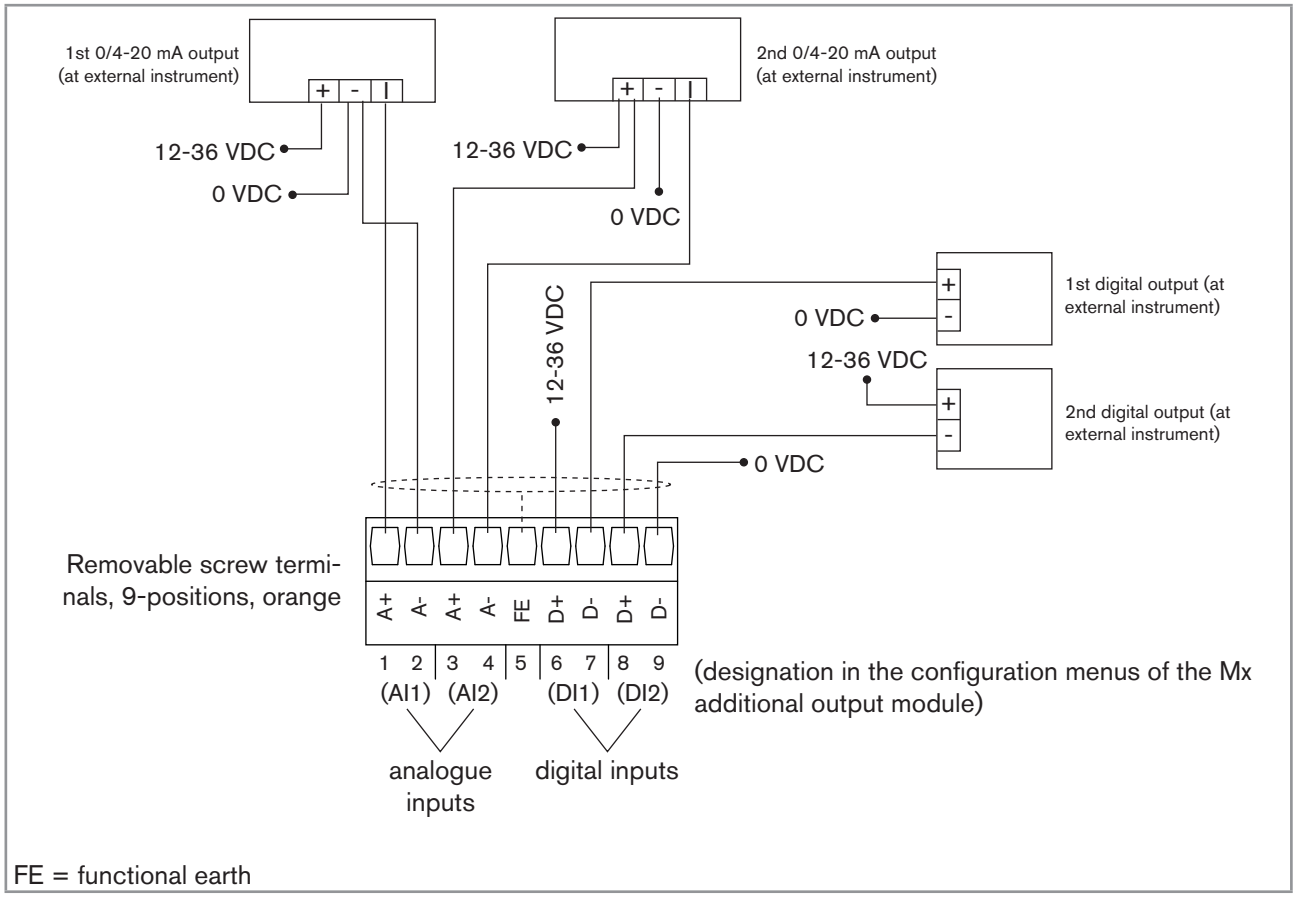

Fig. 23 : Connecting the AI1 analogue input in source mode and the analogue input AI2 in sinking mode to a 3-wire current transmitter (for example type 8025 with relay outputs) and connecting the digital inputs of the input module

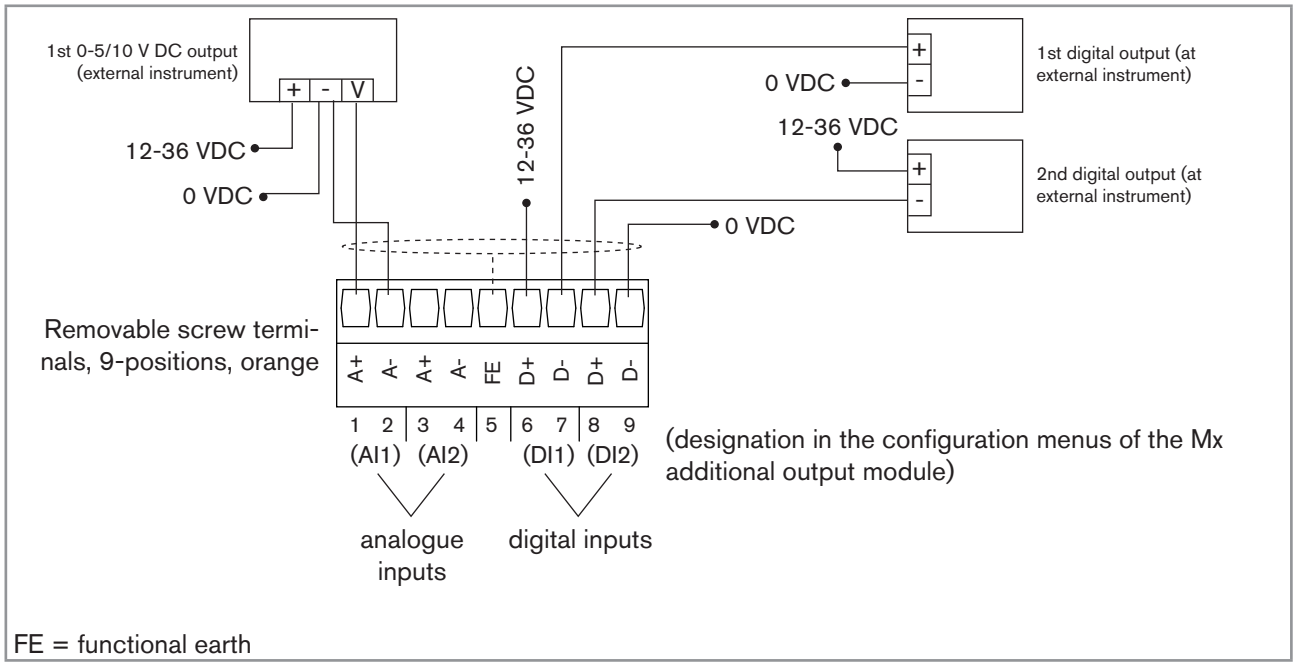

Fig. 24 : Connecting the analogue inputs to a voltage transmitter and connecting the digital inputs of the input module

4.3.13 An example of the connection of a type 8232 chlorine sensor (order code 566051 or 566052) to the input module "INPUT".

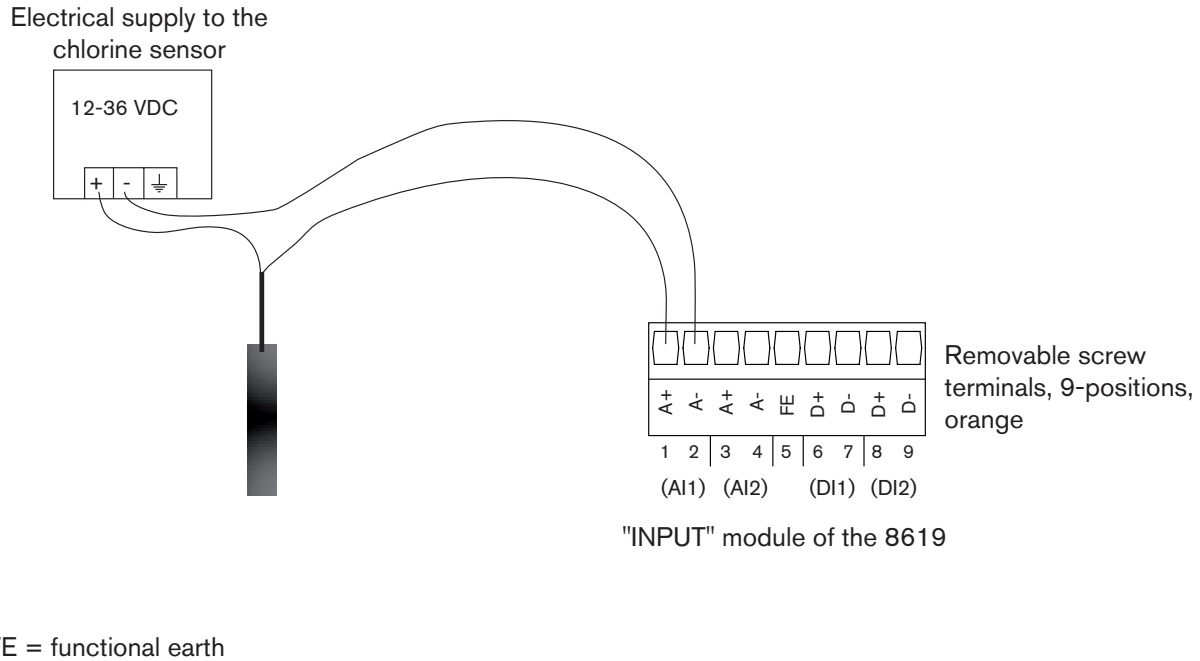

Fig. 25 : Connection of a type 8232 chlorine sensor (order code 566051 or 566052) powered by an external voltage source

4.3.14 An example of the connection of a type 8232 chlorine sensor (order code 565164) to the input module "INPUT".

NOTE

The type 8232 chlorine sensor may be damaged by the electrical power supply.

- Power the chlorine sensor with a voltage between 22.5 and 26 V DC.
- If the chlorine sensor is powered via a type 8619 controller, power the type 8619 controller, 12-36 V DC version, with a power supply between 22.5 and 26 V DC.

Colour of the conductor for chlorine sensor (order code 565164)	Signal
Green	Negative voltage signal
Yellow	Positive voltage signal
White	Positive supply
Brown	Negative supply

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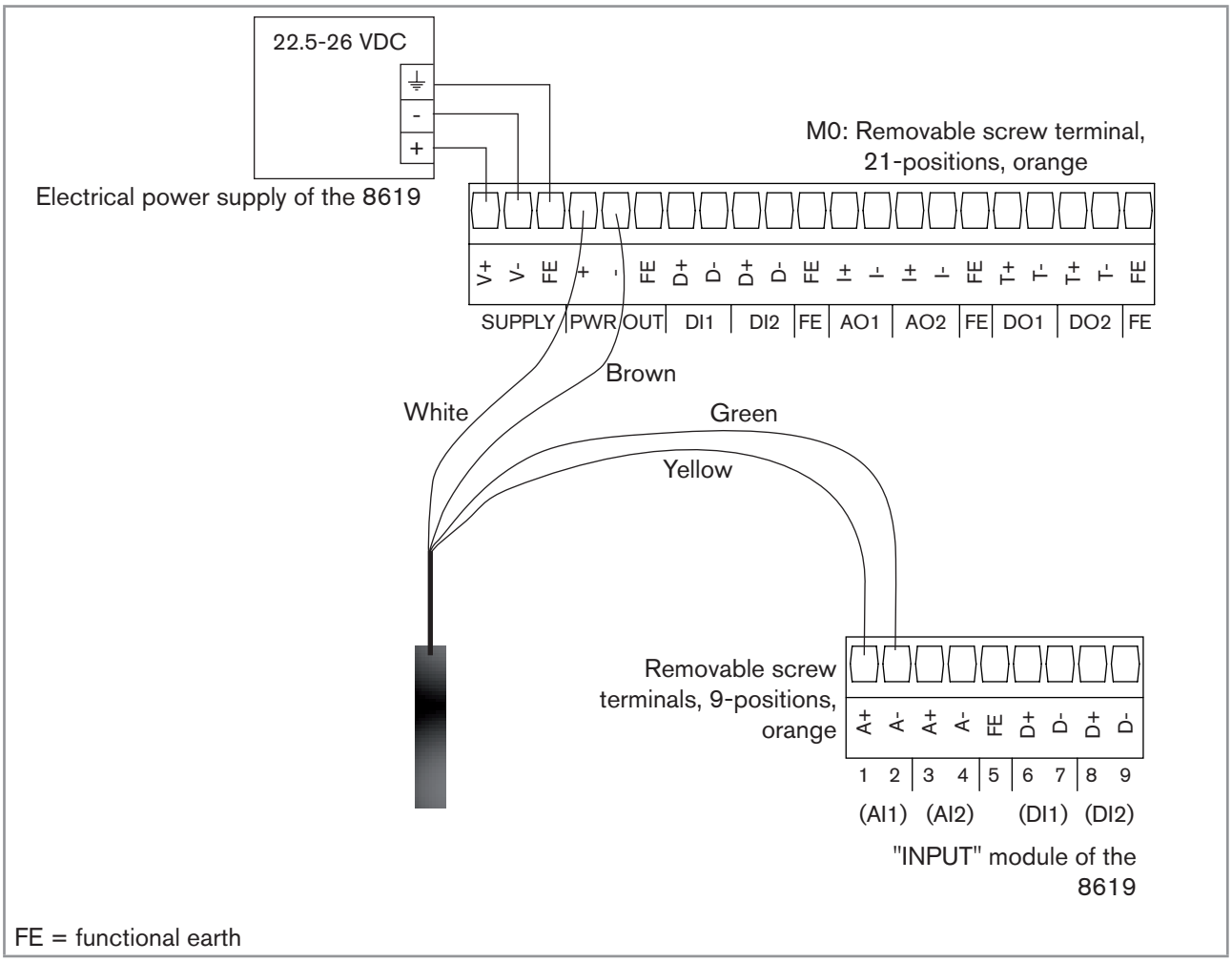

Fig. 26 : Connection of the type 8232 chlorine sensor (order code 565164), powered via the panel-mounting version of the type 8619 transmitter

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4.3.15 Wiring the output module "OUT"

The "OUT" outputs module has:

- Two 4-20 mA analogue outputs;
- Two digital outputs.

The outputs are galvanically insulated, and therefore floating.

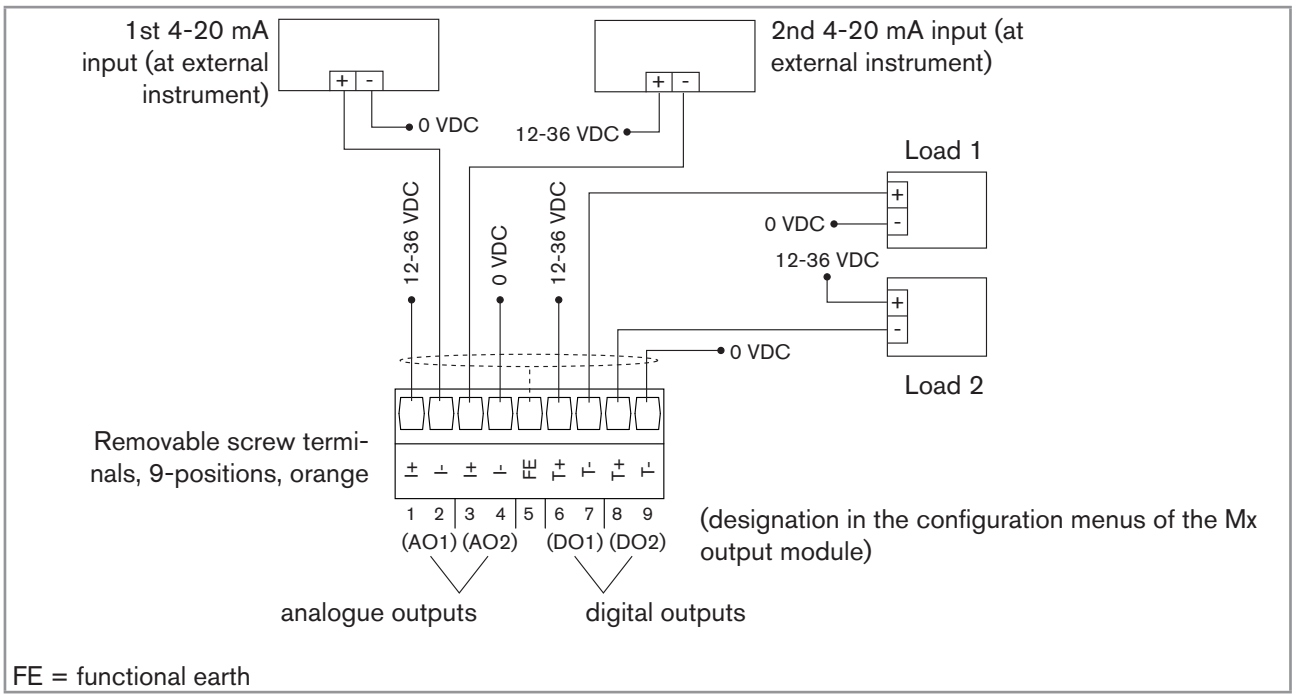

Fig. 27 : Wiring the "OUT" output module

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4.3.16 Wiring the "pH/ORP" module

- To avoid the influence of disturbances, wire the pH/redox sensor in symmetric mode. In this case, it is compulsory to wire the equipotential electrode.
- When the pH/redox sensor is wired in asymmetrical mode, measurement of the pH or the oxidation reduction potential may drift over time when the equipotential electrode is not wired.

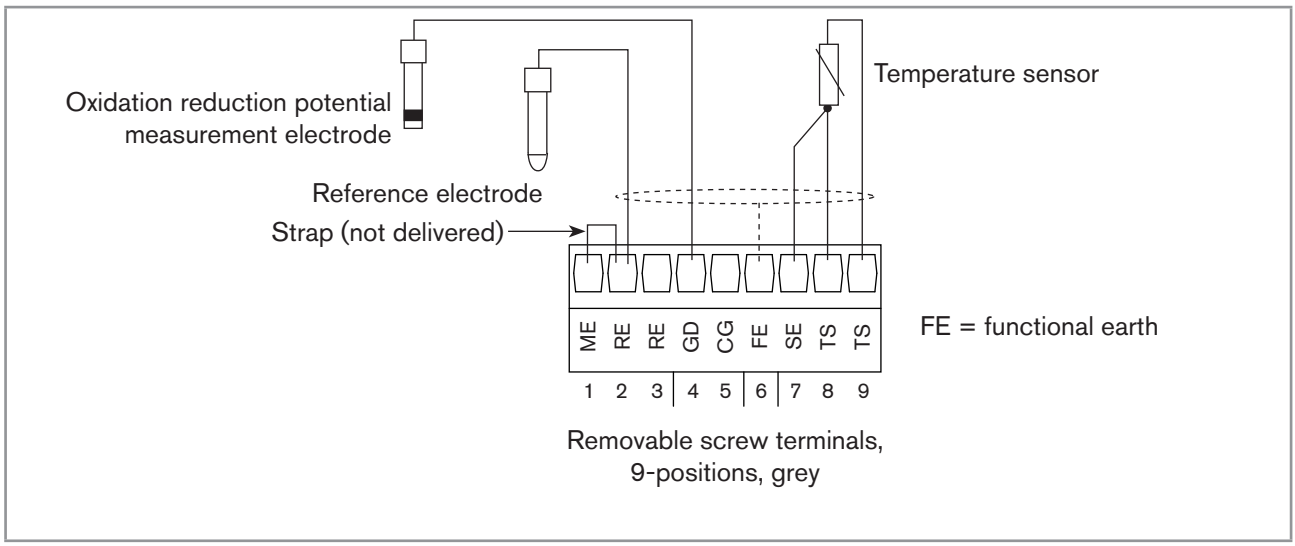

Fig. 28 : Wiring an oxidation reduction potential sensor and a Pt100 or Pt1000 temperature sensor in a pH/ORP module

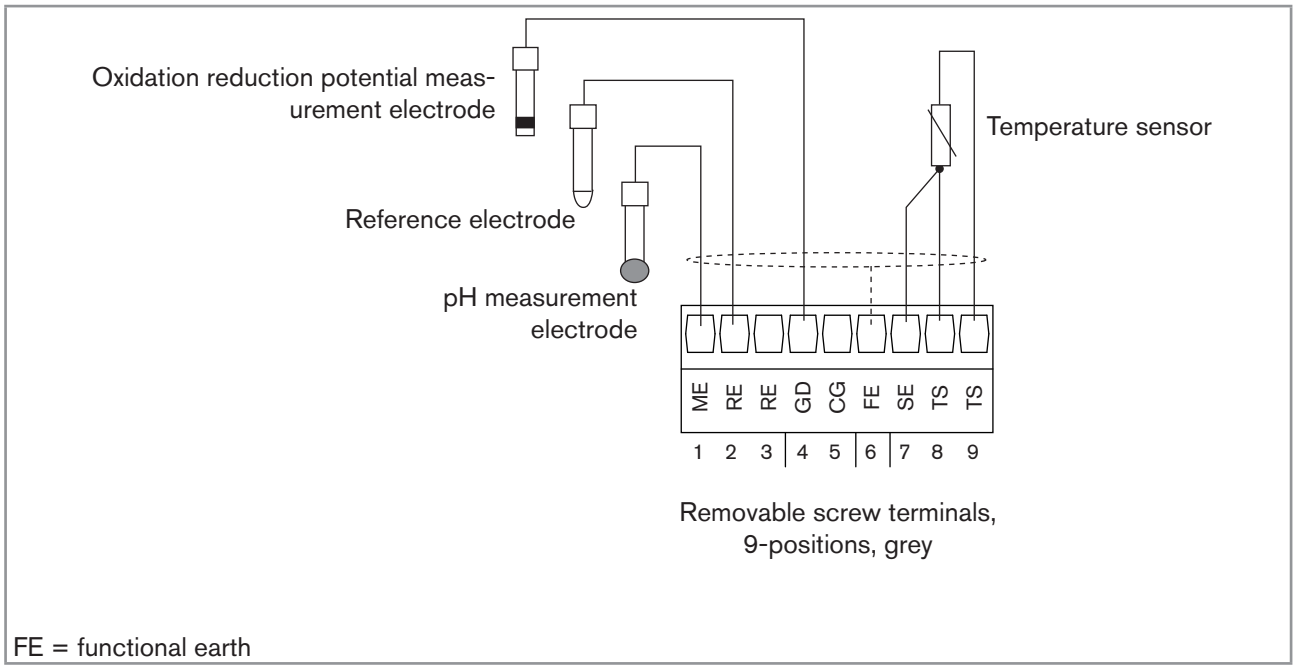

Fig. 29 : Wiring a pH sensor, an oxidation reduction potential sensor and a Pt100 or Pt1000 temperature sensor in a pH/ORP module

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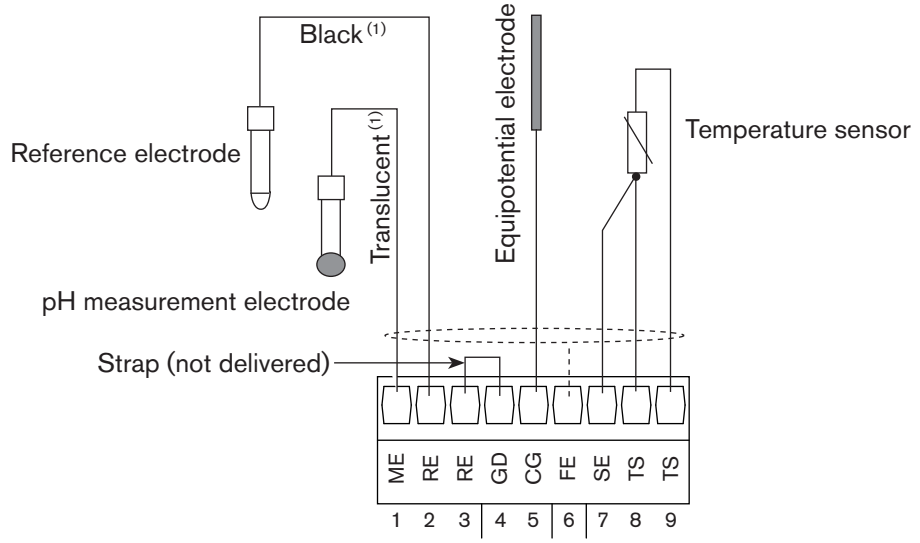


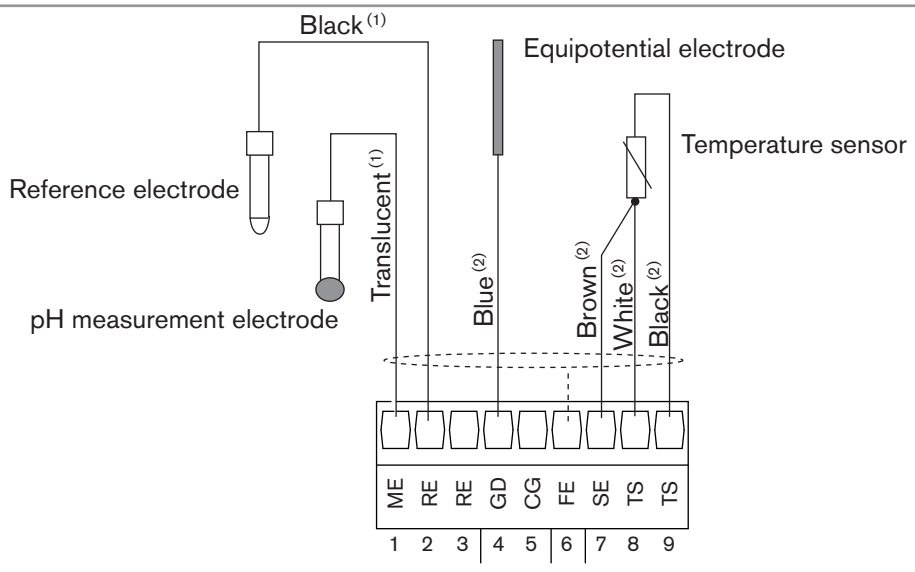
Removable screw terminals, 9-positions, grey

FE = functional earth

(1)Colour of the wires in Bürkert connection cables with order codes 561904, 561905 or 561906.

Fig. 30 : Wiring a pH sensor and a Pt100 or Pt1000 temperature sensor in asymmetrical mode to a pH/ORP module

4.3.17 Examples of connection to be "pH/ORP" module



Removable screw terminals, 9-positions, grey

FE = functional earth

(1)Colour of the wires in Bürkert connection cables with order codes 561904, 561905 or 561906.

(2) Colour of the wires of the Pt1000 sensor with order code 427023 and its Bürkert connection cable with order code 427113.

Fig. 31 : Wiring a Bürkert 8200 type sensor and a Pt1000 temperature sensor in symmetrical mode

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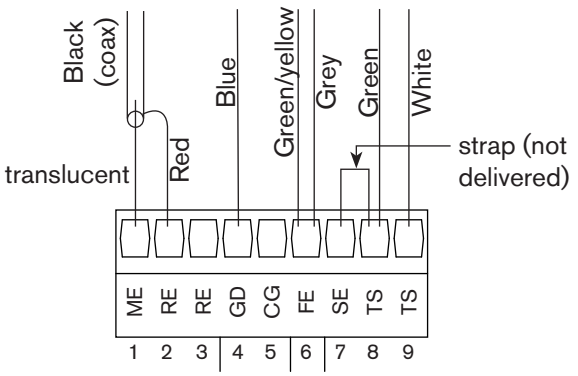
wire colour	signal
translucent	pH sensor
red (coax cable shielding)	reference electrode
blue	rhodium electrode
green/yellow	cable shielding
grey	sensor body
Green	Pt1000
White	Pt1000

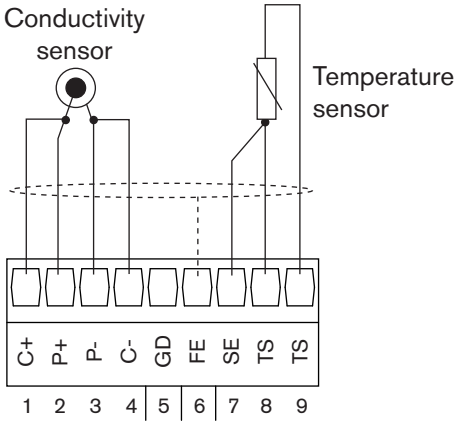


Removable screw terminals, 9-positions, grey

FE = functional earth

Fig. 32 : Wiring a Bürkert 8201 type sensor with integrated Pt1000 temperature sensor in symmetrical mode using a Variopin connection cable with order code 554856 or 554857

4.3.18 Wiring the "COND" conductivity module



Removable screw terminals, 9-positions, green

FE = functional earth

Fig. 33 : Wiring a resistive conductivity sensor with 2 electrodes and a Pt100 or Pt1000 temperature sensor in a conductivity module

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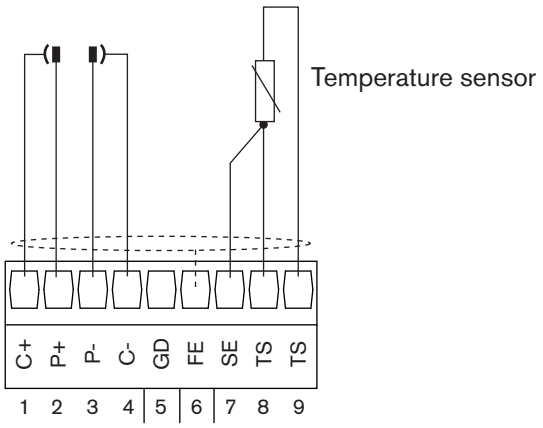
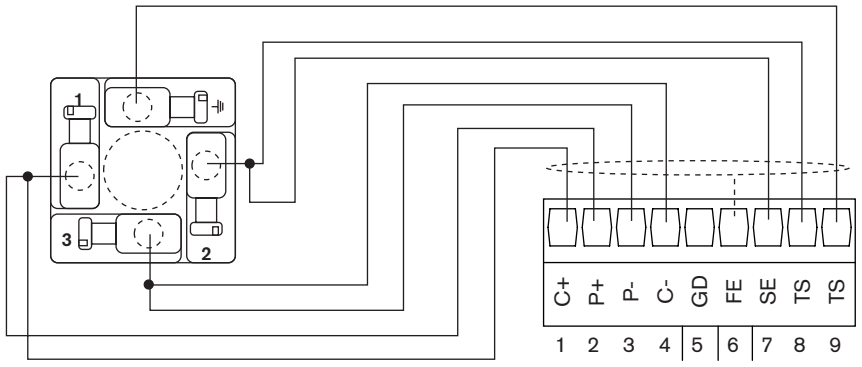


Removable screw terminals, 9-positions, green

FE = functional earth

Fig. 34 : Wiring a resistive conductivity cell with 4 electrodes and a Pt100 or Pt1000 temperature sensor in a conductivity module

4.3.19 Examples of connection to the "COND" conductivity module



Connector terminal block 2508 for the 8220 conductivity sensor

Removable screw terminals, 9-positions, green

Fig. 35 : Wiring an 8220 conductivity sensor

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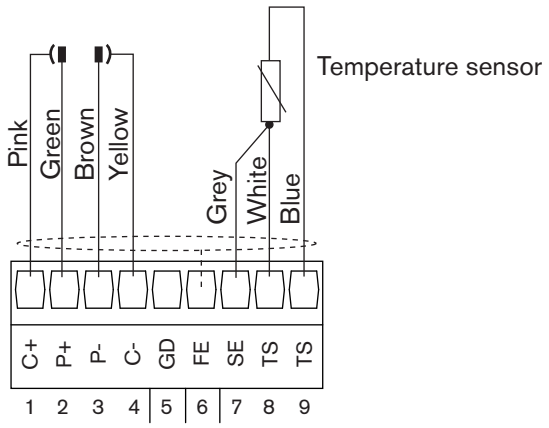
wire colour	signal
Pink	current injection +
Green	conductivity measurement +
Brown	conductivity measurement -
Yellow	current injection -
Grey	Pt1000
White	Pt1000
Blue	Pt1000

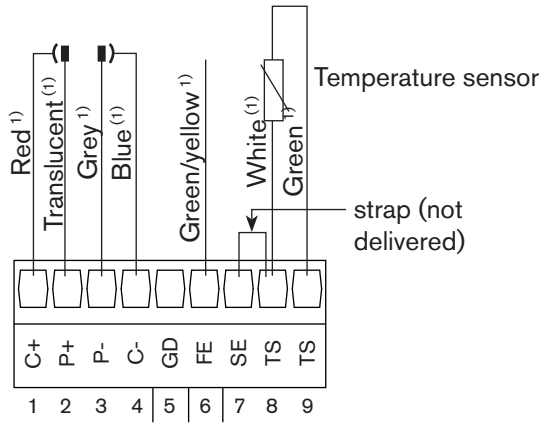


Removable screw terminals,
9-positions, green

FE = functional earth

Fig. 36 : Wiring a type 8221 conductivity sensor with cable gland and connection cable

wire colour	signal
Red	current injection +
translucent	conductivity measurement +
Grey	conductivity measurement -
Blue	current injection -
Green/yellow	functional earth
White	Pt1000
Green	Pt1000



Removable screw terminals,
9-positions, green

FE = functional earth

1) Colour of the wires of the connection cables with order codes 554855, 554856 and 554857.

Fig. 37 : Wiring of a type 8221 conductivity sensor with Variopin connector

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5 ADJUSTMENT AND COMMISSIONING

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5.1 Safety instructions

WARNING

Risk of injury due to non-conforming adjustment.

Non conforming adjustment could lead to injuries and damage the device and its environment.

- The operators in charge of adjustment must have read and understood the contents of this manual.
- In particular, observe the safety recommendations and intended use.
- The device/installation must only be adjusted by suitably trained staff.

WARNING

Danger due to non-conforming commissioning.

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

- Before commissioning, make sure that the staff in charge have read and fully understood the contents of the manual.
- In particular, observe the safety recommendations and intended use.
- The device/installation must only be commissioned by suitably trained staff.

Before commissioning, calibrate each measuring sensor connected to the device.

5.2 Switching on the device for the first time

When switching on the device for the first time, the display shows the first view in Process level:

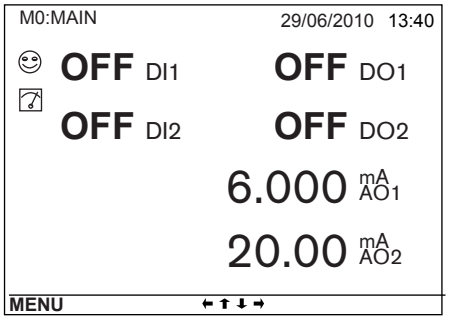

Fig. 38 : Display when switching on for the first time

When switched on subsequently, the last active view in the Process level is displayed. See section 5.8 to browse in all views in Process level.

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5.3 Using the navigation button and the dynamic keys

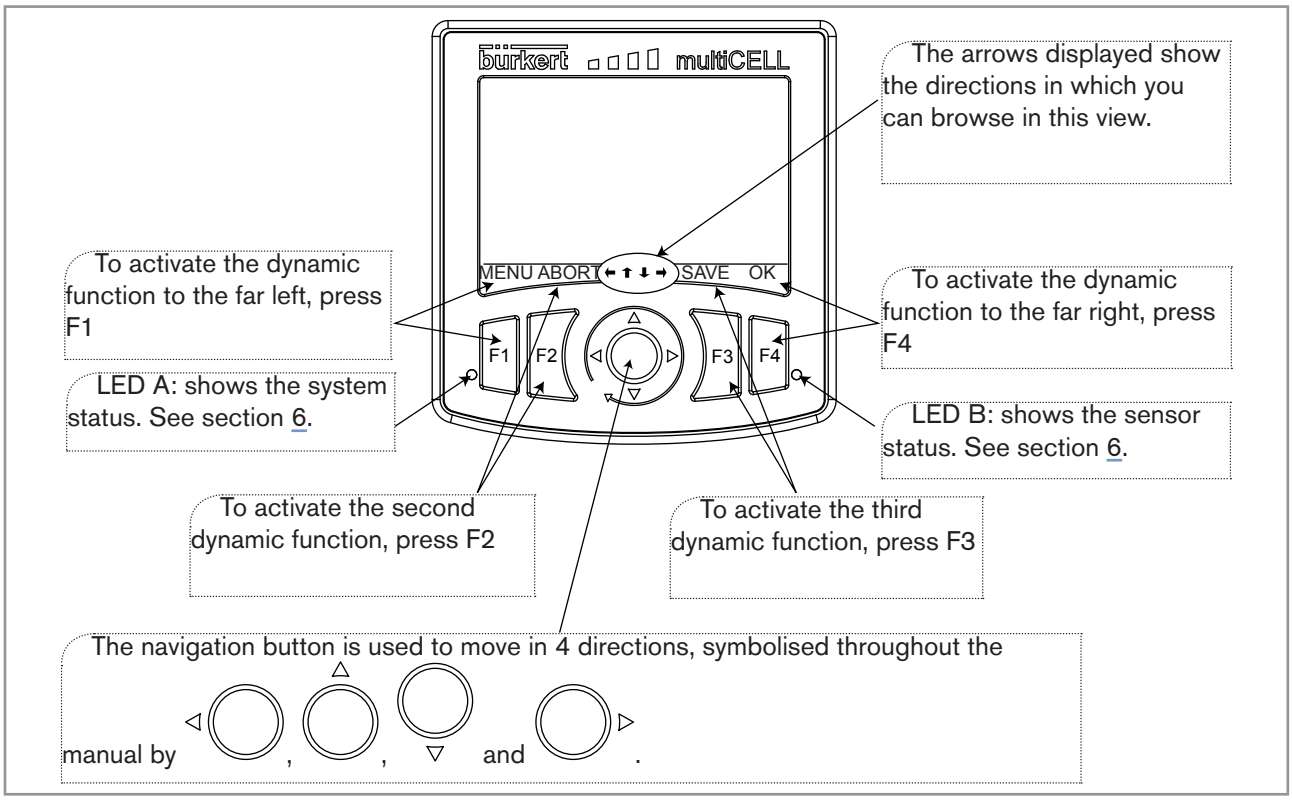

Fig. 39 : Using the navigation button and the dynamic keys

You want to...	Press...
....access the Configuration level	Dynamic function, "MENU", from any view in Process level
...go back to Process level	Dynamic function, "MEAS"
...access the menu displayed	Dynamic function, "OK"
...access the highlighted function	Dynamic function, "OK"
...confirm the entry	Dynamic function, "OK"
...save modifications	Dynamic function "SAVE"
...go back to the parent menu	Dynamic function "BACK"
...cancel the current operation	Dynamic function "ABORT"
...set a setpoint value	Dynamic function "SETP"
...activate manual mode in a configured and activated function	Dynamic function "MANU"
...manually set the percentage of the function	Dynamic function "CMD"
...force the result of a function to 0%	Dynamic function "0%"
...force the result of a function to 100%	Dynamic function "100%"
...activate automatic mode in a configured and activated function	Dynamic function "AUTO"
...start teach-in	Dynamic function "START"
...end teach-in	Dynamic function "END"
...answer the question asked in the affirmative	Dynamic function "YES"
...answer the question asked in the negative	Dynamic function "NO"

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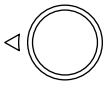
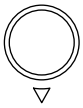
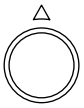
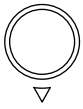
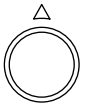
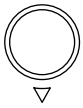
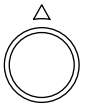
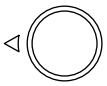
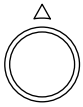
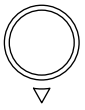
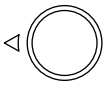
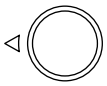
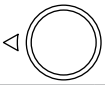
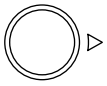
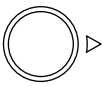
You want to...	Press...			
...select the highlighted character or mode	Dynamic function "SEL"			
...browse in Process level	 next view	 previous view	 niveau suivant	 niveau précédent
...browse in the Configuration level menus	 display the next menu		 display the previous menu	
...browse in the menu functions	 highlight the next function		 highlight the previous function	
...set the contrast or brightness percentage for the display (after accessing the function in the "Parameters" menu)	 increase the percentage		 reduce the percentage	
...modify a numerical value or the units				
	 increment upwards the figure selected or modify the units		 increment downwards the figure selected or modify the units	
	 select the next figure		 select the previous figure	
...allocate the "+" or "-" sign to a numerical value	 to the extreme left of the numerical value then  until the desired sign is displayed			
...move the decimal point in a numerical value	 to the extreme right of the numerical value then  until the decimal point is in the desired place			

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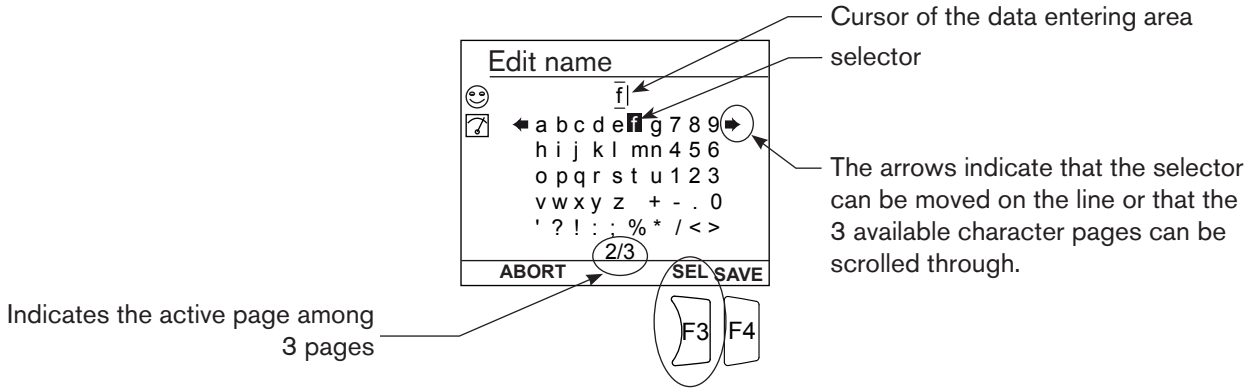
5.4 Entering text

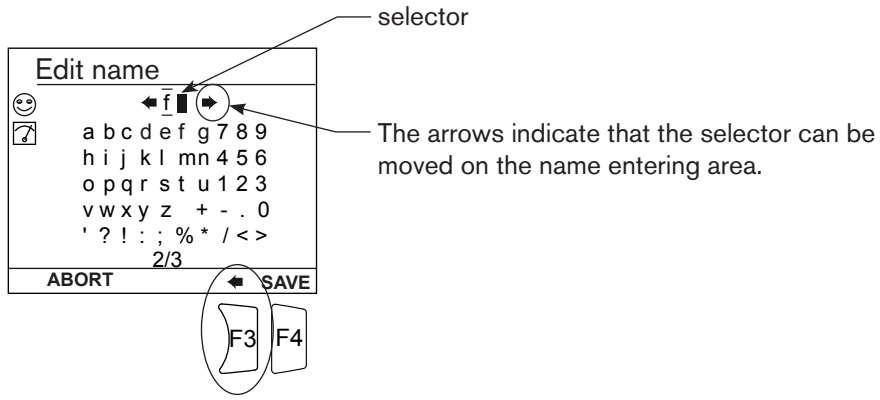
This section describes how to use the keyboard displayed to modify the name of a process variable (13 characters max.), a function (12 characters max.) or the title of a view (12 characters max.).



→ To move the cursor in the data entering area using keys ◁ and ▷ first move the selector into the data entering area using the keys ▽ and △.

→ To insert a character in place of the cursor, move the selector over this character and press key F3 (function "SEL").

→ To remove the character before the cursor, move the selector into the data entering area then press key F3 (function "backspace"):



→ To retrieve the original name of a variable, even after modification and saving:

- Move the selector into the customised name entering area.
- Delete all the characters.
- Save.

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5.5 Entering a numerical value

→ Accessing, for example, the manual calibration function for a conductivity sensor. Refer to section 5.9 to access the "Calibration" menu.

