

TOPAX L1 / L4 / L5

For free chlorine, chlorine dioxide or hydrogen peroxide



EN

02

Operation & Maintenance Instructions

Read these operation and maintenance instructions before start up!

To be held for future reference.

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1. General and Safety Instructions

1.1 General

This Operation & Maintenance Manual contains basic information to be noted during installation, operation and maintenance. It is therefore essential that the contractor read the manual before installing and commissioning the pump/system as well as by the relevant operating personnel/owner of the pump/system. It must remain accessible at the dosing pump/system for reference at all times.

In addition to the general safety instructions under this main heading of Safety, the special safety precautions outlined another section must also be observed.

1.2 Warning symbols used in this Operation & Maintenance Manual

This Operation & Maintenance Manual contains vital information, which may endanger people, the environment and the dosing pump/system if disregarded. These statements are identified by the following symbols:



DANGER! Refers to an imminent danger. Non-compliance can lead to death or serious injury.

WARNING! Refers to a potentially hazardous situation. Non-compliance can lead to death or serious injury.



CAUTION! Refers to a potentially hazardous situation. Non-compliance can lead to minor injury or property damage.

NOTICE! or **INFORMATION!** Appear in conjunction with safety instructions, which may endanger the pump/system and its operation if disregarded.

IMPORTANT! Draws attention to supplementary information to make the work easier and ensure trouble free operation.

1.3 Qualification and training of personnel

The personnel employed for installation, operation, inspection and maintenance work must be qualified to do so. The areas of responsibility, competence and supervision of the personnel must be precisely defined by the owner. Personnel who do not have the required knowledge must be duly trained and instructed. If necessary, this training can also be provided by the manufacturer/supplier on behalf of the dosing pump's owner. In addition, the owner of the system must ensure that the relevant personnel are fully familiar with and have understood the contents of this Operation & Maintenance Manual.

1.4 Important safety instructions

When installing and using this electrical equipment, basic safety precautions should always be followed, including the following:

1.) Read and follow all instructions!

2.) WARNING! To reduce risk of injury, do not permit children to use this product unless they are closely supervised at all times.



WARNING!

3.) WARNING! Risk of electric shock. Connect only to a grounding type receptacle protected by a ground-fault circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.



WARNING!

4.) Do not bury the cord. Locate the cord to minimize abuse from lawn mowers, hedge trimmers, and other equipment.



WARNING!

5.) WARNING! To reduce the risk of electric shock, replace damaged cord immediately.

6.) WARNING! To reduce the risk of electric shock, do not use an extension cord to connect the unit to the electricity supply; provide a properly located outlet.



WARNING!

7.) Save these instructions!

1.5 Hazards due to non-compliance with safety instructions

Failure to comply with safety instructions may endanger not only people, but also the environment and the dosing pump/system. Non-compliance with the safety instructions can lead to the loss of all entitlement to damages.

The following hazard in particular may arise:

- Danger to people due to electrical, mechanical and chemical effects.
- Failure of system functions.
- Danger to the environment due to leakage of hazardous substances.

1.6 Safe operation

The safety instructions in this Operation & Maintenance Manual must be observed.

The owner is responsible for ensuring the compliance with local safety regulations.

1.7 Safety instructions for the owner/operator

Leakages (e.g. due to ruptures in the lining) of hazardous substances (e.g. toxic or abrasive) must be discharged in such a way as to exclude all danger to people and the environment. Statutory regulations must be observed.

Danger due to electric current must be excluded (for further details, refer to the German VDE standards as well as local regulations or chapter 1.4).

1.8 Safety instructions for inspection-, maintenance-, and installation work

The owner must ensure that all inspection, maintenance and installation work is undertaken by authorized and duly qualified personnel who have also studied this Operation & Maintenance Manual.

The dosing pump must always come to a complete stop before starting any work on the pump. The procedure specified in this Operation & Maintenance Manual for shutting down the Dosing/pump/system must be observed without fail.

Dosing pumps or systems in contact with potentially harmful media must be decontaminated.

All safety mechanisms and guards must be refitted and reactivated as the work is completed.

1.9 Unauthorized modifications and production of spare parts

The device may only be modified or converted in consultation with the manufacturer. Genuine spare parts and accessories authorized by the manufacturer ensure greater safety. The use of other parts can void the liability for the subsequent consequences.

1.10 General notes of instruction!

Measuring cables must not be laid parallel or close to power supply or high-voltage current lines. Interferences would mutilate the measurement. At close distances, power supply and measuring lines may only cross at a 90° angle.

The admissible length of the measuring cables must be adhered to with regard to the sensor used. It is of decisive importance whether high-impedance (e.g. pH value) or low-impedance (e.g. free chlorine sensor) measurements are carried out. In the case high-impedance measurements, make sure that the (plug) connections are clean and dry (plug) and the lines do not become brittle due to sharp buckling. The screened cables normally used for such measuring lines must be handled according to the prescribed quality. Screening may only be connected to ground at one end of the cable (preferably at the controller).

Interface lines must be twisted and screened (see recommended cables).



IMPORTANT!

IMPORTANT!

If possible, a continuous cable from sensor to measuring input should be used. An extension of the cable by plugs or terminal socket increases the risk of disturbances due to contamination, humidity or excessive transition resistances.

1.11 Scope of delivery



IMPORTANT!

IMPORTANT!

Please unpack the dosing pump and ordered accessories with great care in order not to miss any small parts. Immediately compare the scope of delivery with the delivery note. The cause of any discrepancies must be determined.

1.12 Disposal

Should the device need to be permanently taken out of operation, please bear in mind that it contains electrolytic capacitors and must therefore be disposed of accordingly.

1.13 Overview of device functions

Metering Unit			
	TOPAX L1	TOPAX L4	TOPAX L5
	Free chlorine 0.0 - 4.0 mg/l Cl ₂	Chlorine dioxide 0.0 - 20.0 mg/l ClO ₂	Hydrogen peroxide 0.0 - 100.0 mg/l H ₂ O ₂
Temperature	-30.0 – +140.0 °C		
Displays	Measurement values with units Temperature with units Status signal sensor, calibration, controller & alarm		
Temperature compensation	manual or automatic with Pt100		
Controller Unit			
Switch points	2 switch points with programmable effective direction		
Controller variants	IN/OUT-Controller, with optional hysteresis P-Controller as pulse-pause, pulse-frequency or continuous output controller PI-Controller as pulse-pause, pulse-frequency or continuous output controller		
Hysteresis	Freely adjustable over the metering range		
P-Range X _p	Freely adjustable over the metering range		
Integral time T _N	0 – 2000 sec.		
Minimum pulse	0.1 – 9.9 sec.		
Puls+pause-time	02 – 99 sec.		
Pulse frequency	100 – 7200 pulses/h		
Turn-on delay	0 – 200 sec.		
Alarm function	min. and max. threshold values und delay time		
Connections			
Relays	3 potential free contacts (2x controller, 1x alarm) 6 A, 250 V, max. 550 VA		
Analog output	0/4-20 mA electrically isolated max. load 500 Ohm		
Analog inputs	1 Measurement input for Cl ₂ or ClO ₂ 1 Measurement input for Pt100		
Digital input	water deficiency safety		
Digitale Interfaces (Optional)	RS485, Baud rate 9600, dataformat 8Bit, 1start and 1stop bit, no even parity		

1.14 Technical data

Feature	Built-in casing	Wall-mounted casing
Installation site	in control cabinet	on panel or wall
Dimensions	96 x 96 x 127 mm (W x H x D)	165 x 160 x 80 mm (W x H x D)
Weight	0.8 kg	1.0 kg
Connections	Plug terminals for wiring up to max. 1.5 mm ²	spring clamps for wiring up to max. 1.5 mm ²
Protection rating	front IP54, with front door IP55	IP65
Supply voltage	230 V +6/-10%, 50/60 Hz alternating 110 V 50/60 Hz or 24 V 50/60 Hz	
Internal safety	none	230 V: 63 mA delayed 110 V: 125 mA delayed 24 V: 800 mA semi-delayed
Performance input	10 VA	
Displays	2-row LCD display, 2x16 characters, backlit, display of measurement values with relative units, additional temperature display, display of relay position	
Current output	0/4-20 mA, electrically isolated, max. load 500 Ohm	
Interfaces (Option)	RS485, baud rate 9600, data format 8 bit, 1 start and 1 stop bit	
Controller	ON/OFF-Controller with optional hysteresis, P- or PI-Controller as pulse-pause or pulse-frequency controller or continuous output controller, dual-direction PI-control possible, adjustable Turn-on delay, manual operation of relays, controller stop by external switch or gauge (water deficiency safety)	
Switch points	2 switch points, free set point within the measurement range	
Alarm function	with minimum and maximum limit values and time delay	
Contact load	6 A/ 250 V, max. 550 VA ohmic resistive load (with RC protective circuit)	
Operating temperature	0 – 50°C	
Storage temperature	-20 – 65°C	
Atmospheric humidity	0 – 90% non-condensing	

2. Device Installation and Connection

Installation

Schematic diagrams and dimensions are provided over the next few pages.

