SPIROTECH

Maximising Performance for You

SPIROEXPAND®
TOUCHSCREEN

Operating Unit
Pressurisation Systems

INSTRUCTION MANUAL

TABLE OF CONTENTS

Disclaimer

This instruction manual has been produced with the greatest possible care. We are however constantly working to improve our products, and we reserve the right to make changes at any time without prior notice. We make no guarantee for the correctness and completeness of this document. All claims, in particular claims for damage, loss of profit or financial losses, are excluded.

1. FOREWORD

1.1. About the device

These instructions describe the operation of Spirotech devices with built-in touchscreen operating unit and are an addition to the relevant device-specific instruction manuals.

This document deals exclusively with the use of the touchscreen operating unit.

1.2. About this document

Please read the instructions before installation, commissioning and operation. Keep these instructions for future reference.

The original language of this instruction manual is German. All versions in other languages have been translated from the original instructions.

Illustrations in this document show a typical installation with the relevant details and may vary depending on the type and equipment of the model supplied, but do not influence the comprehensibility of this document.

1.3. Software Version

This instruction manual refers to Spirotech devices with touchscreen operating unit and software version EderControl V2.03.001 - EderUi V0.1.24. With software versions differing from this one, there may be minor differences with respect to the design and operation of the device.

1.4. Symbols

The following symbols are used in these operating instructions:

	"Caution". Be alert and ensure that nothing happens to guarantee faultless and safe operation.
	"Warning". Warns of an imminent extremely hazardous situation that will lead to death or serious permanent injury in the event the hazard warning is not heeded.
	"Electrical Hazard". To warn of the danger of electrical shock.
	"Note". Provides additional useful information.

2. SAFETY

2.1. Safety Instructions

This information on safety warns the user about risks and indicates how these risks can be avoided.

2.2. Hazard Warnings

⚠ The following applications are expressly excluded:

- Use in explosive environments
- Outdoor use
- Use in spaces with risk of water splash
- Use in areas with highly polluted surrounding air

⚠ In the event of damage to the touchscreen operating unit, it must be taken out of operation and repaired by a trained specialist or exchanged.

No alterations to the product (e.g. soldering) may be made. Installation, commissioning and service may only be carried out by a trained specialist.

Install or uninstall the touchscreen operating unit only with the power supply switched off!

Operation is permissible only with the housing closed.

3. TOUCHSCREEN OPERATING UNIT

3.1. Installation

The touchscreen operating unit is made up of a housing unit with capacitive touchscreen and the integrated computer with user software for complete functionality of the device.