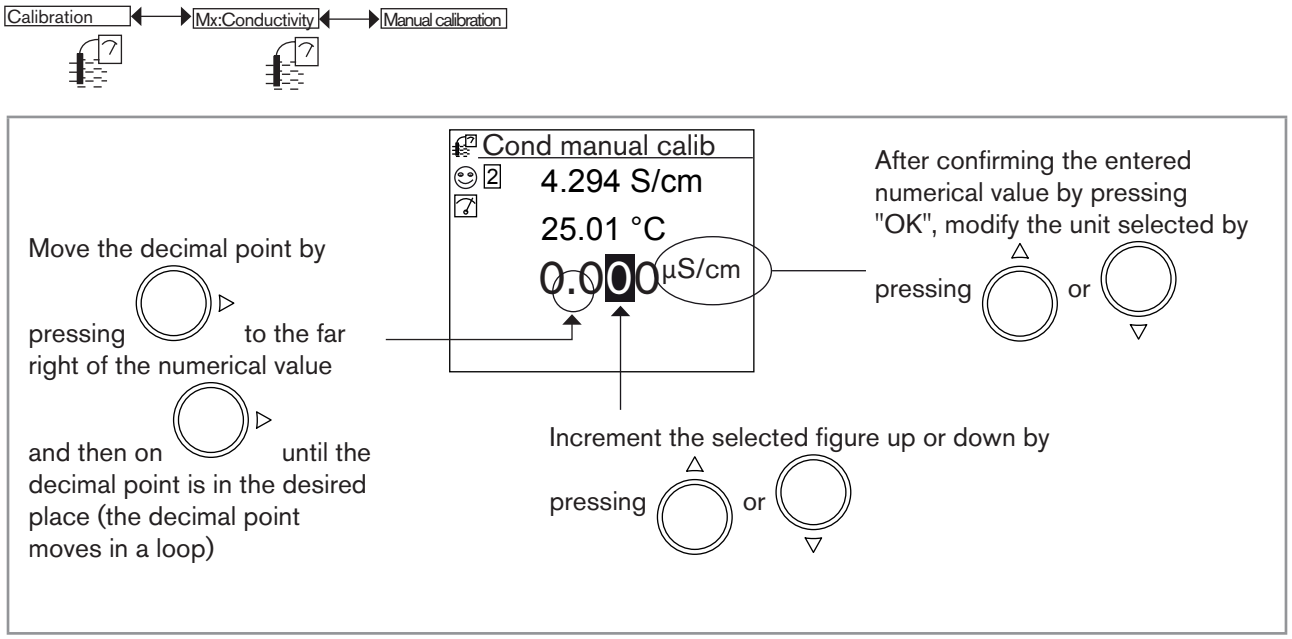
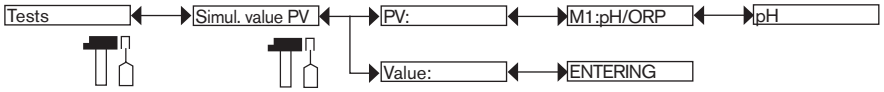


Fig. 40 : Example of entering a numerical value

→ Accessing, for example, the function for simulation of a pH value. Refer to section 5.9 to access the "Tests" menu.



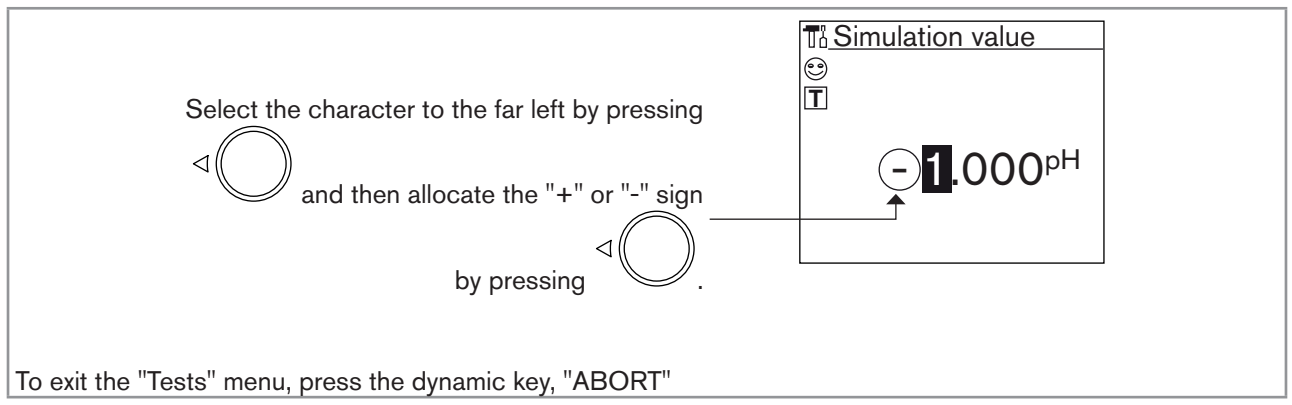


Fig. 41 : Changing the sign of a numerical value

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5.6 Description of the icons

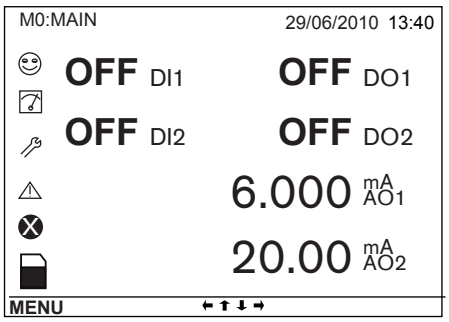

Fig. 42 : Position of the icons

Icon	Meaning and alternatives
	Default icon when process monitoring is not activated via the "Diagnostics" menu; if monitoring is activated, this icon indicates that the parameters monitored are not out of range. If at least one monitoring is activated, the alternative icons in this position are: ▪ , combined with : see sections 5.12.2 to 5.12.6 ▪ , combined with : see sections 5.12.2 to 5.12.6 The "smiley" symbols do not relate to correct functioning of the device.
	Device currently measuring. The alternative icons in this position are: ▪ H flashing: HOLD mode activated (see section 5.11.1) ▪ T flashing: running check that an output is working and behaving correctly (see section 5.13.2 and 5.13.3)
	"Maintenance" event; see section 5.11.18 and 5.11.19.
	"Warning" event; See sections 5.11.18, 5.11.19 and 5.12.2 to 5.12.6
	"Error" event; See sections 5.11.18, 5.11.19 and 5.12.2 to 5.12.6
	Memory card inserted and datalogger activated. The alternative icon to this position is , indicating an error. Access menu "Information -> Log", to read the associated error message and see section 6.3.9 for the meaning of the message.

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5.7 Operating levels

The device has 2 operating levels:

Process level

See section 5.8 for the description of the Process level.

Configuration level

This level comprises 5 menus:

Menu title	Relevant icon
"Parameters": see section 5.10	
"Calibration": see section 5.11	
"Diagnostics": see section 5.12	
"Tests": see section 5.13	
"Information": see section 5.14.	

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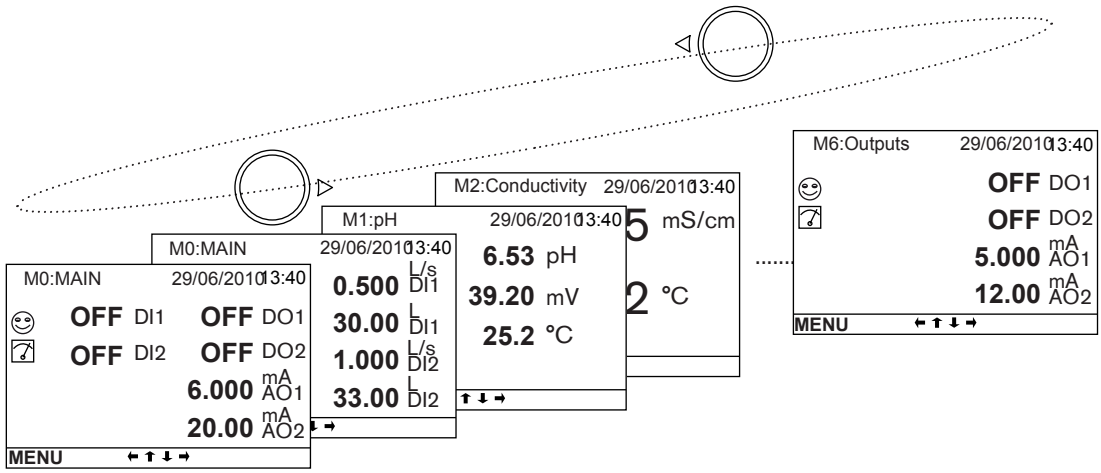
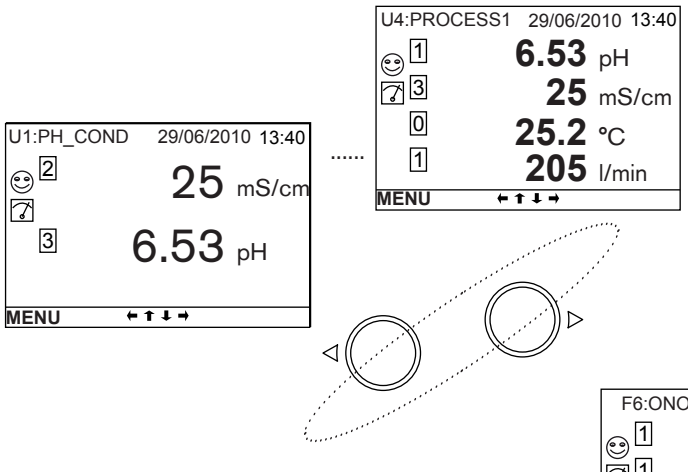
5.8 Process level

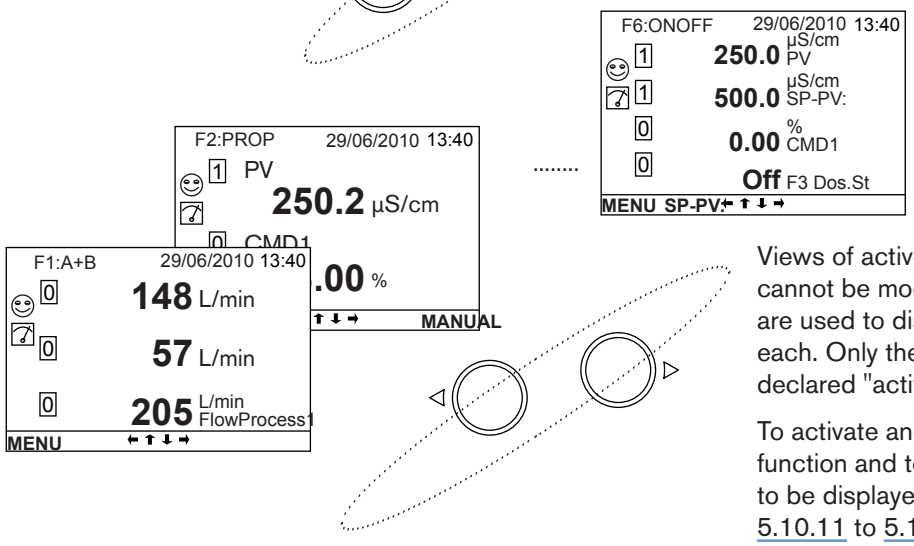


Views of the modules connected to the device (cannot be modified):

- "M0:MAIN" view: displays the values of inputs and outputs on the main board; the second "M0:" view is available if the software option, "FLOW", is activated (see section 5.10.4).
- "M1:" to "M6:" views display the data for modules 1 to 6.



User defined views (U1 to U4) are each used to display 1, 2 or 4 data or a graph. Only the effectively defined views are shown.



Views of active functions which cannot be modified (F1: to F6:) are used to display one function each. Only the views of functions declared "active" are shown.

To activate and configure a function and to select the data to be displayed, see sections 5.10.11 to 5.10.17.

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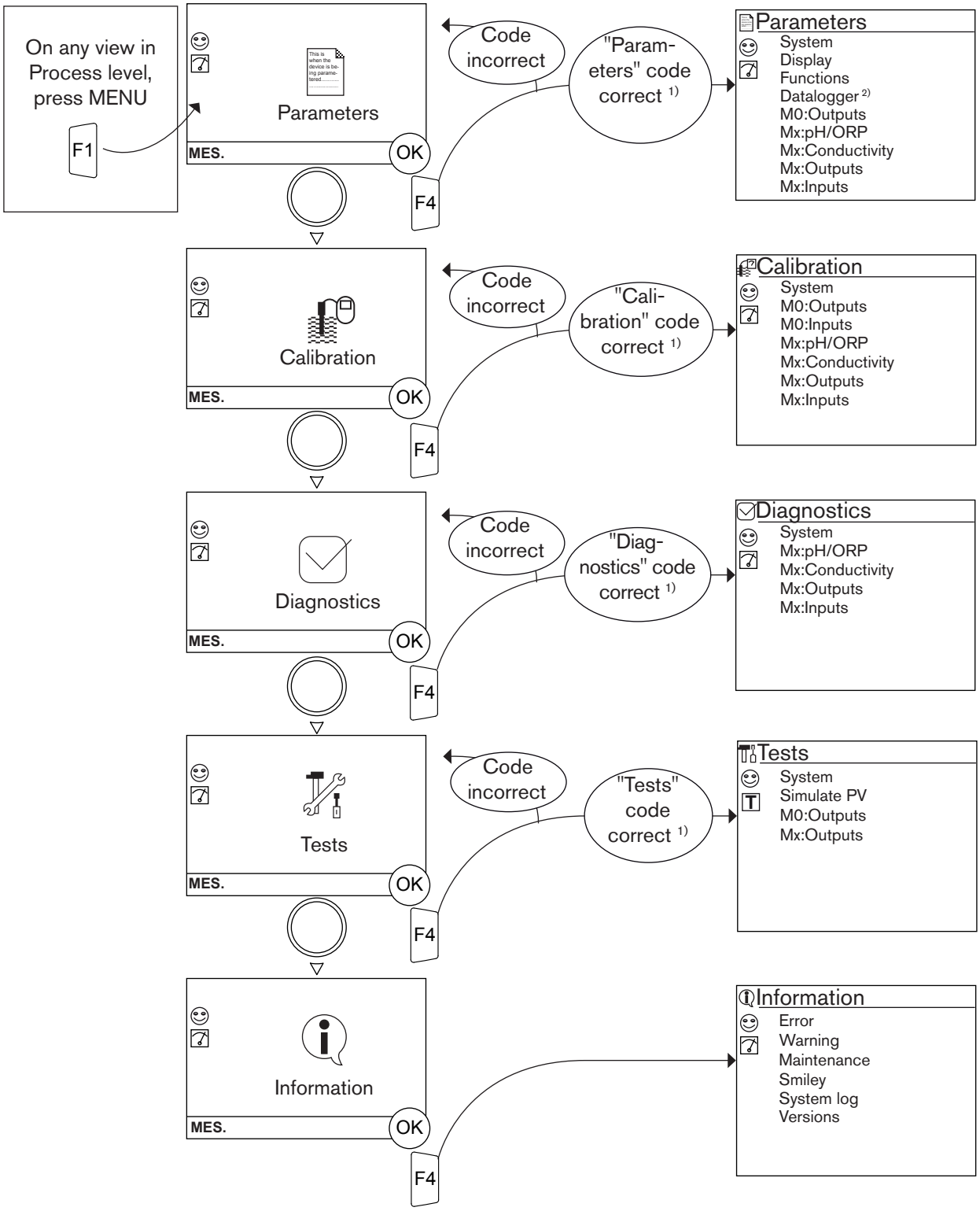
5.9 Configuration level access



1) The code is not requested if the default code "0000" is used.

2) This menu is available as an option (see section 5.10.4).

→ See section 5.15 for details of the functions by menu.

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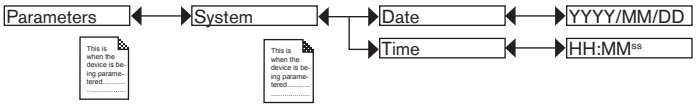
5.10 "Parameters" menu

5.10.1 Setting the multiCELL date and time

Refer to section 5.9 to access the "Parameters" menu.

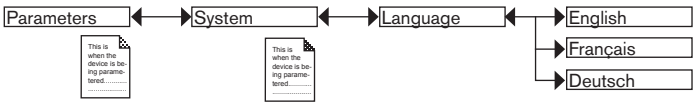


DATE: Set the date

TIME: Set the time

5.10.2 Selecting the display language

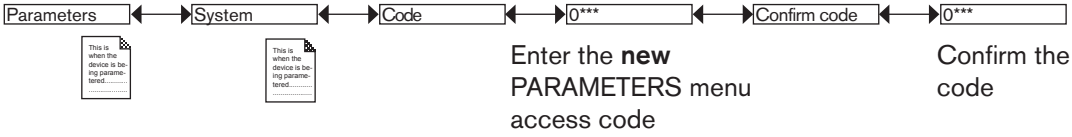
Refer to section 5.9 to access the "Parameters" menu.



The messages are displayed in the new language as soon as the choice has been saved.

5.10.3 Modifying the PARAMETERS menu access code

Refer to section 5.9 to access the "Parameters" menu.



If the default access code "0000" is kept, the device does not request it to access the "Parameters" menu.

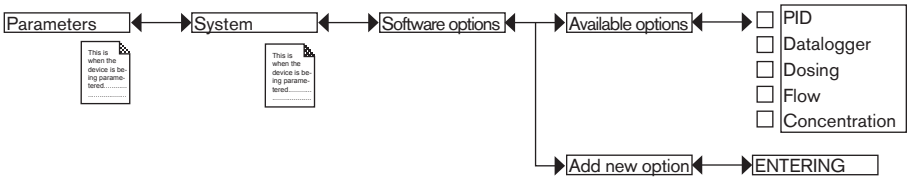
5.10.4 Consulting and/or activating the available software options

This menu is used:

- To consult the list of software options available
- To activate the options by entering the code The activation code is obtained on requests from your Bürkert dealer. Provide him with the order code of the desired option and the order code and serial number of your device which you will find in the menu "Information" -> "Versions" -> "M0:MAIN" -> "Product ID" and "ProductSN".

The "Dosing" option also activates the "Flow" option if it does not exist by default in the device.

Refer to section 5.9 to access the "Parameters" menu.



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When an option is ticked, it is activated in the device.

AVAILABLE OPTIONS Read the options available, whether or not activated on the device:

- *PID:* enables configuring of a PID function on the device; See section 5.10.14.
- *DATALOGGER*: enables the saving of data; See section 5.10.18.
- *DOSING*: enables configuring of the "Time dosing" and "Volume dosing" functions; See sections 5.10.15 and 5.10.16. This option automatically activates the "FLOW" option below.
- *FLOW*: the "Flow" and "Totaliser" process inputs are available in the "PV" list on both the "M0:MAIN" board and the input module "Mx:Inputs" (see section 5.16).
- *CONCENTRATION*: the concentration tables for a number of solutions are available in the menu "Parameters" -> "Mx:Conductivity" -> "Concentration" (see section 5.10.24).

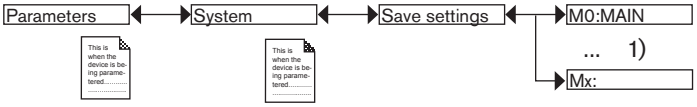
ACTIVATE AN OPTION: enter the activation code for an option.

5.10.5 Saving the data on the memory card

This function is used to save the user parameters ("Parameters" menu) on the memory card in the M0:MAIN board or on each module fitted.

- Insert a memory card in the device.
- Data can only be saved if the "datalogging" function is deactivated. See sections 5.10.4 and 5.10.18.
- The software options activated on the device (see previous section) cannot be transferred.

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values"

If an error message is displayed, refer to section 6.3.7.

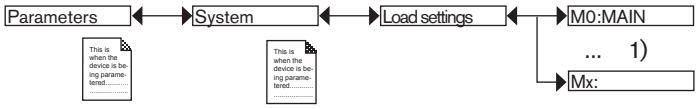
5.10.6 Loading data from the memory card

This function is used to load data from the memory card, initially saved on it.

The device receiving the data must be identical to the one from which these data originate.

- Check that both devices have the same order code and the same activated software options.

Refer to section 5.9 to access the "Parameters" menu.



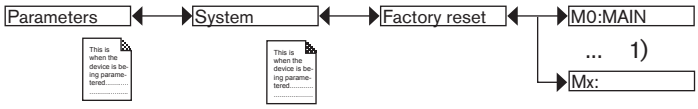
[1]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

If an error message is displayed, refer to section 6.3.8.

5.10.7 Restoring the default parameters of the Process level and the outputs

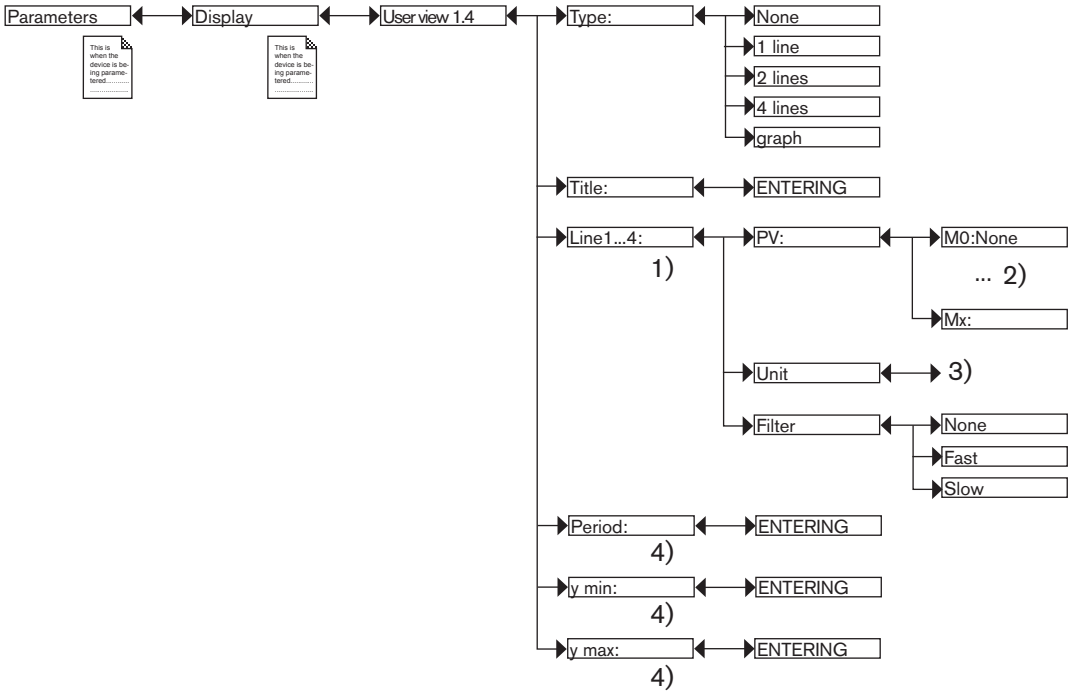
This function is used to restore (dynamic key "Yes") the default parameters of the Process level and outputs or keep (dynamic key "No") the current parameters.

Refer to section 5.9 to access the "Parameters" menu.



5.10.8 Customising user views 1 to 4

Refer to section 5.9 to access the "Parameters" menu.



[1] If "Type" = 1, 2 or 4 "lines"

[2]The choices offered depend on the modules fitted and/or the options activated. See section 5.10.4 and section 5.16.

[3] The choices offered depend on the choice made in "PV" above

[4] If "Type" = "graph"

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TYPE: Choosing to display 1, 2 or 4 values (on 1, 2 or 4 lines) or a graph in the customised "Ux" view selected.
TITLE: Entering the name displayed in the corresponding "Ux" view. See section "5.4 Entering text".

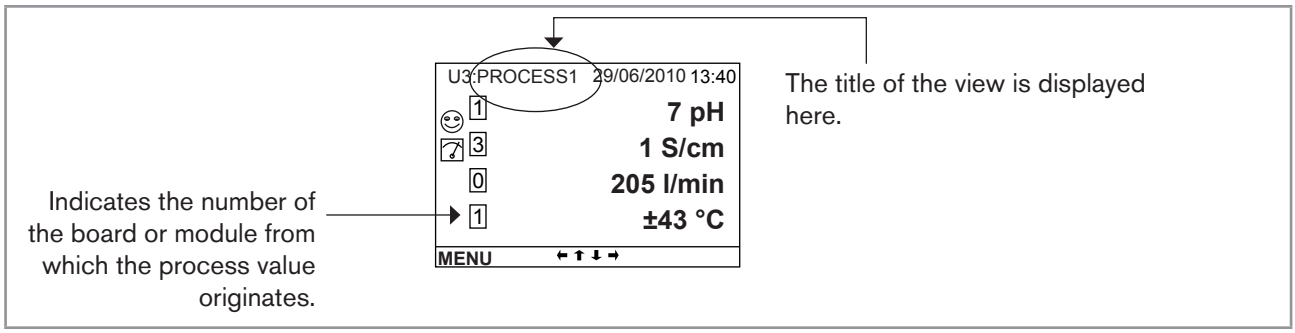

Fig. 43 : Example of a title for a customised view

LINE1 TO LINE4: Setting the parameters for the values (1, 2 or 4) displayed in a customised "Ux" view:

- *PV*: Select the digital input, the analogue output or the physical parameter to be displayed on the line selected in this customised view. The options available depend on the modules fitted.

  One of the "PVs" in the conductivity module, available for the customised "Ux" views, is "USP" (see section 5.10.24).

- *UNITS*: Select the units in which the digital input, the analogue output or the physical parameter selected is displayed on the PV function above.
- *FILTER*: Select the level of attenuation for the measurement signal on the digital input, the analogue output or the physical parameter displayed on the line selected. Three levels of attenuation are proposed: "slow" (slow filtering has a high attenuation effect), "fast" (fast filtering) or "none" (no filtering)

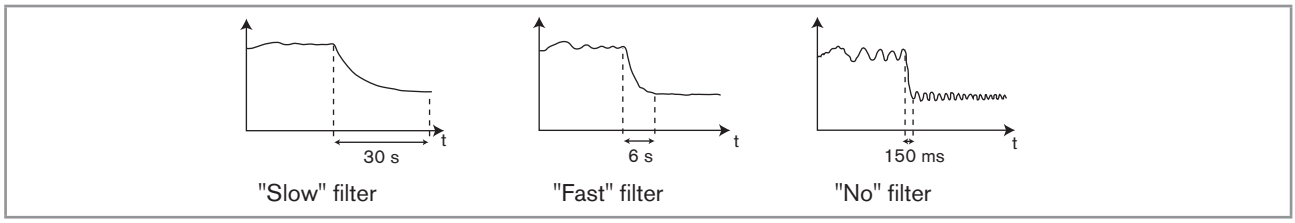

Fig. 44 : Filtering curves

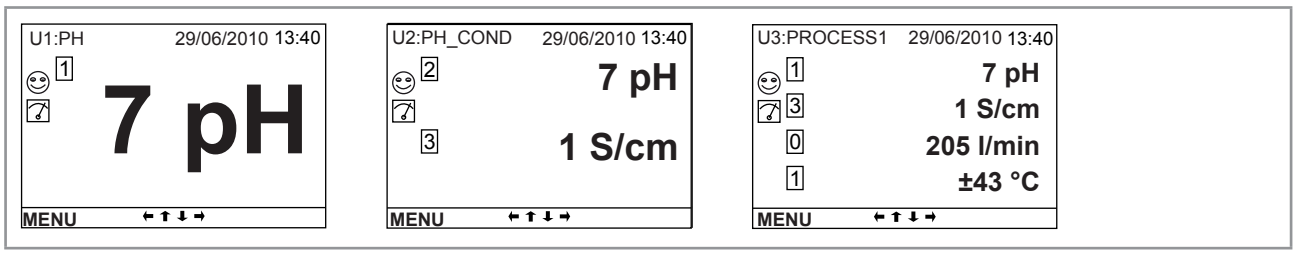

Fig. 45 : Examples of customised views with 1, 2 and 4 lines

LINE: Set the parameters for the graph displayed in a customised "Ux" view:

- *PERIOD*: Enter the graph refresh period in seconds.
- *Y MIN*: Enter the minimum value on the vertical axis for the PV selected.
- *Y MAX*: Enter the maximum value on the vertical axis for the PV selected.

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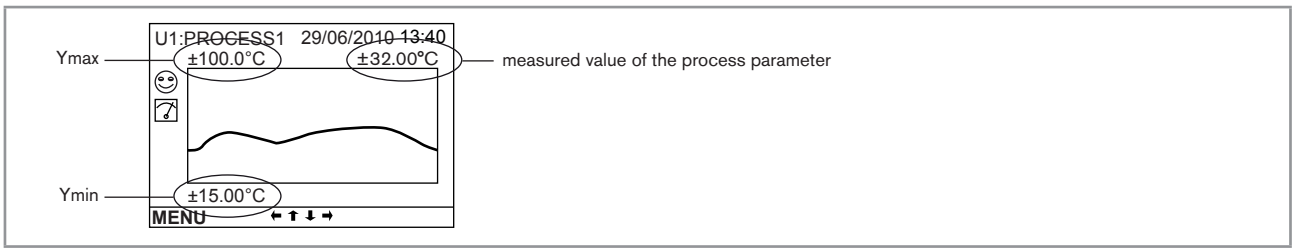


Fig. 46 : Example of a customised view of a graph

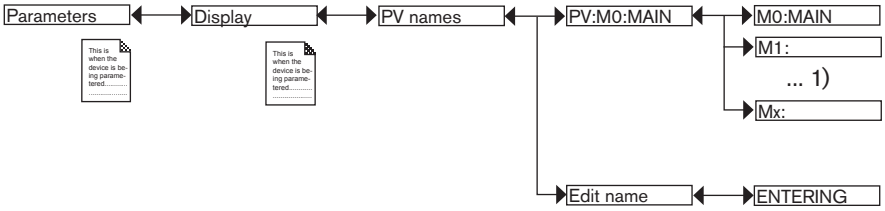
5.10.9 Renaming a process variable

To retrieve the original name of a variable, even after modification and saving:

→ Move the selector into the customised name entering area.

→ delete all the characters and save.

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

The entered name appears in the view in Process level. See section "5.4 Entering text".

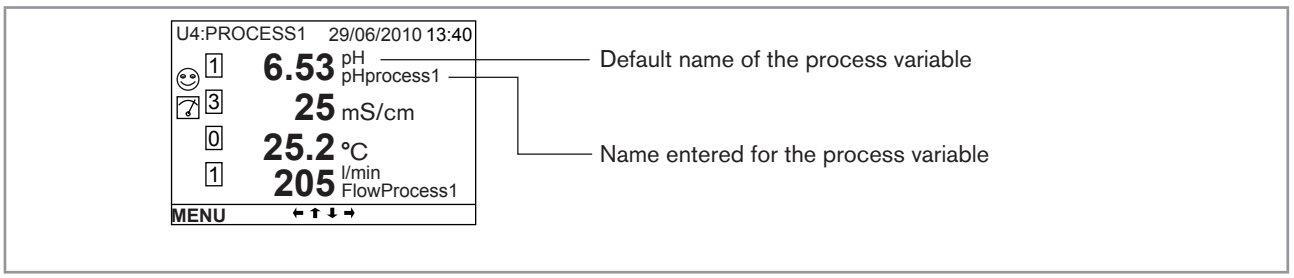
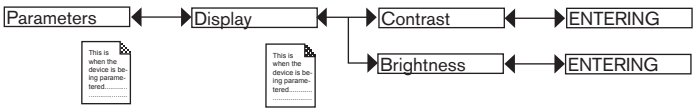
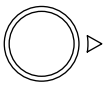
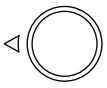


Fig. 47 : Example of a renamed process variable

5.10.10 Setting the display contrast and brightness

Refer to section 5.9 to access the "Parameters" menu.



→ Set each percentage using  and 

CONTRAST: Choose the display contrast level (as a %).

BRIGHTNESS: Choose the light intensity of the display (as a %).

5.10.11 Configuring an arithmetic function

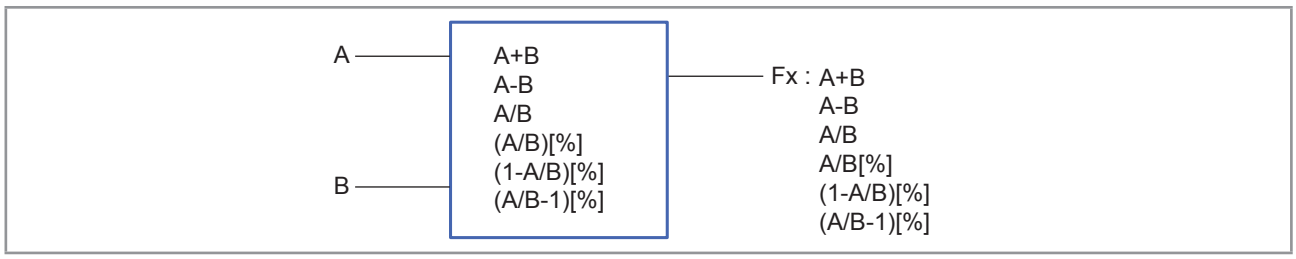


Fig. 48 : Arithmetic functions

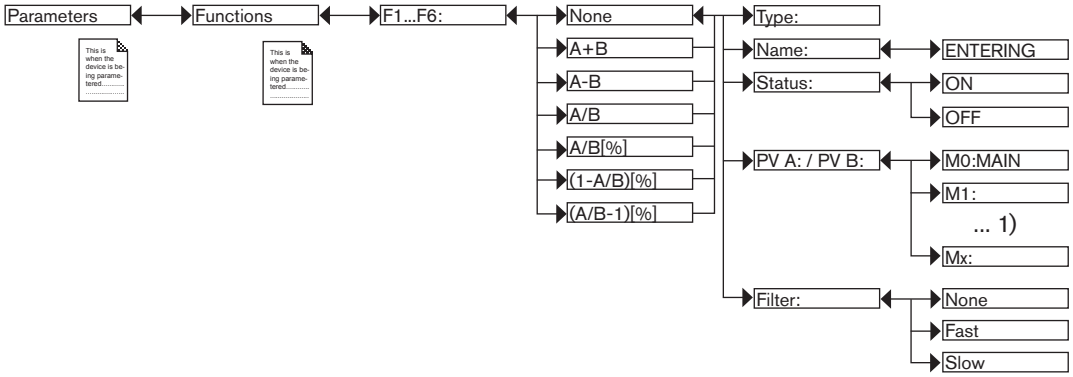
The functional block is used to calculate the image using one of the arithmetic functions available for 2 variables, A and B, selected from the process variables available. Variables A and B must be of a kind and in identical units. Moreover, A and/or B may be the result of a function already used:

Function	Calculation made
A+B	Sum of 2 variables, A and B
A-B	Subtraction between the 2 variables, A and B
A/B	Ratio between the 2 variables, A and B
A/B[%]	Passage rate
(1 - A/B)[%]	Rejection rate
(A/B - 1)[%]	Deviation rate

Once the function has been configured and activated, the result "Fx:" calculated is available in the list of process variables on the "M0:MAIN" board. This list appears in the output configuring, user view configuring and datalogging menus to:

- Assign the result "Fx:" calculated to a physical output (analogue, AO, or digital, DO) (see sections 5.10.21 and 5.10.22).
- Display the result "Fx:" on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of "Fx:" using the datalogger: see section 5.10.18.

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

TYPE: Indicates the function chosen.

NAME: Rename the function chosen. See section "5.4 Entering text". This name appears in the view associated with this function in Process level.

STATUS: Used to activate (choose "ON") or deactivate (choose "OFF") the view of the function selected in Process level.

PV A (OR PV B): Combine a physical parameter (or the result of one of the functions, F1 to F6, already used) with variable A (or B). Variables A and B must be of the same value type and have the same unit.

FILTER: Choose the level of attenuation of the input variables. See "Fig. 44 : Filtering curves".

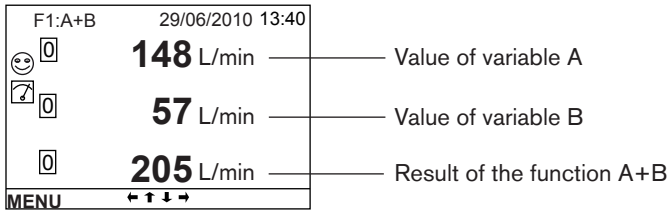


Fig. 49 : Example of a view of an active arithmetic function in Process level

5.10.12 Configuring a "PROP" proportional function

This function is used to scale a process input (PV):

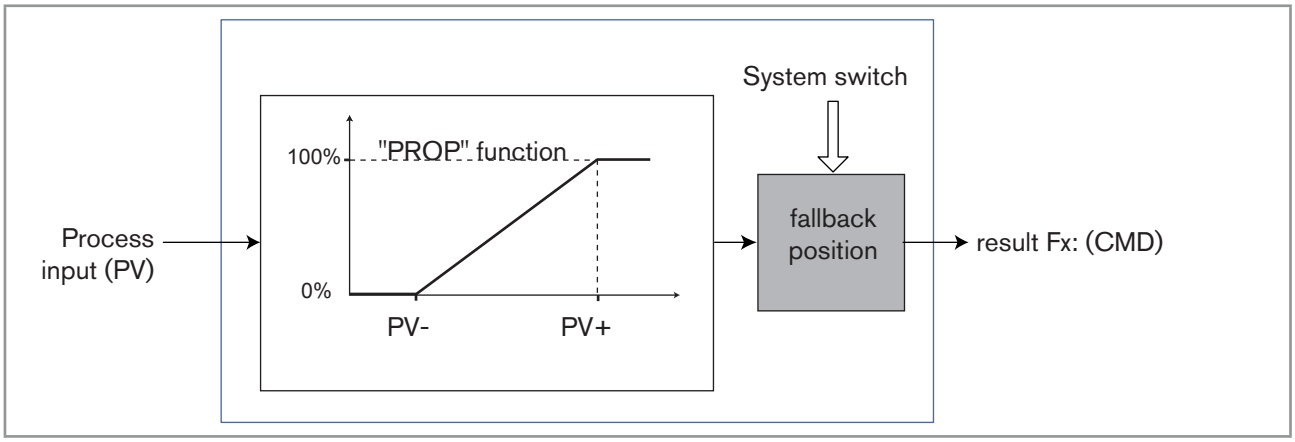


Fig. 50 : "PROP" proportional function

Refer to section 5.9 to access the "Parameters" menu.

Once the function has been configured and activated, the result "Fx:" calculated is available in the list of process variables on the "M0:MAIN" board. This list appears in the output configuring, user view configuring and datalogging menus to:

- Assign the result "Fx:" calculated to a physical output (analogue, AO, or digital, DO) (see sections 5.10.21 and 5.10.22).
- Display the result "Fx:" on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of "Fx:" using the datalogger: see section 5.10.18.

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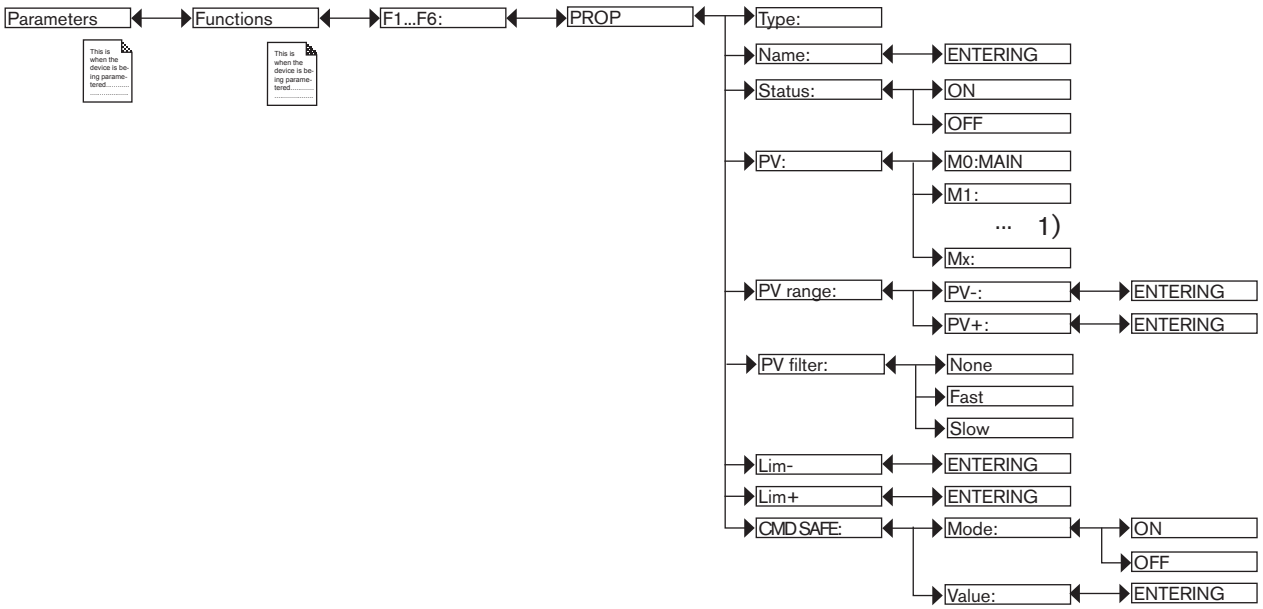

[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

TYPE: Indicates the function chosen (here, "PROP").

NAME: Rename the function chosen. See section "5.4 Entering text". This name appears on the view associated with this function in Process level.

STATUS: Used to activate (choose "ON") or deactivate (choose "OFF") the function selected.

PV: Choose the process input for the function.

PV RANGE: Enter the minimum ("PVScale-") and maximum ("PVScale+") values of the process input.

PV FILTER: Choose the level of attenuation of the chosen process value. See "Fig. 44 : Filtering curves".

LIM-: Enter the lower limit on the output.

LIM+: Enter the upper limit on the output.

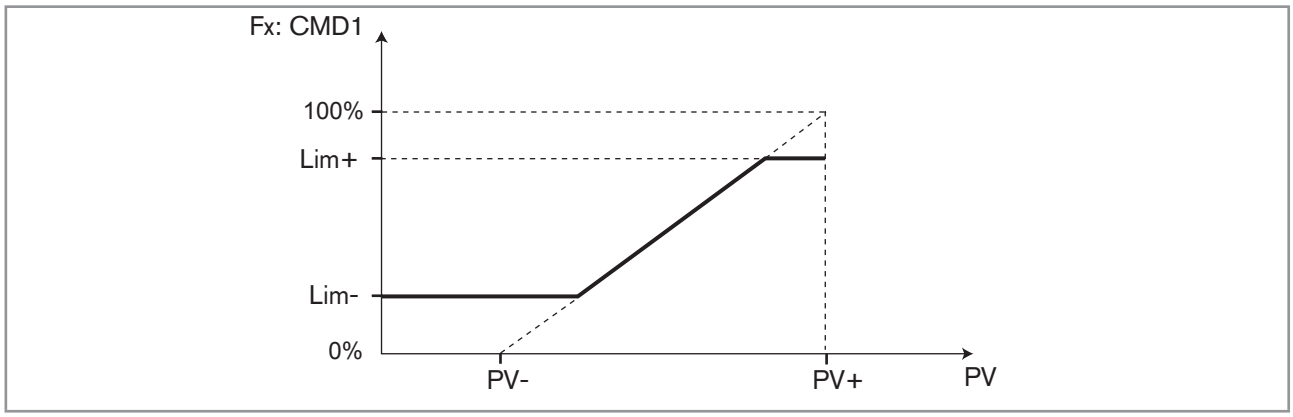

Fig. 51 : Using the "LIM-" and "LIM+" parameters on a "PROP" function

CMD SAFE: Confirm (select "Mode: ON") or do not confirm (select "Mode:OFF") the use of a fallback position on the output when the "System switch" event (see section 5.10.17) has the state "ON". When use of the fallback position is confirmed, enter a fallback position value of between 0 and 100% for each output.