An opening of 92x92mm is necessary for the device casing. The device is to be inserted from the front and fastened with the lock-on clips provided on delivery.

The wall mount casing can be hung up or pushed under into the mounting slots. It must then be fastened on with two screws.

CAUTION

The device assembly site should be chosen such that the device is not subject to any mechanical load or chemical exposure!



CAUTION!

Please note that the corresponding protection classes are:

Built-in casing: IP54 for the front end, with IP55 at the front door

Wall-mounted casing: IP65 (when the clamp cover is closed)

Connections

Connection diagrams are provided on the following pages.

Please be aware of the supply voltage indicated on the rating plate at all times.

CAUTION

Input, output, and control lead wires and cables must always be installed separated from one another and, above all, separated from high voltage lines!



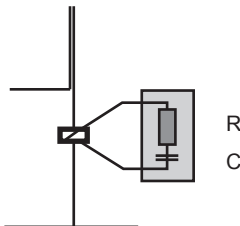
CAUTION!

All input and output wires and cables need to be shielded. The shielding can only be applied on one side.

Potentiostatic measurement is sensitive to parasitic induction. Be sure to use a special, double-shielded cable. The membrane sensors are shipped with the cable included.

For Pt100 temperature sensor connection, be sure to use a heavy gauge cable with the lowest resistance possible.

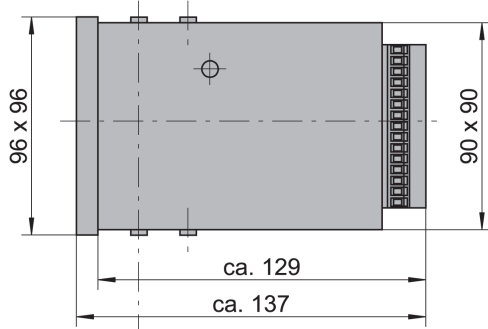
When connecting to the relays, bear in mind that inductive loads need to be interference-suppressed. If this is not possible, the device terminal strip relay contacts need to be provided with an RC-protective circuit. With direct current voltage, the relays or contactor coil need to be interface-suppressed using a freewheeling diode.



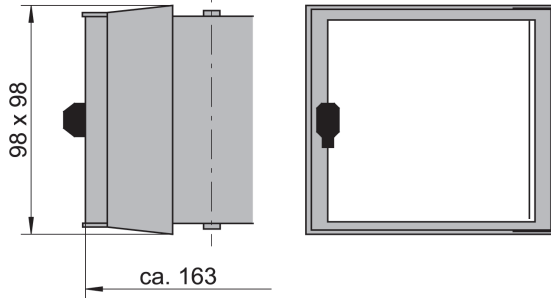
Current up to	Capacitor C	Resistance R
60 mA	10 nF 260 V	390 Ohm 2 Watt
70 mA	47 nF 260 V	22 Ohm 2 Watt
150 mA	100 nF 260 V	47 Ohm 2 Watt
1,0 A	220 nF 260 V	47 Ohm 2 Watt

2.1 Dimensions

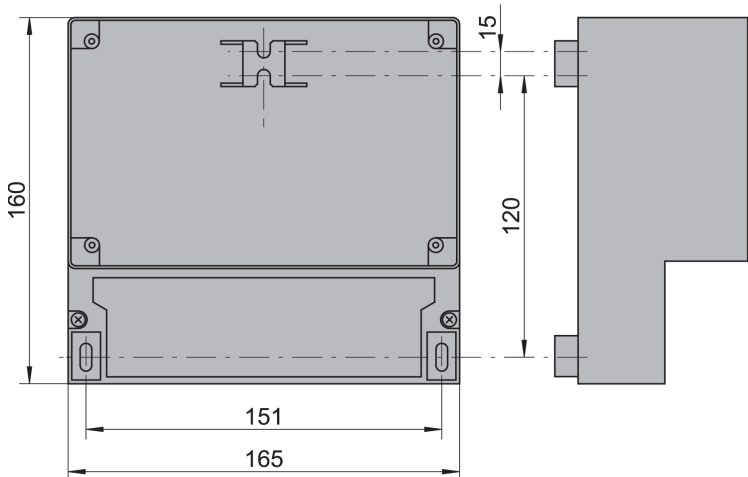
Built-in Casing



Option: Front door

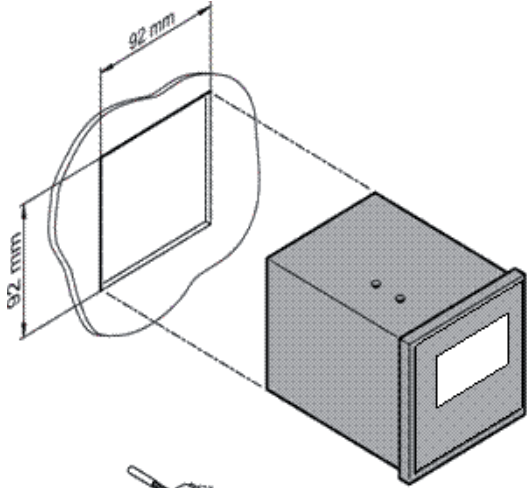


Wall-mounted Casing

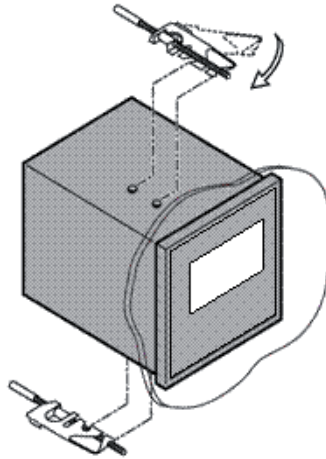


2.2 Installation of built-in casing

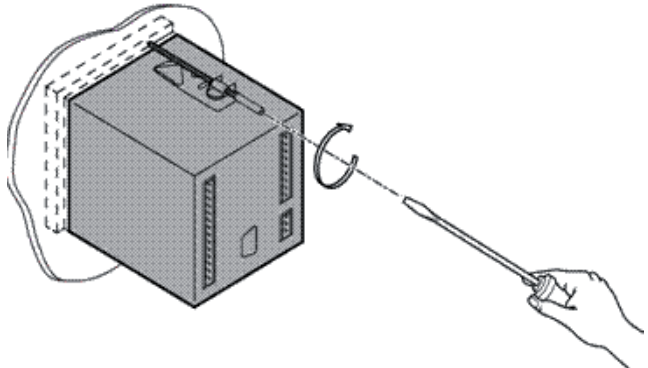
Prepare an opening of 92 x 92 mm.



Insert the device from the fore end firmly, and fixed it on using the appropriate lock-on clips provided on delivery.

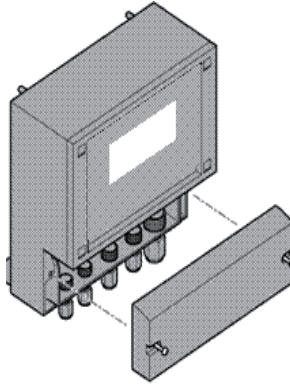


Use a screwdriver to adjust the lock-on clip screws until the device is firmly in place.

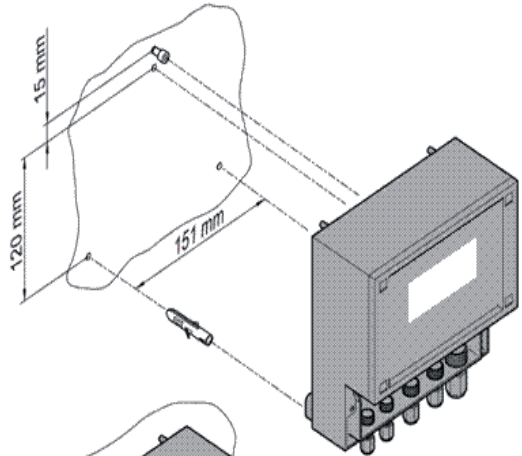


2.3 Installation of wall-mounted casing

First, remove the terminal covering.