Image 1: Touchscreen operating unit - front view

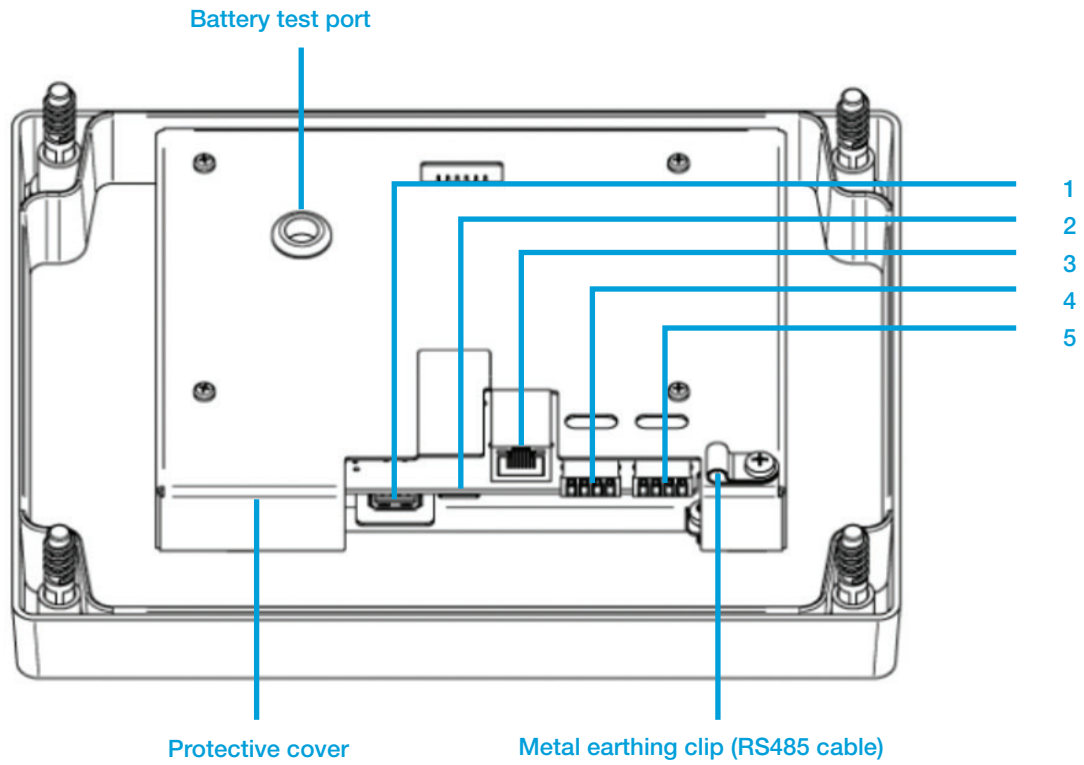


Image 2: Touchscreen operating unit - rear view

3.1.1. Electrical Connections *(see Illustration 2. rear view)*

1. USB interface
   Connection for USB memory stick for installing software updates, saving device settings etc.
2. SD CARD slot
   Currently not in use
3. ETHERNET interface
   Connection to a network. Currently not in use
4. RS485 communications interface
   System bus interface, connection to basic circuit board of the MultiControl device. Connection is essential for the functionality of the device. Power is supplied to the touchscreen operating unit via this interface. The touchscreen operating unit communicates via this connection with the basic circuit board of the MultiControl device and ensures the functioning of the device in this way.
5. RS232 Communications interface
   Connection for communications accessories (busmodule, webmodule, SMS-Module, ASCII log writer)

3.1.2. Characteristics of touchscreen operating unit rear side

Button cell test port;
Facilitates measurement of the CR2032 (+Pol) button cell voltage, without having to remove the electronics protective cover.

Protective cover;
Primarily protects the touchscreen operating unit.

Metal earthing clip;
Earthing clip for attaching the RS485 communications interface cables. Serves as strain relief and to earth the cable through attachment to its protective cover.

3.2. Touchscreen (touch-sensitive surface)

The touchscreen operating unit is operated through the touch sensitive surface. Touching the surface activates menu navigation. The touchscreen supports keying in, as well as swiping up or down. Swiping left, swiping right and zooming are not possible.

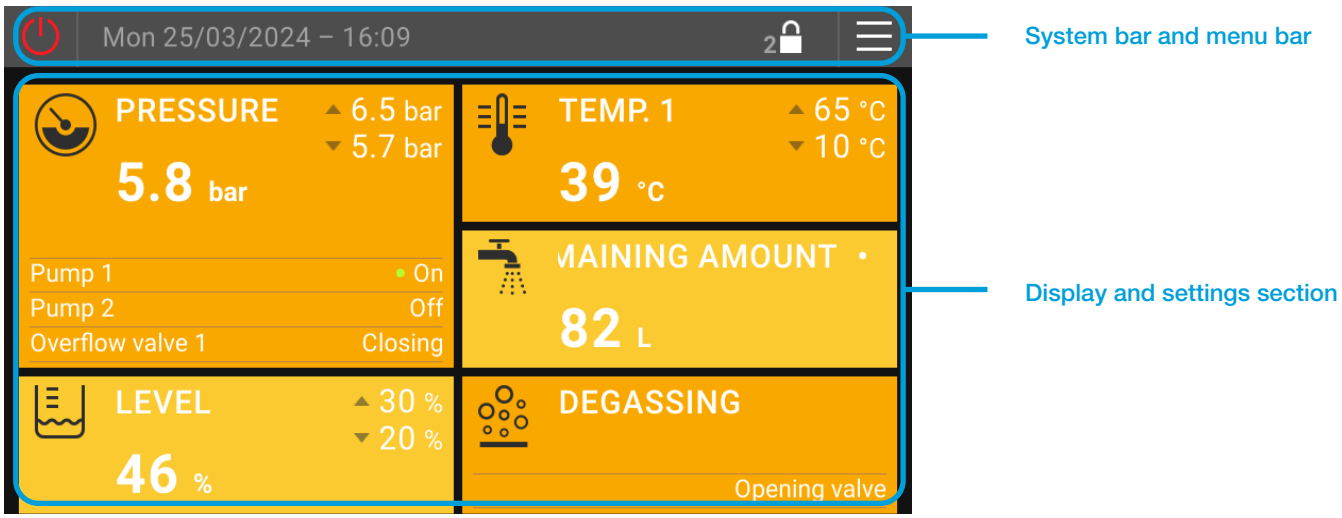


Image 3: Touchscreen

The touchscreen is subdivided into two basic sections
1 … System bar and menu bar
2 … Display section and settings section

3.2.1. System bar

The system bar is part of the home screen or display level. It allows important system commands to be carried out, and the display of system-relevant information.