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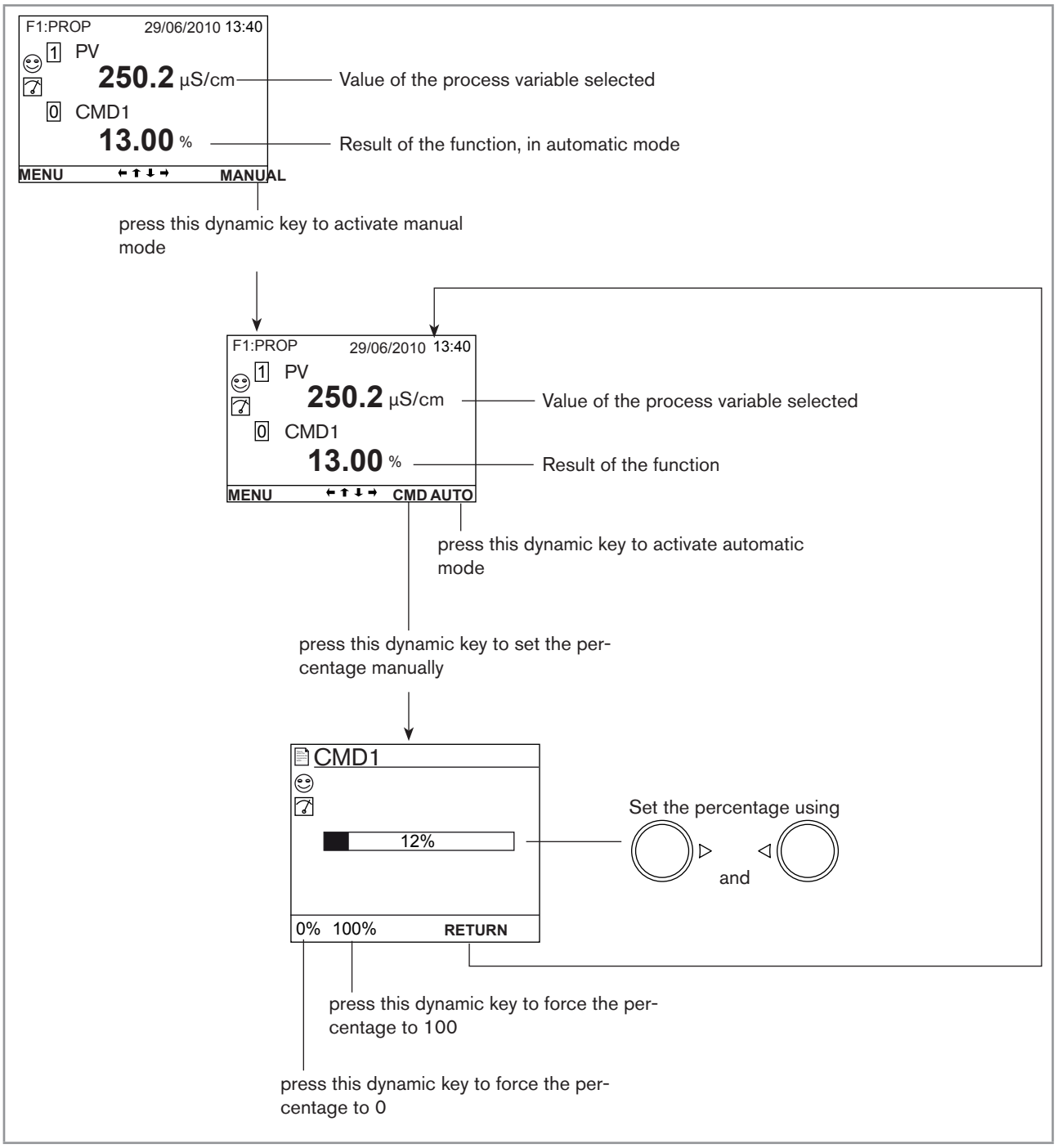

Fig. 52 : Examples of a view of a "PROP" function in Process level and switch to manual or automatic mode

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5.10.13 Configuring an "ONOFF" control function

This function is used to set the on/off control.

A conductivity control system can be combined with the "time dosing" function (see section 5.10.15) to carry out a purging step before dosing.

Once the function has been configured and activated, the result "Fx:" calculated is available in the list of process variables on the "M0:MAIN" board. This list appears in the output configuring, user view configuring and datalogging menus to:

- Assign the result "Fx:" calculated to a physical output (analogue, AO, or digital, DO) (see sections 5.10.21 and 5.10.22).
- Display the result "Fx:" on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of "Fx:" using the datalogger: see section 5.10.18.

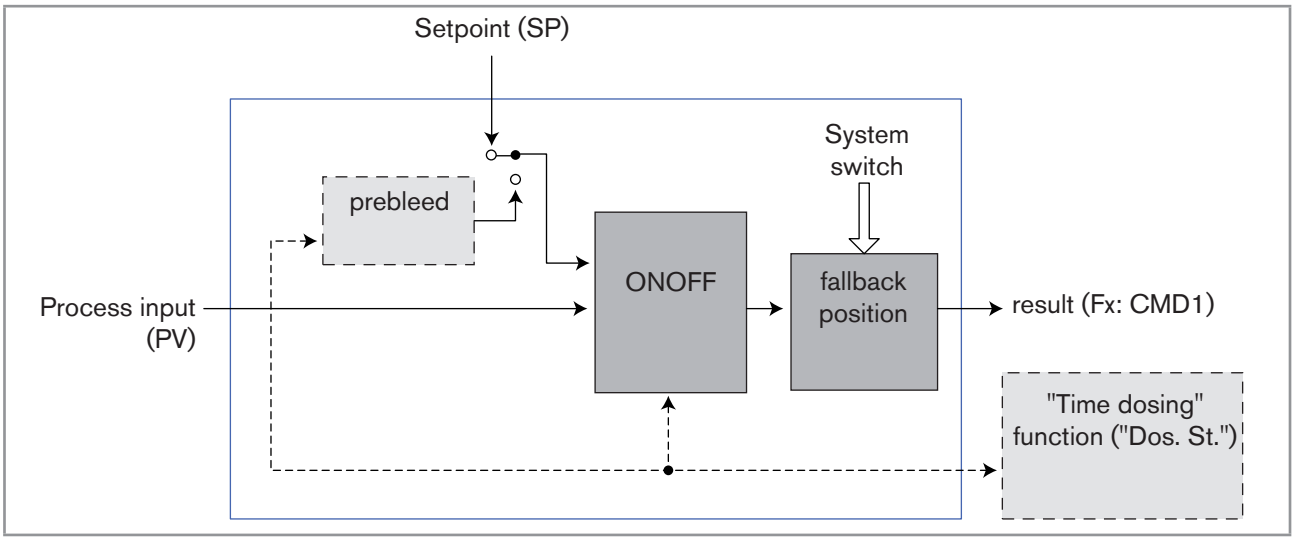

Fig. 53 : "ONOFF" function

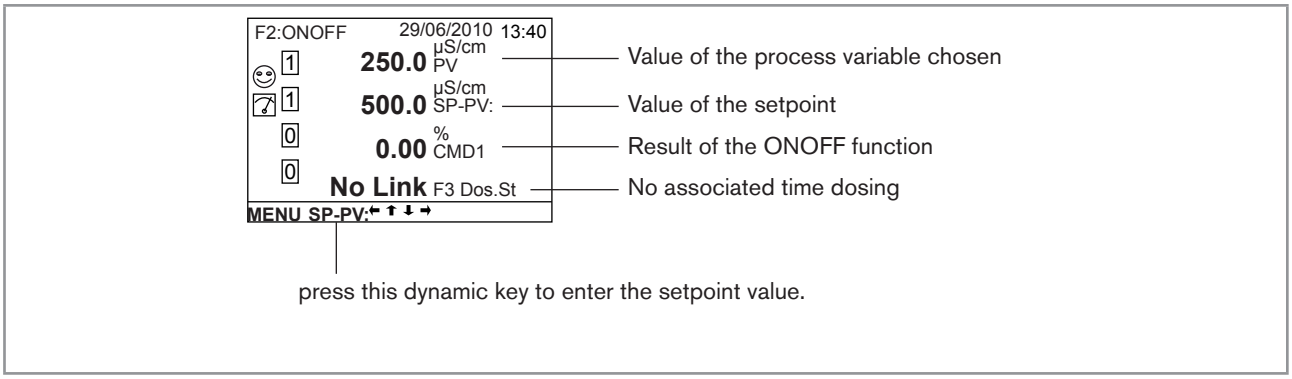

Fig. 54 : Example of a view of an "ONOFF" function in Process level with no associated time dosing

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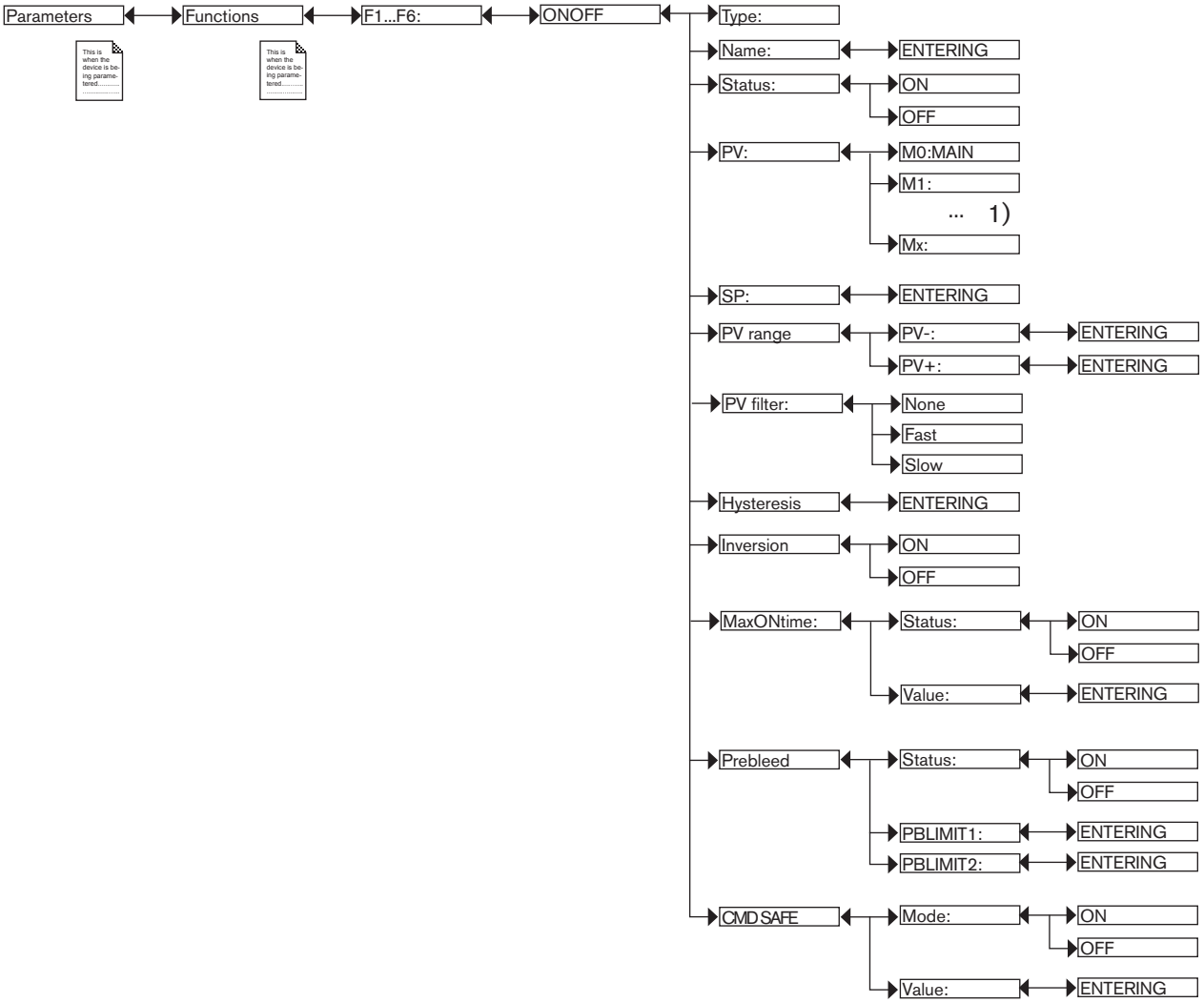
Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

TYPE: Indicates the function chosen.

NAME: Rename the function chosen. See section "5.4 Entering text". This name appears in the view associated with this function in Process level.

STATUS: Used to activate (choose "ON") or deactivate (choose "OFF") the function selected.

PV: Choose the process input for the function from the list suggested by the device. This process input may be a measured physical parameter, an analogue output or the result of another active configured function.

SP: Enter the setpoint value.

PV RANGE: Enter the minimum ("PVScale-") and maximum ("PVScale+") values of the process input.

PV FILTER: Choose the level of attenuation of the chosen process value. See "Fig. 44 : Filtering curves".

HYSTERESIS: Enter a hysteresis value for the switching point.

INVERSION: Used to invert (choose "ON") or not (choose "OFF") the operating direction of switching. See "Fig. 55 : Non-inverted and inverted hysteresis mode".

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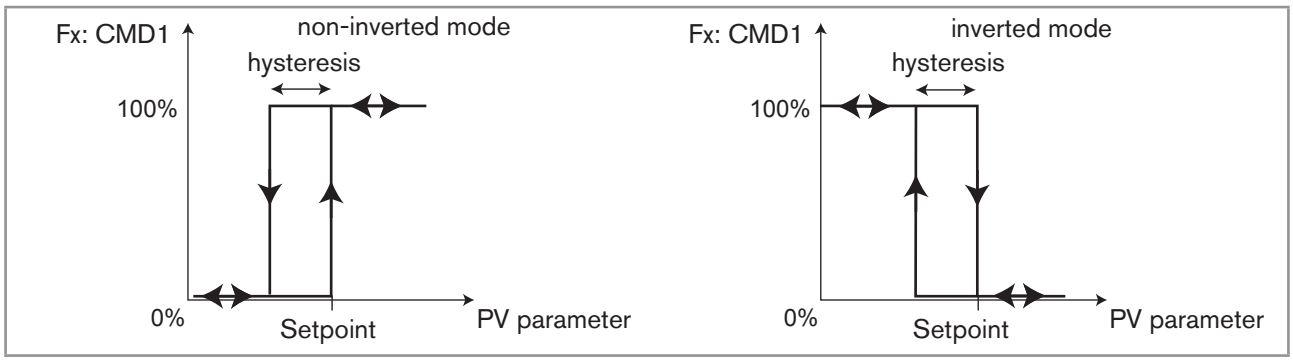

Fig. 55 : Non-inverted and inverted hysteresis mode

MAXONTIME: Enter the max. authorised duration of output control: after this period, the output is deactivated.

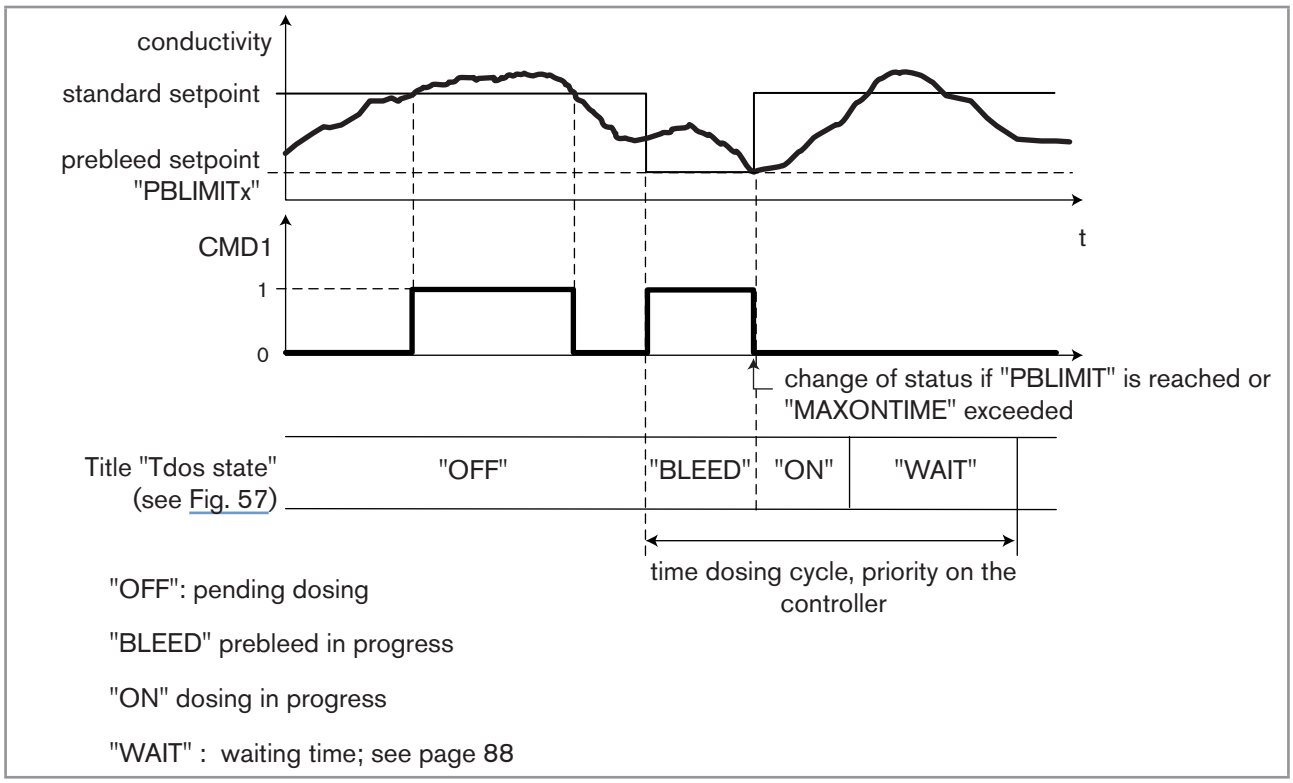

Fig. 56 : Combination of "ONOFF" and "TIME DOSING" functions on a conductivity measurement

PREBLEED: Define (choose "ON") or not (choose "OFF") the ONOFF function for controlling a conductivity function as a prebleed function associated with a time dosing function ("Time Dosing": see section 5.10.15). When prebleed is activated, enter the prebleed setpoint value:

- *LIM CA1*:Enter the prebleed setpoint for channel 1 on the associated "Time Dosing" function.
- *LIM CA2*:Enter the prebleed setpoint for channel 2 on the associated "Time Dosing" function.

A setpoint value must be entered in which is less than or equal to the conductivity setpoint of the ON/OFF regulator.

The prebleed lowers the fluid conductivity to a value less than the standard setpoint value of the ON/OFF regulator. The prebleed setpoint "LIM CAx", when enabled, takes priority over the standard setpoint of the regulator

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CMD SAFE: Confirm (select "Mode: ON") or do not confirm (select "Mode:OFF") the use of a fallback position on the output when the "System switch" event (see section 5.10.7) has the state "ON". When use of the fallback position is confirmed, enter a fallback position value of between 0 and 100% for each output.

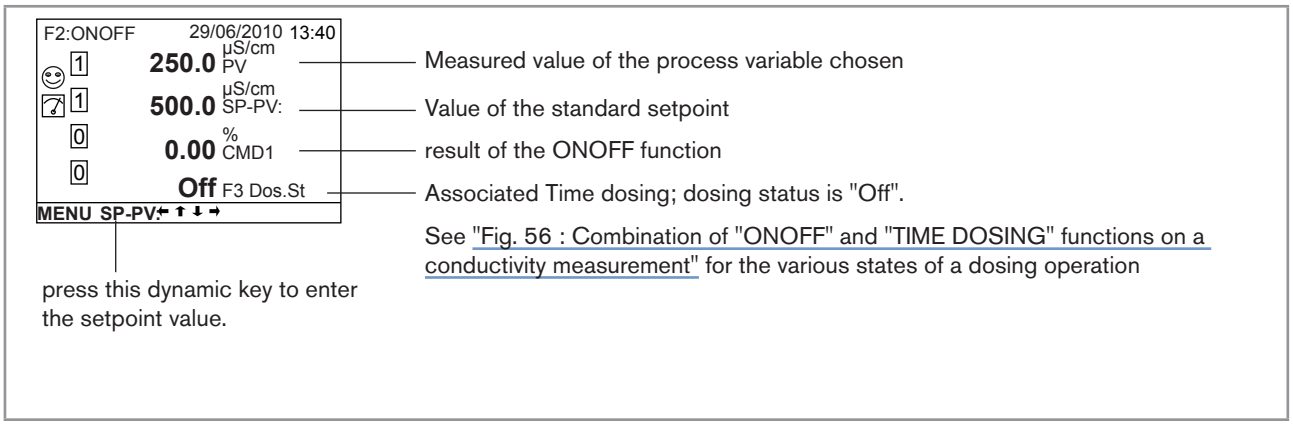

Fig. 57 : Example of a view, in Process level, of the ONOFF function associated with a time dosing function

5.10.14 Configuring a PID (proportional integral derivative) control function

This function is available as an option. See section 5.10.4

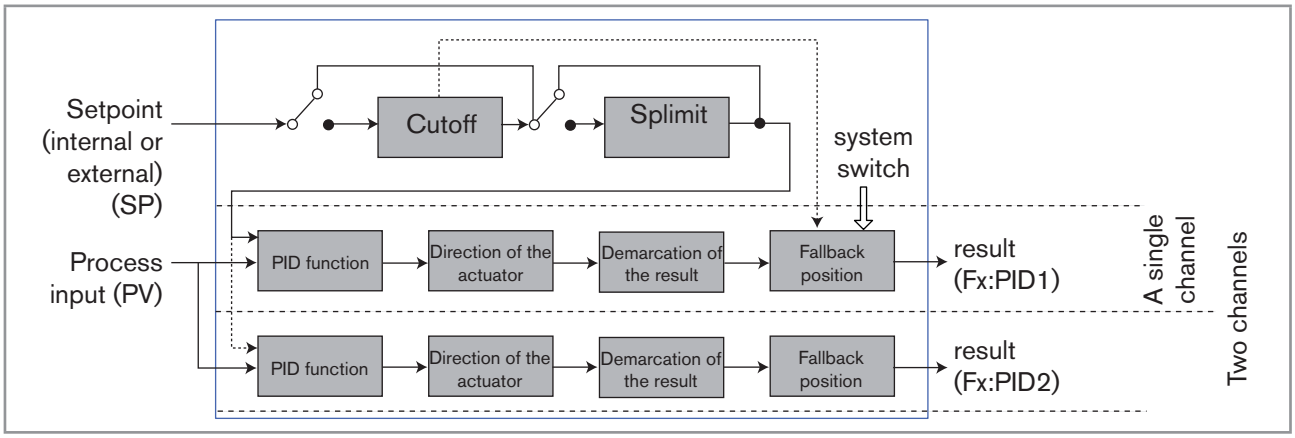

Fig. 58 : PID function

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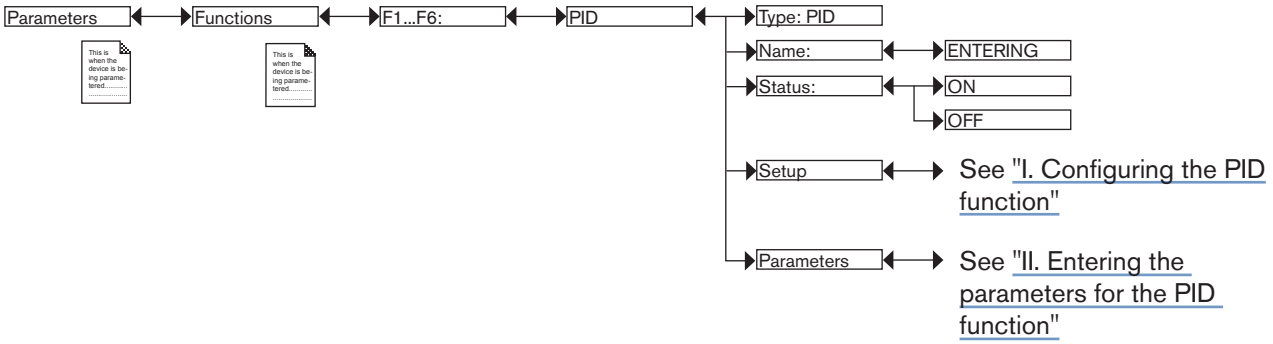
Once the function has been configured and activated, the result "Fx:" calculated is available in the list of process variables on the "M0:MAIN" board. This list appears in the output configuring, user view configuring and datalogging menus to:

- Assign the result "Fx:" calculated to a physical output (analogue, AO, or digital, DO) (see sections 5.10.21 and 5.10.22).
- Display the result "Fx:" on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of "Fx:" using the datalogger: see section 5.10.18.

Refer to section 5.9 to access the "Parameters" menu.



TYPE: Indicates the function chosen (here, PID).

NAME: Rename the function chosen. See section "5.4 Entering text". This name appears in the view associated with this function in Process level.

STATUS: Used to activate (choose "ON") or deactivate (choose "OFF") the function.

To configure the PID function in 2 steps: see "I. Configuring the PID function" and "II. Entering the parameters for the PID function"

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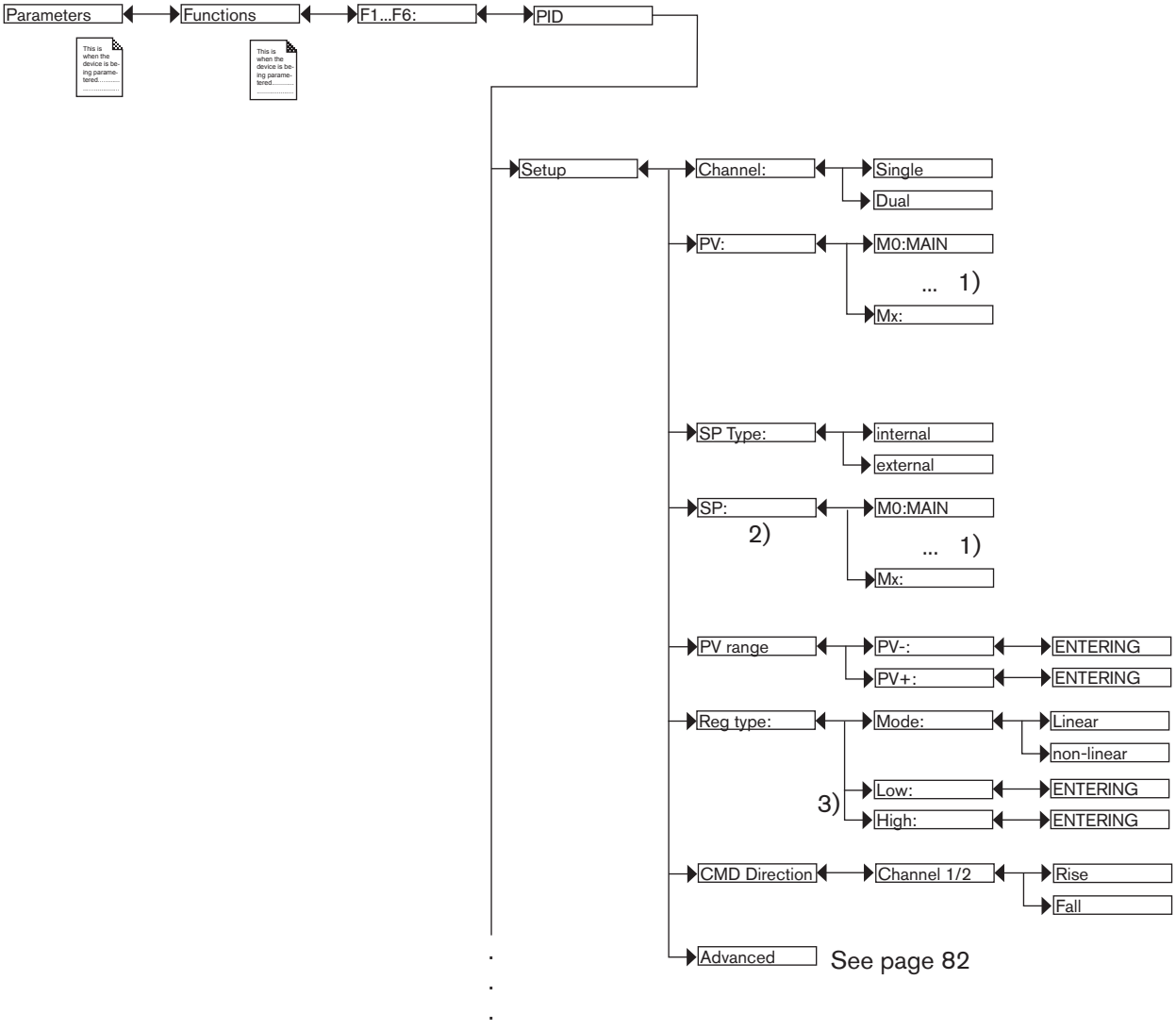
I. CONFIGURING THE PID FUNCTION

Refer to section 5.9 to access the Parameters menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2)] This function is present if "SP Type" = "external"

[3)] These functions are present if "Reg. Type Mode" = "non-linear"

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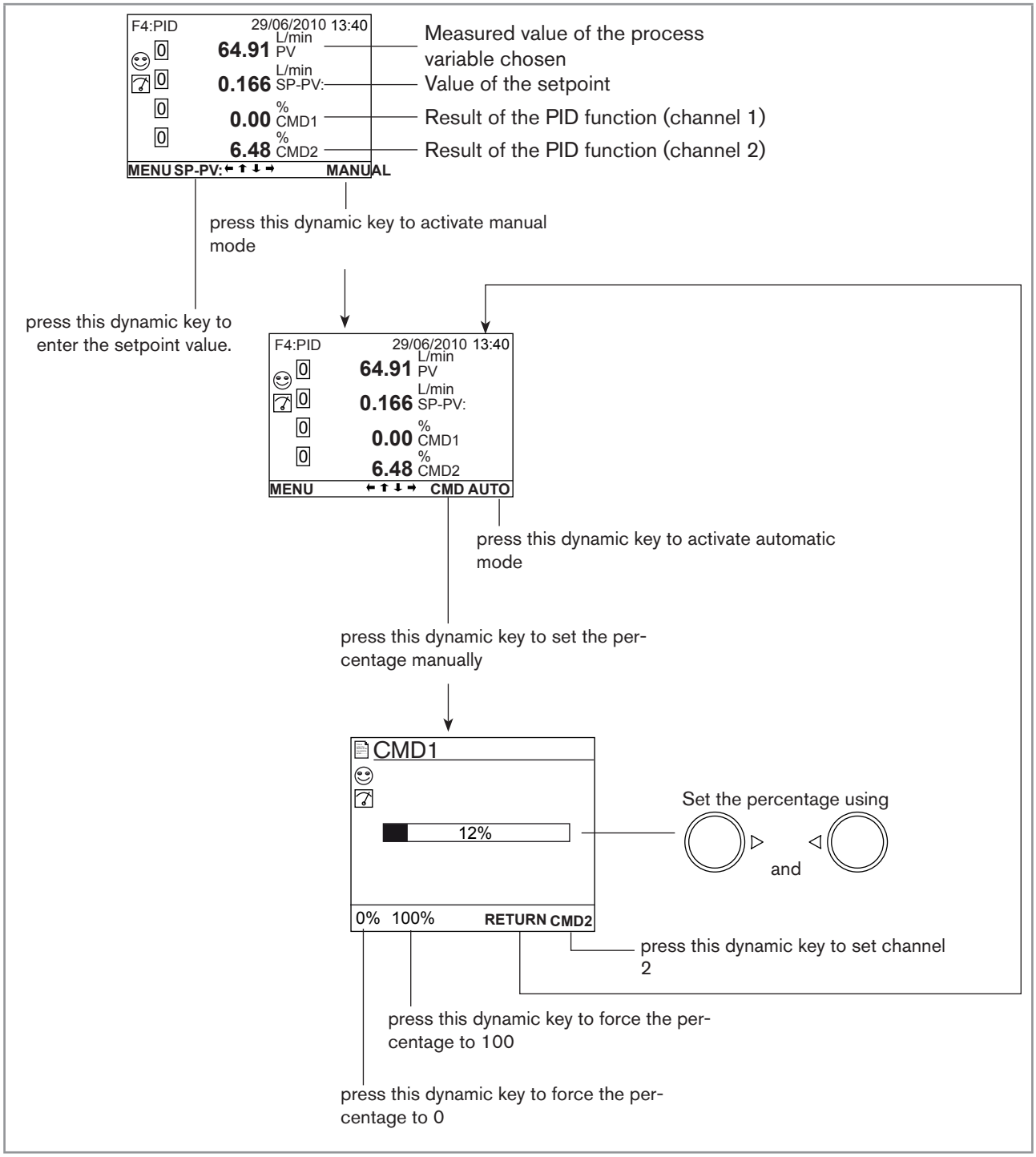

Fig. 59 : Example of a view, in Process level, of the PID function, and switching to manual or automatic mode

CHANNEL: Choose to use a single control loop (choose "Single") or a control loop with 2 outputs, each with a set of parameters (choose "Dual").

"Dual" mode is used, for example, to control the pH with an acid output and a base output: when the "acid" output is controlled, the "base" output is at zero and vice versa.

PV: Choose the process input from the list displayed by the device. This value may be a measurement input or the result of the function.

SP TYPE: Choose between an internal setpoint value (choose "internal") or an external setpoint value (choose "external"; then select the parameter used as the setpoint from the list in the "SP-PV" function below).

SP: Choose the parameter used as the external setpoint for the function.

PV RANGE: Enter the minimum ("PVRange-") and maximum ("PVRange+") measurement values of the process input.

REG TYPE: Choose a linear control mode (choose "linear") or non-linear control mode (choose "non-linear"; then enter under "Low" and "High" the 2 process input thresholds outside of which the "Drift" part is deactivated).

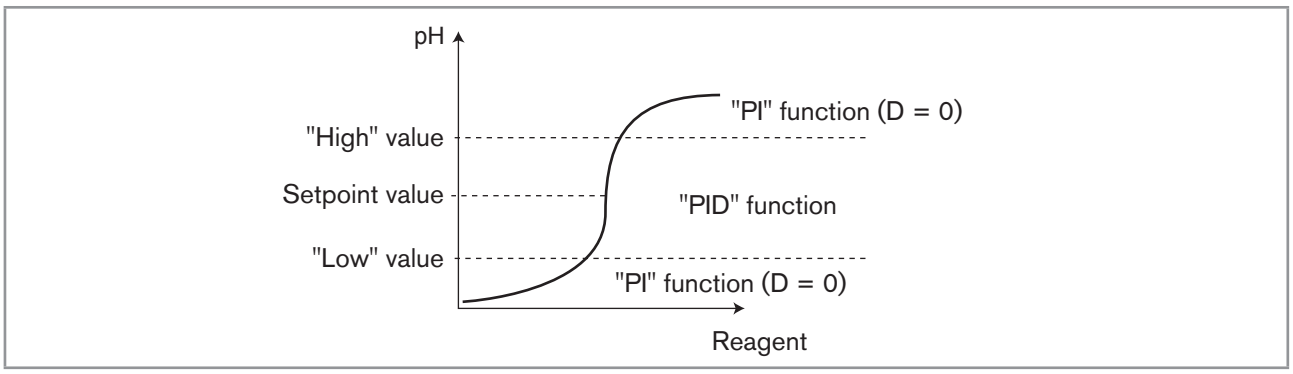

Fig. 60 : Example of non-linear control of the pH

CMD DIRECTION: Choose the control direction for the function (CMD1 or CMD2 respectively): ascending (choose "Rise") or descending (choose "Fall").

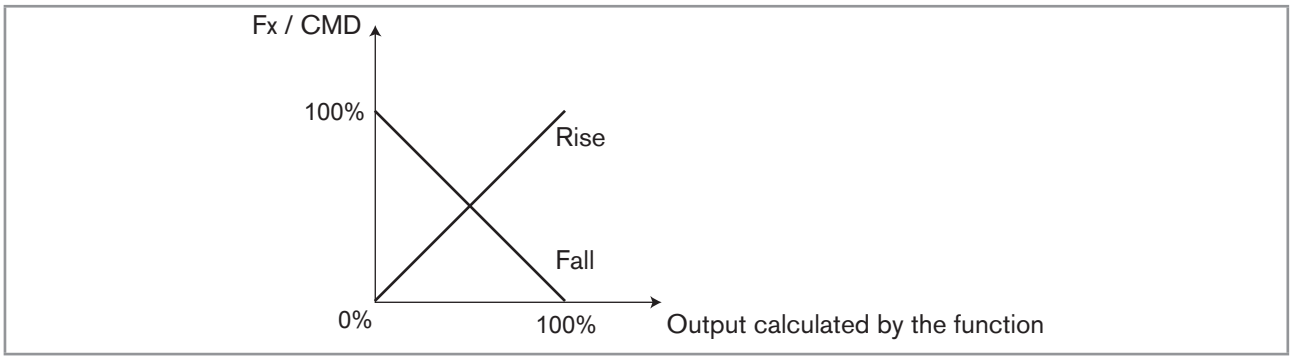

Fig. 61 : CMD DIRECTION graphs

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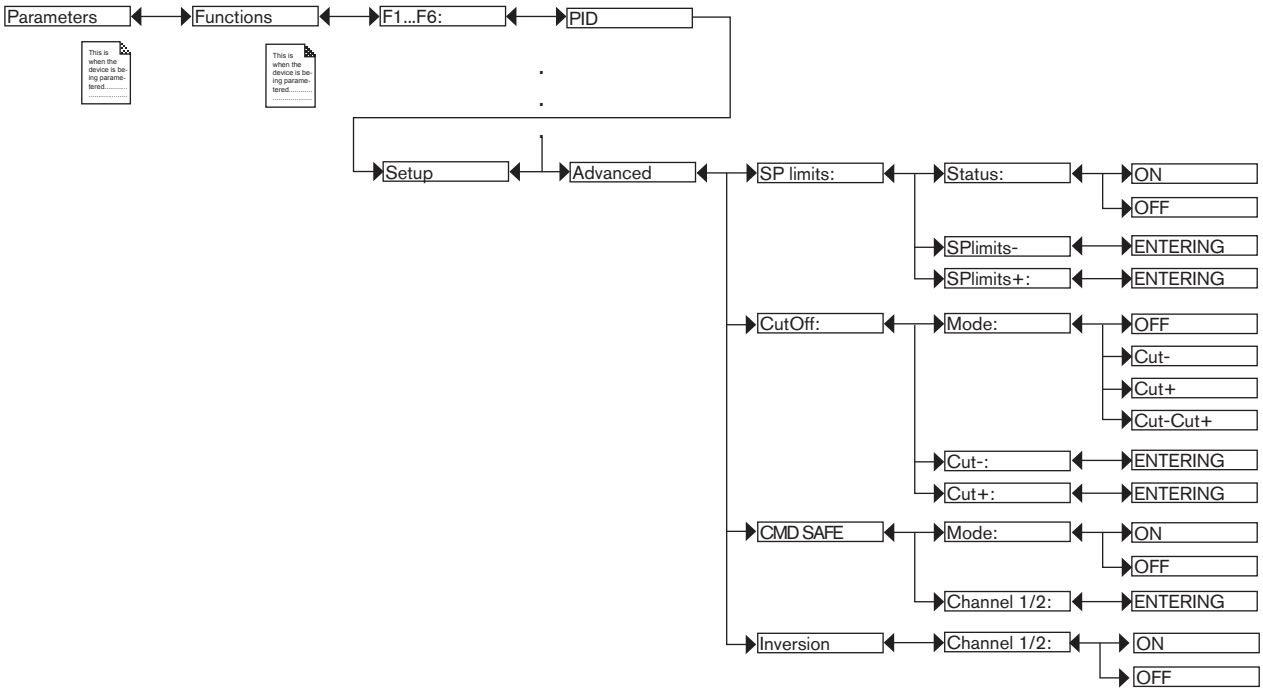

SP LIMITS: Set the low and high limits of the setpoint value in order to limit the working range of the setpoint.

CUTOFF: Force or do not force the module output to 0% or 100% if the setpoint value is outside a range defined by "Cut-" and "Cut+", or under the low range "Cut-", or above the high range "Cut+".

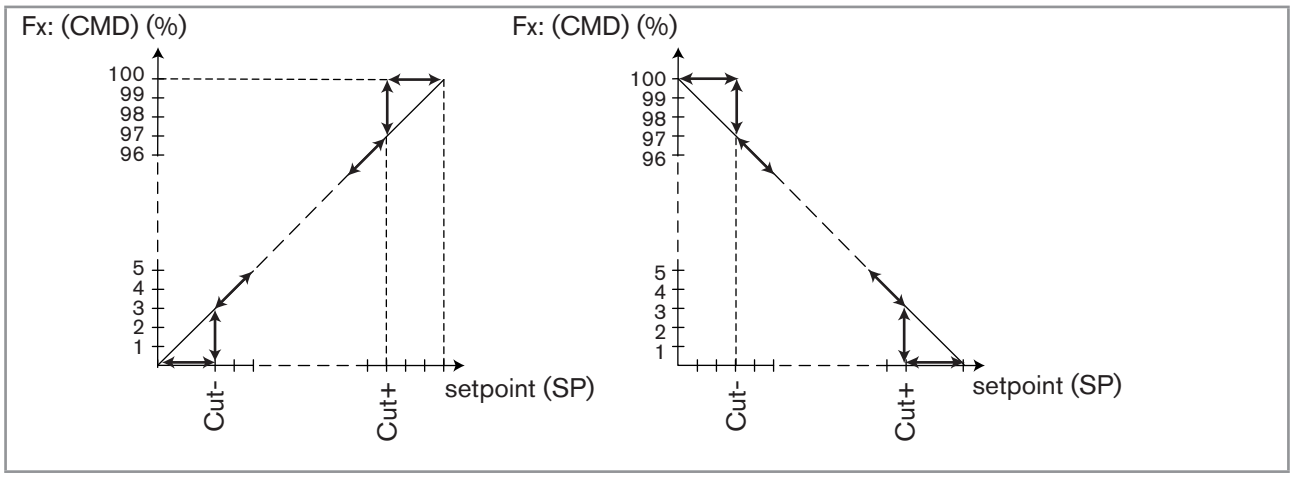

Fig. 62 : "CUTOFF" graphs

CMD SAFE: Confirm (select "Mode: ON") or do not confirm (select "Mode:OFF") the use of a fallback position on the output when the "System switch" event (see section 5.10.17) has the state "ON". When use of the fallback position is confirmed, enter a fallback position value of between 0 and 100% for each output.

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INVERSION: Used to invert (choose "ON") or not (choose "OFF") the operating direction of the output depending on the indication of the difference between setpoint (SP) and measurement (PV). This function is used in particular in an acid-base regulation.

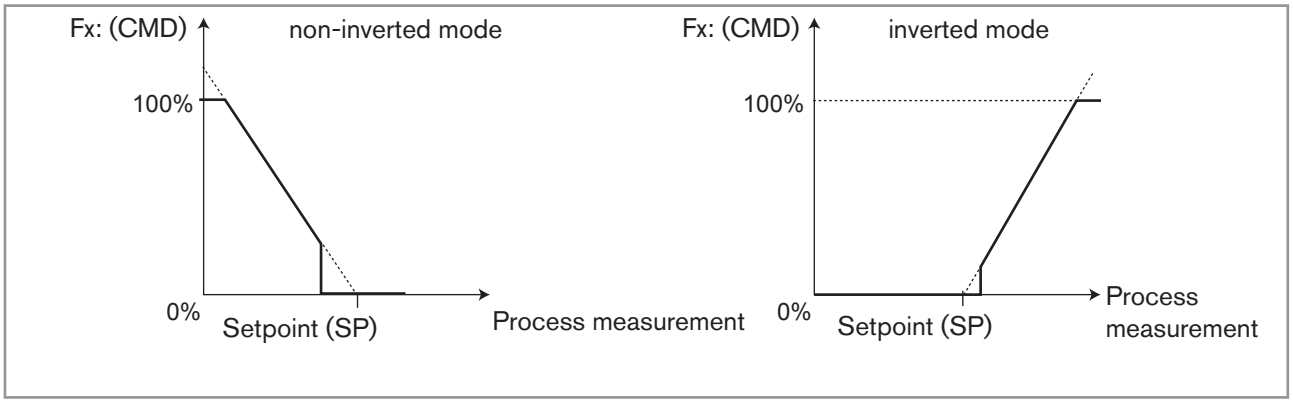
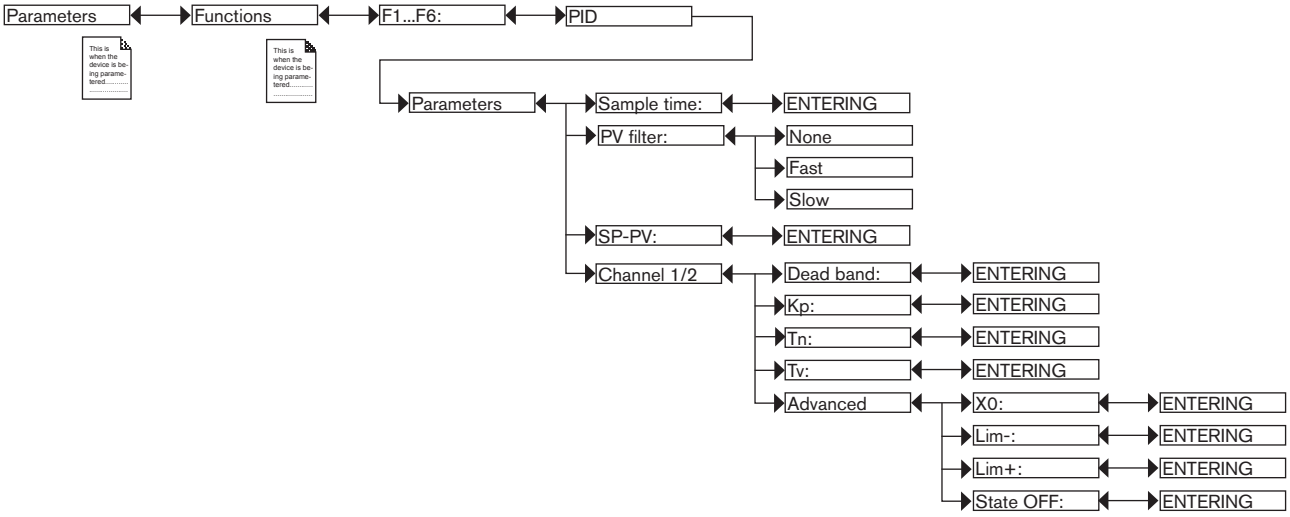


Fig. 63 : Operating direction of the output, non-inverted or inverted

II. ENTERING THE PARAMETERS FOR THE PID FUNCTION

Refer to section 5.9 to access the Parameters menu.