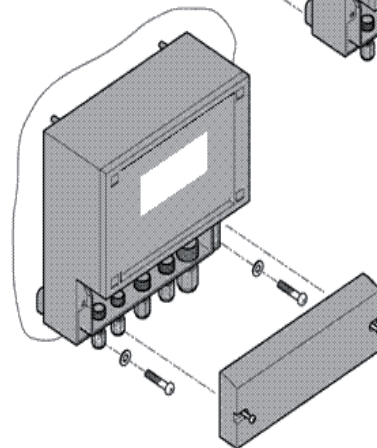


Prepare three drill holes (max. M5). Check the top hole, to ensure that the wall-mount casing can either be safely hung on or pushed under. If it is hung on, the top hole must be 120 mm above the bottom two. If it is pushed under, this distance must be 135 mm.

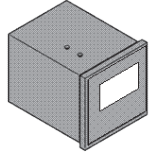


In both cases the screws must protrude outwards at least 3mm.

Hang the device onto the top screw or push it under, then fix it on via the two bottom screws. Either fit the terminal covering back on, or proceed directly with the various connections.



2.4 terminal connection diagram of built-in casing

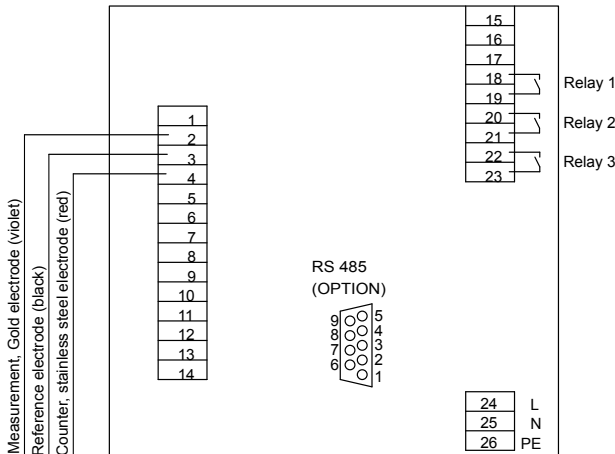


Electrode/ Clips	Potentiostatic Type PM-J	Potentiostatic- Type PM-K	Amperometric	Hydrogen peroxide
1 = Shield 2 = Measuring- 3 = Reference- 4 = Counter- electrode	= - = Gold- (violet) = (black) = stainless steel- (red) elektrode	= - = (Pin 1) = (Pin 2) = (Pin 3)	= - = Platin- (rot) = Brigde to 4 = Copper- (blue) or Silver electrode	= Shield = (brown) = (white) = green (blue)
TOPAX L1 (Cl ₂)	X (<4 mg/l)	X (>4 mg/l)	X	-
TOPAX L4 (ClO ₂)	X (<4 mg/l)	X (>4 mg/l)	-	-
TOPAX L5 (H ₂ O ₂)	-	-	-	X

Connection	Terminals	Directions
Pt100	5 + 6	
Analog Output	9 + 10	9 = +, 10 = -, maximum 500 Ohm load
Digital Input	11 + 12	11 = +, 12 = -, external controller stop or water deficiency
Relay 1	18 + 19	
Relay 2	20 + 21	
Relay 3	22 + 23	Alarm-Relay
Power Supply	24 + 25 + 26	Check indications on rating plate!
RS485 (Optional)	Sub-D	3 = +, 8 = -
	Sub-D 4/7	Bridge circuits = termination impedance activated

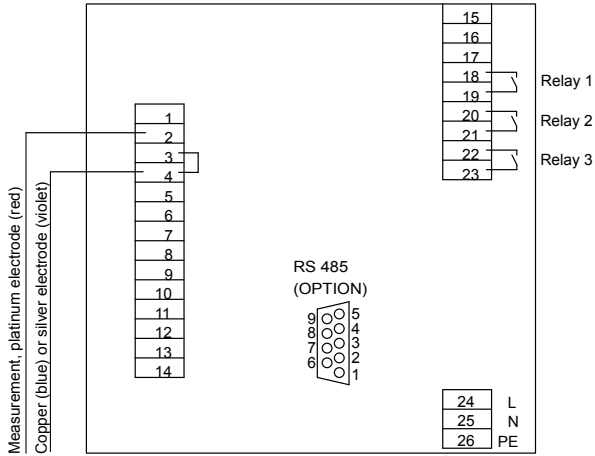
Terminal connection of electrodes

Potentiostatic electrode, Type PM-J, <4 mg/l

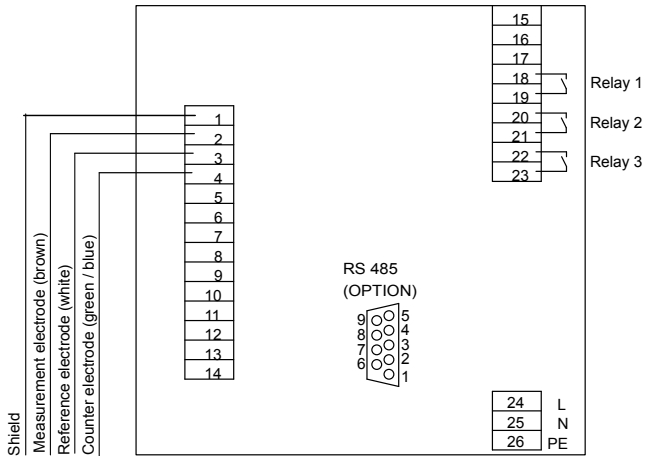


Terminal connection of electrodes

Amperometric electrode



Hydrogen peroxide electrode

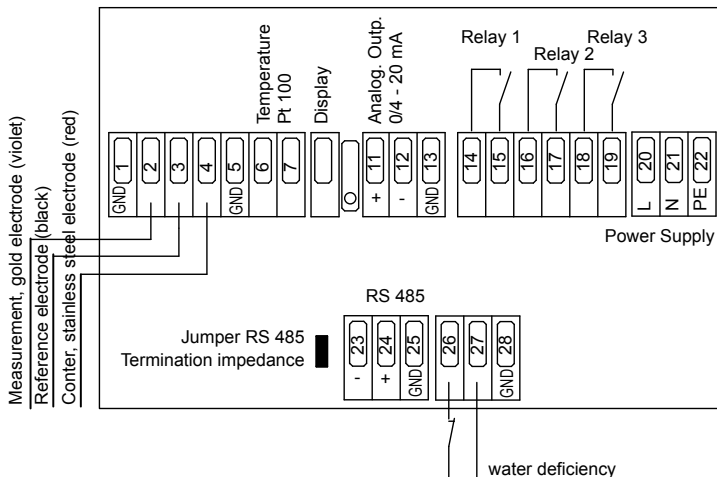


2.5 terminal connection diagram of built-in casing

Electrode/ Clips	Potentiostatic Type PM-J	Potentiostatic Type PM-K	Amperometric	Hydrogen peroxide
1 = Shield 2 = Measuring- 3 = Reference- 4 = Counter- electrode	= - = Gold- (violet) = (black) = stainless steel- (red) elektrode	= - = (Pin 1) = (Pin 2) = (Pin 3)	= - = Platin- (rot) = Brigde to 4 = Copper- (blue) or Silver electrode	= Shield = (brown) = (white) = green (blue)
TOPAX L1 (Cl ₂)	X (<4 mg/l)	X (>4 mg/l)	X	-
TOPAX L4 (ClO ₂)	X (<4 mg/l)	X (>4 mg/l)	-	-
TOPAX L5 (H ₂ O ₂)	-	-	-	X
Connection	Terminals	Directions		
Temperature	6 + 7	Pt100		
Display		Trimmer for adjustment of display contrast		
Analog Output	11 + 12	11 = +, 12 = -, maximum 500 Ohm load		
Relay 1	14 + 15			
Relay 2	16 + 17			
Relay 3	18 + 19	Alarm-Relay		
Power supply	20 + 21 + 22	Check indications on rating plate!		
RS485 (Optional)	23 + 24	23 = -, 24 = + Jumper plugged in = termination impedance activated		
Digital Input	26 + 27	26 = +, 27 = -, external controller stop or water deficiency		