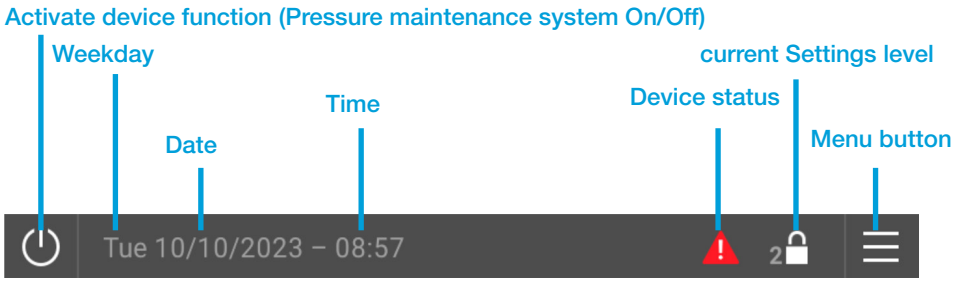


Image 4: System bar

Activating device function:

System "OFF", deactivate device function. All actuators are deactivated. Only the device sensors remain active. Caution: No Pressure maintenance function in this mode!

System "ON", device function activated. All actuators (pumps, valves, etc.) are activated according to the requests of the internal controls.

A white and red device function activation symbol flashing at one-second intervals (system "ON" - system "OFF") indicates that the function of the device is being locked by the "Enable contact equipped". Either through the "External notification input (digital input)" or "Enable device clearance by Busmodule". For status see "General" display.

Weekday, Date:

Tue 10/10/2023 — Display of current weekday and date

Time:

11:10 — Display of the current time configured. The "Time zone" has been taken into account. The changeover to summer time occurs automatically.

Device status:

No notification. No warning and/or error notifications present.

Warning(s) present. There is at least one warning, nevertheless safe operation of the system is still possible.

Error notification(s) present. There is at least one error affecting the faultless operation of the system (rectify error immediately!)
In addition to the error, there may also be warnings with this notification.

Current Settings level / Enter code selection:

Display of the current settings level (2 … Settings level 2, 3 … Settings level 3, …).
The "Enter code" menu for activating higher settings levels will emerge by using the keys.
Settings level 2 = Standard settings level, no activation code required
Settings level 3, 4, … = advanced settings levels, activation by entering code.
Clearance code for Settings level 3: 1424

Advanced settings levels are exited automatically after a specified time, if no operations are carried out on the touchscreen operating unit after activation.

Advanced settings levels are skilled personnel levels. Basic system settings are possible here. These may have effects on the entire program sequence of the touchscreen operating unit and on device function.

All setting in Settings level 3 may only be implemented by a competent specialist! This person is responsible for the settings implemented.

Menu button:

Tapping the menu button takes you into the settings section. Depending on the activation code, the settings section allows setting of the language, implementation of settings, deletion of actions and adjusting the system settings.

In Settings level 2, no settings affecting the function are possible. This protects against unwanted changes to settings by unauthorised users.

3.2.2. Menu bar

The menu bar is part of the settings level and displays the menu you are in.

Image 5: Menu bar

Back:

Back to previous menu

Title:

Settings level

Menu … > Settings section main menu
Language, Actions, Settings, System … > Settings section submenus

Home:

Back to home screen

3.2.3. Home screen

The home screen appears immediately on starting up the touchscreen operating unit. It displays the significant device data on multiple predefined display fields. The home screen extends over the touchscreen's entire display.

> The ex-factory predefined home screen can be adapted to the individual requirements of the system user (see Settings level, Settings). The position of the main display field (field with double height) cannot be changed.