SAMPLE TIME: Define the sampling time (between 0.1 and 60 s).

SP: Enter the setpoint value.

PV FILTER: Choose the level of attenuation of the chosen process value. See "Fig. 44 : Filtering curves".

DEADBAND: Define the percentage, from 0 to 100%, of the deadband around the setpoint value.

KP: Define the proportional gain applied to the difference between the setpoint value and the measured value.

TN: This parameter represents the integral part of the PID module used to eliminate the static error between the measurement and the setpoint. Enter a value of between 0.1 and 9999 seconds (default value: 9999 s).

TV: This parameter represents the drift part of the PID module used to react quickly to variations in measurement or setpoint and anticipate variations on the controller. Use this variable on slow processes. Enter a value of between 0.0 and 9999 seconds (default value: 0.0 s).

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If the system becomes unstable, the "TV" value set is too high: reduce it as quickly as possible.

X0: Enter the working point of the output, from 0 to 100%.

LIM- and *LIM+*: Some actuators (proportional solenoid valves) work over a reduced range (for example 40 - 80 %). The parameters "Lim-" and "Lim+" enable a correspondence between the working range of the actuator and that of the 8619 regulator: see Fig. 64.

STATE OFF: When scaling of the output is configured using the parameters "Lim-" and "Lim+", the parameter "STATE OFF" is used to guarantee the output setting to 0% or 100% to prevent a permanent command subsisting on the actuator terminals.

$$\Delta = \text{"state off"} \times (\text{"Lim+"} - \text{"Lim-"})$$

i.e. a proportional solenoid valve operating between a command of 40% and 80%.

Then set parameters "Lim-" = 40% and "Lim+" = 80 %

If "state OFF" = 2 %, then Δ = 2 % x (80 - 40) = 0.8 %

Therefore, when the actual output is below 40 + 0.8 = 40.8%, the command switches to 0% and when the actual output is above 80 – 0.8 = 79.2%, the command switches to 100%.

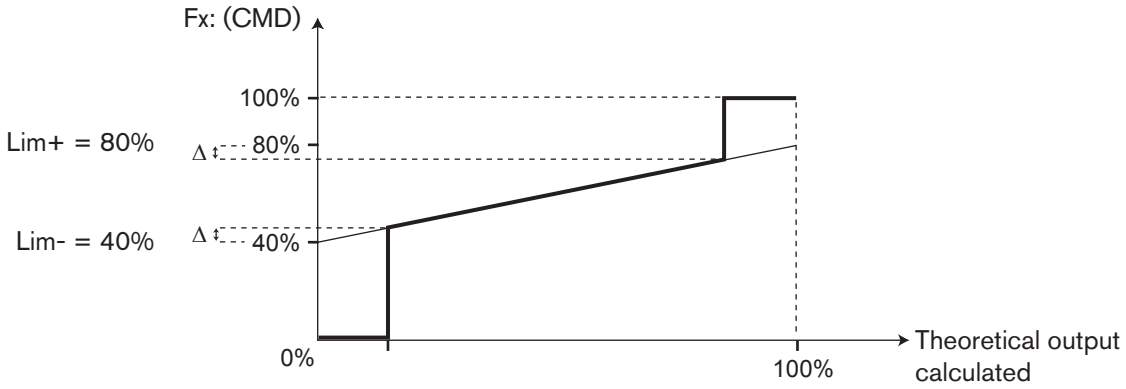

Fig. 64 : Example of "Lim-", "Lim+" and "State OFF" parameter setting

5.10.15 Configuring a time dosing cycle

This function is available as an option. See section 5.10.4

It is used to add one or two products to the process, either at regular intervals ("DoMode" = "Period"), or according to the days of the week ("DoMode" = "Week"). The quantity added is proportional to the time open (programmable) of the command unit.

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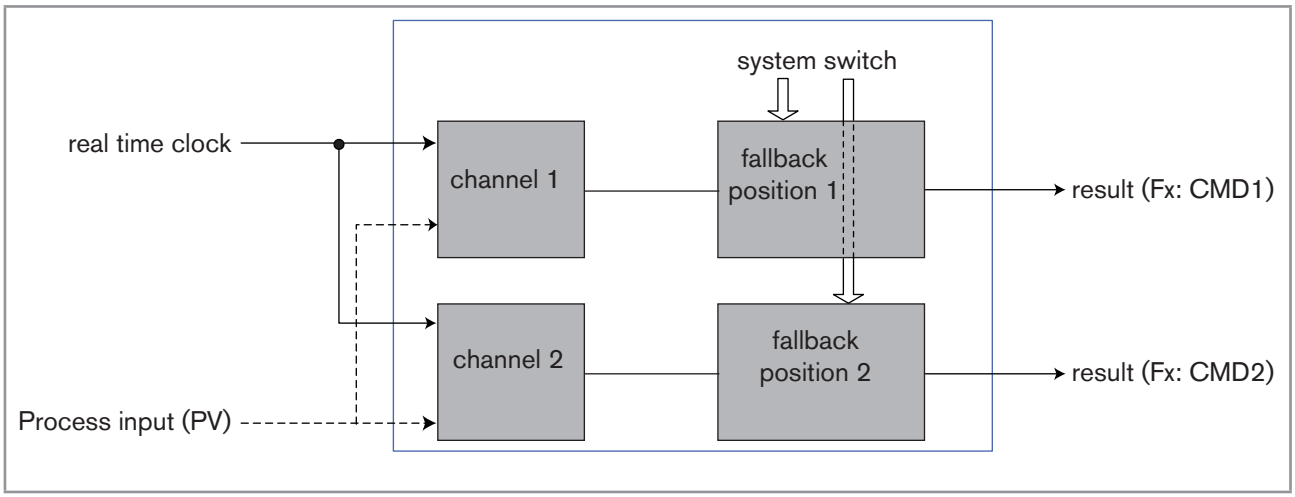

Fig. 65 : "Time dosing" function

Once the function has been configured and activated, the result "Fx:" calculated is available in the list of process variables on the "M0:MAIN" board. This list appears in the output configuring, user view configuring and datalogging menus to:

- Assign the result "Fx:" calculated to a physical output (analogue, AO, or digital, DO) (see sections 5.10.21 and 5.10.22).
- Display the result "Fx:" on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of "Fx:" using the datalogger: see section 5.10.18.

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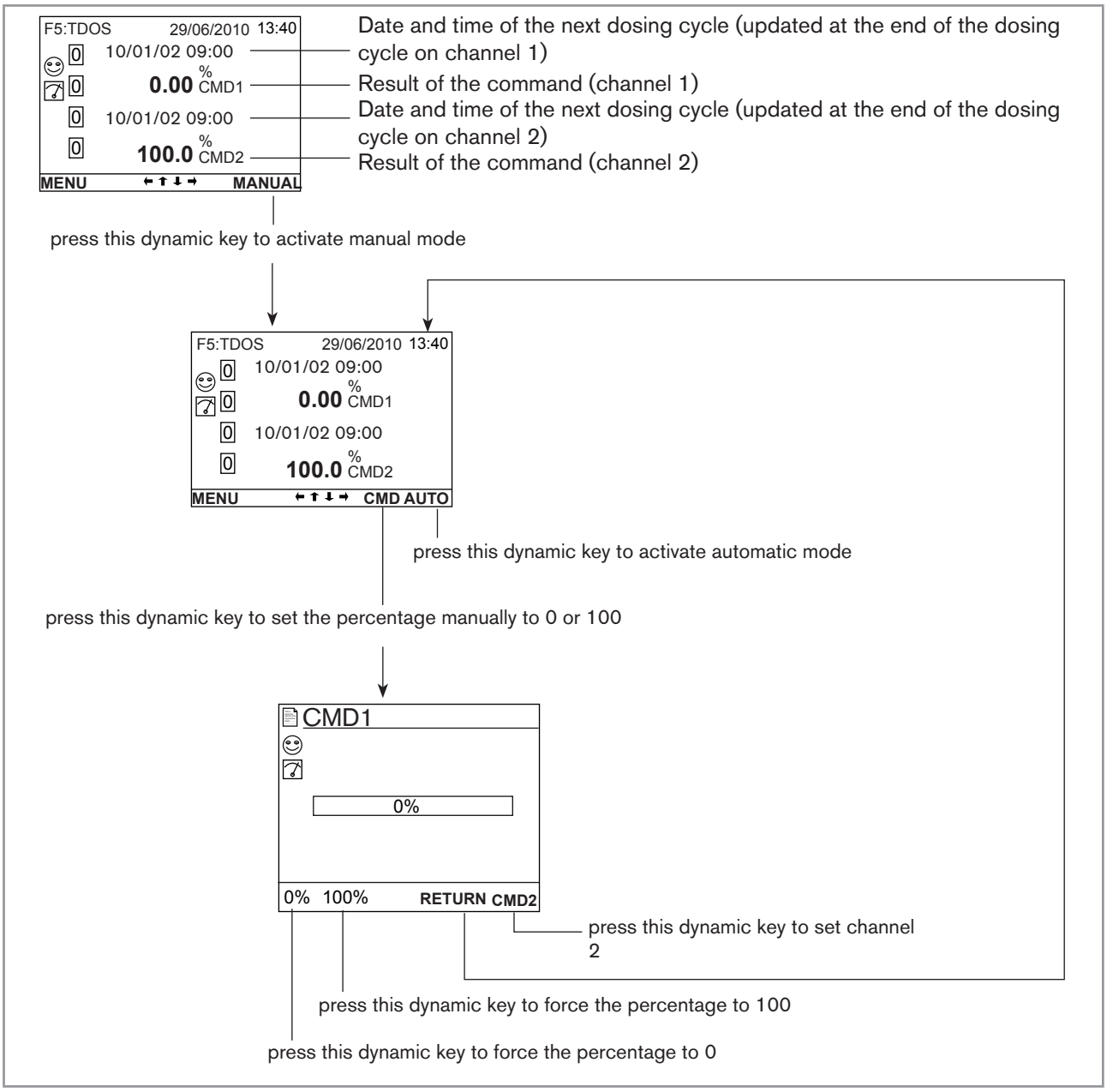

Fig. 66 : Example of a view, in Process level, of the "time dosing" function

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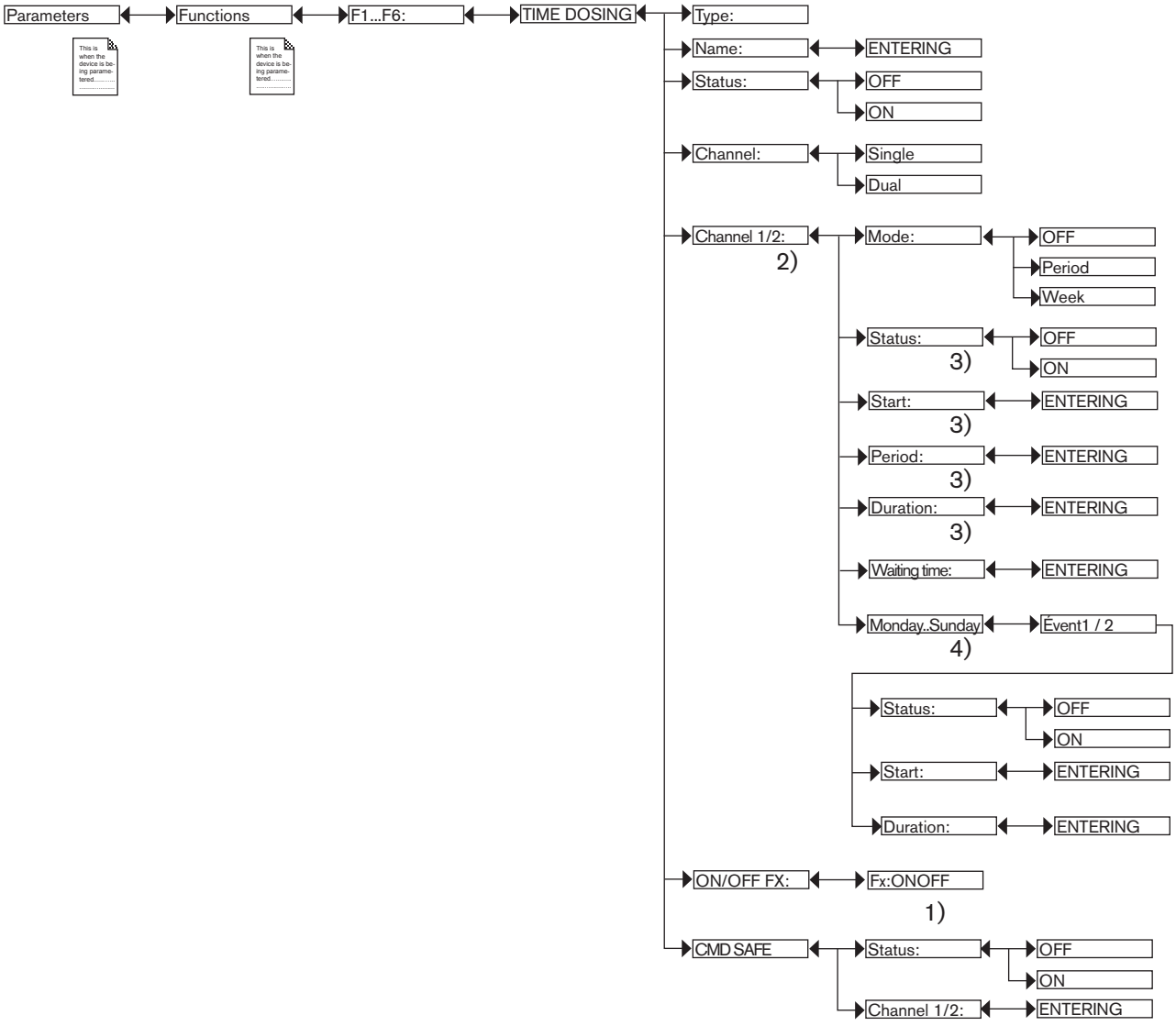
Refer to section 5.9 to access the "Parameters" menu.



[1)]"Fx:" represents the ONOFF function declared "active"

[2)]"Channel2" is present if "Channel" = "Dual"

[3)]These functions are present only if "Mode" = "Period"

[4)]These functions are present only if "Mode" = "Week"

TYPE: Indicates the function chosen.

NAME: Rename the function chosen. See section "5.4 Entering text". This name appears in the view associated with this function in Process level.

STATUS: Used to activate (choose "ON") or deactivate (choose "OFF") the function.

CHANNEL: Choose to dose a chemical product (choose "Single") via 1 channel or two chemical products (choose "Dual") via 2 different channels.

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CHANNEL 1/CHANNEL 2: Set the parameters for channel 1 and, if "CHANNEL" = "DUAL", channel 2.

- *MODE*: Choose to deactivate (choose "OFF") channel 1 or 2 or to configure the channel in dosing mode at regular intervals (choose "Period") or dosing according to the days of the week (choose "Week"). See details below for each mode.

Configure "channel1" or "channel2" in "Period" mode, dosing at regular intervals:

- *STATUS*: Choose to activate (choose "ON") or deactivate (choose "OFF") the channel.
- *START*: Define the time of the first dosing of the day. The subsequent dosing cycles will be run at the intervals defined in "PERIOD" below.
- *PERIOD*: Define the interval between 2 dosing cycles.
- *DURATION*: Define the duration of the dosing cycle.
- *WAITING TIME*: Define the waiting time during which no new dosing cycles can be started, particularly when time dosing is associated with an ONOFF function (see section 5.10.13).

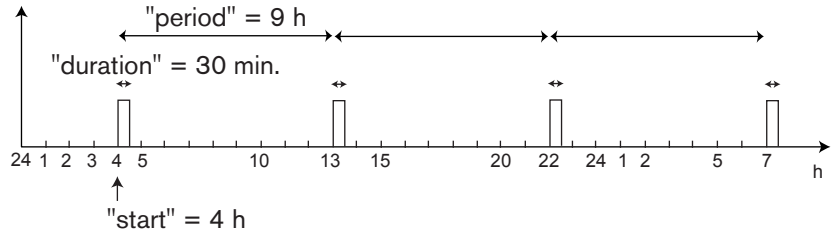

Fig. 67 : Example of configuring in "Period" mode

Configure "channel1" or "channel2" in "Week" mode, dosing according to the days of the week:

In this mode, 1 or 2 dosing cycles (or "events") for the same product (in the same channel) can be configured for each day of the week ("Monday" to "Sunday").

- *STATUS*: Choose to activate (choose "ON") or deactivate (choose "OFF") the channel.
- *WAITING TIME*: Define the waiting time during which no new dosing cycles can be started, particularly when time dosing is associated with an ONOFF function (see section 5.10.13).
- *START*: Define the start time of the dosing cycle for this day of the week.
- *DURATION*: Define the duration of the dosing cycle.

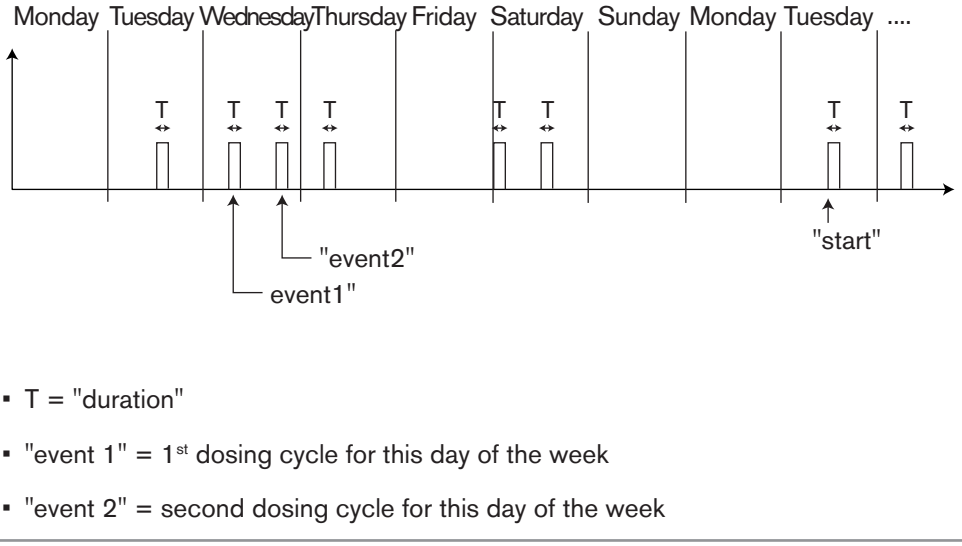

Fig. 68 : Example of configuring in "Week" mode

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ON/OFF FX: Combine the TIME DOSING function with an ONOFF function (see section 5.10.13) for a conductivity measurement only in order to ensure prebleed of the system. Configure and activate the "ONOFF" function before this "TIME DOSING" function so that it appears in this menu.

CMD SAFE: Confirm (select "Mode: ON") or do not confirm (select "Mode:OFF") the use of a fallback position on the output when the "System switch" event (see section 5.10.17) has the state "ON". When use of the fallback position is confirmed, enter a fallback position value of between 0 and 100% for each output.

- The time base is the one set in the "Date" and "Time" functions in the "Parameters" menu. See section 5.10.1
- When the "time dosing" function is already operational, modifying one of its parameters resets the function.
- A new dosing cycle on the same channel cannot start until the previous dosing cycle has finished.
- Channels 1 and 2 operate independently of each other.
- When a dosing cycle is running on one of the channels, a new dosing cycle on the other channel is run according to the following rules:
  - when the current cycle is in prebleed phase, the lowest prebleed setpoint "PBLIMIT" of the 2 cycles is taken into account. Moreover, the longest prebleed duration of the 2 cycles is taken into account.
  - The prebleed phase on the new dosing cycle is not run if the current cycle is in dosing or waiting phase.
  - It is only when both cycles are finished that the conductivity controller takes over.

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5.10.16 Configuring a "Volume Dosing" function

This function is available as an option. See section 5.10.4

This function is used to add a product to a process during a predefined period after a predefined volume of fluid has been totalised.

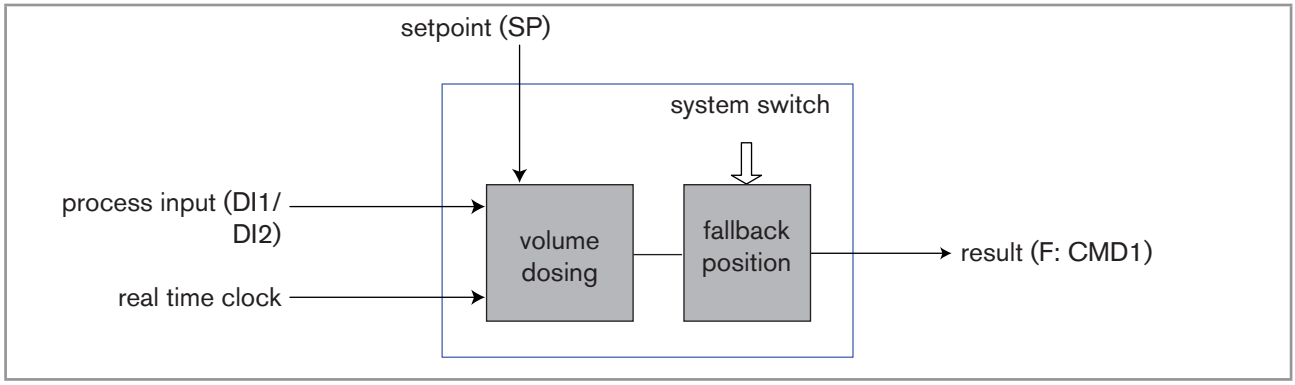

Fig. 69 : "Volume dosing" function

Once the function has been configured and activated, the result "Fx:" calculated is available in the list of process variables on the "M0:MAIN" board. This list appears in the output configuring, user view configuring and datalogging menus to:

- Assign the result "Fx:" calculated to a physical output (analogue, AO, or digital, DO) (see sections 5.10.21 and 5.10.22).
- Display the result "Fx:" on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of "Fx:" using the datalogger: see section 5.10.18.

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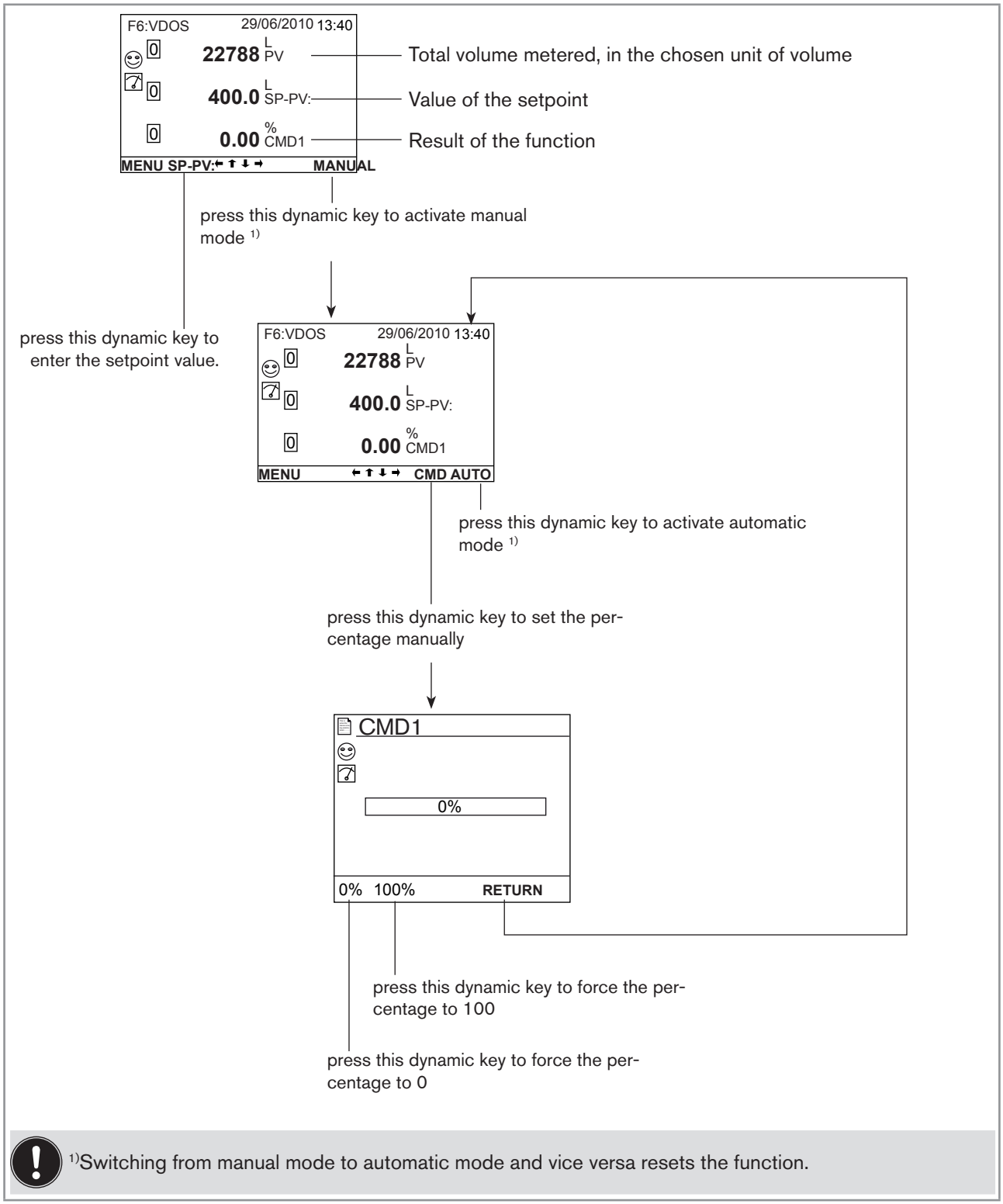

Fig. 70 : Example of a view, in Process level, of the "volume dosing" function, and switching to manual or automatic mode

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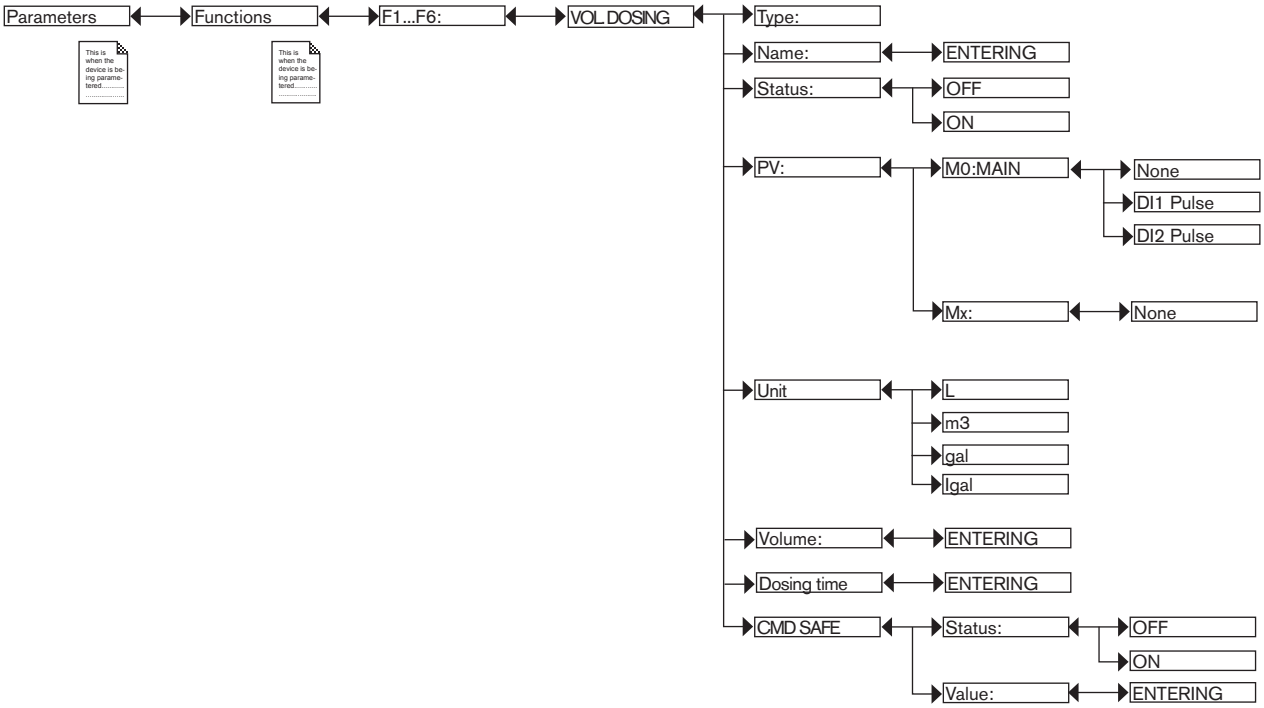
Refer to section 5.9 to access the "Parameters" menu.



TYPE: Indicates the function chosen.

NAME : Rename the function chosen. See section "5.4 Entering text". This name appears in the view associated with this function in Process level.

STATUS : Used to activate (choose "ON") or deactivate (choose "OFF") the function.

PV: Define the digital input "DI1" or "DI2" as the volume metering base.

UNITS: Choose the unit of volume.

VOLUME: Enter the volume to be metered.

DOSING TIME: Enter the duration of dosing.

CMD SAFE: Confirm (select "Mode: ON") or do not confirm (select "Mode:OFF") the use of a fallback position on the output when the "System switch" event (see section 5.10.17) has the state "ON". When use of the fallback position is confirmed, enter a fallback position value of between 0 and 100% for each output.

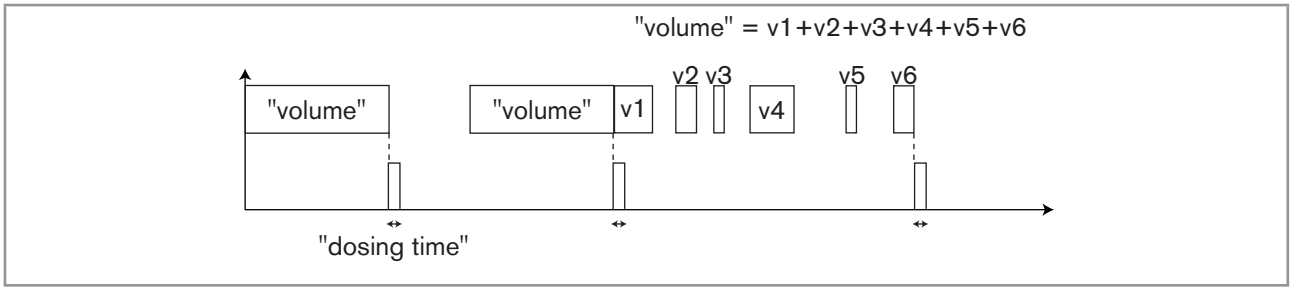


Fig. 71 : Example of the "volume dosing" function

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5.10.17 Configuring the "System switch" event

The "System switch" event can be used to force the result of a function using the "CMD SAFE" menu for this function. The outputs of the function switch automatically to the values set in the "CMD safe" menu of each function, when the "System switch" event is at "ON".

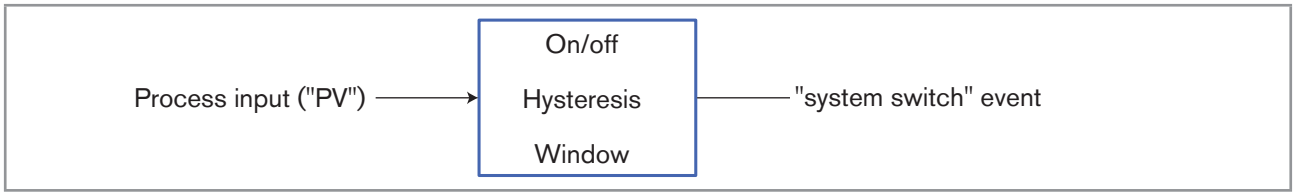
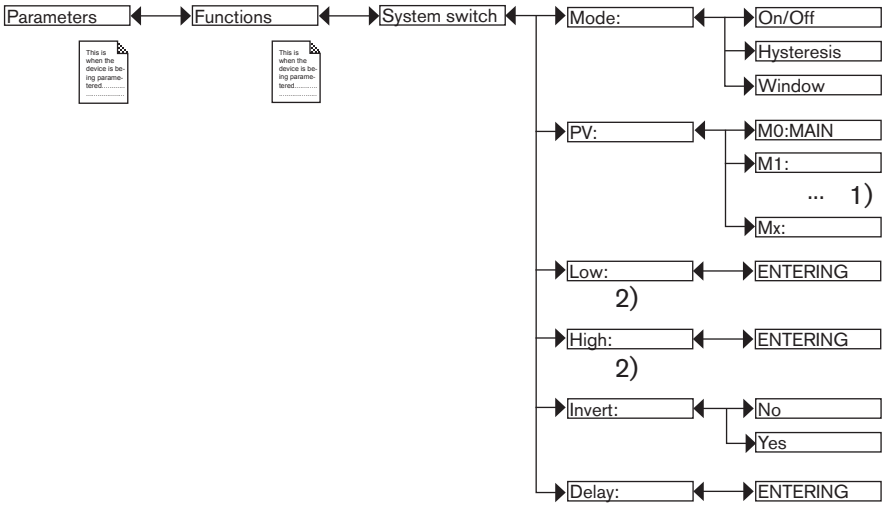


Fig. 72 : "System switch" event

Once the "System switch" event has been configured and activated, it is available in the list of process variables on the "M0:MAIN" board. This list appears in the user view configuring and datalogging menus to:

- Display the "System switch" event on one of the user defined "Ux" views: see section 5.10.8.
- Logging the values of the "System switch" event using the datalogger: see section 5.10.18.

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2)] These functions are present if "Mode" ≠ "TOR"

MODE: Choose the switching mode: "On/Off", "hysteresis" or "window".

Configuring in "On/Off" mode

PV: Choose a process input with 2 states, ON or OFF, associated with the "System switch" event.

INVERT: Invert the event or not.

DELAY: Choose the value of the time-out before switching.

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Configuring in "Hysteresis" mode

The output status changes when a threshold is reached:

- by increasing process input value, the output status changes when the high threshold is reached.
- by decreasing process input value, the output status changes when the low threshold is reached.

Fig. 73 : Hysteresis mode

PV: Choose the process input associated with the "System switch" event.

LOW: Choose the value of the low switching threshold.

HIGH: Choose the value of the high switching threshold.

INVERT: Invert the event or not.

DELAY: Choose the value of the time-out before switching. This is valid for both thresholds, "Low" and "High". Switching is only done if one of the thresholds, high or low, is exceeded for a duration longer than this time-out.

Configuring in "Window" mode

The output status changes as soon as any threshold (low or high) is reached.

Fig. 74 : Window mode

PV: Choose the process input associated with the "System switch" event.

LOW: Choose the value of the low switching threshold.

HIGH: Choose the value of the high switching threshold.

INVERT: Invert the event or not.

DELAY: Choose the value of the time-out before switching. This is valid for both thresholds, "Low" and "High". Switching is only done if one of the thresholds, high or low, is exceeded for a duration longer than this time-out.

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5.10.18 Datalogging (datalogger)

This function is available as an option. See section 5.10.4

This function is used to log the measurement history of one to sixteen process inputs ("PV") on the memory card at regular intervals defined in the "Period" function.

Risk of data loss

- Set the "status" of the function to "OFF" before removing the memory card from the device.
- Do not remove the memory card from the device when a file is being written.
- Do not switch off the electrical power source when a file is being written.
- If the datalogging is unintentionally interrupted, check the memory card on a PC and format it if necessary before reuse in the multiCELL.
- In the event of problems during recording, the icon is displayed. For more information, access the "Information -> Log" menu and consult the error table in section 6.3.9.

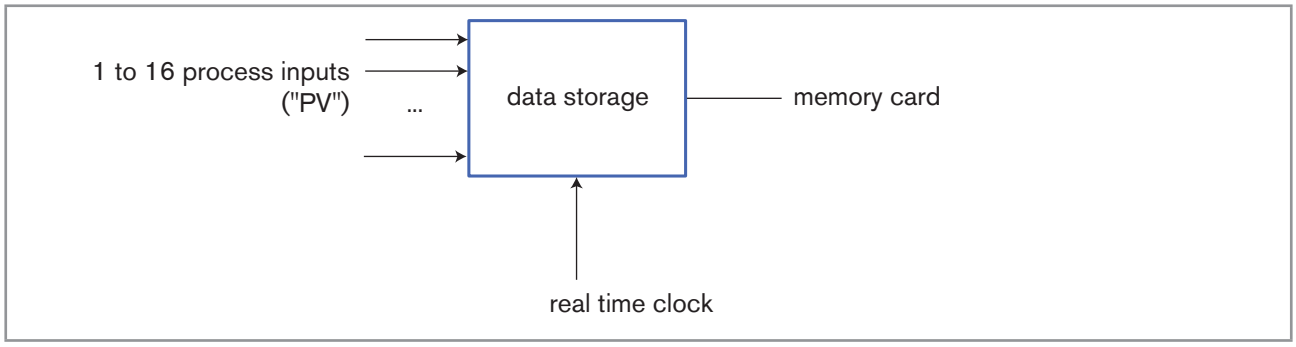
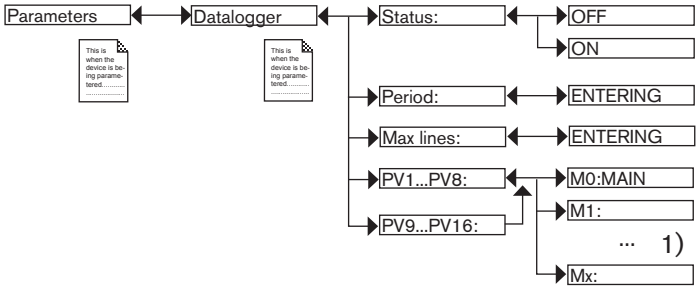


Fig. 75 : Datalogger

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

STATUS: Choose to activate (choose "ON") or deactivate (choose "OFF") the datalogger function.

PERIOD: Choose the data storage interval (in seconds), if datalogging is activated.

MAX LINES : Enter the maximum number of lines that a data file contains. The files are saved under "DL000000" to "DL999999".

PV1 TO PV8 OR PV9 TO PV16: Choose the process input for which the values are logged.

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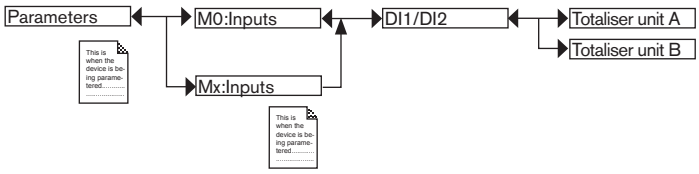
5.10.19 Choosing the units for the totalisers

This function is available on the devices with analysis modules if the software option, "FLOW", is activated. See section 5.10.4

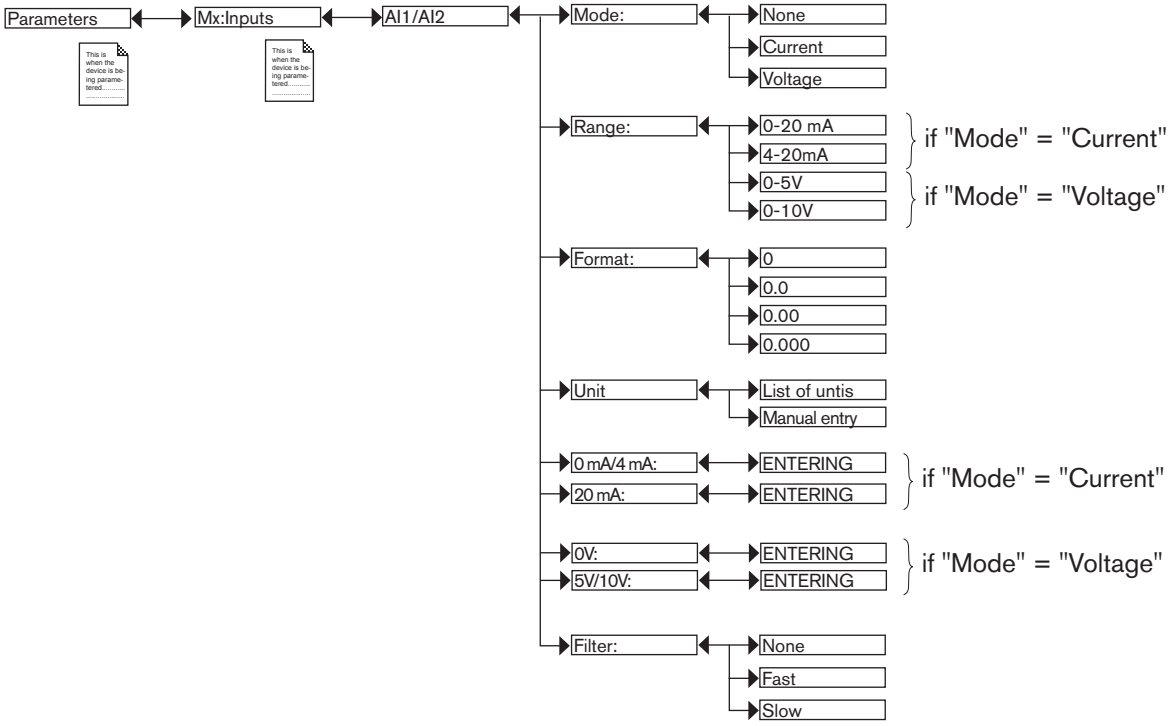
Refer to section 5.9 to access the "Parameters" menu.



The function makes it possible to select the units of the totalisers.

5.10.20 Configuring the analogue inputs

Refer to section 5.9 to access the "Parameters" menu.



MODE: Choose the input signal type, current or voltage.

RANGE: Choose the range of the input signal, depending on the choice made in "MODE".

FORMAT: Choose the number of displayed decimals.

UNITS: Choose the units of the process input associated to the input signal within a predefined list or enter it.

0/4 MA: Enter the value of the previously selected process variable, which is associated to a 0/4 mA input current. Instead of being entered, the value can be automatically determined using the function "PV calibration" in the menu "Calibration -> Mx:Inputs -> AI1 or AI2". See section .

20 MA: Enter the value of the previously selected process variable, which is associated to a 20 mA input current. Instead of being entered, the value can be automatically determined using the function "PV calibration" in the menu "Calibration -> Mx:Inputs -> AI1 or AI2". See section .

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0V: Enter the value of the previously selected process variable, which is associated to a 0 V input voltage. Instead of being entered, the value can be automatically determined using the function "PV calibration" in the menu "Calibration -> Mx:Inputs -> AI1 or AI2". See section

5/10V: Enter the value of the previously selected process variable, which is associated to a 10 V input voltage. Instead of being entered, the value can be automatically determined using the function "PV calibration" in the menu "Calibration -> Mx:Inputs -> AI1 or AI2". See section

P1 and P2 are the values of the process variables which are associated to the selected input range.

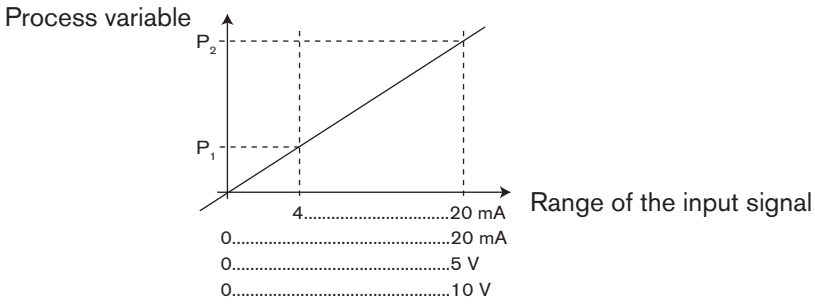
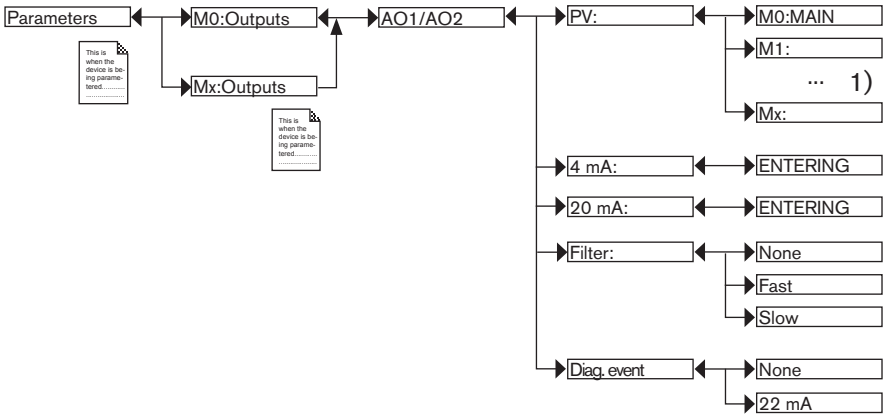


Fig. 76 : Configuring an analogue input

FILTER: Choose the level of attenuation for the fluctuations of the current or voltage value. See "Fig. 44 : Filtering curves".