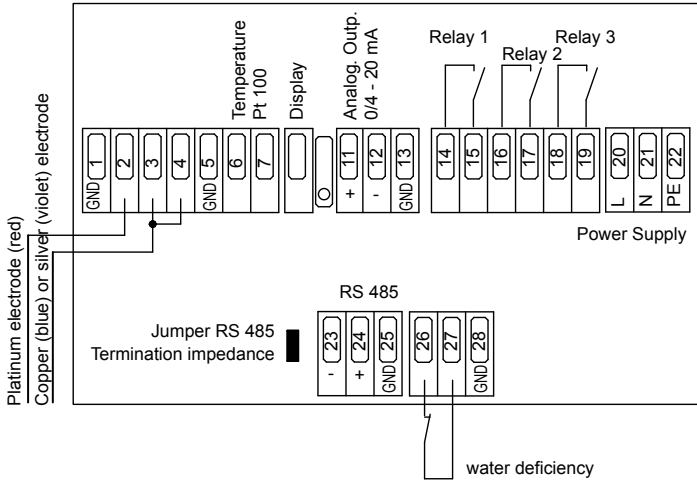
Terminal connection of electrodes

Potentiostatic electrode, Type PM-J, <4 mg/l

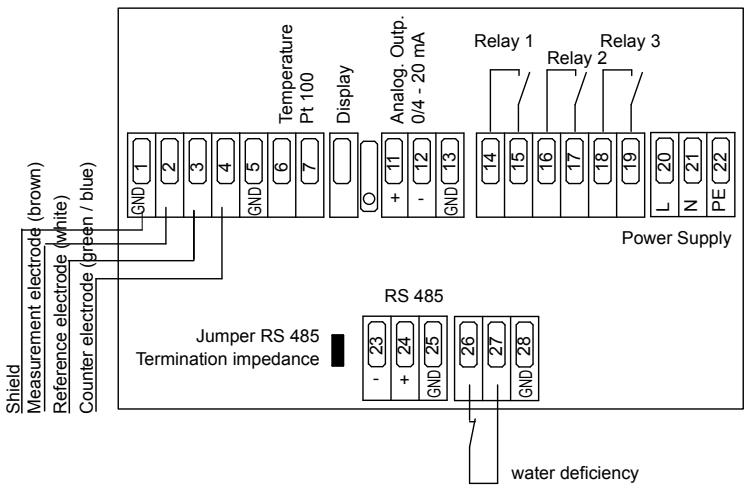


Terminal connection of electrodes

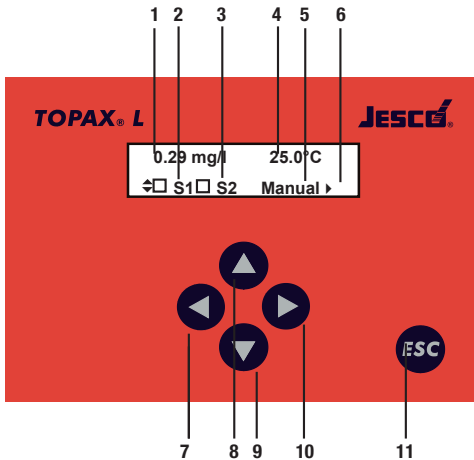
Amperometric electrode



Hydrogen peroxide electrode



3. Instructions for Device Operation



- 1 Measurement value
- 2 Relay 1 activation mode
- 3 Relay 2 activation mode
- Relais OFF
- Relais ON
- 4 Temperature
- 5 Controller operation mode
 AUTO: Controller ON
 MANUAL: Controller OFF
 (Manual relay operation)
- 6 Direction indicator
- 7 LEFT arrow key (◀)
- 8 UP arrow key (▲)
- 9 DOWN arrow key (▼)
- 10 RIGHT arrow key (▶)
- 11 „ESC“ key

Once switched on, the device will initially display the measuring value data with the operating mode of the controller (Auto/Manual) and the activation mode of relays S1 and S2.

It is possible to scroll through the menu using the operating keys:

Use key ▼ to go from the measuring value indication to the main menu.

Use key ▲ und ▼ to scroll upwards and downwards..

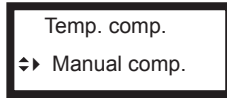
Use key ▶ to select a menu or a parameter.

Use key ◀ to exit a menu and to save/enter data.

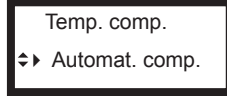
To facilitate orientation, different triangles are visible on the display. They should serve as direction indicators, advising you in which directions you can scroll from your current position.

The “ESC” key will always bring you back to the measuring value indication.

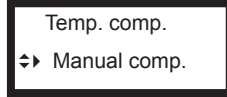
3.1 Parameter settings



1) When a parameter is selected its current setting is displayed.



2) Change to the next option by pressing the ▶ key.

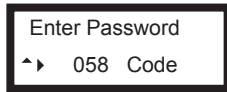


3) After scrolling through all the options, pressing the ▶ key again will return you to the original setting displayed.

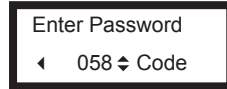
Selection of the various options

In most cases, all that is required is a selection between the various options provided. For example, when you need to select either manual or automatic temperature compensation, simply use the ▶ key to scroll across from one option to the next, until you come back to the start point or until you reach the option required.

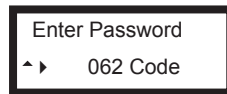
For these parameters, any changes are effective immediately upon selection. There is no need to enter an extra saving command for setting activation.



1) Select the parameter by pressing the ▶ key.



2) A double triangle appears behind the number and indicates that the number can now be changed using the ▲ and ▼ keys.



3) When you have set the desired value, save the setting by pressing the ◀ key. The double triangle will disappear – the new value has been saved.

Numeric parameter settings

Numeric parameter settings can generally only be modified when a double triangle is visible behind the number. This double triangle will first become visible when the number is selected with the ▶ key.

Change the number using the ▲ and ▼ keys. A short press of the key will increase or decrease the last digit by 1. When the key is held longer, the numeric value begins to change and will continue until the key is released.

Save your settings by pressing the ◀ key. The double triangle will disappear.

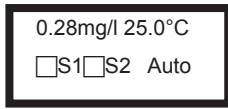


NOTE!

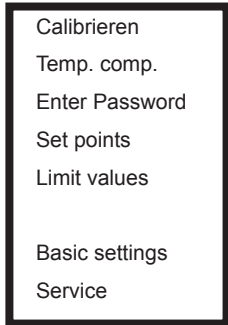
NOTE

If you do not wish to save a setting, press the “ESC” key instead of the ◀ key.

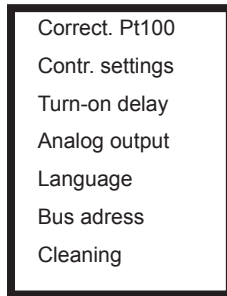
3.2 Menu overview



Main menu



Basic settings



Measurement value display

The main menu is reached by pressing the ▼ key:

Calibration function

Temperature compensation

Password function

Controller settings - Set points, P range, I-gain range

Alarm function

All parameters that, in principal, only have to be set once - when putting the device into operation the first time - are found in the "Basic settings" menu.

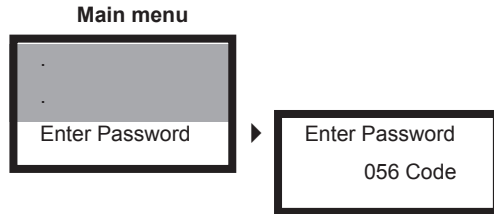
Main menu and basic settings

The parameters are divided into two menus. In the main menu all the functions which are used on a regular basis are listed. The basic settings menu includes those parameters which are only set once, when the device is being put into operation for the first time.

The manner in which parameters can be set and which parameters are important for your needs are described in the following pages. They are arranged according to the order of operational start-up:

- 1) Basic settings: Password codes and languages
- 2) Metering unit settings: calibration, temperature compensation
- 3) Controller setting: Selection of controller variant and corresponding parameters
- 4) Data readout settings: analog, digital and/or as alarm

4. Password Codes and Languages



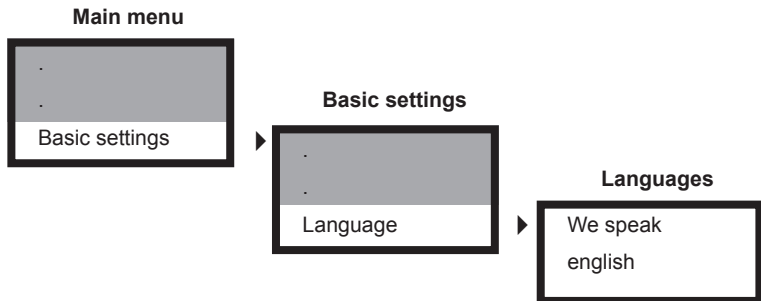
Entering password codes

Before setting functions can be accessed, the corresponding password code must be entered:

Password code 11 allows access to commonly used functions such as “calibration”, “temperature compensation” and “controller setting”.

Password code 86 allows access to all parameters and functions.

Any other codes will not enable access to any parameter or function.



Languages

There is a selection of languages available for device communication.

Since the language settings are part of the fundamental device settings, password code 86 is necessary. If a different password code has been set, you will immediately be requested to enter the required code number.

5. Metering Unit Settings

Calibration of the measurement and display of the slope rate.