5.10.21 Setting the parameters of the current outputs

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

PV: Choose the process input associated with the current output.

4 MA: Choose the value of the process input previously selected, associated with a current of 4 mA, for each current output. See Fig. 77.

20 MA: Choose the value of the process input previously selected, associated with a current of 20 mA, for each current output. See Fig. 77.

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P_1 and P_2 are the values associated with a current of 4 mA or 20 mA respectively.

If P_1 is higher than P_2, the signal is inverted and the range P_1-P_2 corresponds to the range for the 20-4 mA current.

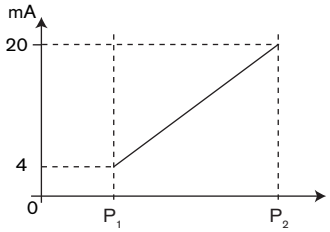

Fig. 77 : 4-20 mA current depending on the PV selected

FILTER: Choose the level of attenuation for the fluctuations of the current value for each current output. See "Fig. 44 : Filtering curves".

DIAG. EVENT : Choose to emit a current of 22 mA on the current output selected when an "error" event related to diagnostics (see sections 5.12.2 to 5.12.6) is generated by the multiCELL or allow the current output to operate normally (choose "none").

See also "If you encounter problems" in section 6.3.

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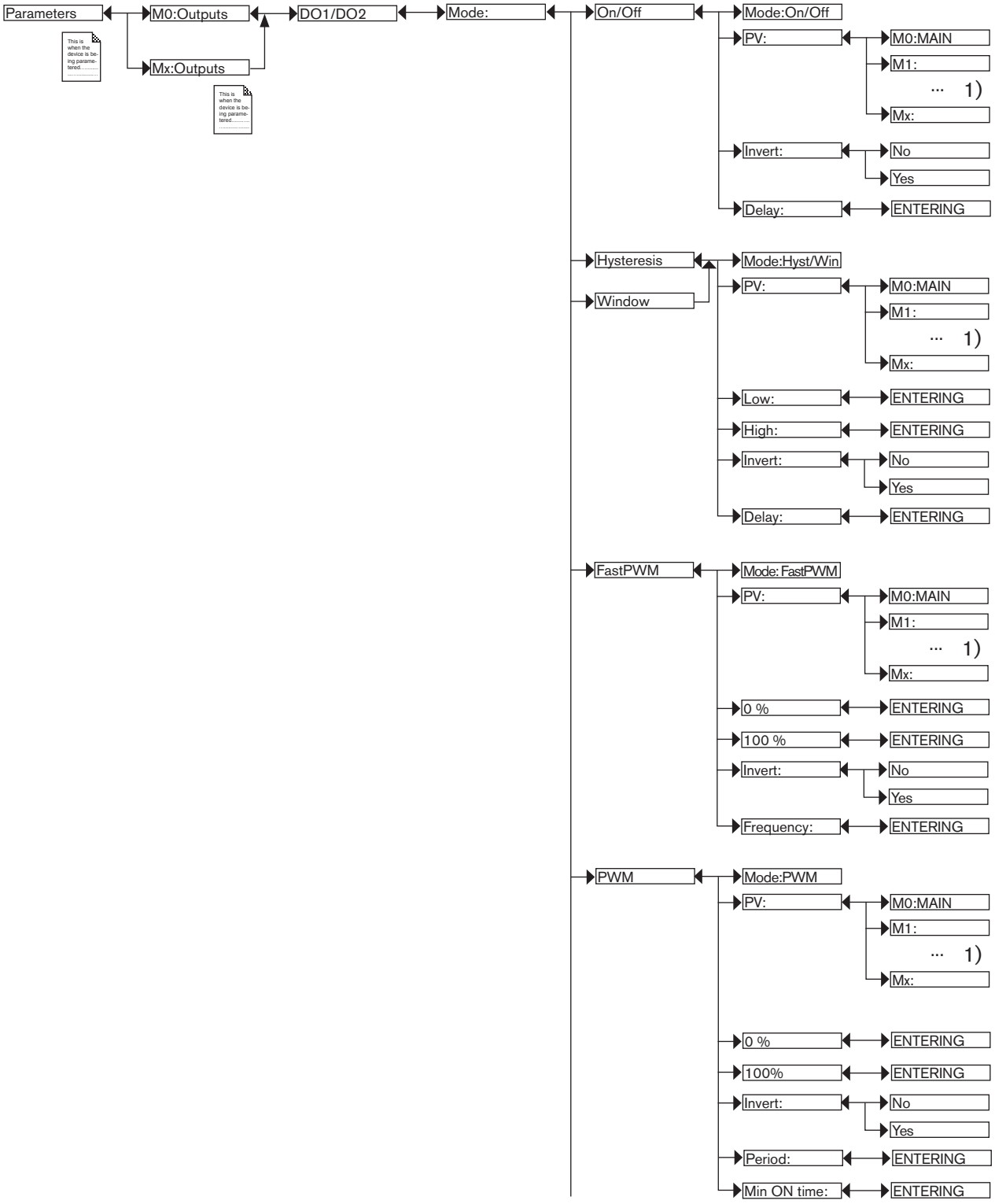
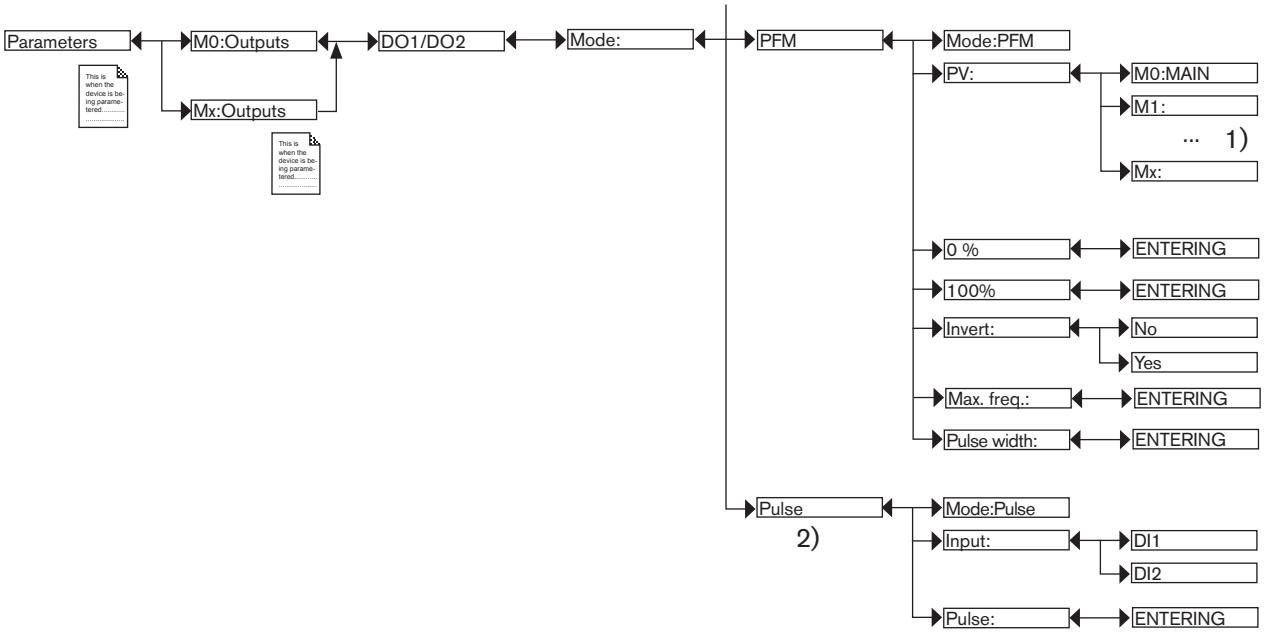
5.10.22 Setting the parameters of the digital outputs

Refer to section 5.9 to access the "Parameters" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2)]Function possible only for the DO1 and DO2 outputs on the MAIN board

MODE: Choose the switching mode for the digital output selected.

Configuring in "On/Off" mode

PV: Choose a process input with 2 states, ON or OFF, associated with the output.

One of the "PVs" on the M0:MAIN board, available in "On/Off" mode, is the "warning" event. Such an event is generated when the calibration date expires and/or during the monitoring of certain process parameters (see section 5.11.18, 5.11.19, and 5.12.2 to 5.12.6). When the "warning" event is associated with a digital output, the output switches whenever such an event is generated by the multiCELL. See also "If you encounter problems" in section 6.3.

One of the "PVs" in the conductivity module, available in "ON/OFF" mode, is "USP" (see section 5.10.24).

INVERT: Invert the output or not.

DELAY: Choose the value of the time-out before the output is switched.

Configuring in "Hysteresis" mode

The output status changes when a threshold is reached:

- When increasing the process input value, the output status changes when the high threshold is reached.
- When decreasing the process input value, the output status changes when the low threshold is reached.

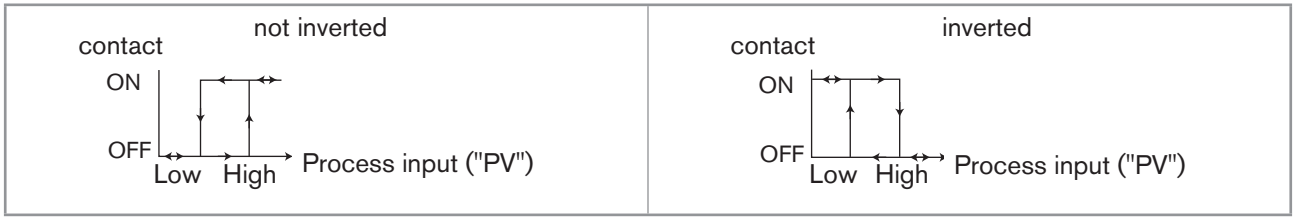


Fig. 78 : Hysteresis mode

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PV: Choose the process input associated with the output.

LOW: Choose the value of the low switching threshold of the output.

HIGH: Choose the value of the high switching threshold of the output.

INVERT: Invert the output or not.

DELAY: Choose the value of the delay time before switching for each digital output. This is valid for both output thresholds. Switching is only done if one of the thresholds, high or low (functions "High" or "Low"), is exceeded for a duration longer than this delay time.

Configuring in "Window" mode

The output status changes as soon as any threshold (low or high) is reached.

Fig. 79 : Window mode

PV: Choose the process input associated with the selected output.

LOW: Choose the value of the process input for the low switching threshold of the output.

HIGH: Choose the value of the process input for the high switching threshold of the output.

INVERT: Invert the output or not.

DELAY: Choose the value of the delay time before switching for each output. This is valid for both output thresholds. Switching is only done if one of the thresholds, high or low (functions "High" or "Low"), is exceeded for a duration longer than this delay time.

Configuring in "FastPWM" mode

This mode is used to control a proportional solenoid valve.

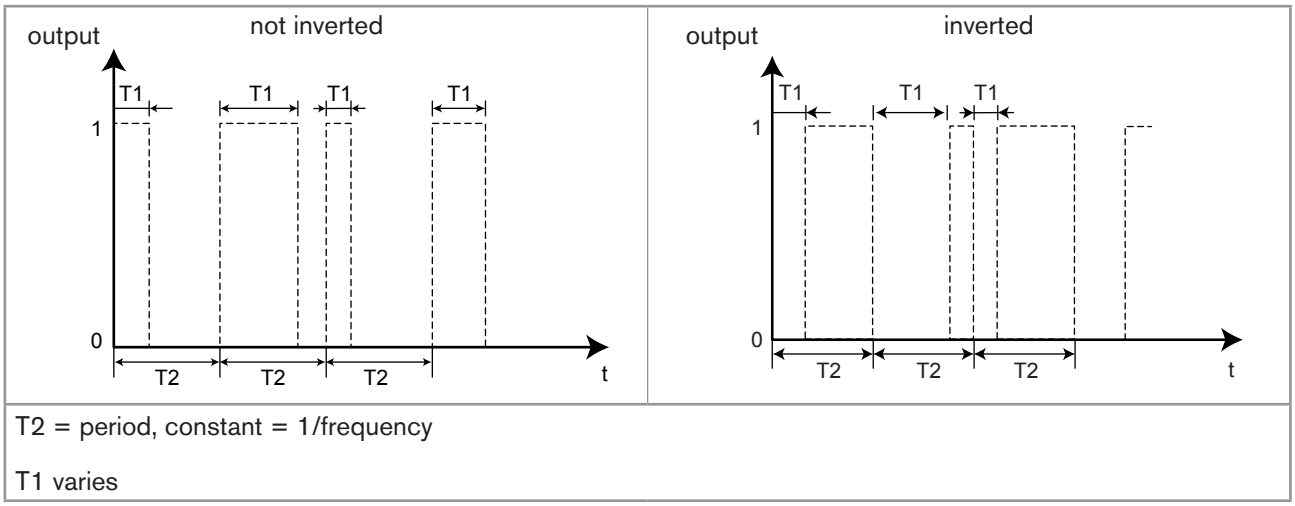

Fig. 80 : "FastPWM" mode

PV: Choose the process input associated with the selected output.

0 %: Choose the value of the process input ("PV") corresponding to 0 % PWM.

100 %: Choose the value of the process input ("PV") corresponding to 100 % PWM.

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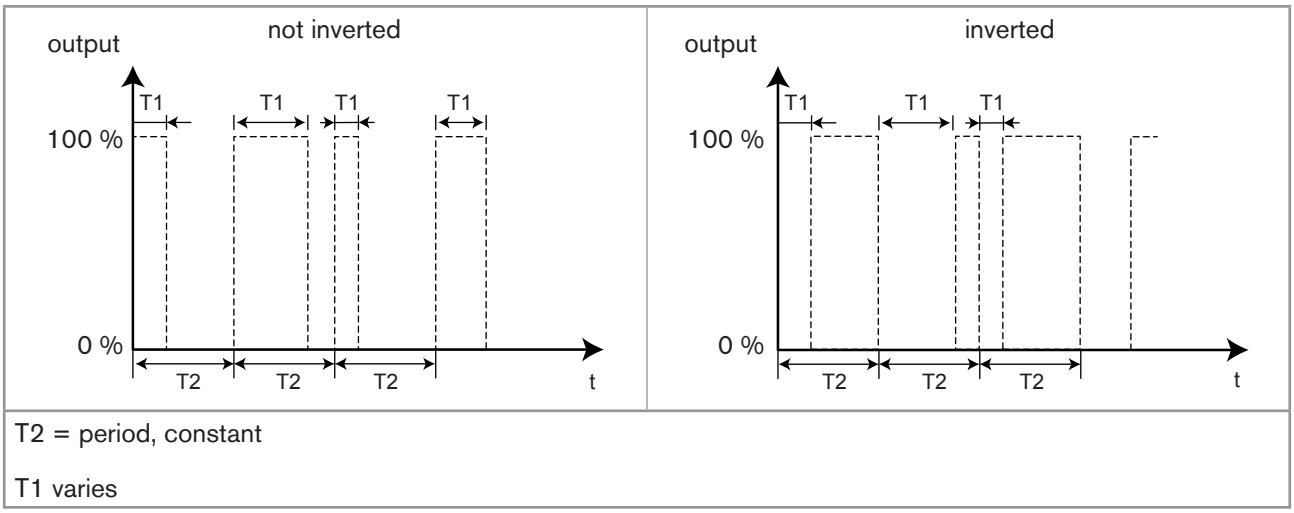
INVERT: Invert the output or not.

FREQUENCY: Choose the value of the output frequency (= 1/T2), from 2 to 2000 Hz.

Configuring in "PWM" mode

This mode is used to control an "ON/OFF" actuator.



T2 = period, constant

T1 varies

Fig. 81 : "PWM" mode

PV: Choose the process input associated with the selected output.

0 %: Choose the value of the process input ("PV") corresponding to 0 % PWM.

100 %: Choose the value of the process input ("PV") corresponding to 100 % PWM.

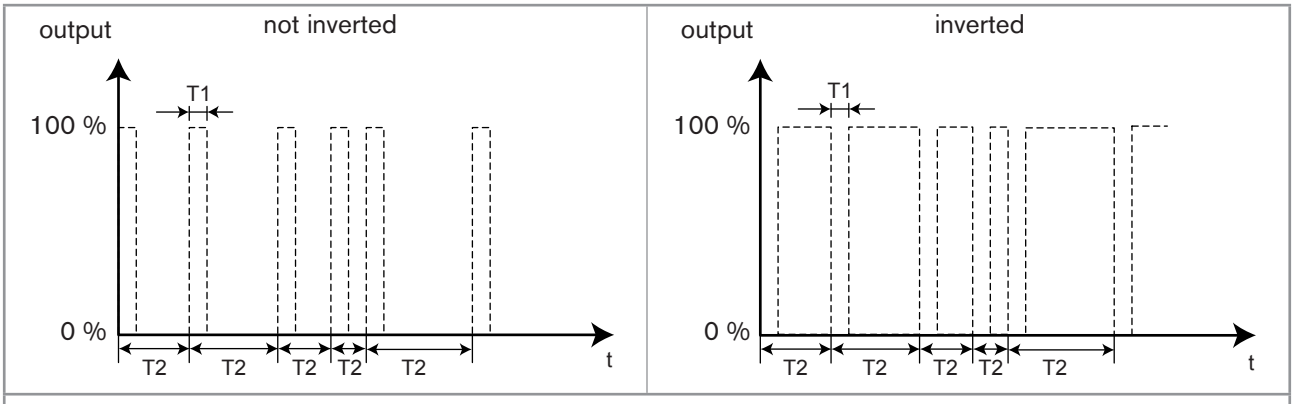
INVERT: Invert the output or not.

PERIOD: Choose the value of period T2 in seconds.

MIN ON TIME: Choose the minimum value of T1 in seconds.

Configuring in "PFM" mode

This mode is used to control a dosing pump, for example.



T1 = period, constant

T2 varies

Fig. 82 : "PFM" mode

PV: Choose the process input associated with the selected output.

0 %: Choose the value of the process input corresponding to the min. frequency.

100 %: Choose the value of the process input corresponding to the max. frequency defined in "MAX FREQ." below.

INVERT: Invert the output or not.

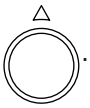
MAX. FREQ. : Choose the maximum value of the pulse frequency (1/T2) (180 pulses per minute maximum)

PULSE WIDTH : Choose the value of the pulse width (T1).

Configuring in "Pulse" mode

This function is available only if the "FLOW" option is activated on the device (see section 5.10.4). It is used to generate a pulse on the output each time a predetermined volume of fluid passes.

INPUT: Choose the digital input DI1 or DI2 associated with the output selected.

PULSE: Choose the volume of fluid for which a pulse must be transmitted on the selected output. First enter the digital value, then confirm by pressing the "OK" dynamic key in order to modify the volume units by pressing successively on  .

- A "Warning" event is emitted and the message "M0:W:Pulse x lim." is displayed when the volume entered multiplied by the K factor of the device > 1,000,000.
- A "Warning" event is emitted and the message "M0:W:Pulse x 1:1" is displayed when the volume entered multiplied by the K factor of the device < 1. In this case, the pulse frequency is forced to the value of the input frequency.

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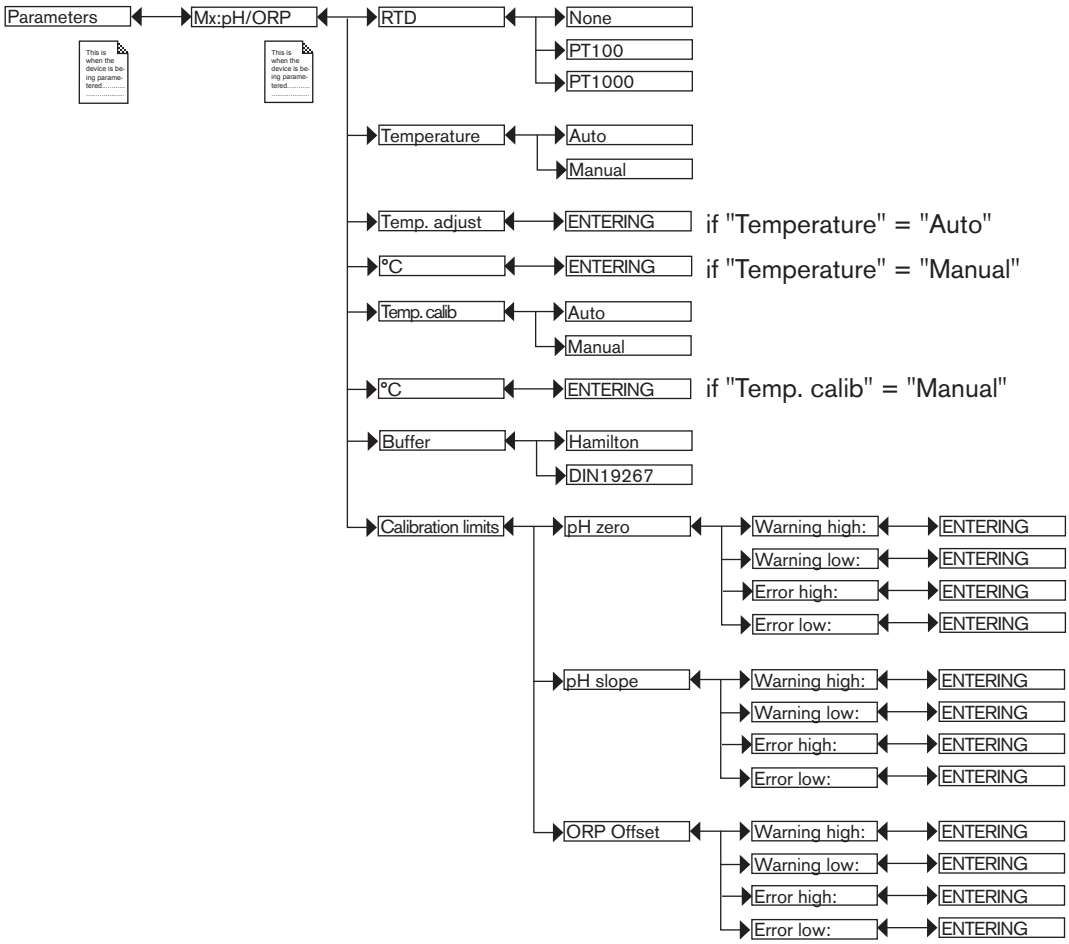
5.10.23 Setting the parameters of a pH/redox module

Refer to section 5.9 to access the "Parameters" menu.



RTD: Choose the type of temperature sensor connected to the module.

TEMPERATURE: Choose the value of the temperature used in the process (particularly to compensate for the pH measurement):

- choose "Auto": the temperature of the fluid is measured by the sensor.
- choose "Manual": enter the value of the process temperature (in °C) in the next field, e.g. when no temperature sensor is connected to the module.

ADJUST TEMP. : The measured temperature can be corrected by an offset value. Enter the offset value in °C.

TEMP. CALIBRATION: Choose the value of the temperature used when calibrating the probe/sensor:

- choose "Auto": the temperature of the fluid is measured by the sensor.
- choose "Manual": enter the value of the calibration temperature (in °C) in the next field, e.g. when no temperature sensor is connected to the module.

BUFFER CALIB. : Choose the type of buffer solution used for automatic calibration of the pH probe/sensor, "Hamilton" solutions sold by Bürkert or solution conforming to DIN 19267:

- the multiCELL automatically recognises the pH of the following "Hamilton" solutions: 2, 4.01, 7, 10 and 12;

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- the multiCELL automatically recognises the pH of the following "DIN19267" solutions: 1.09, 4.65, 6.79, 9.23 and 12.75;

CALIBRATION LIMITS: Enter the ranges outside of which a warning or error message is generated during calibration:

- PH ZERO:
  - WARNING HIGH: Enter the pH_0 value above which a warning message is displayed during calibration of the pH sensor.
  - WARNING LOW: Enter the pH_0 value below which a warning message is displayed during calibration of the pH sensor.
  - ERR. HIGH: Enter the pH_0 value above which an error message is displayed during calibration of the pH sensor.
  - ERR. LOW: Enter the pH_0 value below which an error message is displayed during calibration of the pH sensor.
- PH SLOPE:
  - WARNING HIGH: Enter the slope value above which a warning message is displayed during calibration of the pH sensor.
  - WARNING LOW: Enter the slope value below which a warning message is displayed during calibration of the pH sensor.
  - ERR. HIGH: Enter the slope value above which an error message is displayed during calibration of the pH sensor.
  - ERR. LOW: Enter the slope value below which an error message is displayed during calibration of the pH sensor.
- ORP OFFSET:
  - WARNING HIGH: Enter the oxidation reduction potential value above which a warning message is displayed during calibration of the redox sensor.
  - WARNING LOW: Enter the oxidation reduction potential value below which a warning message is displayed during calibration of the redox sensor.
  - ERR. HIGH: Enter the oxidation reduction potential value above which an error message is displayed during calibration of the redox sensor.
  - ERR. LOW: Enter the oxidation reduction potential value below which an error message is displayed during calibration of the redox sensor.

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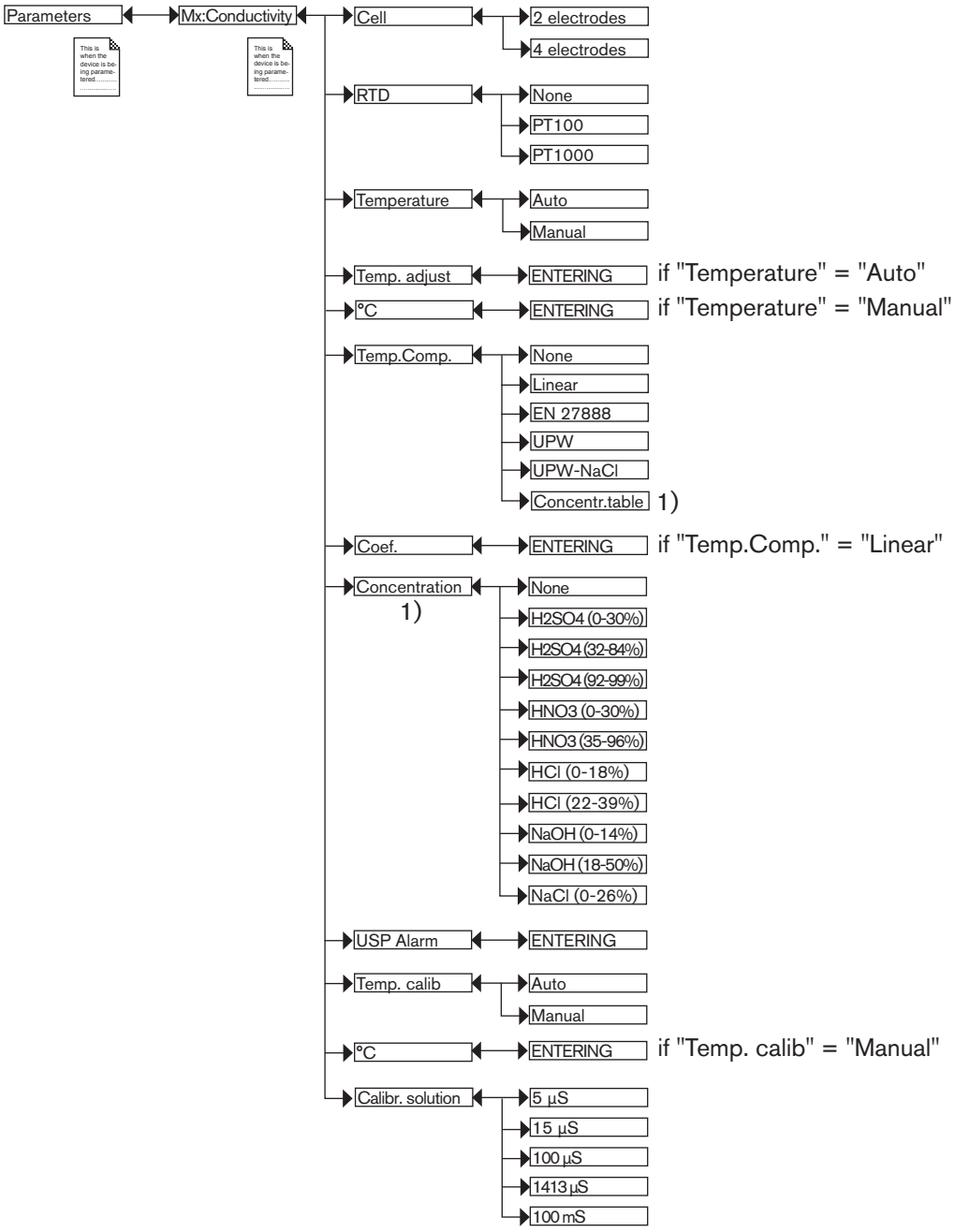
5.10.24 Setting the parameters of a conductivity module

Refer to section 5.9 to access the "Parameters" menu.



[1] This menu is available as an option (see section 5.10.4).

CELL: Choose the type of conductivity cell, either with 2 or 4 electrodes, connected to the module.

RTD: Choose the type of temperature sensor connected to the module.

TEMPERATURE: Choose the value of the temperature used in the process:

- choose "Auto": the temperature of the fluid is measured by the sensor.
- choose "Manual": enter the value of the process temperature (in °C) in the next field, e.g. when no temperature sensor is connected to the module.

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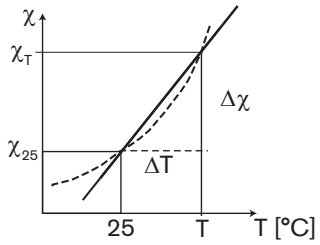
ADJUST TEMP. : The measured temperature can be corrected by an offset value. Enter the offset value in degrees Celsius.

TEMP. COMP. : Choose the type of temperature compensation to determine the fluid conductivity:

- in accordance with a linear percentage (select "linear"). Linear temperature compensation may be sufficiently accurate for your process, provided the temperature of your process is always > 0 °C. Enter a compensation between 0.00 and 9.99 %/°C in the subsequent "Coeff." field.
  Use the following graph and equation to calculate the mean value of the compensation coefficient α according to a temperature range ΔT and the associated conductivity range $\Delta\chi$:

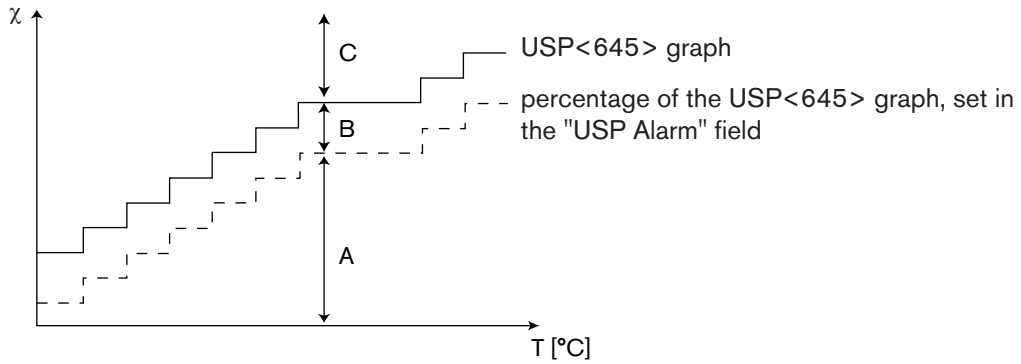


$$\alpha = \frac{\Delta\chi}{\Delta T} \times \frac{1}{\chi_{25}}$$

- or according to the natural water law (choose "EN27888").
- or according to the ultra pure water law (choose "UPW").
- or according to the ultra pure water and sodium chloride laws (choose "UPW-NaCl").
- or according to the law of the concentration table (choose "Concentration table", available as an option) that has been chosen in the "Concentration" function hereafter.
- or deactivate temperature compensation (choose "None").

CONCENTRATION: Available as an option. Choose the mass concentration table for your fluid from the list offered. This data (%) is then available in the list of process variables for the conductivity module. The fluid concentration is determined using the measured and non-compensated values of the conductivity and the temperature, whatever the choice made in "Temp.Comp.".

ALARM USP: Enter a conductivity value percentage from the table "USP <645>".



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Graph zone	Description	Name displayed in the user defined "Ux" view (see section 5.10.8)	Associated code in the datalogger (see section 5.10.18)	Status of the "ON/ OFF" output (see section 5.10.22)
C	The conductivity of the fluid has exceeded the value in the table USP<645> at the corresponding temperature.	"> Max."	1	ON (output not inverted)
B	The conductivity of the fluid is between the percentage set in the function "USP Alarm" and the value in the table USP<645> at the corresponding temperature.	"USP Alarm"	2	ON (output not inverted)
A	The conductivity of the fluid is below the percentage set in the function "USP Alarm" at the corresponding temperature.	"OK"	0	OFF (output not inverted)

CALIB. TEMP. : Choose the value of the temperature used when calibrating the probe/sensor:

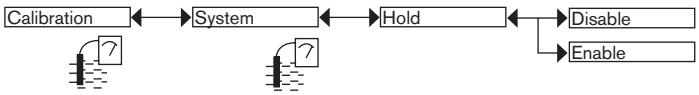
- choose "Auto": the temperature of the fluid is measured by the sensor
- choose "Manual": enter the value of the temperature (in °C) in the next field, e.g. when no temperature sensor is connected to the module.

CALIBRATION SOLUTION : Choose the calibration solution used for automatic calibration of the conductivity sensor.

5.11 Calibration menu

5.11.1 Enabling/disabling the Hold function

Refer to section 5.9 to access the "Calibration" menu.



The Hold mode is automatically deactivated when the multiCELL restarts after a power interruption, if the Hold mode was activated at the moment of the power cut-off.

The Hold mode is used to carry out maintenance work without interrupting the process.

To activate the HOLD mode:

→ access the "HOLD" function;

→ choose "Enable";

→ confirm by "OK".

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When the device is in Hold mode:

- the display shows the icon H instead of the icon ;
- the current emitted on each 4-20 mA output is fixed at the last value of the process input associated with each output;
- each digital output is fixed at the state acquired at the moment the Hold function is activated;
- the multiCELL remains in Hold mode until the Hold function is disabled.

To disable the HOLD mode:

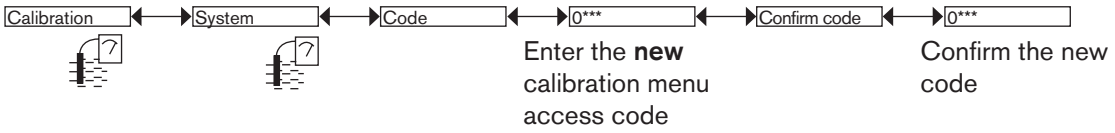
→ access the "HOLD" function;

→ choose "Disable"

→ confirm by "OK".

5.11.2 Modifying the Calibration menu access code

Refer to section 5.9 to access the "Calibration" menu. If the default access code "0000" is kept, the device does not request it to access the Calibration menu.



5.11.3 Adjusting the current outputs

Ensure that Hold mode is disabled before adjusting the current outputs: icon appears on the display.

Refer to section 5.9 to access the "Calibration" menu.

4 MA: Adjust the offset of the current output.

When the "4mA" function is selected, the multiCELL generates a current of 4 mA:

→ measure the current emitted by the 4-20 mA output using a multimeter;

→ enter the value given by the multimeter.

20 MA: Adjust the span on current output 1 or current output 2.

When the "20mA" function is selected, the multiCELL generates a current of 20 mA:

→ measure the current emitted by the 4-20 mA output using a multimeter;

→ enter the value given by the multimeter.

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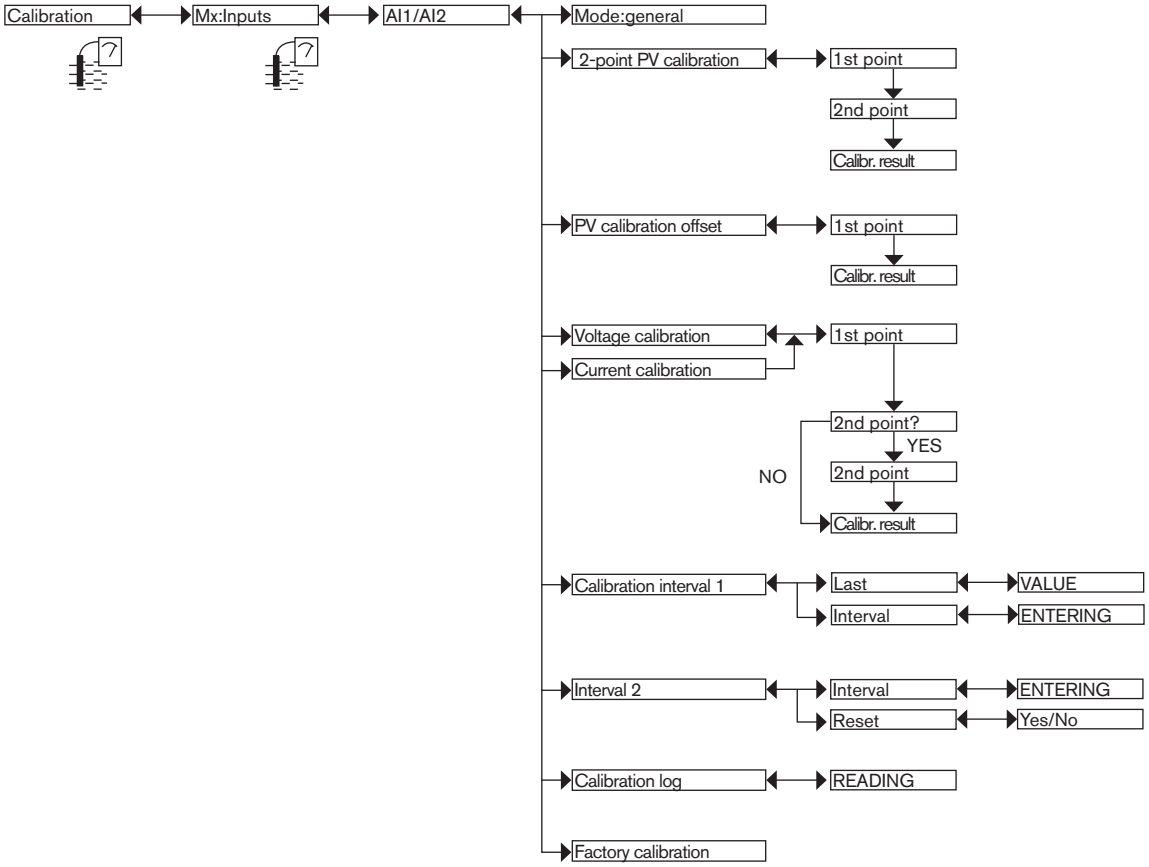
5.11.4 Calibrating an analogue input AI1 or AI2 connected to a sensor other than a chlorine sensor

Refer to section 5.9 to access the "Calibration" menu.



If a measuring sensor (other than a chlorine measuring sensor) is connected to an AI1 or AI2 analogue intput, the analogue input can be calibrated:

- either with respect to the measured value, at two points or at one point. See section "5.11.6 Calibrating an analogue input, AI1 or AI2, at two points, with respect to a measured value other than chlorine" or section "5.11.7 Calibrating an analogue input, AI1 or AI2, at one point (offset), with respect to a measured value other than chlorine".
- or with respect to the current or voltage received on the input. See section "5.11.8 Calibrating an analogue input connected to a current output or a voltage output".

→ To read the date of the last calibration of an analogue input, see section 5.11.11.

→ To enter the periodicity of calibrations, see section 5.11.12.

→ To enter the periodicity of a maintenance operation to be carried out on the sensor connected to the analogue input, see section 5.11.13.

→ To read the values of the last calibration with respect to a physical value, see section 5.11.14.

→ To return to the calibration parameters for the analogue input, as carried out in the factory, see section 5.11.15.

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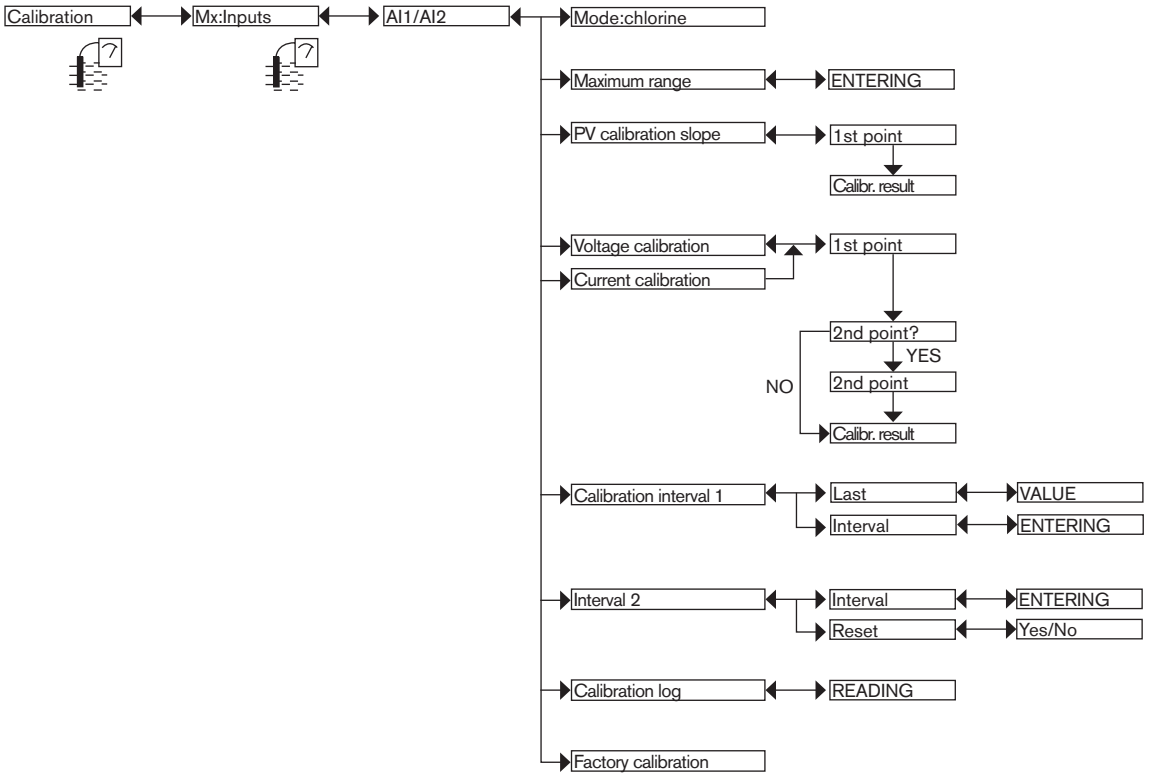
5.11.5 Calibrating an analogue input AI1 or AI2 connected to a chlorine sensor

Refer to section 5.9 to access the "Calibration" menu.



If a chlorine measuring sensor is connected to an AI1 or AI2 analogue intput, the analogue input can be calibrated:

- either with respect to the measured chlorine value, at one point. See section "5.11.9 Calibrating an analogue input, AI1 or AI 2, at 1 point (slope): Type 8232 chlorine sensor example".
- or with respect to the current or voltage received on the input. See section "5.11.8 Calibrating an analogue input connected to a current output or a voltage output".

→ To enter the max. value of the chlorine measuring range, marked on the name plate of the chlorine sensor, see section 5.11.10.

→ To read the date of the last calibration of an analogue input, see section 5.11.11.

→ To enter the periodicity of calibrations, see section 5.11.12.

→ To enter the periodicity of a maintenance operation to be carried out on the sensor connected to the analogue input, see section 5.11.13.

→ To read the values of the last calibration with respect to a physical value, see section 5.11.14.

→ To return to the calibration parameters for the analogue input, as carried out in the factory, see section 5.11.15.

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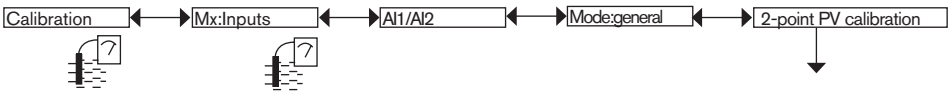
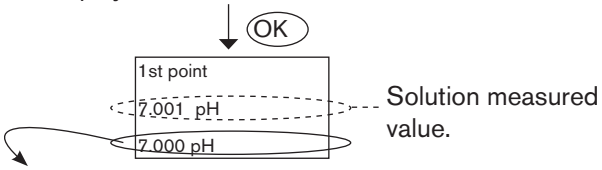
5.11.6 Calibrating an analogue input, AI1 or AI2, at two points, with respect to a measured value other than chlorine

This calibration does not replace the calibration of the measuring sensor connected to the analogue input.

Refer to section 5.9 to access the "Calibration" menu.



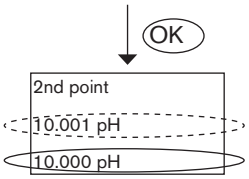
→ Immerse the probe of the sensor (for example a pH sensor) in the first buffer solution: The multiCELL displays the value measured for the solution.



→ Enter the value of the buffer solution (indicated on the bottle).

→ Wait for the measurement to stabilise.

→ The multiCELL displays the measured value of the solution.

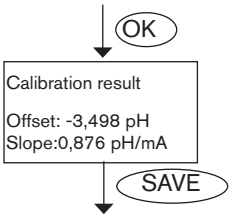


→ Rinse the probe.

→ Immerse the clean probe in the second buffer solution: The multiCELL displays the measured pH of the solution.

→ Enter the value for the second buffer solution (indicated on the bottle)

→ Wait for the measurement to stabilise.



The multiCELL associates the two calibrated values to the range of the selected analogue input signal (slope and offset).

Fig. 83 : Example for the calibration at 2 points of an analogue input with respect to the pH measured by an instrument having a 4-20 mA output

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5.11.7 Calibrating an analogue input, AI1 or AI2, at one point (offset), with respect to a measured value other than chlorine

This calibration does not replace the calibration of the measuring sensor connected to the analogue input.

Refer to section 5.9 to access the "Calibration" menu.

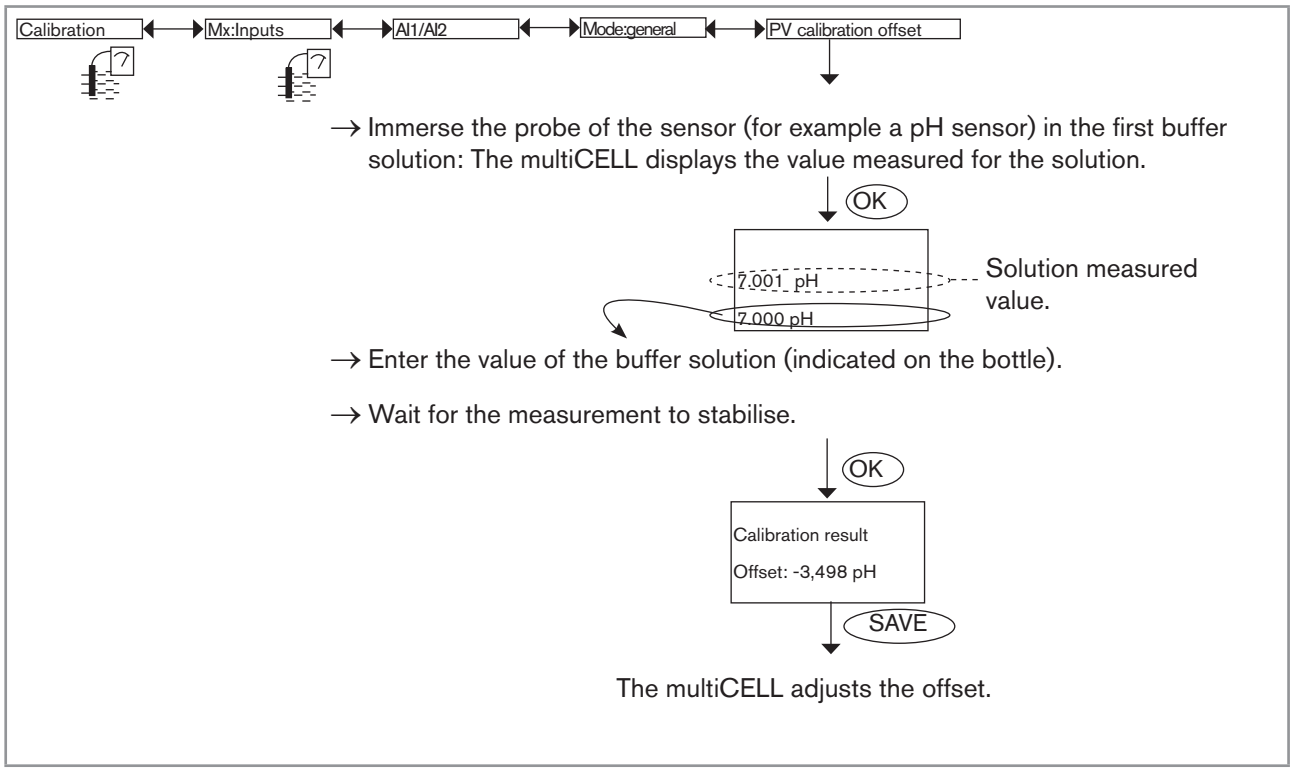

Fig. 84 : Example for the calibration at 1 point of an analogue input with respect to the pH measured by an instrument having a 4-20 mA output

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5.11.8 Calibrating an analogue input connected to a current output or a voltage output

If an analogue input, AI1 or AI2, is connected to the current or voltage analogue output of an external instrument (for instance, the 4-20 mA output of a pressure measuring device type 8311), calibrate the analogue input according to Fig. 85.

This calibration is used to precisely adjust the bounds of the analogue input to the bounds of the connected instrument.

Refer to section 5.9 to access the "Calibration" menu.

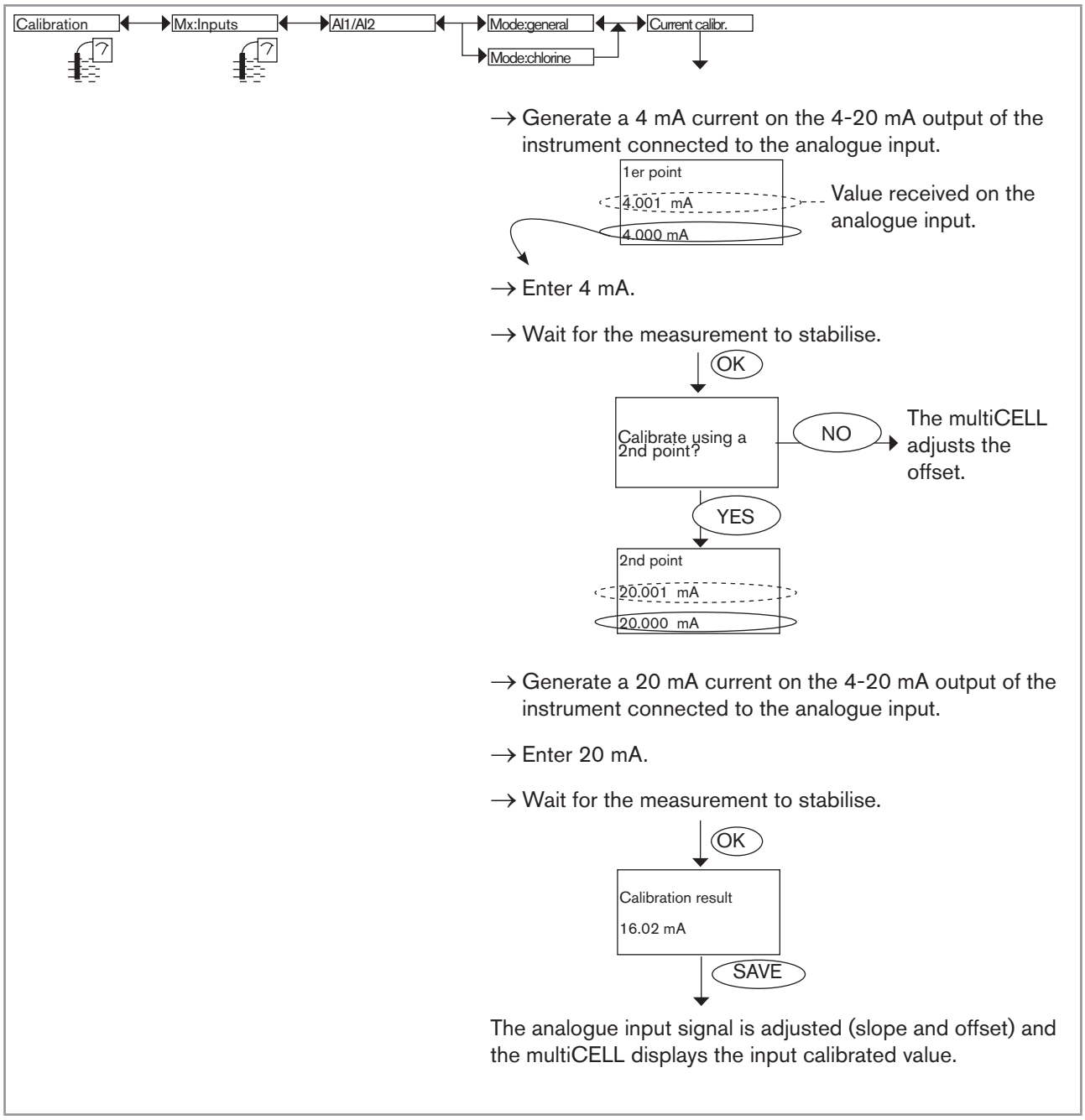

Fig. 85 : Example for the calibration of an analogue input with respect to the current output of a pressure measuring device type 8311

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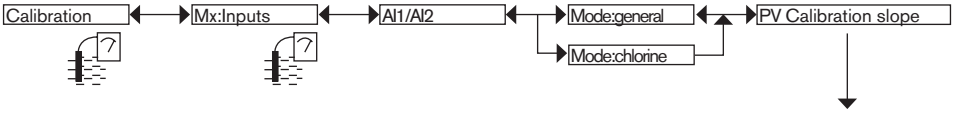
5.11.9 Calibrating an analogue input, AI1 or AI 2, at 1 point (slope): Type 8232 chlorine sensor example

This function is used to determine the slope of the straight line of the measurement signal.

Refer to section 5.9 to access the "Calibration" menu.

→ Install the chlorine sensor in the process with respect to the related Operating instructions.

→ Connect the chlorine sensor to an analogue input, AI1 or AI2.

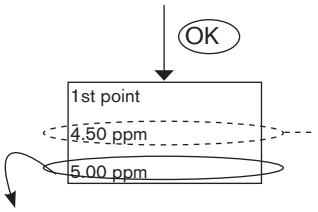


→ Activate the 1-point calibration function: The 8619 saves the current value on the analogue input.

→ The device shows the measured value of chlorine.

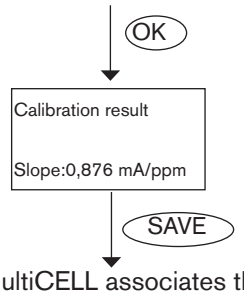
→ Take a sample of the solution to be measured.

→ With the DPD1 method, determine the chlorine concentration of the sample.



Solution measured value.

→ Enter the value of the chlorine concentration of the sample, that has been determined with the DPD1 method.



The multiCELL associates the calculated slope with the analogue input signal selected [1)]

1)

A warning message signals a slope < 25 % or > 400 %.

- Replace the electrolyte and/or the membrane.

Fig. 86 : Example for the calibration of an analogue input with respect to the chlorine measured by an instrument having a 4-20 mA output

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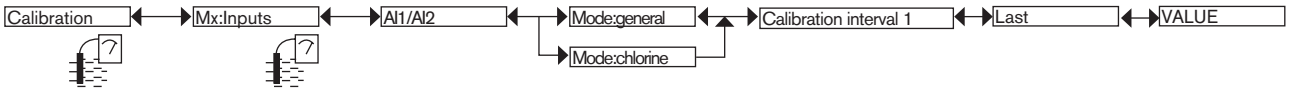
5.11.10 Entering the max. value of the chlorine measuring range

Refer to section 5.9 to access the "Calibration" menu.

→ Enter the max. value of the measuring range indicated on the name plate of the chlorine sensor.

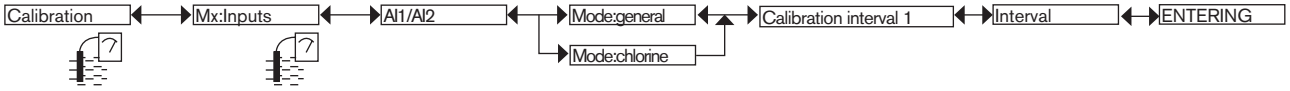
5.11.11 Reading the date of the last calibration of an analogue input

Refer to section 5.9 to access the "Calibration" menu.



5.11.12 Entering the periodicity of the calibrations

Refer to section 5.9 to access the "Calibration" menu.



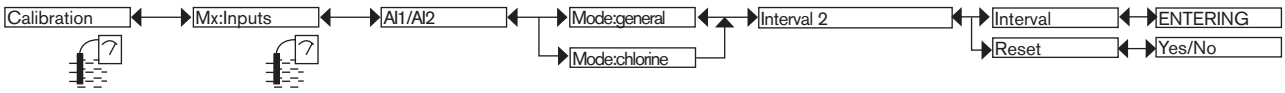
On each due date, the multiCELL generates a "maintenance" event, signalled on the display by the icon , and a "warning" event, signalled on the display by the icon ⚠.

If a calibration is successfully performed, the events disappear and be days count is recommenced.

→ In order not to use the automatic calibration reminders, enter "0000 days".

5.11.13 Entering the periodicity of a maintenance operation to be carried out on the sensor connected to the analogue input

Refer to section 5.9 to access the "Calibration" menu.



On each due date, the multiCELL generates a "maintenance" event, signalled on the display by the icon , and a "warning" event, signalled on the display by the icon ⚠.

When the maintenance operation has been performed, recommence or otherwise the days count in the "Reset" function of the "Interval 2" submenu.

→ In order not to use the automatic reminder for the maintenance operation, enter "0000 days".

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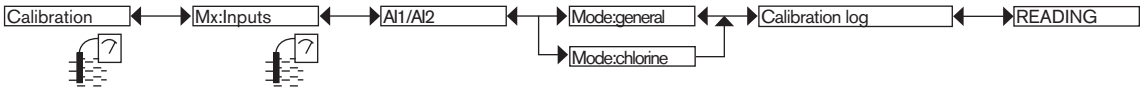
5.11.14 Reading the last calibration values of an analogue input with respect to a physical value

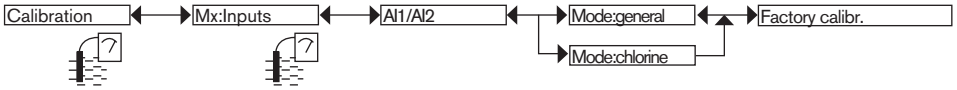
Refer to section 5.9 to access the "Calibration" menu.



The log indicates the last successful calibration values with respect to a physical value.

5.11.15 Restoring the factory calibration of the analogue inputs

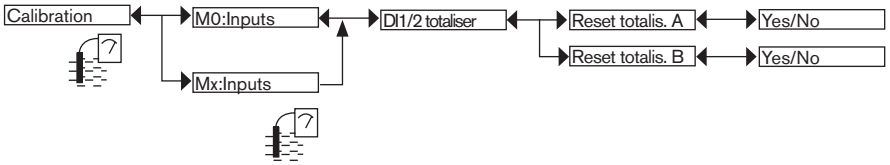
Refer to section 5.9 to access the "Calibration" menu.



5.11.16 Resetting the totalisers

This function is available on the devices with analysis modules if the software option, "FLOW", is activated. See section 5.10.4

Refer to section 5.9 to access the "Calibration" menu.



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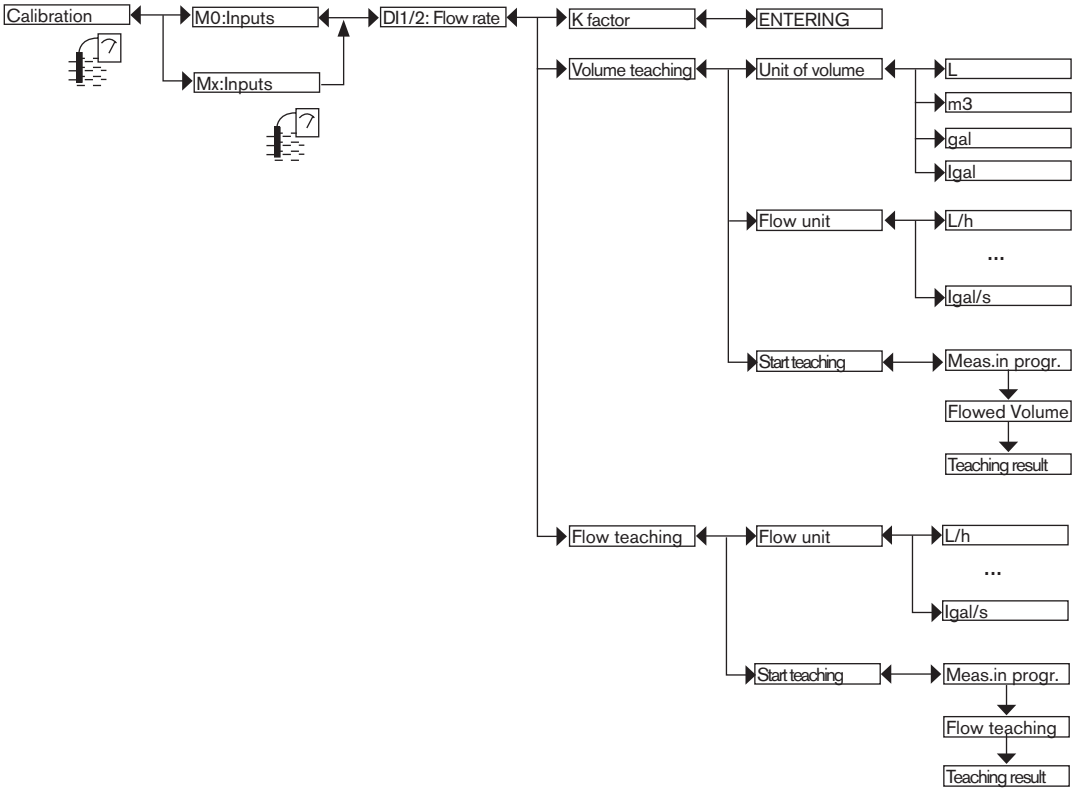
5.11.17 Entering the K factor for the used fitting or determining it using teach-in

This function is available on the devices with analysis modules if the software option, "FLOW", is activated. See section 5.10.4

Refer to section 5.9 to access the "Calibration" menu.



→ Use one of the following 3 methods to configure the pulse input of the multiCELL for a flow rate measurement:

- *K FACTOR*: Enter the K factor in pulse/litre unique to the fitting used. Refer to the user manual of the fitting used.
- *VOLUME TEACHING*: Determine the K factor unique to your installation using a teach-in procedure by volume. Follow the procedure below.
- *FLOW TEACH*: Determine the K factor unique to your installation using a teach-in procedure by flow rate. Follow the procedure on next page.

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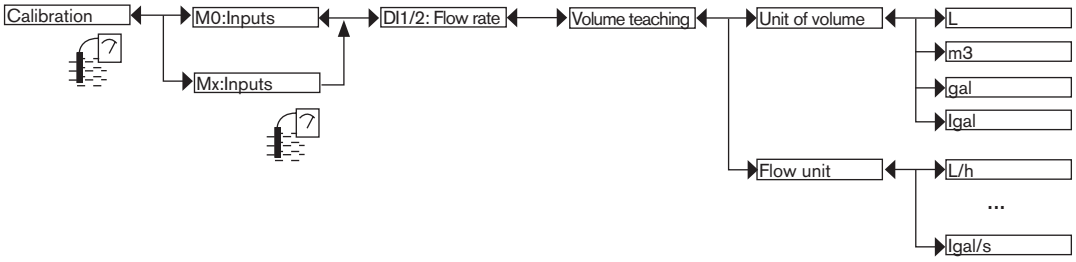
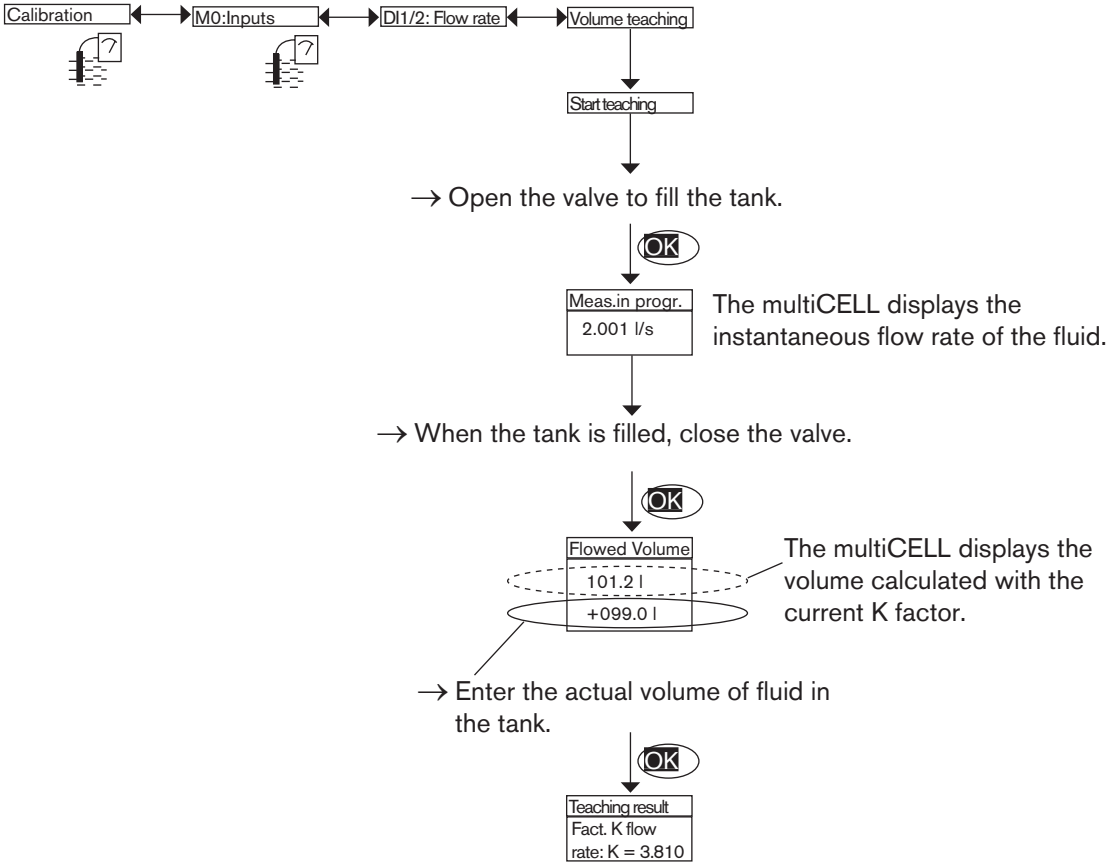
Detailed procedure for teach-in by volume

→ Prepare a tank capable of containing 100 litres, for example;

→ Choose the volume unit and the flow rate unit in which the teach-in is run:



→ Running teach-in by volume:



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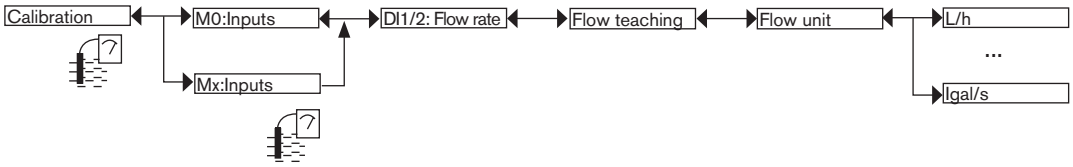
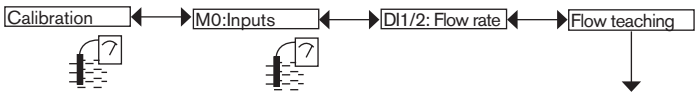
Detailed procedure for teach-in by flow rate

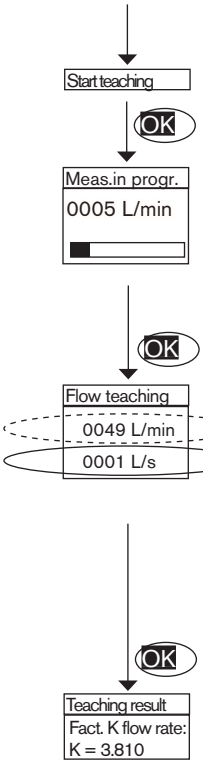
→ Choose the flow rate unit in which teach-in is run:



→ Run teach-in by flow rate:



→ Allow the fluid to circulate in the pipes and wait for the flow rate to stabilise.



The multiCELL calculates the flow rate measured in the pipe, with the current K factor, for 100 seconds [1].

The bargraph shows the time elapsed.

The multiCELL displays the flow rate calculated with the current K factor

→ Enter the value of the flow rate in the pipe.

The multiCELL displays the K factor calculated by teach-in.

[1] Measurement can be suspended at any time by clicking on "OK".

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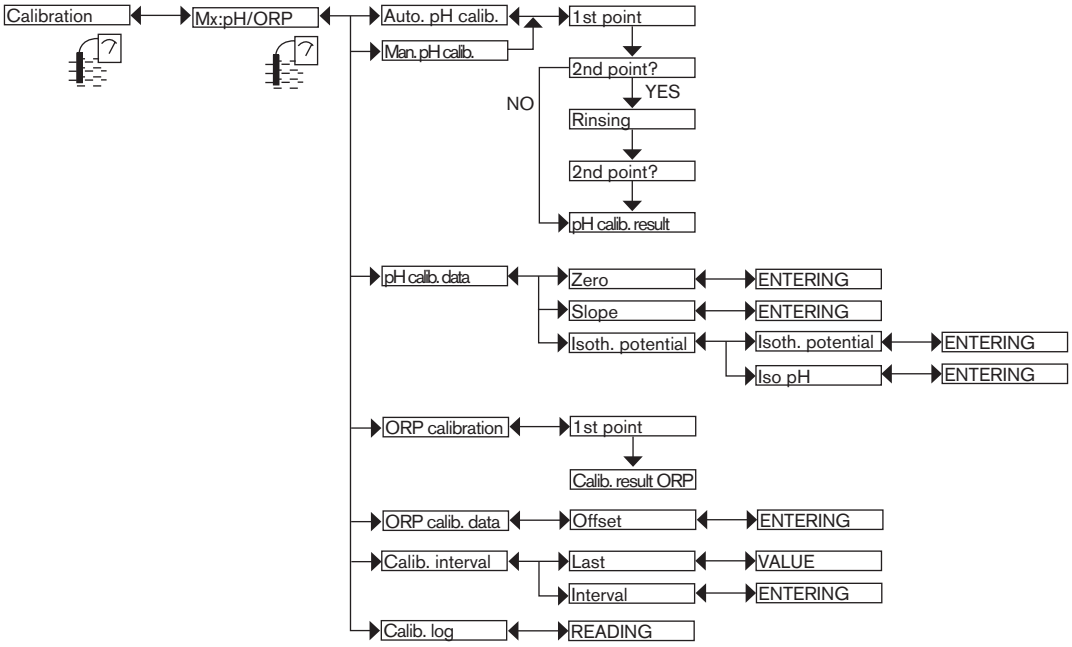
5.11.18 Calibrating a pH or redox sensor

Refer to section 5.9 to access the "Calibration" menu.



→ Use one of the following 3 methods to calibrate a pH sensor:

- *PH AUTO CALIBRATION* : Automatically calibrate the pH sensor; first choose the buffer solution used in the menu "Parameters -> Mx:pH/ORP -> Buffer". The multiCELL automatically recognises the pH of the solution used: When a sensor is calibrated automatically, the most recent calibration date is updated (function "LAST" in the submenu "CALIBRATION INTERVAL" below).
- *PH MANUAL CALIBRATION*: Calibrate the pH sensor using a 1- or 2-point procedure. See details on the following pages. When a sensor is calibrated manually, the most recent calibration date is updated (function "LAST" in the submenu "CALIBRATION INTERVAL" below).
- *PH CALIBRATION DATA*: Enter the zero values and the slope indicated on the certificate for the pH sensor, if provided. This entry does not update the most recent calibration date (function "LAST" in the sub-menu "CALIBRATION INTERVAL" below).

→ Use one of the following 2 methods to calibrate a redox sensor:

- *ORP CALIBRATION*: Manually calibrating the redox sensor using the 1-point method See details on the following pages.
- *ORP CALIBRATION DATA*: Enter the offset value indicated on the certificate for the redox sensor, if provided.

CALIBRATION INTERVAL: Read the date of the most recent manual or automatic calibration and enter the periodicity of calibration, in days: each time a calibration is due, the multiCELL generates a "maintenance" event, signalled on the display by the icon , and a "warning" event, signalled on the display by the icon ⚠. Configure "0000 days" in order not to use the function.

- The "warning" event may be associated with one and/or other of the digital outputs (see section 5.10.22).
- See also "If you encounter problems" in section 6.3.

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CALIBRATION LOG: Read the latest valid calibration values.

Manually calibrating the pH or redox sensor

- The pH sensor can be calibrated according to a 1-point or a 2-point procedure.
- The redox sensor can only be calibrated according to a 1-point procedure.

- Modify the default calibration limits before calibrating your sensor: see section 5.10.23.
- In order not to interrupt the process, activate the HOLD function (see section 5.11.1).
- Before each calibration, correctly clean the electrode with a suitable product.
- In a 2-point calibration, the buffer solutions used must be at the same temperature.
- Set the periodicity of calibrations in the "Calibration Interval" function (see previous page): each time a calibration is due, the multiCELL generates a "maintenance" event and a "warning" event.

Detailed procedure for the 1- or 2-point calibration of a pH sensor

- The 1-point calibration procedure is used for rapid calibration by adjusting the zero of the measurement graph with a buffer solution with a known pH (to calibrate a pH sensor: see below) or a known oxidation reduction potential (to calibrate a redox sensor: see page 124).
- The 2-point calibration procedure is used for accurate calibration of zero and the slope of the measurement graph of the pH sensor. This operation requires 2 buffer solutions: in general a first solution with a pH of 7 and a second solution with a pH very close to that of the process value to be measured. See next page.

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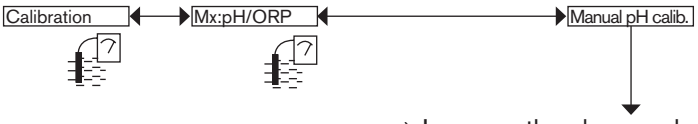
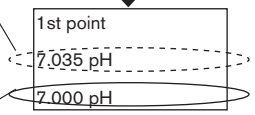
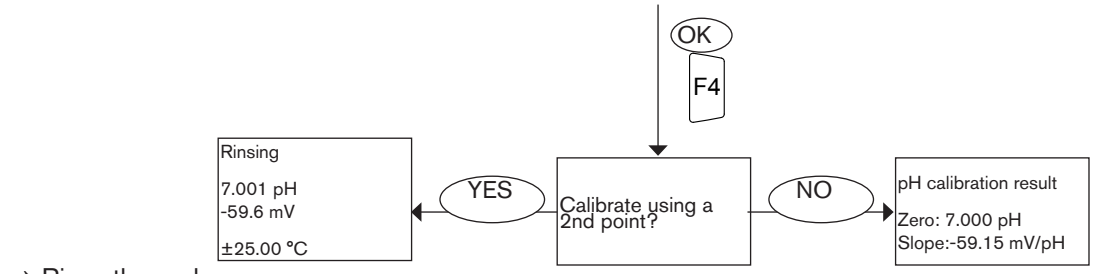


→ Immerse the clean probe in the first buffer solution: the multiCELL displays the measured pH of the solution.



→ Enter the pH of the buffer solution (indicated on the bottle)

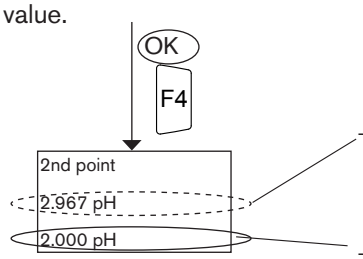
→ Wait until the measured pH stabilises.



→ Rinse the probe.

→ confirm rinsing by "OK" when the pH reaches the desired value.

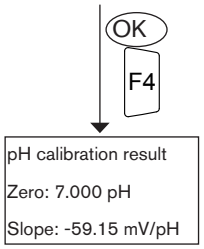
The multiCELL displays the calibration result. [1)]



→ Immerse the clean probe in the second buffer solution: the multiCELL displays the measured pH of the solution.

→ Enter the pH of the second buffer solution (indicated on the bottle)

→ Wait until the measured pH stabilises.



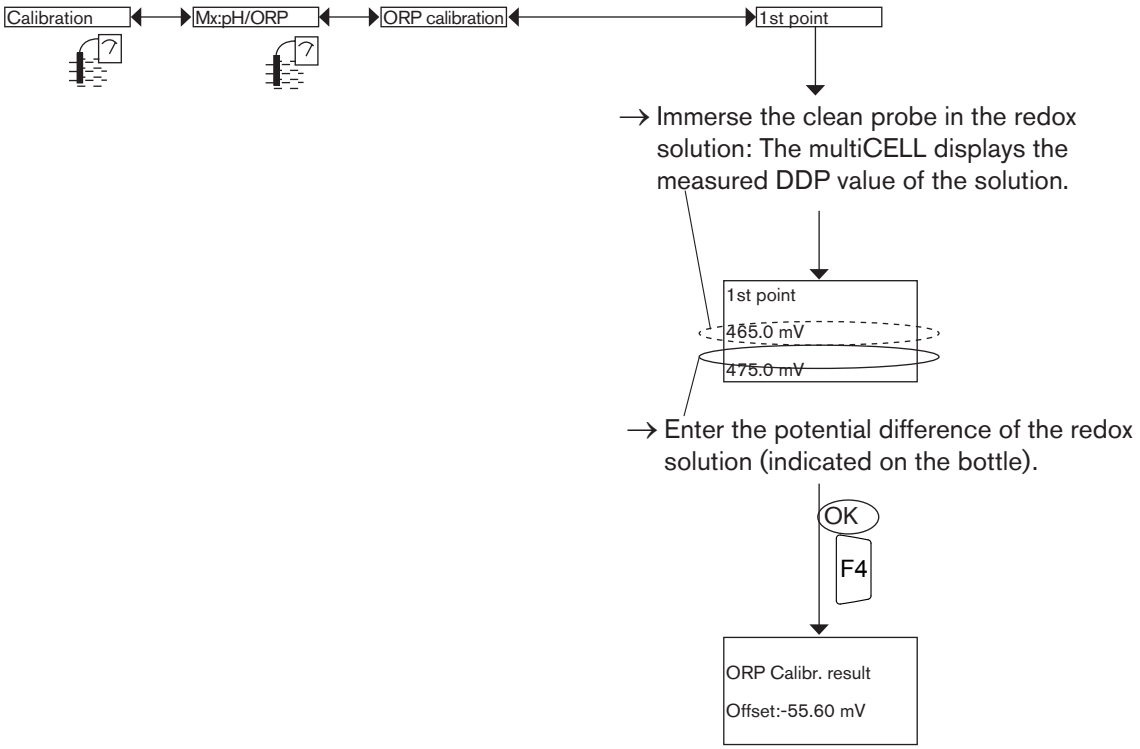
The multiCELL displays the calibration result. [1)]

1)

- a possible "warning" message indicates either an error in the solution or the ageing of the probe.
- a possible "error" message indicates that the probe must be replaced.

Detailed procedure for the calibration of the oxidation reduction potential sensor (1-point method only)

The 1-point calibration procedure is used for a quick calibration by adjusting the zero of the measurement graph with a buffer solution with a known oxidation reduction potential.



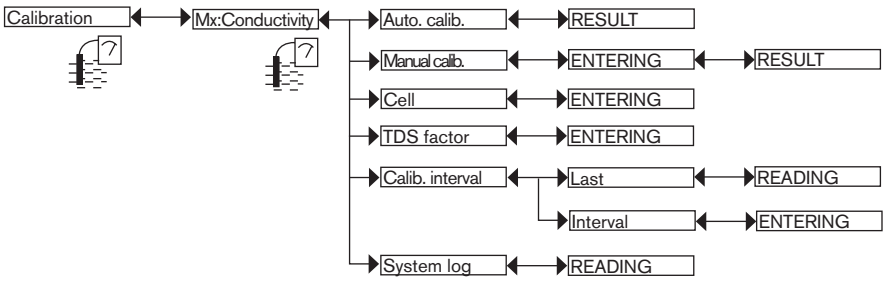
The multiCELL displays the calibration result. [1)]

1)

- a possible "warning" message indicates either an error in the solution or the ageing of the probe.
- a possible "error" message indicates that the probe must be replaced.

5.11.19 Calibrating a conductivity sensor

Refer to section 5.9 to access the "Calibration" menu.



→ Use one of the following 3 methods to calibrate a conductivity sensor:

- *AUTOMATIC CALIBRATION*: Calibrate the conductivity sensor by automatically determining its specific C constant; choose the reference solution used in the menu "Parameters -> Mx:conductivity -> Calibration solution".

- *MANUAL CALIBRATION*: Calibrate the conductivity sensor by determining its specific C constant. See details of the procedure below.
- *CELL*: Read the most recent C constant determined by one of the calibration functions or modify it. This entry does not update the most recent calibration date (function "LAST" in the sub-menu CALIB INTERVAL below).

TDS FACTOR: Enter the conversion factor between conductivity and quantity of dissolved solids (TDS) appropriate to your fluid.

CALIBRATION INTERVAL: Read the date of the last calibration (function "LAST") and set the periodicity of calibrations, in days (function "INTERVAL"): each time a calibration is due, the multiCELL generates a "maintenance" event, signalled on the display by the icon and a "warning" event. Set "0000 days" in the "INTERVAL" function in order not to use the function.

- The "warning" event may be associated with one and/or other of the digital outputs (see section 5.10.22).
- See also "If you encounter problems" in section 6.3.

CALIB. LOG: Read the latest valid calibration values.

Details of the calibration procedure for a conductivity sensor

Calibration consists in determining the cell constant specific to each sensor using a solution with a known conductivity.

- In order not to interrupt the process, activate the HOLD function (see section 5.11.1).
- Before each calibration, correctly clean the electrode with a suitable product.
- Set the periodicity of calibrations in the "Interval" function of the "calibration interval" submenu (see above). Each time a calibration is due, the multiCELL generates a "maintenance" event and a "warning" event.

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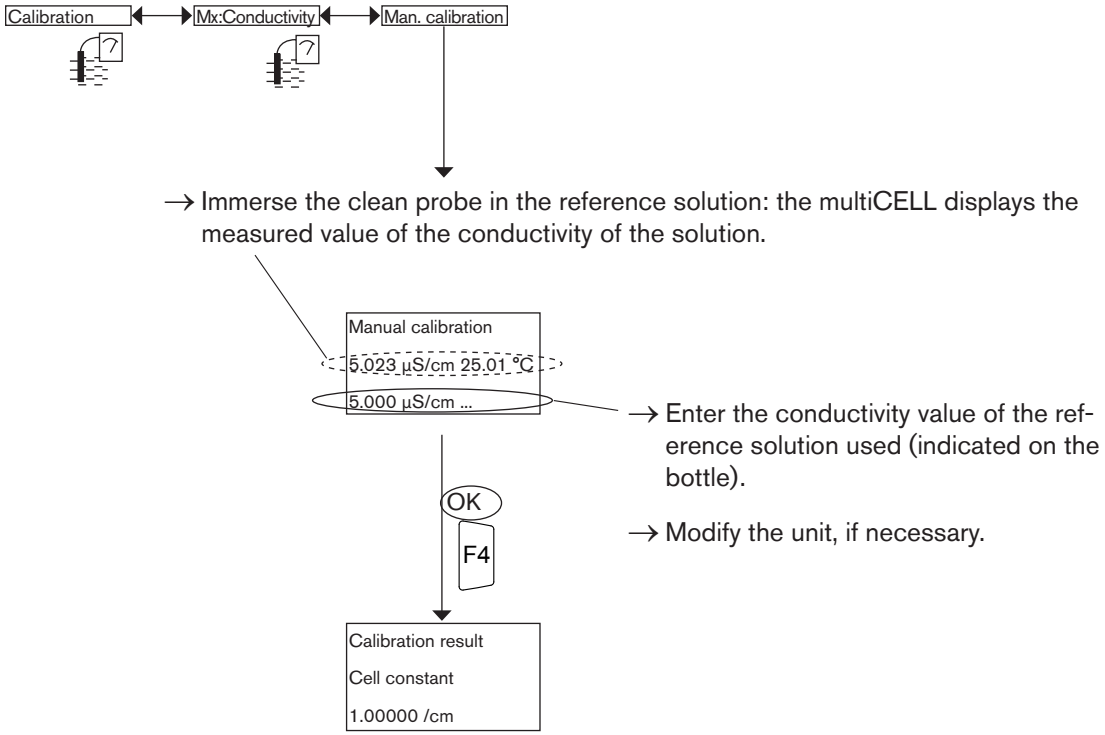
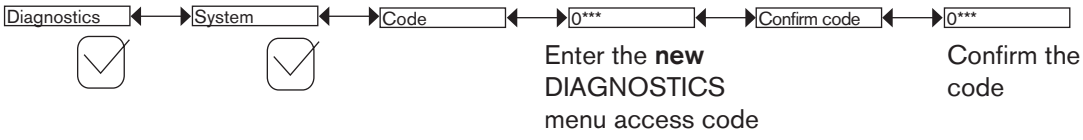


The multiCELL displays the calibration result.

5.12 "Diagnostics" menu

5.12.1 Modifying the "Diagnostics" menu access code

Refer to section 5.9 to access the "Diagnostics" menu. If the default access code "0000" is kept, the device does not request it to access the Diagnostics menu.



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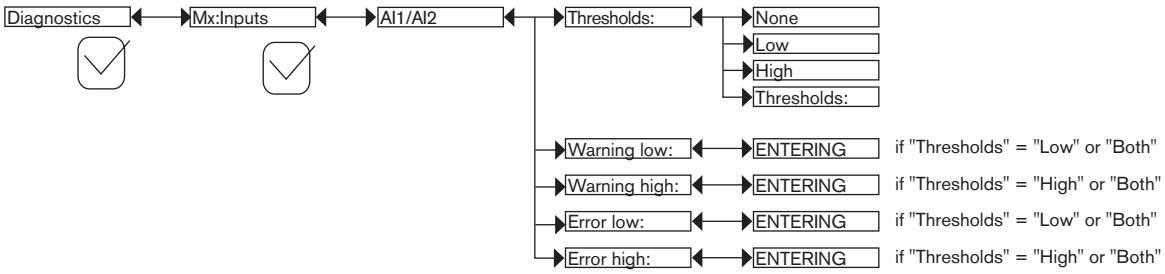
5.12.2 Monitoring the current or voltage value received on the analogue inputs

This function is used to define the behaviour of the limits entered by the user are reached.

Refer to section 5.9 to access the "Diagnostics" menu.



A malfunction in your process may be revealed by too low or too high value received on the analogue input.

To be warned when the value received on the analogue input is out of range:

→ choose which thresholds have to be monitored, in the "Thresholds" function, and then

→ set one or two threshold values outside of which the multiCELL generates a "warning" event and displays the icons and ⚠;

→ set one or two threshold values outside of which the multiCELL generates an "error" event and displays the icons and .

When a "warning" or "error" event is generated by the multiCELL:

→ go into the "Information" menu to read the cause of generation of this event;

→ correct the problem according to the instructions given in section 6.3.

- The "warning" event may also be associated with one and/or other digital outputs. See section 5.10.22.
- A current of 22 mA may be emitted on one and/or other of the current outputs when an "error" event related to either the monitoring of the fluid pH, redox, conductivity or temperature values or the monitoring of an analogue input is generated. See section 5.10.21.
- See also "If you encounter problems" in section 6.3.

WARN. LOW: Enter the analogue input value below which a "warning" event is generated.

WARN. HIGH: Enter the analogue input value above which a "warning" event is generated.

ERR. LOW: Enter the analogue input value below which an "error" event is generated.

ERR. HIGH: Enter the analogue input value above which an "error" event is generated.

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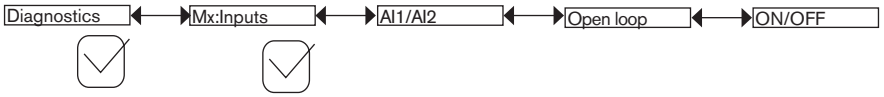
5.12.3 Detecting an open loop on a voltage input

This function is available for an analogue input configured in "voltage" mode.