Selection of either automatic or manual temperature compensation; for manual compensation the temperature must be pre-set.

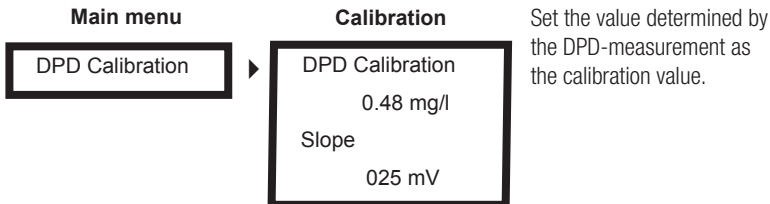
Calibration of the temperature measurement

5.1 Calibration

Potentiostatic measurement requires a 1-point calibration:

The actual concentration of the measurement water is determined using a comparative method – e.g. by way of photometric measurement with DPD – and this value is set as the calibration value.

In addition, the measurements are slightly temperature dependent. The effect of temperature can be either manually or automatically compensated for. For manual compensation, the temperature is entered manually; while for automatic compensation, it is necessary to have a temperature sensor connected.



Calibrations of Cl₂ or ClO₂ measurements

- 1) As a precaution, set the controller to manual operation.
- 2) Zero point calibration: When connecting a CS 120 measuring cell, a zero point calibration must be carried out once. The measuring cell is to be run using chlorine-free water. In the DPD calibration menu the value must be set to 0.00 mg/l using the ▲ and ▼ keys. This value is saved by holding down the ▶ key and then pressing the ◀ key. After this, the measuring cell is to be run with chlorinated water.
- 3) Obtain a water sample from immediately behind the metering station and determine the actual contents by means of comparative measurements, e.g. photometric with DPD.
- 4) Enter this value in the DPD calibration menu and save this by holding down the ▶ key and then pressing the ◀ key.
- 5) Check the displayed slope rate, then set the controller back to automatic.
- 6) When connecting a potentiostatic measuring cell, the zero point calibration is not necessary; in this case, it is only necessary to carry out a DPD calibration with chlorinated water.

NOTE!

Details about optimum slope rate and the slope rate alarm limits are found in the “Error Advisory” chapter.



NOTE!



NOTE!

NOTE!

Chlorine measurement is pH and flow dependent. The slope rate rises with increased flow and decreases with higher pH values. Before calibrating, make sure that the flow is constant at approx. 40-45 l/h and the pH value lies between 6.5 and 7.5, and try to ensure that both values do not change.



NOTE!

NOTE!

You may also take the water samples in other locations, e.g. directly in the pool. In that case, the fact that concentration-losses may occur on the way to the measuring site must be taken into consideration. These result in a lower slope rate and fluctuations in concentration-losses enter into the measurement as errors.

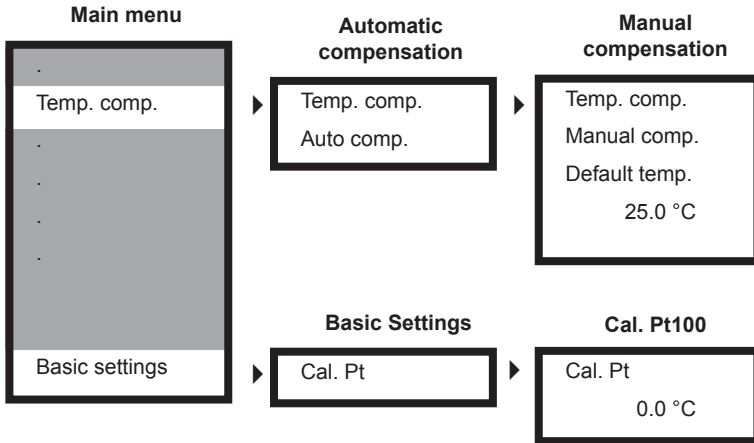


NOTE!

NOTE!

The determination of chlorine dioxide with DPD is done in exactly the same way as that for chlorine and can be conducted using the same reagents. However, if your photometer is not equipped with a chlorine dioxide display, you must multiply the measurement value displayed in “mg/l Cl₂” by a factor of 1.9 since photometric measuring only records the molecule count and chlorine dioxide molecules are heavier than chlorine molecules.

5.2 Temperature compensation



Two options are provided for temperature compensation:

1) Automatic compensation with temperature sensor connection

Ensure that the temperature sensor consistently records the temperature that the electrode is exposed to. When the temperature sensor and the electrodes are not in the same solution, we recommend that you opt for manual compensation.

2) Manual compensation

If the temperature remains sufficiently constant, it is also possible to set the temperature manually. The device then constantly compensates the measurement value based on the temperature influence of the temperature as set.

Temperature measurement calibration

If the temperature sensor is hooked up using dual-lead technology slight variations in temperature measurements may occur. The temperature measurement can thus be calibrated.

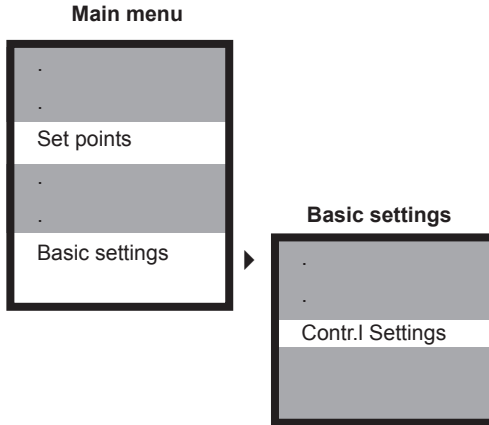
Measure the temperature once manually while putting the device into operation and correct for the temperature measurement accordingly.

6. Controller Unit Settings

Select between ON/OFF-Controller, P- or PI-Controller, set points setting, P range and I-gain range for two switch points.

Setting frequency, pulse/pause times, and hysteresis; presetting of effective direction.

Presetting of a delay time before control activation after separation from power supply.



For control functioning, it is imperative that the set points and effective direction be set.

This means you must determine which values you want to achieve with the metering and if the metering will increase or decrease the measurement value.

For control implementation, you can select from three controller variants:

ON/OFF-Controller

The ON/OFF controller switches ON when a switch-point threshold is exceeded and goes OFF when a threshold is under-run, or vice versa, depending on effective operating direction. Metering is therefore always carried out at 100% (ON) or 0% (OFF). A hysteresis can be preset as one of the Contr. settings.

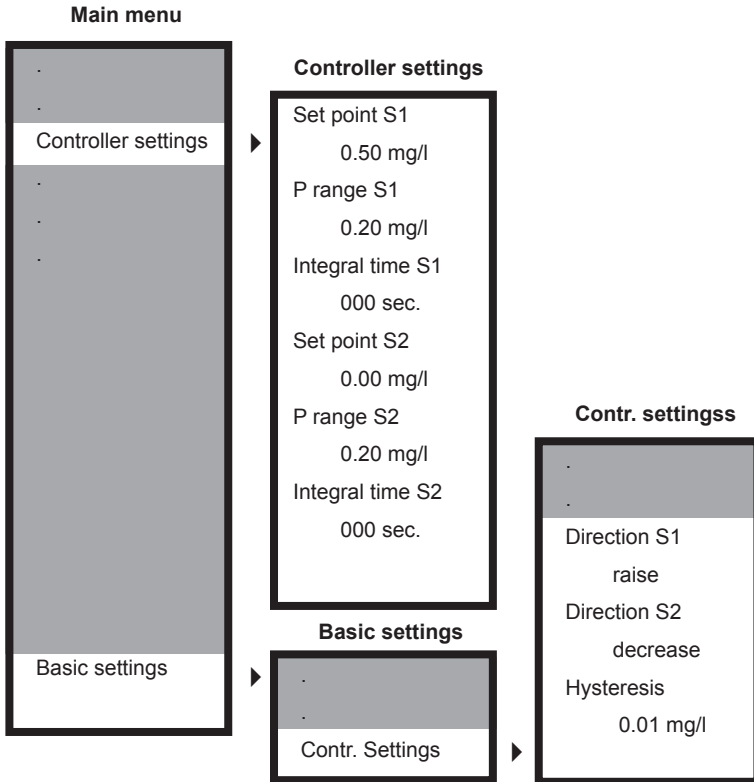
P-Controller

The P-Controller or Proportional Controller provides for metering reduction upon approaching of the set point, proportional to control deviation. This always occurs when using the power output as control output, when using the relay either via reduction of the switching frequency (pulse-frequency Controller) or via reduction of the time span of a preset switch frame with the relay CLOSED (pulse-pause controller). Setting of the P range is required and, depending on the application, the setting of the pulse frequency, pulse + pause time and minimum pulse parameters.

PI-Controller

The PI-Controller is a P-Controller with an additional I-function. Set-up is carried out as per the P-Controller, whereby the additional setting of a Integral time, corresponding to the "I" integral gain, is also required. The "I" gain locks on later than the P-Controller and principally eliminates residual control deviation, which is always present with the P-Controller.

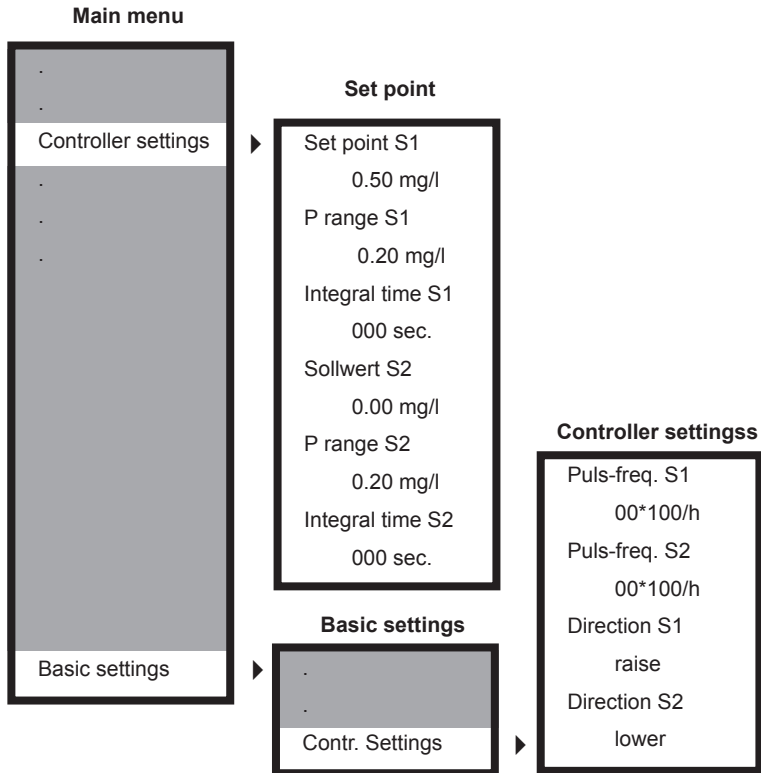
6.1 ON/OFF-Controller



The following parameters must be set for the ON/OFF-Controller:

- 1) Set points S1 and S2
S1 corresponds to Relay 1, S2 to Relay 2.
- 2) P range and Integral time for S1 and S2
Set the P range = 0 and Integral time = 0, such that your controller functions as an ON/OFF-Controller.
- 3) Effective operating direction for S1 and S2
Set the “raise” option, if the metering increases the measurement value.
Set the “lower” option if the metering decreases the measurement value.
- 4) Optional hysteresis
The hysteresis prevents the relay from constantly switching back and forth when approaching the set point. When the hysteresis is set, the relay does not switch until the set point has been exceeded or under-run by half of the hysteresis.

6.2 P-/PI-Controller as pulse-frequency controller

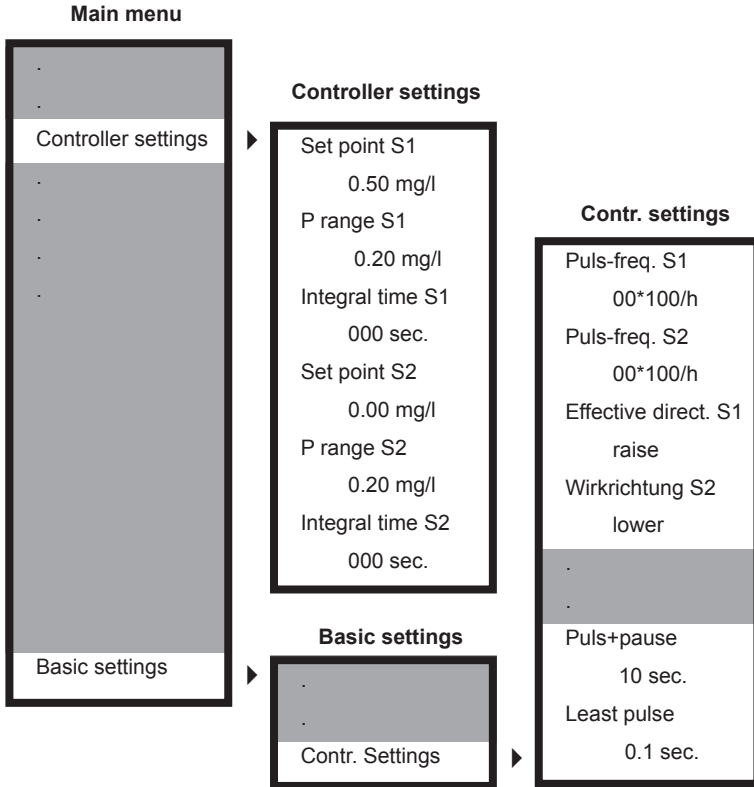


Different controller settings can be selected for S1 and S2.

The following parameters must be set for the Pulse-frequency controller:

- 1) Set points S1 and S2
S1 corresponds to Relay 1, S2 to Relay 2.
- 2) P range and Integral time for S1 and S2
Enter a P range > 0.
For a P-Controller it is necessary that Integral time = 0,
for a PI-Controller the Integral time must be > 0.
- 3) Pulse-frequency for S1 and S2
Preset the maximum pulse frequency, which would correspond to a metering of 100%.
- 4) Effective operating direction for S1 and S2
Set the "raise" option, if metering increases the measurement value.
Set the "lower" option if metering decreases the measurement value.

6.3 P-/PI-Controller as pulse-pause controller



Different controller settings can be selected for S1 and S2. The pulse+pause time must be at least twice as great as the minimum pulse time. The following parameters must be set for the pulse-pause controller:

- 1) Set points S1 and S2: S1 corresponds to Relay 1, S2 to Relay 2.
- 2) P range and Integral time for S1 and S2: Enter a P range > 0. For a P-Controller it is necessary that Integral time = 0, for a PI-Controller the Integral time must be > 0.
- 3) Pulse-frequency for S1 and S2: Both frequencies must be set to 00 otherwise the controller functions as a pulse-frequency controller.
- 4) Effective operating direction for S1 and S2:
Set the "increase" option, if metering increases the measurement value.
Set the "decrease" option if metering decreases the measurement value.
- 5) Pulse+pause time: Define a time frame in which the relay is CLOSED (pulse) and OPEN (pause) proportional to the control deviation.
- 6) Minimum pulse time: Set the minimum time that the relay must be CLOSED such that the connected actuator meters out any amount at all.

6.4 Controller activation and deactivation

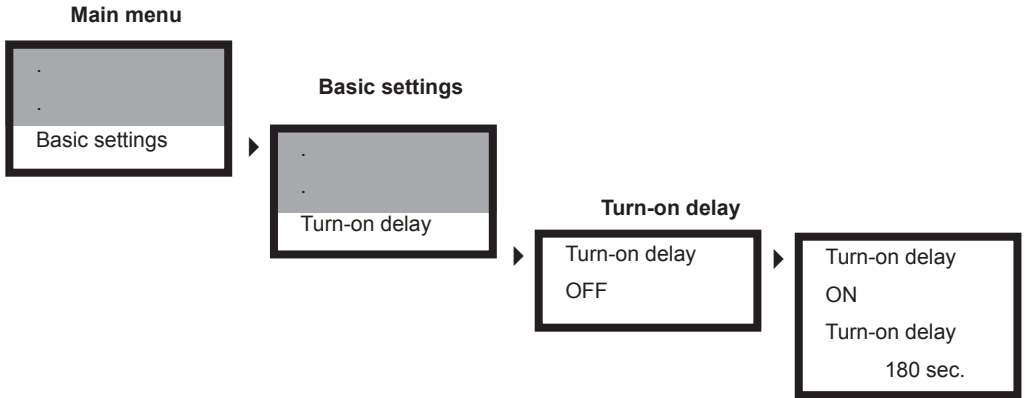
The controller can be activated and deactivated directly from the measurement value display by pressing the ▶ key. With this, operation is changed from manual (controller OFF) to automatic (controller ON) and vice versa. The current operating mode will appear on the display.



WARNING!

WARNING!

Ensure that the controller is deactivated before connecting metering pumps or other similar devices to the unit!



6.5 Turn-on delay

With the Turn-on delay, upon putting the device into operation the first time or on subsequent occasions or after disconnection from the main power supply, you can enter a time which must elapse before the controller becomes active. This delay time gives the measuring processes time to settle and stabilise, thereby preventing false metering incidents in the device start-up phases.