Refer to section 5.9 to access the "Diagnostics" menu.



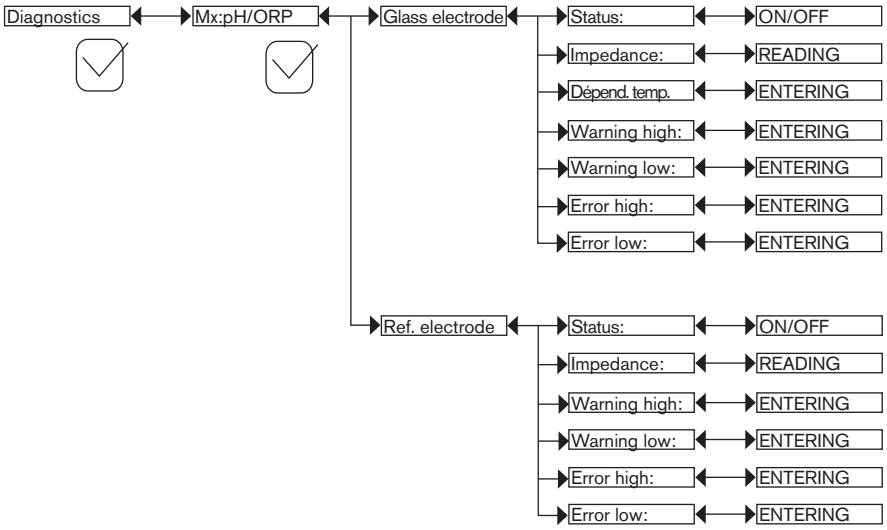
ON/OFF: Activate or deactivate the open loop detection.

When the function has been activated, an "error" event is generated and the message "Mx:E:AIx open" registered in the data logger if no source is connected to the voltage input or if the wiring is incorrect.

5.12.4 Monitoring the pH or redox values

This function is used to define the behaviour of the device if problems arise on the pH probe (glass electrode and/or reference electrode) or the redox probe (reference electrode only).

Refer to section 5.9 to access the "Diagnostics" menu.



A malfunction in your process or on the measurement probe may be revealed by too low or too high value of the impedance.

To be warned when the impedance measurement is out of range:

→ activate monitoring of fluid impedance in the "Status" function, and then

→ set an impedance range outside of which the multiCELL generates a "warning" event and displays the icons ☹ and ⚠;

→ set an impedance range outside of which the multiCELL generates an "error" event and displays the icons ☹ and ⊗ .

When a "warning" or "error" event is generated by the multiCELL:

→ go into the "Information" menu to read the cause of generation of this event;

→ and/or read the measured impedance value;

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→ if necessary, clean the probe and/or recalibrate the measurement sensor;

→ if necessary, check the process.

- The "warning" event may also be associated with one and/or other digital outputs. See section 5.10.22.
- A current of 22 mA may be emitted on one and/or other of the current outputs when an "error" event related to either the monitoring of the fluid pH, redox, conductivity or temperature values or the monitoring of an analogue input is generated. See section 5.10.21.
- See also "If you encounter problems" in section 6.3.

STATUS: Choose to activate or deactivate monitoring of the impedance of the electrode selected.

This monitoring is done by the generation of a "warning" event if the impedance range defined in the "Warn Hi/Lo" functions below is exceeded and an "error" event if the impedance range defined in the "Err Hi/Lo" functions below is exceeded.

IMPEDANCE: Read the impedance, measured in real time, on the electrode selected.

TEMP. DEPEND. : Temperature coefficient of correction for the impedance measurement of a fluid. The default coefficient is valid for probes sold by Bürkett

WARN. HIGH: Enter the impedance value above which a "warning" event is generated.

WARN. LOW: Enter the impedance value below which a "warning" event is generated.

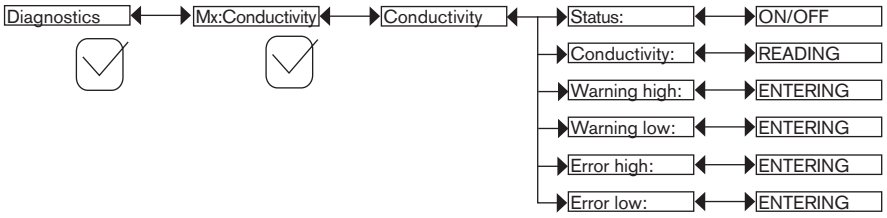
ERR. HIGH: Enter the impedance value above which an "error" event is generated.

ERR. LOW: Enter the impedance value below which an "error" event is generated.

5.12.5 Monitoring the conductivity of the fluid

This function is used to monitor the fluid conductivity and define the device's behaviour if the ranges defined are exceeded.

Refer to section 5.9 to access the "Diagnostics" menu.



A malfunction in your process or on the measurement cell may be revealed by too low or too high a fluid conductivity.

To be warned when the conductivity is out of range:

→ activate monitoring of fluid conductivity in the "Status" function, and then

→ set a fluid conductivity range outside of which the multiCELL generates a "warning" event and displays the icons ☹ and ⚠.

→ set a fluid conductivity range outside of which the multiCELL generates an "error" event and displays the icons ☹ and ⓧ .

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When a "warning" or "error" event is generated by the multiCELL:

→ go into the "Information" menu to read the cause of the event generation

→ and/or read the measured conductivity value.

→ If necessary, clean the cell and/or recalibrate the sensor.

→ If necessary, check the process.

- The "warning" event may also be associated with one and/or other digital outputs. See section 5.10.22.
- A current of 22 mA may be emitted on one and/or other of the current outputs when an "error" event related to either the monitoring of the fluid pH, redox, conductivity or temperature values or the monitoring of an analogue input is generated. See section 5.10.21.
- See also "If you encounter problems" in section 6.3.

STATUS: Choose whether or not to activate monitoring of fluid conductivity.

This monitoring is done by the generation of a "warning" event if the fluid conductivity range defined in the "Warn Hi/Lo" functions below is exceeded and an "error" event if the fluid conductivity range defined in the "Err Hi/Lo" functions below is exceeded.

CONDUCTIVITY: Read the fluid conductivity measured in real time by the sensor.

WARN. HIGH: Enter the fluid conductivity value above which a "warning" event is generated.

WARN. LOW: Enter the fluid conductivity value below which a "warning" event is generated.

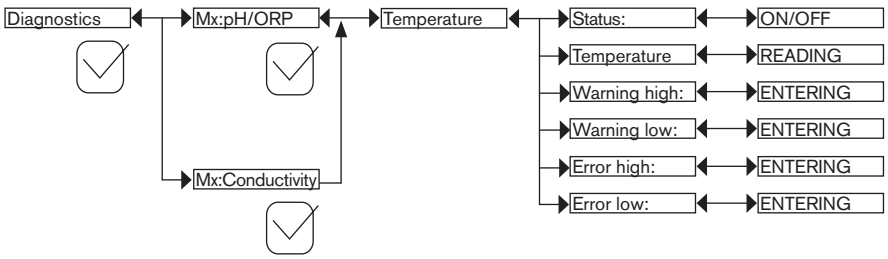
ERR. HIGH: Enter the fluid conductivity value above which an "error" event is generated.

ERR. LOW: Enter the fluid conductivity value below which an "error" event is generated.

5.12.6 Monitoring the temperature of the fluid

This function is used to monitor the fluid conductivity and define the device's behaviour if the ranges defined are exceeded.

Refer to section 5.9 to access the "Diagnostics" menu.



A malfunction in your process or on the temperature sensor may be revealed by too low or too high a fluid temperature or by an incorrect temperature measurement.

To be warned when the temperature measurement is out of range:

→ activate monitoring on the fluid temperature in the "Status" function, and then

→ set a temperature range (in °C) outside of which the multiCELL generates a "warning" event and displays the icons ☹ and ⚠;

→ set a temperature range (in °C) outside of which the multiCELL generates an "error" event and displays the icons ☹ and ⓧ .

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When a "warning" or "error" event is generated by the multiCELL:

→ go into the "Information" menu to read the cause of the event generation

→ and/or read the measured temperature value.

→ check whether the temperature sensor is working correctly by measuring a fluid with a known temperature. If the temperature sensor is faulty, return the device to Bürkert;

→ if the temperature sensor is not the cause of the problem, check the process.

- The "warning" event may also be associated with one and/or other digital outputs. See section 5.10.22
- A current of 22 mA may be emitted on one and/or other of the current outputs when an "error" event related to either the monitoring of the fluid pH, redox, conductivity or temperature values or the monitoring of an analogue input is generated. See section 5.10.21.
- See also "If you encounter problems" in section 6.3.

STATUS: Choose whether or not to activate monitoring of the fluid temperature.

This monitoring is done by the generation of a "warning" event if the fluid conductivity range defined in the "Warn Hi/Lo" functions below is exceeded and an "error" event if the fluid conductivity range defined in the "Err Hi/Lo" functions below is exceeded.

TEMPERATURE: Read the fluid temperature measured in real time by the temperature sensor.

WARN. HIGH: Enter the fluid temperature value above which a "warning" event is generated.

WARN. LOW: Enter the fluid temperature value below which a "warning" event is generated.

ERR. HIGH: Enter the fluid temperature value above which an "error" event is generated.

ERR. LOW: Enter the fluid temperature value below which an "error" event is generated.

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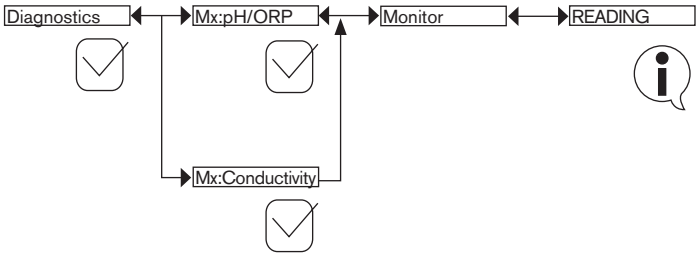
5.12.7 Reading the parameters of the pH, redox or conductivity sensor

Refer to section 5.9 to access the "Diagnostics" menu.



5.13 Tests menu

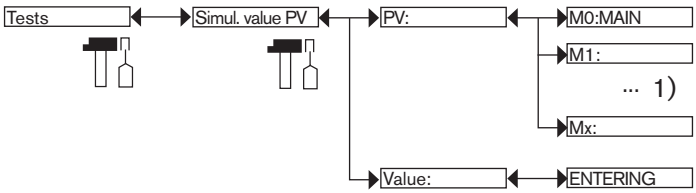
5.13.1 Modifying the "Tests" menu access code

Refer to section 5.9 to access the "Tests" menu. If the default access code "0000" is kept, the device does not request it to access the "Tests" menu.

5.13.2 Verifying the correct behaviour of the outputs by simulating an input or a process variable

The icon T is displayed in place of the icon whenever the correct operation test is run on an output. During the test, this output no longer reacts, depending on the physical parameter measured.

Refer to section 5.9 to access the "Tests" menu.



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

To exit the "Tests" menu, press the dynamic key, "ABORT".

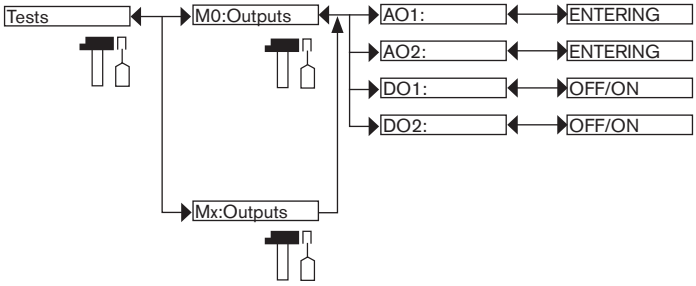
PV: Choose the process input to simulate. The options available depend on the modules fitted.

VALUE: Enter a process value selected from the "PV" function above to check output behaviour.

5.13.3 Checking that the outputs are working correctly

The icon T is displayed in place of the icon whenever the correct operation test is run on an output. During the test, this output no longer reacts, depending on the physical parameter measured.

Refer to section 5.9 to access the "Tests" menu.



To exit the "Tests" menu, press the dynamic key, "ABORT".

AO1: Check that current output 1 on the selected module is working correctly by entering a current value and then selecting "OK".

AO2: Check that current output 2 on the selected module is working correctly by entering a current value and then selecting "OK".

DO1: Check that digital output 1 on the module selected is working correctly by selecting the state "ON" or "OFF" and then "OK".

DO2: Check that digital output 2 on the module selected is working correctly by selecting the state "ON" or "OFF" and then "OK".

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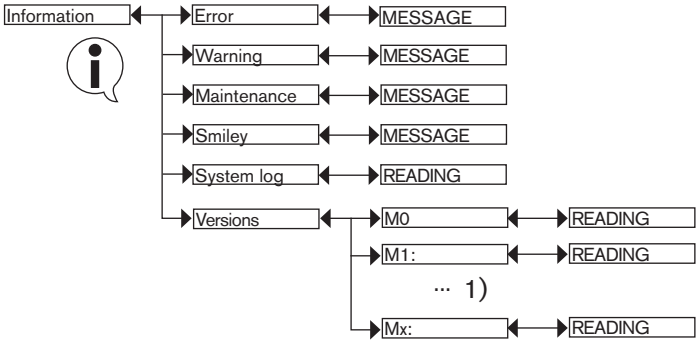
5.14 Information menu

Refer to section 5.9 to access the Information menu.



[1] The choices offered depend on the modules fitted

This menu is used to read:

- A short description of the reason why the following icons are generated and displayed by the multiCELL:
  - ERROR:
  - WARNING: ⚠
  - MAINTENANCE:
  - SMILEY: ☺ or ☹

See also "If you encounter problems" in section 6.3.

- and:
  - "SYSTEM LOG" function: read all the messages generated by the multiCELL including "error", "warning" and "maintenance" events.
  - "VERSIONS" function: the software version of modules for the acquisition/conversion of measured physical parameters and for the M0:MAIN board: the serial number of the device ("Product SN"), the order code for the device ("Product ID"), etc

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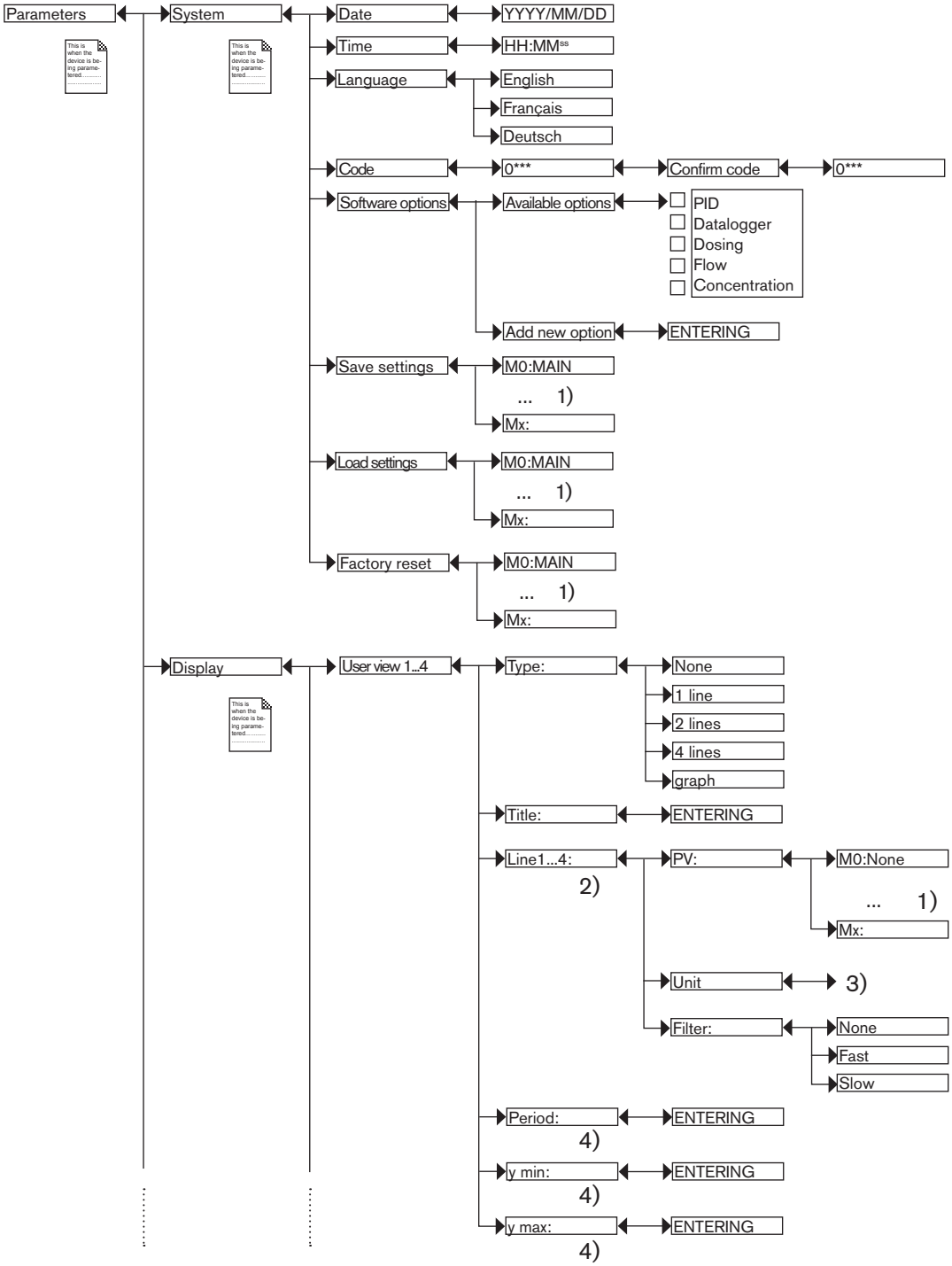
5.15 Structure of the configuration menus

Refer to section 5.9 to access the Configuration level.

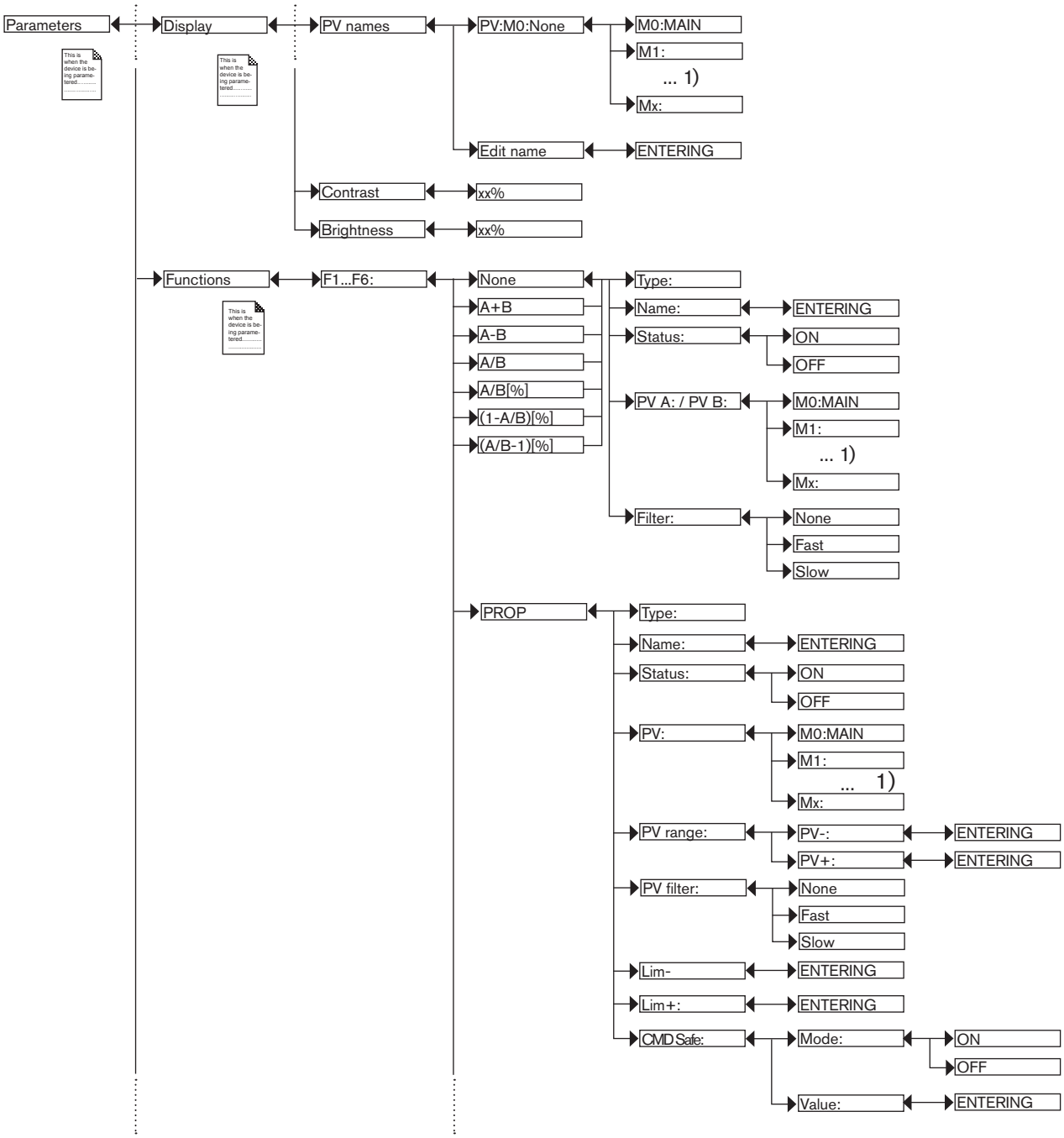


[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2)] If "Type" = 1, 2 or 4 "lines"

[3)] The choices offered depend on the chosen "PV".

[4)] If "Type" = "graph"



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

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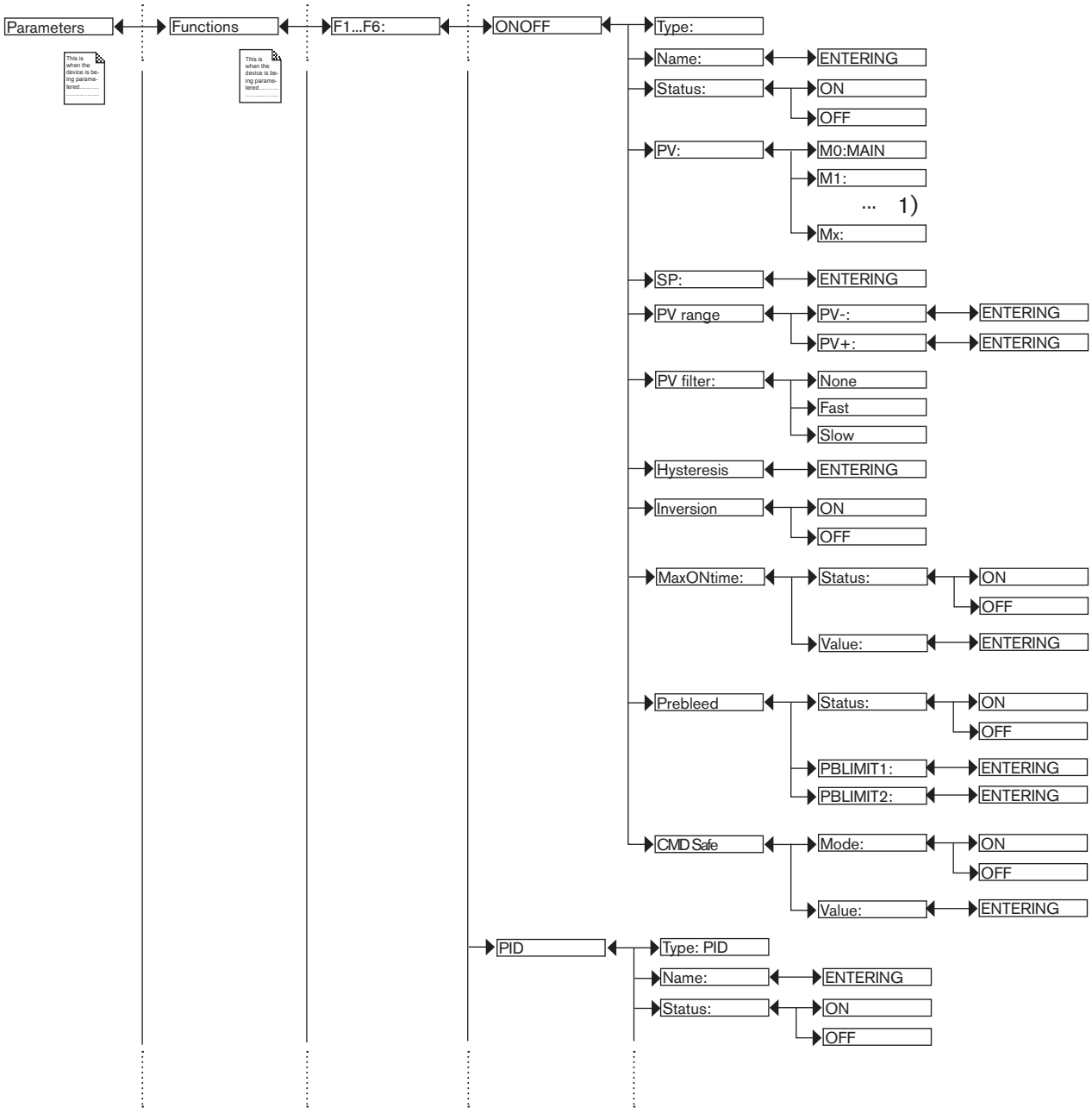

[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

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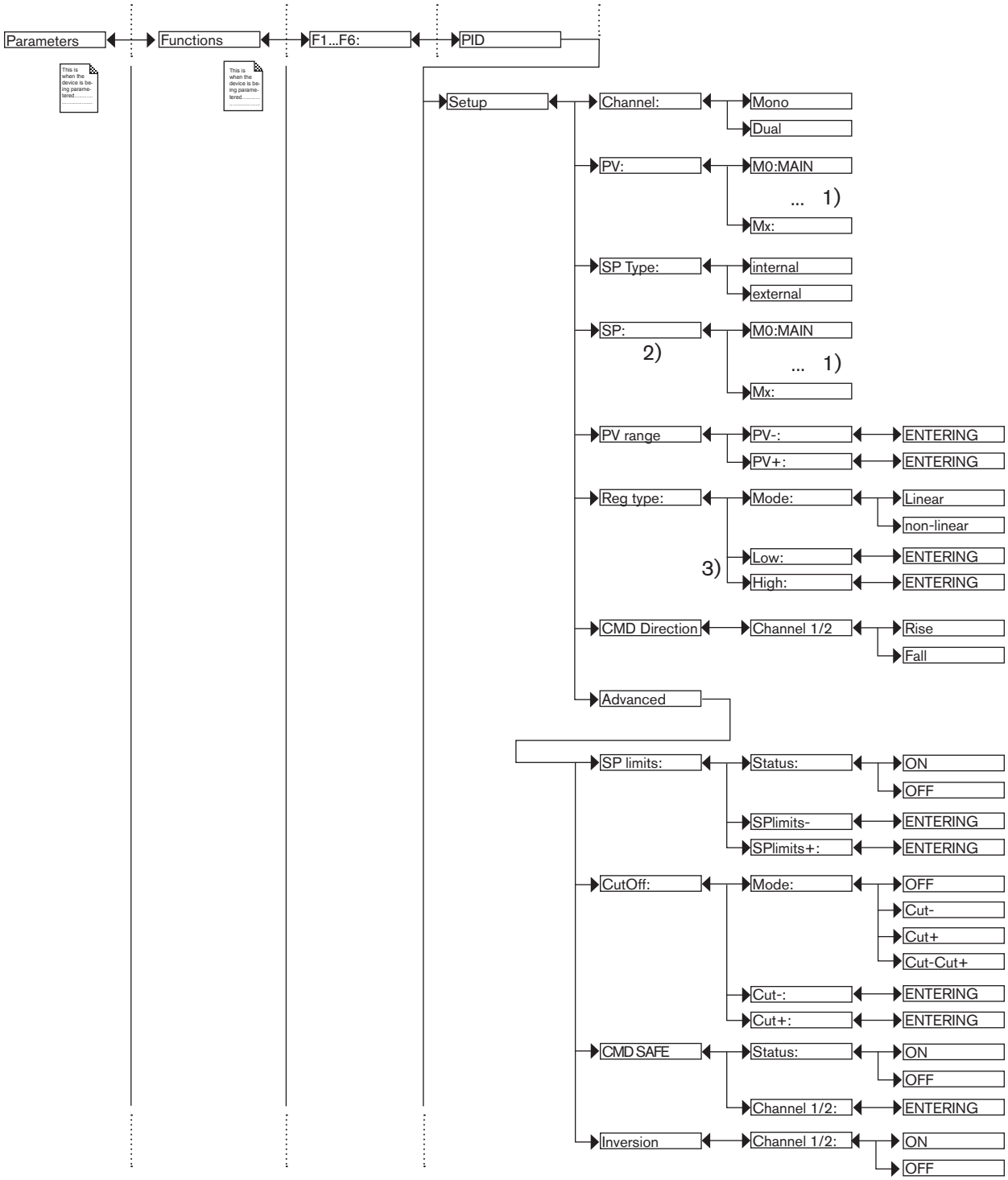

[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2)] This function is present if "SP Type" = "external"

[3)] These functions are present if "Regulation" = "non-linear"

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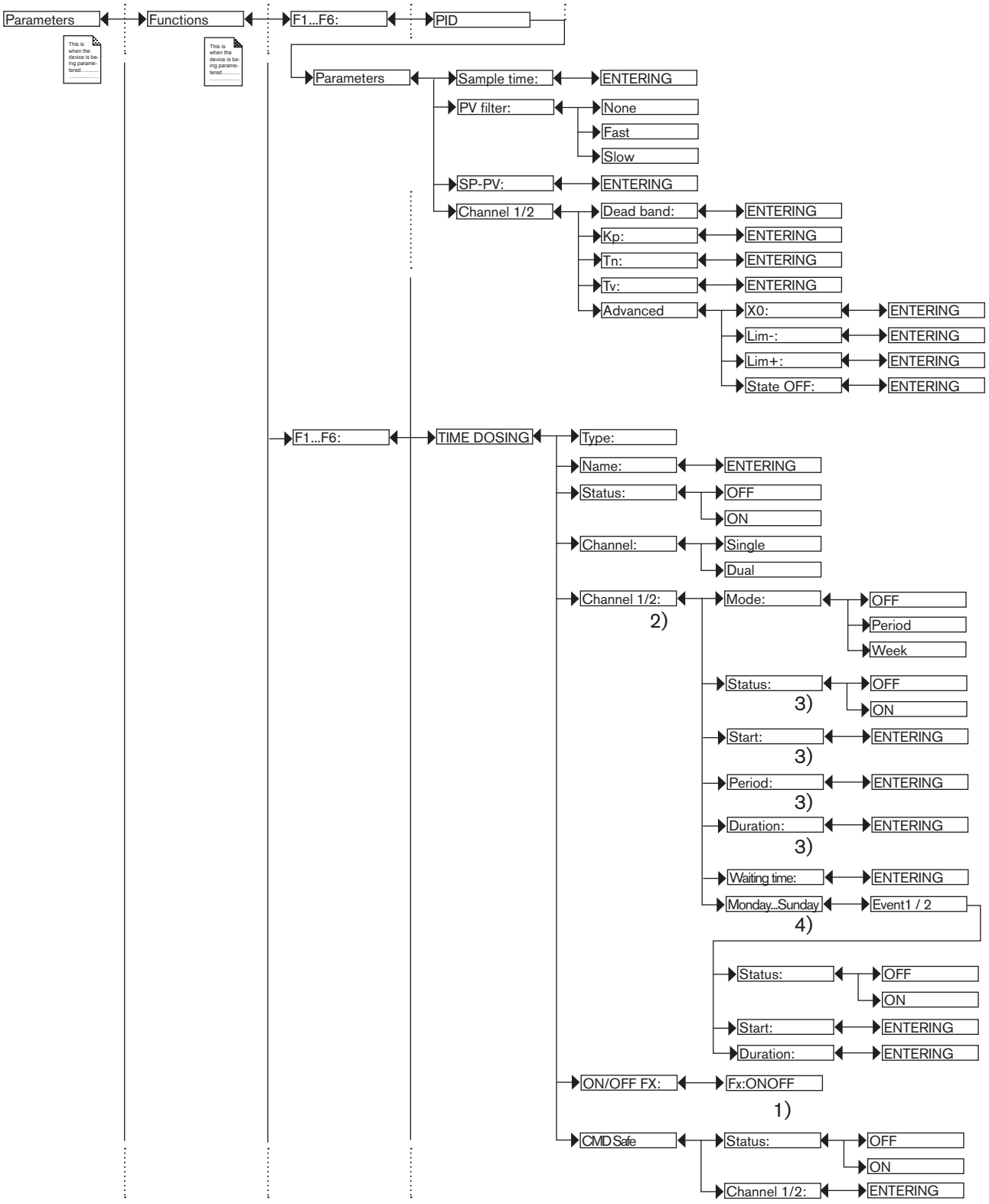

[1])"Fx:" represents the ONOFF function declared "active"

[2]) "Channel2" is present if "Channel" = "Dual"

[3])These functions are present only if "Mode" = "Period"

[4])These functions are present only if "Mode" = "Week"

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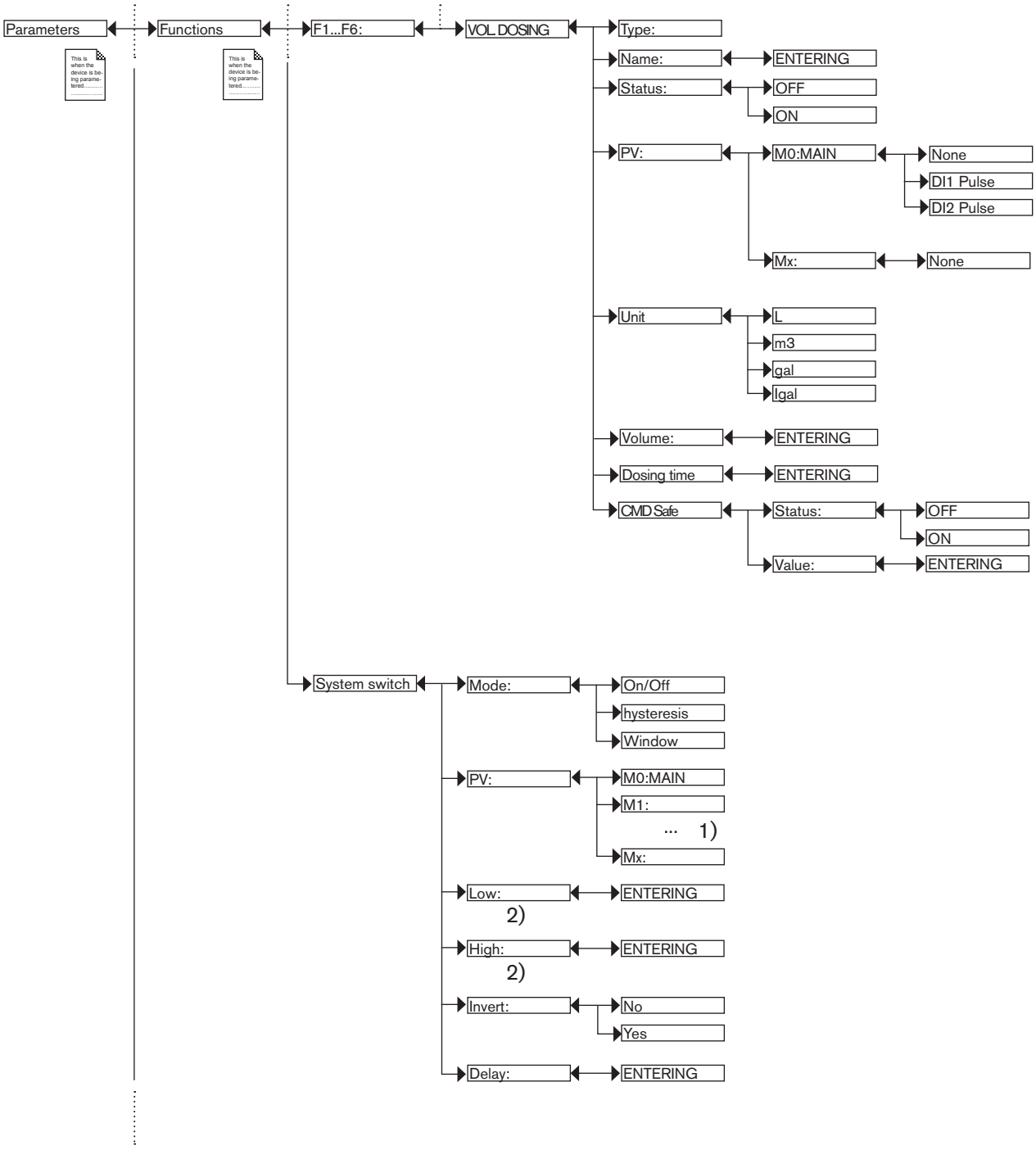

[1]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2] These functions are present if "Mode" ≠ "TOR"

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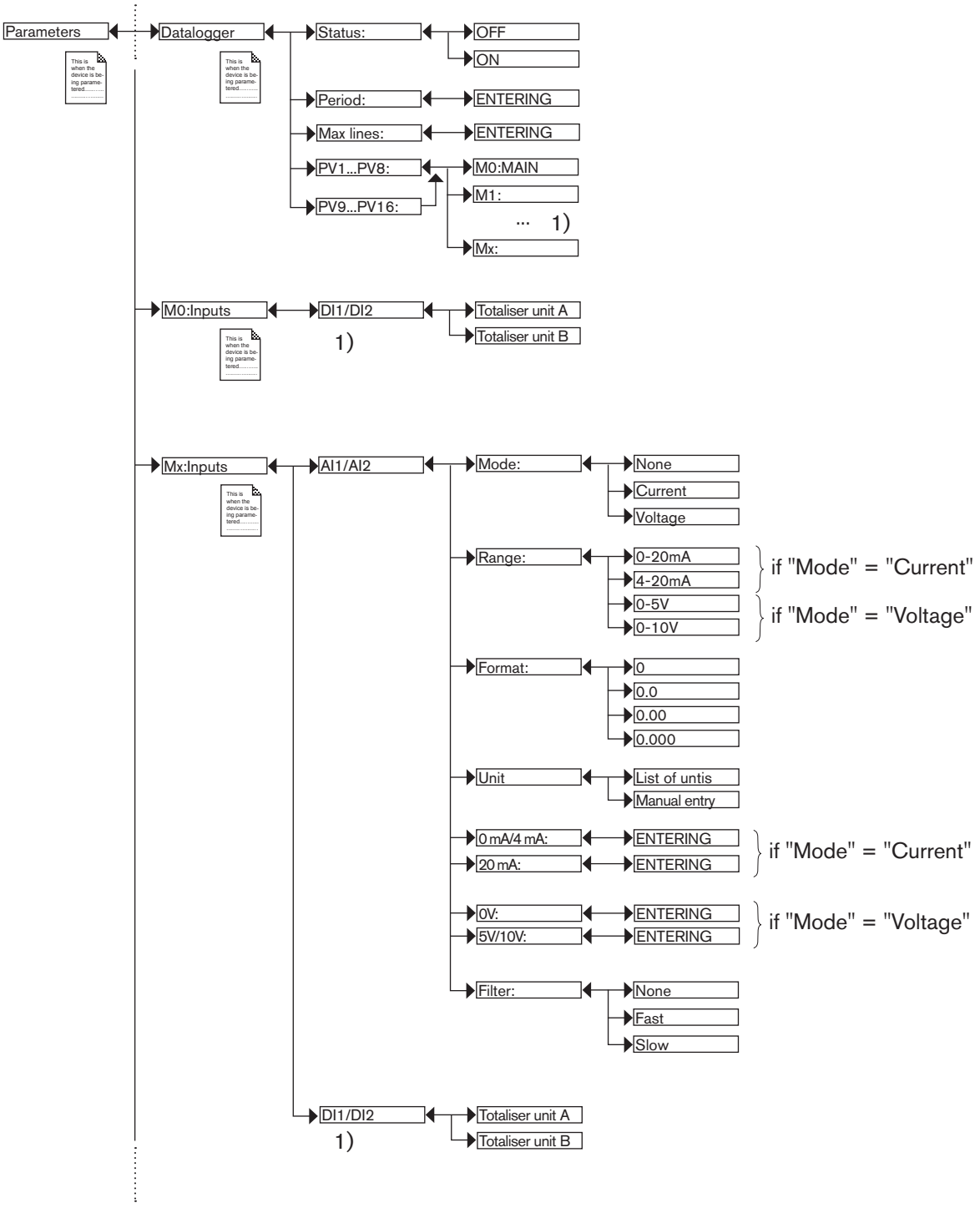

[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

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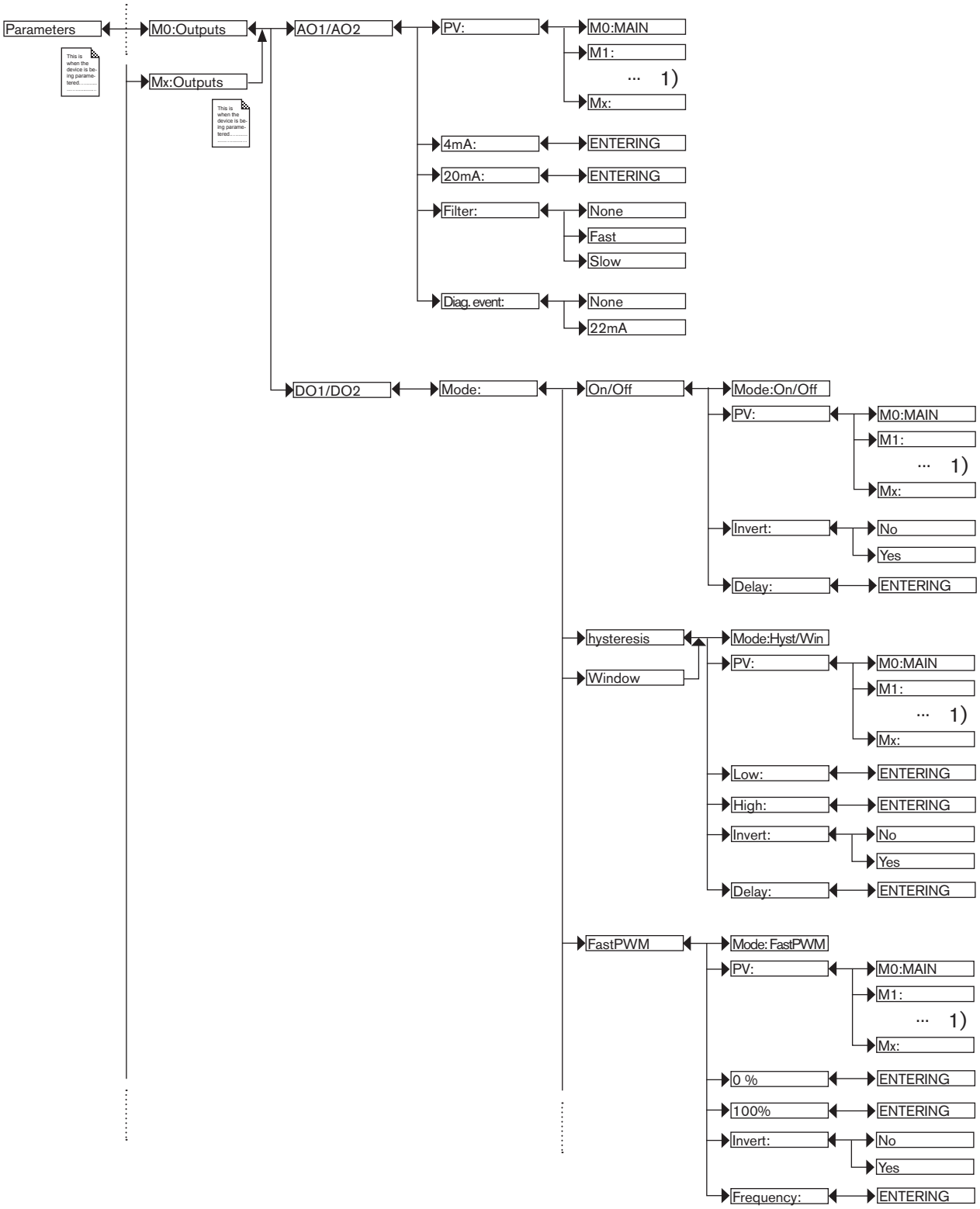