6.6 External controller stop

It is also possible to switch the device ON and OFF externally. No settings are required to do so. You must simply connect an external switch to the digital input. When the input is opened, the controller stops and the “Water Deficiency” message will come up on display.



NOTE!

NOTE!

This function can also be utilised as a water deficiency protection by connecting a float gauge.

6.7 Manual relay control

0.29 mg/l 25.0°C
▼ □S1□S2 Auto ▶

If the controller is set to automatic, change it to manual operation by pressing the > key.

Instead of "Auto", "Manual" will appear in the display.

0.29 mg/l 25.0°C
↔ □S1□S2 Man. ▶

2) Change into the S1 switch mode by pressing the ^ key.

The box to the left of S1 will begin to blink.

0.29 mg/l 25.0°C
↔ □S1□S2 Man. ▶

3) Switch Relay 1 ON by pressing the > key.

The box to the left of S1 will become dark.

0.29 mg/l 25.0°C
↔ ■S1□S2 Man. ▶

4) By again pressing the > key, the relay is switched OFF again. The box will become light again.

0.29 mg/l 25.0°C
↔ □S1□S2 Man. ▶

5) Change to the S2 switch mode by pressing the ^ key.

The box to the left of S2 will begin to blink.

0.29 mg/l 25.0°C
↔ □S1□S2 Man. ▶

6) Switch the relay ON by pressing the > key.

The box to the left of S2 will become dark.

0.29 mg/l 25.0°C
↔ □S1■S2 Man. ▶

7) By again pressing the > key, the relay is switched OFF again. The box will become light again.

0.29 mg/l 25.0°C
↔ □S1□S2 Man. ▶

8) Exit the S2 switch mode by pressing the ^ key.

0.29 mg/l 25.0°C
↔ □S1□S2 Man. ▶

When both boxes are light and neither is blinking you have exited the switch mode.

Manual control of the relay is possibly directly from the measurement value display.

With the ▶ key, switch the controller to manual operation.

Using the ▲ key, change between manual operation <> S1 switch mode <> S2 switch mode <> manual operation.

In switch mode, the selected relay can be switched on and off using the ▶ key.

A blinking box signifies a relay in switch mode.

A dark box signifies an activated relay.

A light box signifies a deactivated relay.



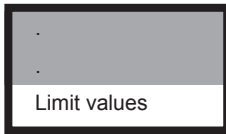
WARNING!

WARNING!

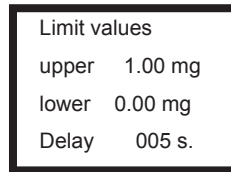
Manually activated relays remain activated until they are manually switched off!

6.8 Alarm

Main menu



Limit values



You can set two threshold values:

Threshold value 1 is an upper threshold value. If it is exceeded, the alarm will be activated.

Threshold value 2 is a lower threshold value. If it is under-run, the alarm will be activated.

In both cases, the display will show the advisory "Threshold value exceeded", and Relay 3 will switch. This can, in turn, activate an external sound warning such as a horn, or a warning lamp.



NOTE!

NOTE!

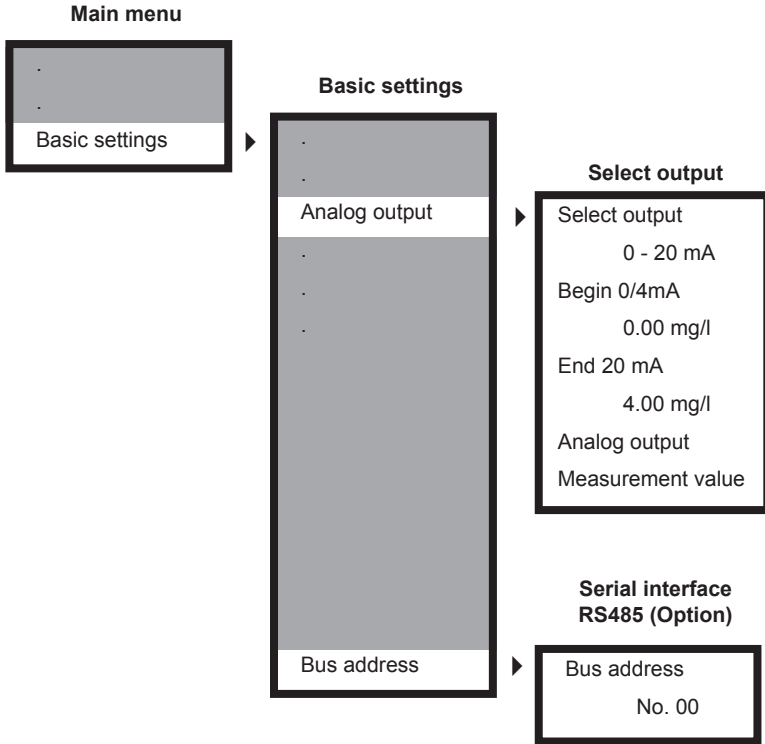
The alarm function is only active if the controller is switched on, with the display showing it is in AUTO mode. If the controller is switched to MANUAL, the alarm alert is cancelled and the relay will switch OFF.

Alarm delay

Depending on the type of control processes being run, threshold values can also be exceeded during standard operations. To prevent that during any such brief overshoots an alarm is set off, it is possible to set a delay time that must elapse before the alarm is activated.

In other words, the alarm will be activated only when the threshold value is either exceeded or under-run for a longer period of time than the delay time setting.

7. Data Readout



Select

- between 0-20 mA and 4-20 mA
- the measurement value at 4 mA
- the measurement value at 20 mA
- between register output and controller output

If the controller is integrated into a data network, a bus address between 1 and 15 must be entered.

CAUTION!

The bus address “10” is not allowed.



CAUTION!

7.1 Current output

You can read out the measurement values as a 0/4-20 mA signal over the current output. By setting the 4-20 mA signal, resolution is indeed lost; defective cable connections are, however, immediately recognizable.

With the start value and end value parameters, you can decide which section of the measurement range you register over the current output.

As an alternative, you can also use the current output as a permanent register output and assign the actuating variable of S1 or S2. In this case, the start and end values should not be taken into account.

7.2 RS485 Serial interface (optional)

The devices can be supplied with an optional RS485 interface for data bus integration. The interface does allow for readout of all data and settings. All information for the communication is available on request.

7.3 Assembly of a Data Network (TopView).

With the (optional) RS 485 computer interface it is possible to transfer data to a PC. Furthermore multiple TOPAX L/LFs can be connected to a network. Each TOPAX L/LF (with RS 485) has to be allocated an address for this purpose.

The maximum length of data transfer amounts to 1000 m. Up to 14 TOPAX L/LFs can be connected with a PC to a network. The data line has to be attached directly to the TOPAX L/LF's RS 485 terminal:

Casing	Connection		Allocation	
wall assembly	terminal	18	+	A
		17	-	B
mounting	sub-D	3	+	A
		8	-	B

CAUTION!

Separate connection sockets or junction boxes within the data line have to be avoided. One must use a cable type "KAT.5, 2X2XAWG24/1 (Lapp cable) or better. The manufacturer is not liable for this.

Due to electromagnetic compatibility the cable's screen has to be connected on both sides before the device connections large surface area and conduct well with the protective earth. For this it has to be confirmed that no potential current loss can escape over the screen.

Today's computers are equipped with a serial computer interface RS 232 (9-pin Sub-D connector) and/or with a USB-connector. In this case an additional connector converter has to be inserted in the PC (RS 485 to RS 232 or RS 485 to USB).

120 ohm cut-off resistances.

At both ends of the network the data line has to be cut off with a resistance of 120 ohm. It is possible to put the switch for the resistance on the last TOPAX L/LF in the network

through the composition of jumpers (see chapter 2.4 and 2.5).

If the connector converters with order no. 44300101 (RS 232 to RS 485) or no. 44300102 (USB to RS 485) are attached to the PC, the cut-off resistance of the PC's sides is already activated.

Pull-up/pull-down resistance.

The data line has to be set at a fixed potential. A cut-off of the cable with Pull-up/Pull-down resistances is fundamentally necessary for the RS485-connections, in the times, in which the data sender is active, in order to exact the quiescent level on the bus system. Without this measure it is not possible to transfer data.

To activate all resistances jumpers have to be attached to the TOPAX DE (see following illustration). For this purpose the device front has to be unscrewed and flipped up.

CAUTION!

It is not at all possible to install resistances for Pull-up/Pull-down on a TOPAX L/LF. (However, the resistances for Pull-up/Pull-down can be activated on a TOPAX DE or TOPAX DX).

To guarantee the transfer of data with only TOPAX L/LF devices and/or with a TOPAX L/LF to the network end, one must install an additional bus terminal (order no. 41900001) to the PC. The Pull-up/Pull-down resistances are inserted into it.

TopView

To visualize the data read out in the network we offer the application TopView 2.0 in two versions: Standard and Mini. The programme "TopView 2.0 Standard" has the order no. 78349. The Software "TopView 2.0 Mini" is free to download from the manufacturer's website.



WARNING!



CAUTION!



NOTE!

8. Operation and Maintenance

Device maintenance

Device operation is maintenance free. No check settings are required during operation. Should you however require a verification of your device at any time, you can forward it to us. It shall be returned to you within two weeks together with a protocol test report.

Display contrast

The display contrast of the device can be adjusted in the wall-mounted casing using a potentiometer. The potentiometer is designated by "Display" in the connection diagram.

Safety protection replacement

Wall mounted devices are equipped with an internal safety protection that may have to be replaced under some circumstances. A spare safety protection is accordingly provided on issue with the device. You will find it is stored in the terminal covering. Instructions regarding safety protection are provided under the "Technical Specifications" section herein.

For safety protection replacement, it is necessary to unscrew and remove the front end of the device by carefully flipping it upwards. The safety protection is located below and on the right hand side. It is locked on with a bayonet catch. Rotate the catch leftwards, until the safety protection slips out. Exchange it with the spare safety protection and fasten it in place by turning the catch rightwards. Replace the front end of the device again and screw it on firmly.

WARNING!

Prior to opening the device, make sure that it is completely powered down!

CAUTION!

During service and maintenance operations, be careful with the connection cable located on the front of the device!

Cleaning

Please ensure that during cleaning operations, the face end of the device does not come into contact with solvents such as methanol, alcohol or methylated spirits. Take care that no water leaks into the device. We recommend cleaning the device by simply wiping it with a clean, damp cloth.

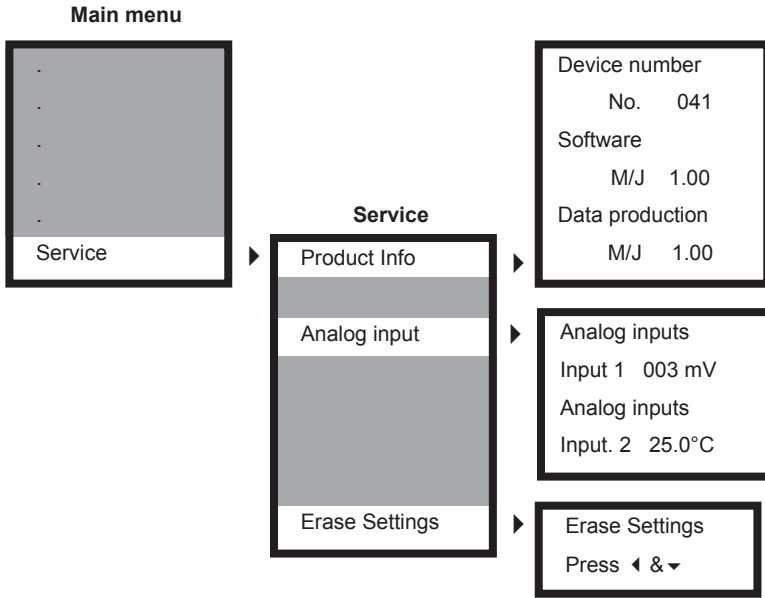
Measurement maintenance

Both chlorine measurement and chlorine dioxide measurement must be calibrated on a regular basis.

NOTE!

During each calibration, the device tests the utility of the sensors and specifies when a sensor needs to be cleaned or replaced. For more details, please refer to the "Error Advisory" section of this manual.

9. Service



In the test functions menu you will find data that is particularly relevant for any inquiries, supplements, updates or problems.

9.1 Device data

The device data specified allow for clear device identification (of both hardware and software).

9.2 Analog inputs

This menu displays the data that the device receives from the sensors. This raw data is not influenced by compensations and calibrations and provides important information when any problems arise with measurements or device operation.

Should you have any problems with the interpretation of this data, simply inform your supplier accordingly – providing the device data – and he will be able to give some information in this regard.

9.3 Erase Settings (Reset)

This function gives you the opportunity to delete all the settings entered and to reset the device back to the original manufacturer's settings.

This process takes a few seconds. Once done, the device will return automatically to the initial measurement display page, and the controller operations will be switched off.

10. Error advisory

Error advisory	Cause	Course of action
Slope rate error	The slope rate determined in the calibration is less than 3 mV/0.1 mg/l.	The calibration process may have lead to errors. Check - the connections - the pH value - the flow - the set temperature and re-calibrate. If a slope rate error is again displayed, the electrode should be cleaned or replaced.
Error Input 1	Input 1 is not receiving a proper signal.	Check the terminal connections and, when necessary, the electrode cable.
Error Input 2	Input 2 is not receiving a proper signal.	Automatic temperature compensation is set but no compliant temperature sensor is connected.
Water Deficiency	The digital input has been closed.	Close the input when you wish to proceed with control. When a water deficiency sensor is connected, this error advisory indicates that the measurement water supply has been interrupted.

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12. Declaration of conformity

This declaration is no assurance of characteristics in the sense of the product liability law. The safety notes in the operation & maintenance instructions must be observed.

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EG - Konformitätserklärung

Hiermit erklären wir, Lutz-Jesco GmbH
Am Bostelberg 19
D - 30900 Wedemark

dass das nachfolgend bezeichnete Produkt aufgrund seiner Konzipierung und Bauart in der von uns in Verkehr gebrachten Ausführung den einschlägigen grundlegenden Sicherheits- und Gesundheitsanforderungen und den unten aufgeführten EG-Richtlinien entspricht.
Bei einer nicht mit uns abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit.

Bezeichnung des Produktes: Mess- und Regeleinheit

Typenbezeichnung: TOPAX L

Einschlägige EG-Richtlinien: EG-Niederspannungsrichtlinie (73/23/EWG)
EG-Richtlinie Elektromagnetische Verträglichkeit
(89/336/EWG) i.d.F. 93/31/EWG

Angewandte harmonisierte: EN 55011 :1998 +A1:1999 +A2:2002 Störaussendung,
Industrieumgebung
EN 61000-6-2 :2001 Störfestigkeit, Industrieumgebung

Datum, Hersteller-Unterschrift: 19.12.2006.....i.V. *MA* *MA*

Angaben zum Unterzeichner: Herr Klaus Albert, Dipl. Ing.
Leiter Technik

Die Anhänge sind Bestandteil dieser Erklärung.

Diese Erklärung bescheinigt die Übereinstimmung mit der genannten Richtlinie, beinhaltet jedoch keine Zusicherung von Eigenschaften.

Die Sicherheitshinweise der mitgelieferten Produktinformation sind zu beachten

19.04.2007



**Anhang zur EG - Konformitätserklärung
zur Niederspannungs-Richtlinie 73/23/EWG**

Produkt : **TOPAX L**

Angewendete Normen und technische Spezifikationen:

unter Berücksichtigung folgender EMV- Grundnormen:

- EN 61000-4-2: 1995 +A1:1998 +A2:2001
- EN 61000-4-3: 2002 +A1:2002
- EN 61000-4-4: 2004
- EN 61000-4-5: 1995 +A1:2001
- EN 61000-4-6: 1996 +A1:2001
- EN 61000-4-11: 2004

EN 61010-1 :2002-08 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte

13. Revision

This Operating Manual is valid for the following devices:

Device	Revision
TOPAX L1	11/2006
TOPAX L4	11/2006
TOPAX L5	03/2007

It contains all the technical information required for installation, start-up and maintenance. Should you have any questions or require further information regarding these operating instructions, please contact the manufacturer or its official national representative.

14. Warranty Application

Please copy and send with the device.

If the device breaks down within the period of warranty, please return it in a cleaned condition with the complete warranty application, filled out.

Sender

Company:..... Phone:..... Date:.....

Address:.....

Contact person:

Lutz-Jesco order-no.:..... Delivery date:.....

Device type:..... Serial no.:.....

Nominal capacity/nominal pressure:

Description of fault:

.....

.....

Type of fault:

1. Mechanical fault

- premature wear

- wear parts

- breakage/other damage

- damage in transit

3. Leaks

- connections

- dosing head

2. Electrical fault

- loose connections such as plug connector or cable

- operating elements (e.g.. switches/buttons)

- electronics - corrosion

4. No or inadequate function

- defective diaphragm

- other

Service conditions of the device

Point of use / system designation:.....

Accessories used:.....

.....

.....

Commissioning (date):.....

Duty period (approx. operating hours):.....

Please describe the specifics of the installation and provide a simple diagram with details of the material, diameter, length and levels.



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