[1]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

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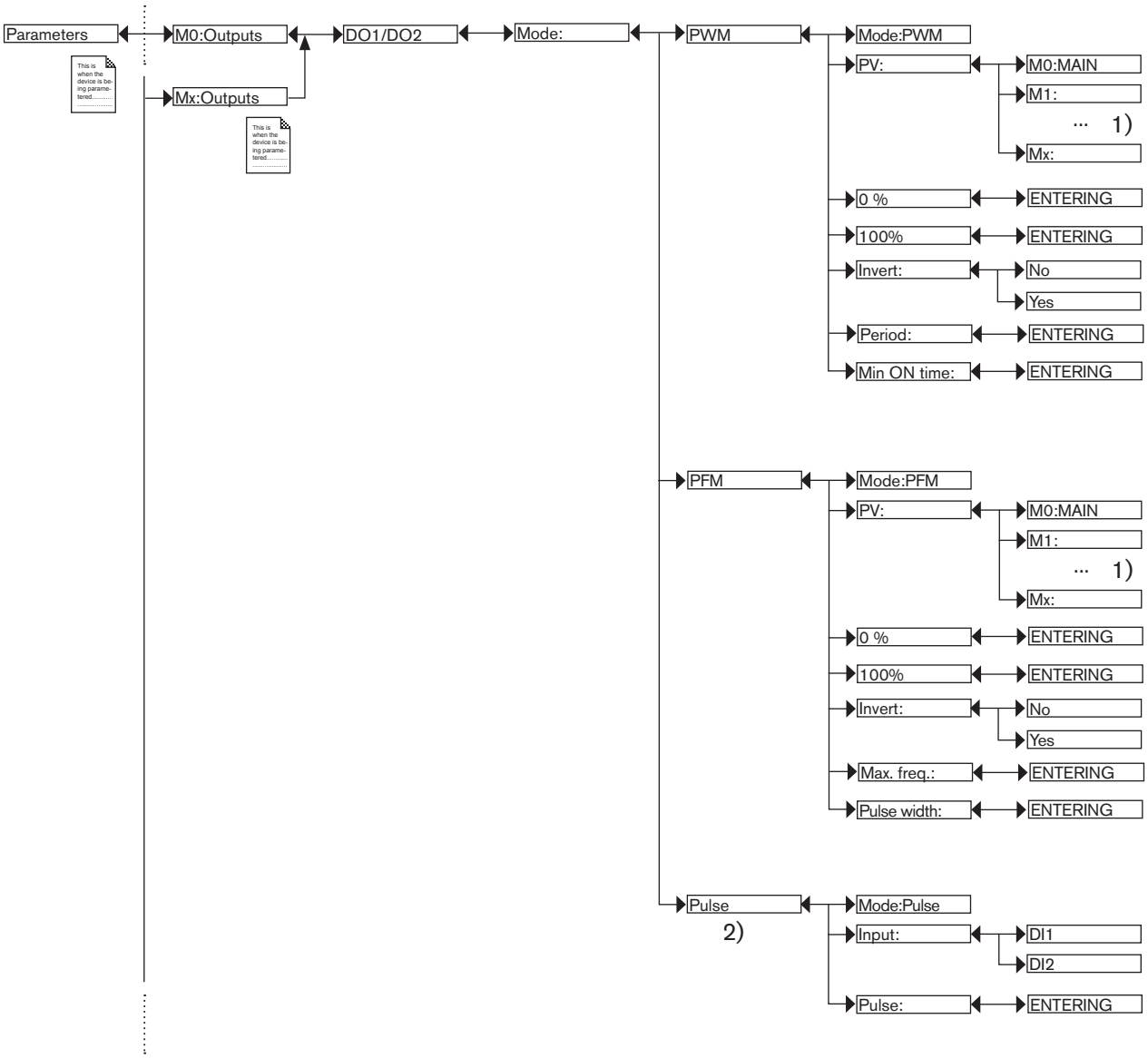

[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

[2)]Function possible only for the DO1 and DO2 outputs on the MAIN board

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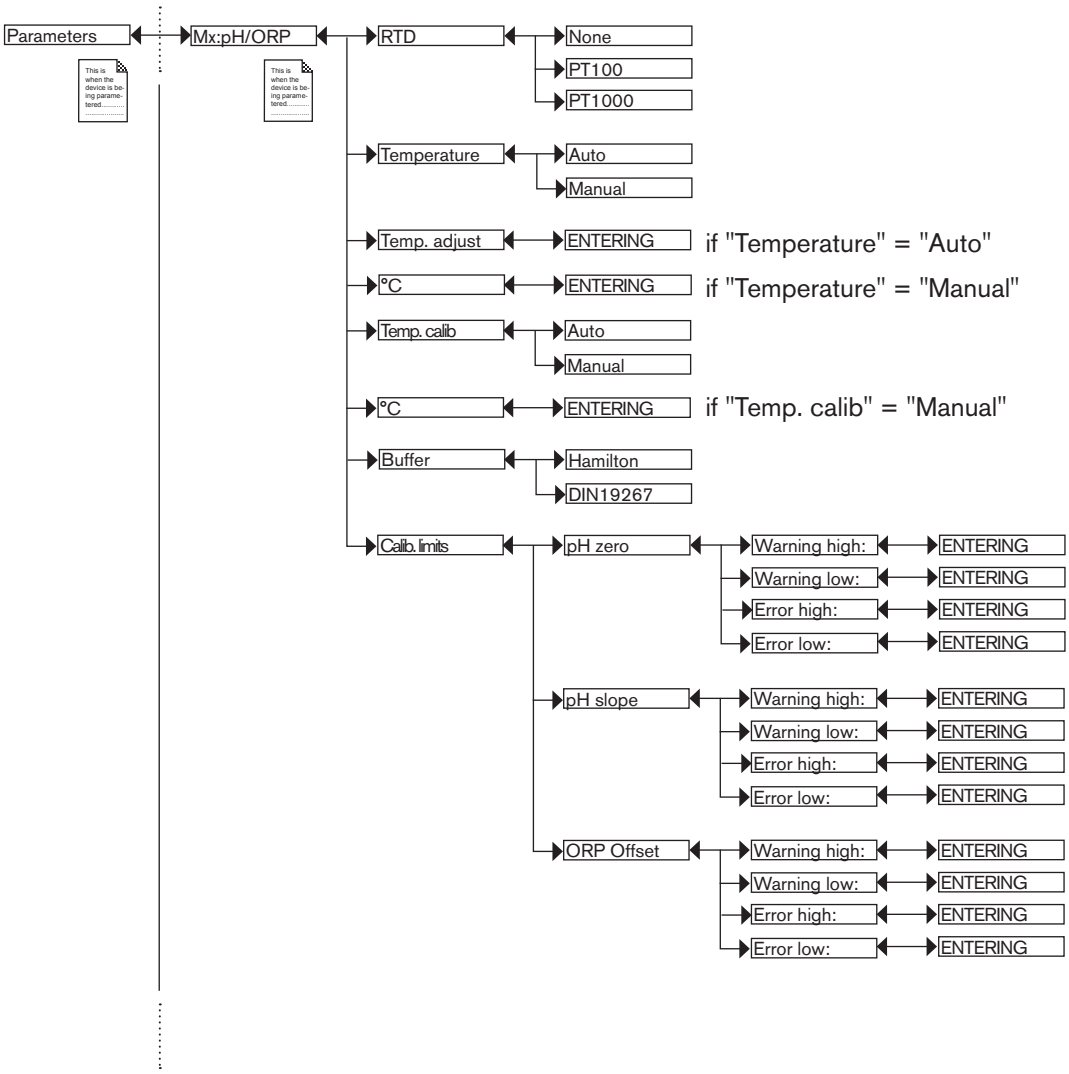

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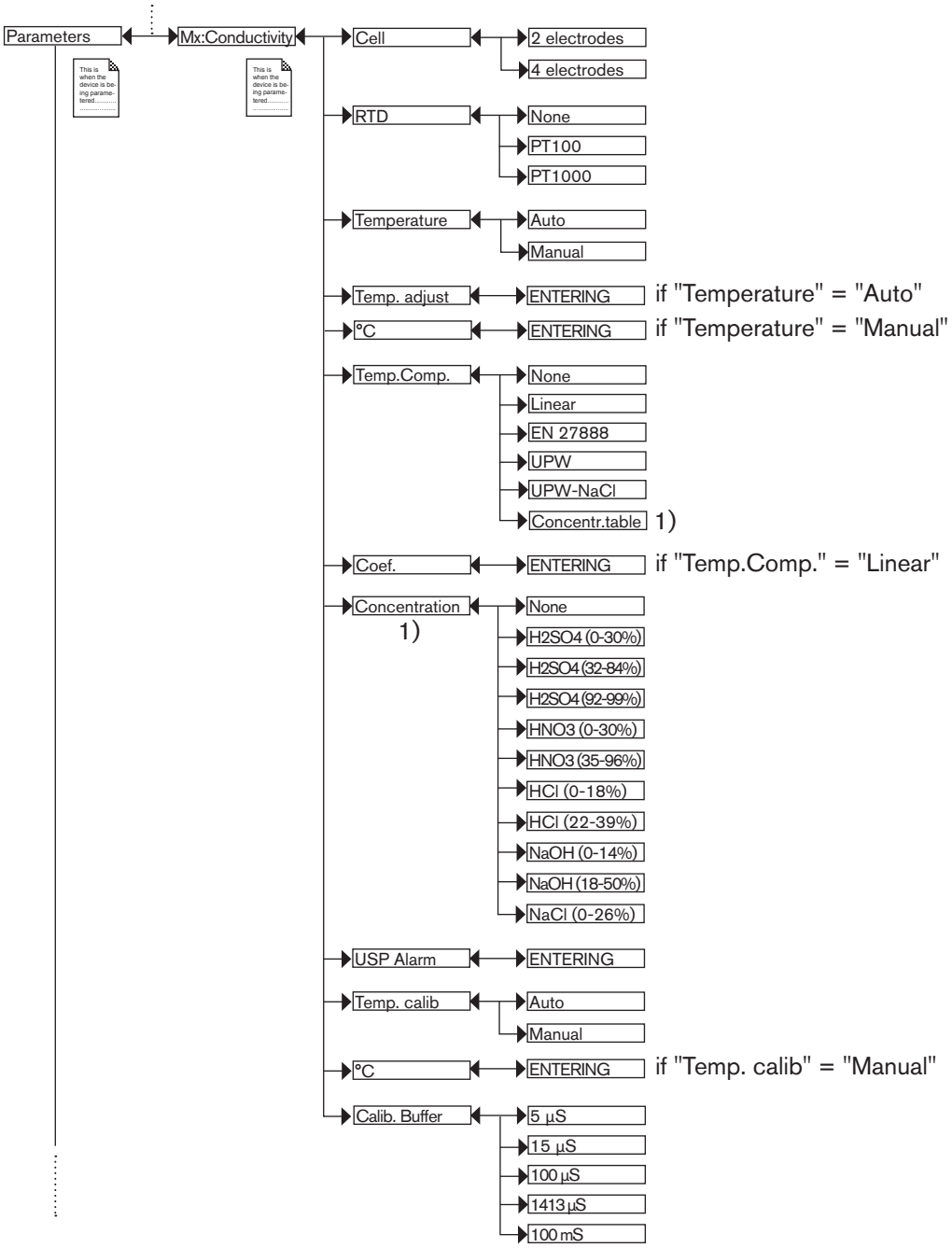

[1] This menu is available as an option (see section 5.10.4

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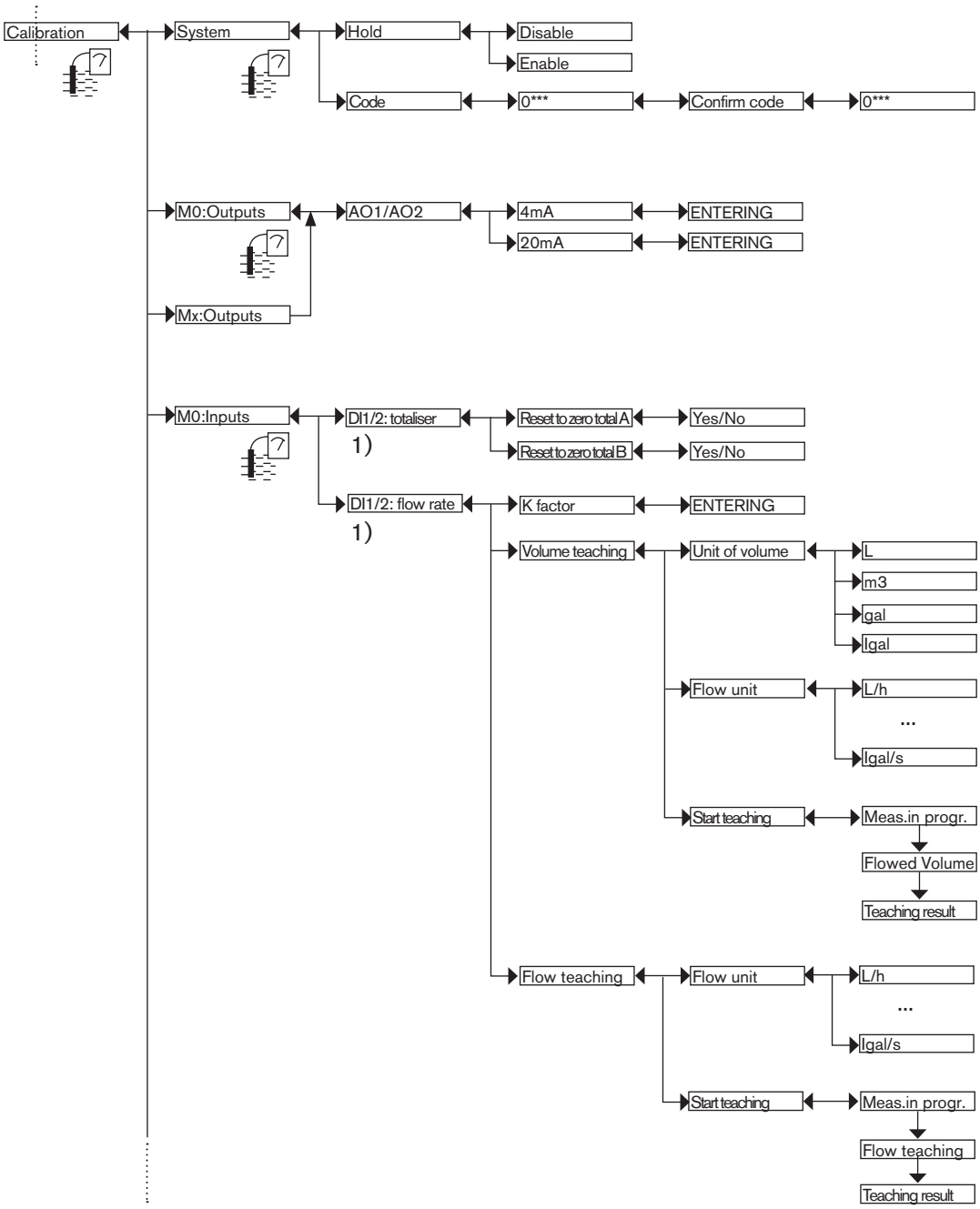

[1] This menu is available as an option (see section 5.10.4

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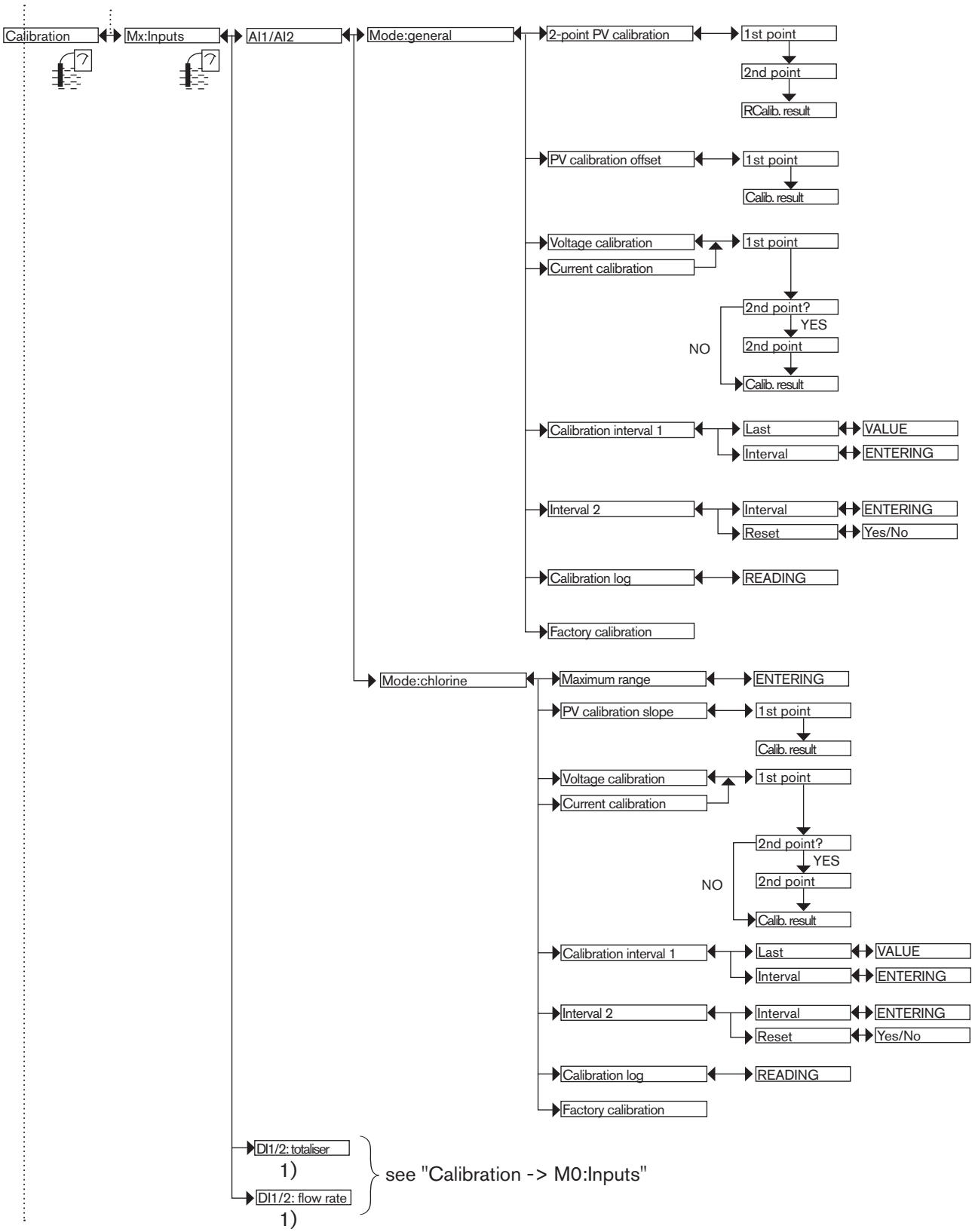
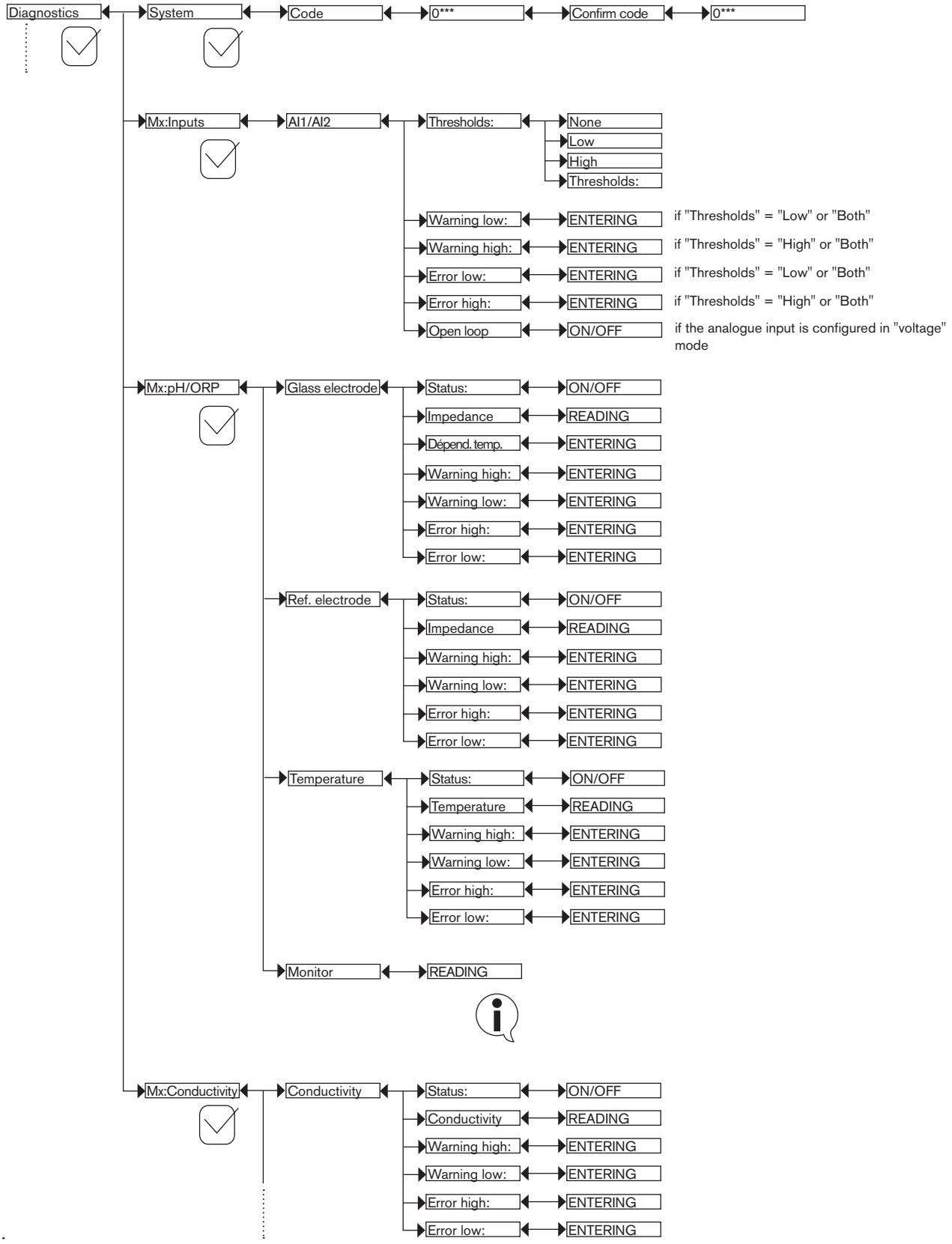
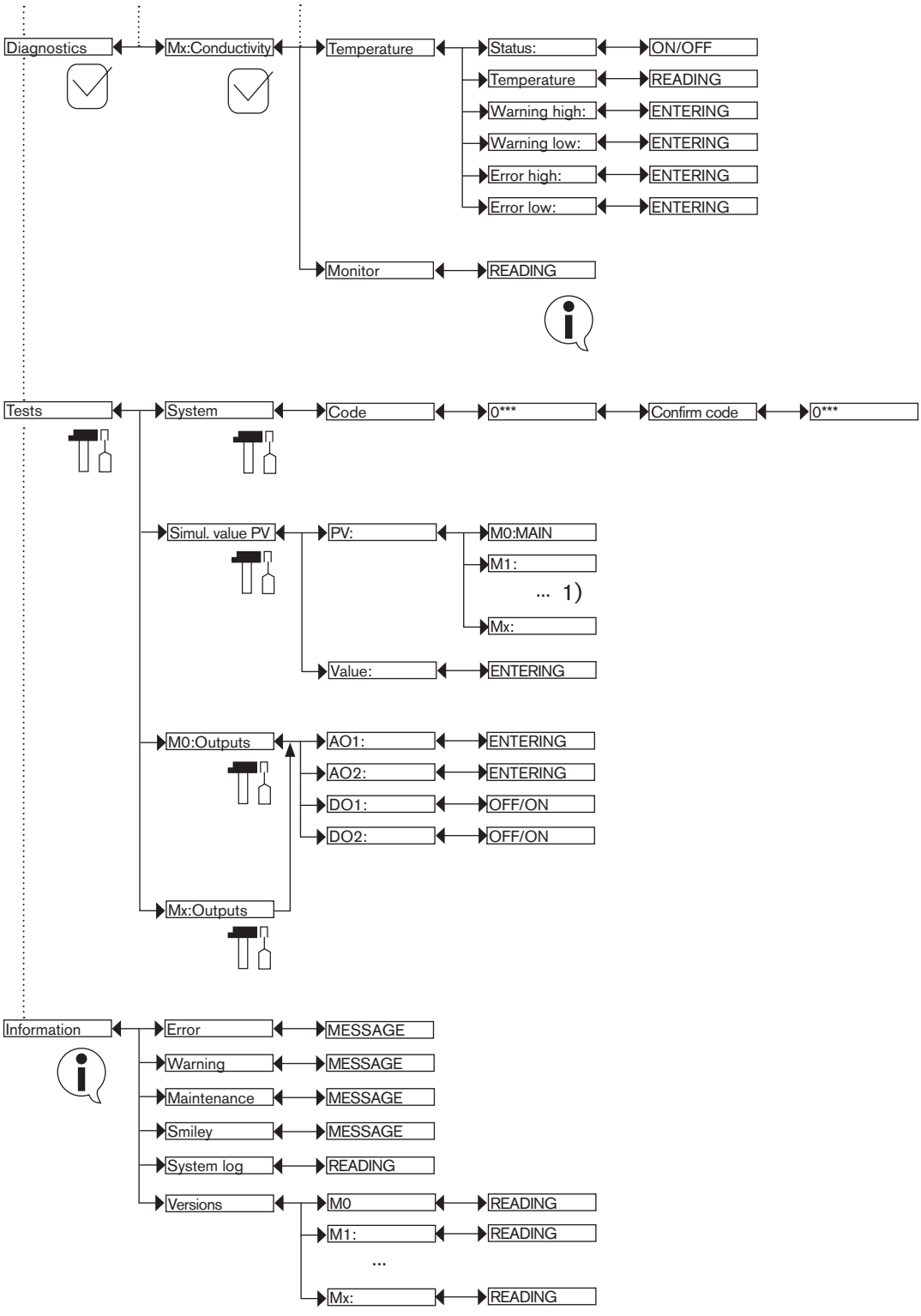


[1] *This menu is available as an option (see section 5.10.4*

MAN 1000139642 EN Version: E Status: RL (released | freigegeben) printed: 12.06.2014



MAN 1000139642 EN Version: E Status: RL (released | freigegeben) printed: 12.06.2014



[1)]The choices offered depend on the modules fitted and/or the options activated. See section "5.10.4 Consulting and/or activating the available software options" and section "5.16 Process inputs or values".

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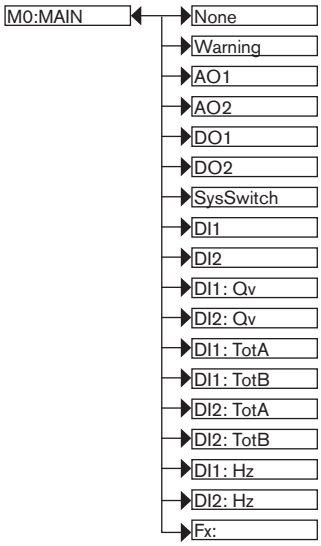
5.16 Process inputs or values

5.16.1 On the M0:MAIN board



Available on the device if the software option "FLOW" is active. See section 5.10.4

"Warning" = event generated by the multiCELL

"AOx" = analogue output

"DOx" = digital output

"System switch" = when the corresponding event is configured and activated

"DIx" = digital input

"DIx Qv" = flow rate on digital input DIx

"DIx TotA" = totaliser A on digital input DIx

"DIx TotA" = totaliser B on digital input DIx

"DIx Hz" = frequency on digital input DIx

"Fx:" = result of configured and activated functions

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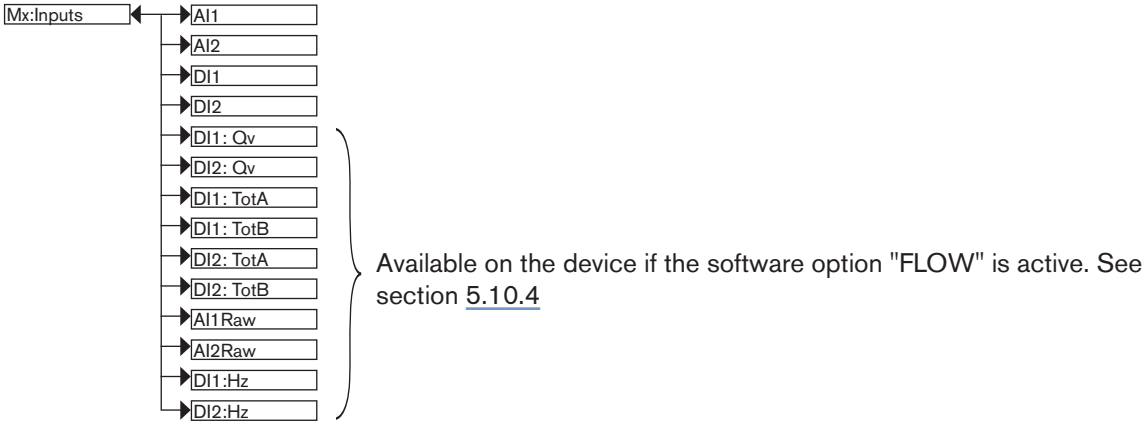
5.16.2 On the input module



"AIx" = scaled physical value (see section 5.10.20).

"DIx" = digital input

"DIx Qv" = flow rate on digital input DIx

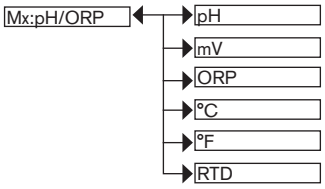
"DIx TotA" = totaliser A on digital input DIx

"DIx TotA" = totaliser B on digital input DIx

"AIxRaw" = current or voltage standard signal on analogue input AIx

"DIx Hz" = frequency on digital input DIx

5.16.3 On the pH/redox module



"pH" = measured pH of the fluid

"mV" = measured pH of the fluid in mV

"ORP" = measured oxidation reduction potential of the fluid in mV

"°C" = measured temperature of the fluid in °C

"°F" = measured temperature of the fluid in °F

"RTD" = input resistance of the temperature stage in Ω

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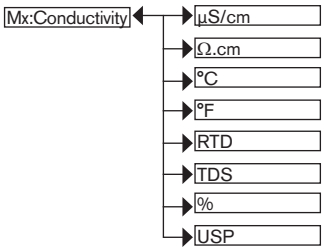
5.16.4 On the conductivity module



"µS/cm" = measured conductivity of the fluid

"$\Omega_{.cm}$" = resistivity

"°C" = measured temperature of the fluid in °C

"°F" = measured temperature of the fluid in °F

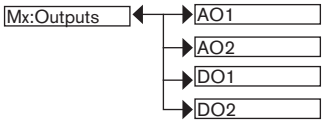
"RTD" = input resistance of the temperature stage in Ω

"TDS" = quantity of dissolved solids in the fluid in ppm

"%" = mass concentration of the fluid (software option)

"USP" = state of the USP function

5.16.5 On the additional outputs module



"AOx" = analogue output

"DOx" = digital output

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6 REPAIR AND MAINTENANCE

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6.1 Safety instructions

DANGER

Risk of injury due to electrical voltage.

- Shut down and isolate the electrical power source 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.

6.2 Maintenance of the multiCELL

The multiCELL can be cleaned with a duster slightly moistened with water with possible addition of a detergent compatible with the materials it is made of.

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

6.3 If you encounter problems

6.3.1 Miscellaneous problems

Problem	Recommended action
On a wall mounting version, the display is not lit although the device is supplied with power.	→ Check that the ribbon cable which links the display to the electronics board is connected. → If the ribbon cable is connected, check the wiring.

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6.3.2 "Error" events related to the monitoring of process parameters (Right red LED and icons ⊗ and ☹ displayed)

When an error event related to the monitoring of the process parameters is generated:

- The 4-20 mA output(s) generate a current of 22 mA if "Diag. events" is configured as "22 mA" (see section 5.10.21);
- The transistor outputs operate normally.

Message displayed in the "Information" menu	Meaning	Recommended action
"Mx:E:AIx low"	The value of the analogue input of the "Mx:Inputs" module is out of range. This message is displayed if monitoring of the analogue input is activated for the "Mx" module, depending on the ERROR LOW threshold defined (see section 5.12.2).	→ Check the wiring of the input. → Make sure the connected instrument functions correctly.
"Mx:E:AIx high"	The value of the analogue input of the "Mx:Inputs" module is out of range. This message is displayed if monitoring of the analogue input is activated for the "Mx" module, depending on the ERROR HIGH threshold defined (see section 5.12.2).	→ Check the wiring of the input. → Make sure the connected instrument functions correctly.
"Mx:E:AIx open"	An open loop has been detected on the analogue input configured in voltage mode. This message is displayed if detection of an open loop is activated for module "Mx" (see section 5.12.3).	→ Check the wiring of the input. → Make sure the connected instrument functions correctly.
"Mx:E:Glass imped."	The impedance of the measurement electrode on the "Mx" module is out of range. This message is displayed if monitoring of the impedance of the measurement electrode on the "Mx" module is activated, depending on the ERROR LOW and ERROR HIGH thresholds defined (see section 5.12.4).	→ Go to the "Diagnostics" menu to read the impedance value of the pH electrode (section 5.12.4). → If necessary, clean the probe then recalibrate the measurement sensor or replace the probe.
"Mx:E:Ref. imped."	The impedance of the reference electrode is out of range. This message is displayed if monitoring of the impedance of the reference electrode is activated, depending on the ERROR LOW and ERROR HIGH thresholds defined (see section 5.12.4).	→ Go to the "Diagnostics" menu to read the impedance value of the reference electrode (section 5.12.4). → If necessary, clean the probe then recalibrate the measurement sensor or replace the probe.
"Mx:E:Conductivity"	The fluid conductivity is out of range. This message is displayed if monitoring of the fluid conductivity on the "Mx" module is activated, depending on the ERROR LOW and ERROR HIGH thresholds defined (see section 5.12.5).	→ Go to the "Diagnostics" menu to read the fluid conductivity value (section 5.12.5). → If necessary, clean the measuring cell and/or recalibrate the sensor.

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Message displayed in the "Information" menu	Meaning	Recommended action
"Mx:E:Temperature"	The fluid temperature is out of range. This message is displayed if monitoring of the fluid temperature on the "Mx" module is activated, depending on the ERROR LOW and ERROR HIGH thresholds defined (see section 5.12.6).	→ Go to the "Diagnostics" menu to read the value of the temperature measured (section 5.12.6). → If necessary, check whether the temperature sensor is working correctly by measuring a fluid with a known temperature. → If the temperature sensor is faulty, return it to the manufacturer. → If the temperature sensor is not the cause of the problem, check the process.
"Mx:E:RTD open"	The temperature sensor is not connected to the "Mx" module This message may only be displayed if the measurement mode of the temperature for module "Mx" is set to "automatic" (see section 5.10.23 and/or 5.10.24).	→ Connect a temperature sensor to the "Mx" module or → set the temperature value used in the process to "Manual" mode (see section 5.10.23 and/or 5.10.24).

6.3.3 "Error" events related to a problem with the device (Left red LED and icons ⓧ and ☺ displayed)

When an error event related to a problem with the device is generated:

- The 4-20 mA output(s) generate a current of 22 mA
- The transistor outputs operate normally.

Message displayed in the "Information" menu	Meaning	Recommended action
"Mx:E:ORP sat." "MxE:pH sat."	The pH and/or redox value is not being correctly measured due to the saturation of the input stage of the measuring board	→ Check the correct wiring of the earth points → Check the equipotential surfaces of the installation
"M0:E:Mx com."	The link to the measurement module(s) is interrupted	→ Switch the power supply off then on again → If the error persists, return the device to Bürkert
"Mx:E:Memory FR"	Factory data is lost. The process continues but the accuracy of the device is modified.	→ Switch the power supply off then on again → If the error persists, return the device to Bürkert
"Mx:E:Memory IR"		

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Message displayed in the "Information" menu	Meaning	Recommended action
"Mx:E:Memory UR" "Mx:E:Memory UW"	User data for the sensors is lost	→ Switch the power supply off then on again → Check the parameters of all the sensors then save them again → If the error persists, return the device to Bürkert
"Mx:E:Memory CR" "Mx:E:Memory CW"	The calibration parameters of the "Mx" module are lost	→ Switch the power supply off then on again → If the error originates in the "M0" main board, perform a new teach-in → If the error originates in an "Mx" module, calibrate the sensor connected to this module again → If the error persists, return the device to Bürkert
"Mx:E:RTClock"	The clock is faulty. The process continues.	→ Return the device to Bürkert.

6.3.4 "Warning" events related to the monitoring of process parameters (Right orange LED and icons ⚠ and ☹ displayed)

When a "warning" event related to the monitoring of the process parameters is generated:

- The 4-20 mA output(s) operate normally
- The transistor outputs configured in "warning" mode switch.

Message displayed in the "Information" menu	Meaning	Recommended action
"Mx:W:AIx low"	The value of the analogue input of the "Mx:Inputs" module is out of range. This message is displayed if monitoring of the analogue input is activated for the "Mx" module, depending on the WARNING threshold defined Defined LOW (see section 5.12.2).	→ Check the wiring of the input. → Make sure the connected instrument functions correctly.
"Mx:W:AIx high"	The value of the analogue input of the "Mx:Inputs" module is out of range. This message is displayed if monitoring of the analogue input is activated for the "Mx" module, depending on the WARNING threshold defined Defined HIGH (see section 5.12.2).	→ Check the wiring of the input. → Make sure the connected instrument functions correctly.

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Message displayed in the "Information" menu	Meaning	Recommended action
"Mx:W:Ref imped."	The impedance of the reference electrode on the "Mx" module is out of range. This message is displayed if monitoring of the impedance of the reference electrode is activated on the "Mx" module, depending on the WARNING LOW and WARNING HIGH thresholds defined (see section 5.12.4).	→ Go to the "Diagnostics" menu to read the impedance value of the reference electrode (section 5.12.4). → If necessary, clean the probe then recalibrate the measurement sensor or replace the probe.
"Mx:W:Glass imped."	The impedance of the measurement electrode on the "Mx" module is out of range. This message is displayed if monitoring of the impedance of the measurement electrode is activated on the "Mx" module, depending on the WARNING LOW and WARNING HIGH thresholds defined (see section 5.12.4).	→ Go to the "Diagnostics" menu to read the impedance value of the measurement electrode (section 5.12.4). → If necessary, clean the probe then recalibrate the measurement sensor or replace the probe.
"Mx:W:Conductivity"	The fluid conductivity is out of range. This message is displayed if monitoring of the fluid conductivity is activated on the "Mx" module, depending on the WARNING LOW and WARNING HIGH thresholds defined (see section 5.12.5).	→ Go to the "Diagnostics" menu to read the fluid conductivity value (section 5.12.5). → If necessary, clean the cell then recalibrate the measurement sensor
"Mx:W:Temperature"	The fluid temperature is out of range. This message is displayed if monitoring of the fluid temperature is activated on the "Mx" module, depending on the WARNING LOW and WARNING HIGH thresholds defined (see section 5.12.6).	→ Go to the "Diagnostics" menu to read the value of the temperature measured (section 5.12.6). → If necessary, check whether the temperature sensor is working correctly by measuring a fluid with a known temperature. → If the temperature sensor is faulty, return it to the manufacturer. → If the temperature sensor is not the cause of the problem, check the process.

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6.3.5 "Warning" events related to a problem with the device (Left orange LED and icons ⚠ and ☺ displayed)

When a "warning" event related to a problem with the device is generated:

- The 4-20 mA output(s) operate normally
- The transistor outputs configured in "warning" mode switch.

Message displayed in the "Information" menu	Meaning	Recommended action
"M0:W:Time lost"	The date and time are lost.	→ Set the date and time again (see section 5.10.1).
"M0:W:ON/OFF time"	The duration defined for the "Max-ONtime" parameter in the ON/OFF function has been exceeded (see section 5.10.11)	→ Deactivate then reactivate the ON/OFF function
"M0:W:Pulse x lim."	In "Pulse" mode, the volume entered for a pulse is incorrect (see page 103)	→ Enter an appropriate volume → Check the K factor.
"M0:W:Pulse x 1:1"	In "Pulse" mode, the volume entered for a pulse is incorrect (see page 103).	→ Enter an appropriate volume → Check the K factor.

6.3.6 "Maintenance" events related to calibration (Right orange LED and icons 🔧, ⚠ and ☺ displayed)

When a "maintenance" event related to calibration is generated:

- The 4-20 mA output(s) operate normally
- The transistor outputs configured in "warning" mode switch.

Message displayed in the "Information" menu	Meaning	Recommended action
"MxM:Time to cal."	A calibration is due on the sensor in the "Mx" module. The periodicity of calibrations is set in the "INTERVAL" function in the "CALIBRATION INTERVAL" menu (see section 5.11.15 or 5.11.16).	→ Calibrate the sensor (section 5.11.15 or 5.11.16)

6.3.7 Error messages during data saving

The following error messages may be displayed when saving data (see section 5.10.5).

Message displayed	Meaning	Recommended action
"Missing memory card"	No memory card has been inserted into the device or the memory card has not been formatted.	→ Insert a memory card into the device (see section 2.2). → Format the memory card.

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Message displayed	Meaning	Recommended action
"Datalogger is enabled"	The memory card is already used by the datalogger.	→ Deactivate the "data logging" (see section5.10.18).
«File open»	The file cannot be created.	→ Format the memory card.
"Memory card write"	Write problem of the file.	→ Check that the memory card is not write protected. → Check that there is enough free space on the memory card.

6.3.8 Error messages during data loading

The following error messages may be displayed when loading data (see section 5.10.6).

Message displayed	Meaning	Recommended action
"Missing memory card"	No memory card has been inserted into the device or the memory card has not been formatted.	→ Insert a memory card into the device (see section 2.2). → Format the memory card.
"Datalogger is enabled"	The memory card is already used by the datalogger.	→ Deactivate the "data logging" (see section 5.10.18).
«File open»	The file with the saved data cannot be read: ▪ Either because the two devices are not compatible. ▪ Or, because the data saving failed.	To check the compatibility between the devices: → Save the data from each device (on two different memory cards), → Check that the file names are the same. → If the file names are different, enter the configuration by hand.
"Memory card read"	The file with the saved data is corrupted.	→ Use another file.
«Incompatible module»	You are trying to transfer data saved from one module to another module of a different type (e.g. the data saved from a pH module to a conductivity module).	→ Load data to a module of the same type.

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6.3.9 Messages during datalogging (icon displayed)

The error messages associated to the icon , can be transmitted during datalogging (see section 5.10.18).

Message displayed in the system log	Meaning	Recommended action
"M0:MC read only"	The card is write protected.	Authorise writing on the card by pushing the load lever.
"M0:MC failure"	Problem on the memory card.	▪ Make sure there is a memory card in the device. ▪ Format the memory card. ▪ If the problem persists, change the memory card.
"M0:MC full"	The memory card is full.	▪ Insert an empty memory card or delete data on the current card. ▪ If the problem persists, format the card using a PC. ▪ If the problem persists, change the memory card type.
"M0:MC data loss"	The card was removed when the datalogger was "ON" Data is lost.	Always deactivate the datalogger before removing the memory card from the device (see section 5.10.18).

6.3.10 Miscellaneous messages

Message displayed in the system log	Meaning	Recommended action
"M0:Power on"	The device is switched on.	-

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6.4 Spare parts and accessories

CAUTION

Risk of injury and/or material 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.

Spare part	Order code
4 plastic fasteners, panel-mounting version	560225
4 plastic screws for the cover of the wall-mounting version	565193

Accessory	Order code
Mounting set for the pipe mounting of a wall-mounting version	on request
pH sensor connection cable, 3m	561904
pH sensor connection cable, 5m	561905
pH sensor connection cable, 10m	561906
Pt1000 temperature sensor connection cable, 3m	561907
Pt1000 temperature sensor connection cable, 5m	427113
Pt1000 temperature sensor connection cable, 10m	554822
Variopin cable, 3m	554855
Variopin cable, 5m	554856
Variopin cable, 10m	554857
Software option: PID	561836
Software option: datalogger	561837
Software option: dosing	561838
Software option: flow	561839
Software option: concentration	561840

6.5 Packaging and 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.

6.6 Storage

NOTE

Poor storage can damage the device.

▸ Store the device in a dry place away from dust.

▸ Storage temperature: -20 ... +70 °C, limited to -10 ... +70°C if a memory card (with order code 564072) is inserted.

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6.7 Disposal of the device

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

Note:

Comply with the national and/or local regulations concerning waste disposal.

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