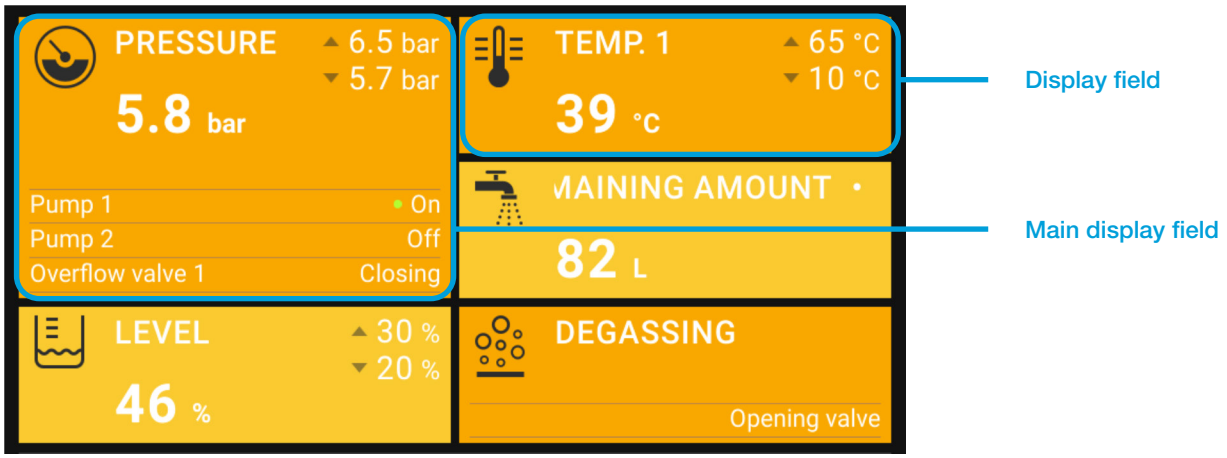


Image 6: Home screen

4. DISPLAY LEVEL

The display level is used to show measurements and operating conditions.

Swiping up brings up the individual categories of the display level, depending on the home screen (Pressure maintenance, Makeup, etc.).

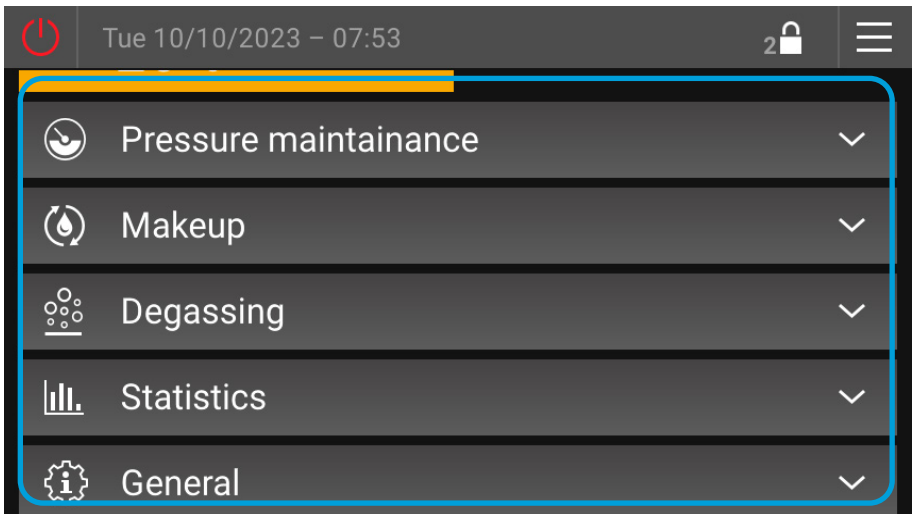


Image 7: Display level

4.1. Display fields

Tapping a category opens the display fields in it. Display fields extending down beyond the display section are called up by swiping up. Depending on the current settings level (2, 3, …) more or fewer display fields may be visible.

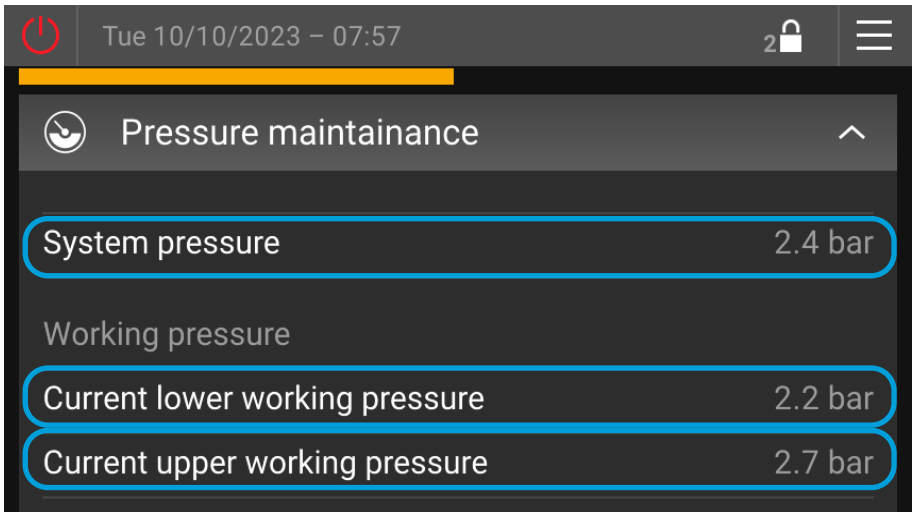


Image 8: Display fields

4.2. Display field groups

Display fields that belong together are grouped into so-called "groups". The start of a group is marked by grey text without display value. Groups start and end in each case with an enlarged distance to the previous or subsequent display field.

Depending on the settings level currently active (see system bar), the number of display fields may vary.

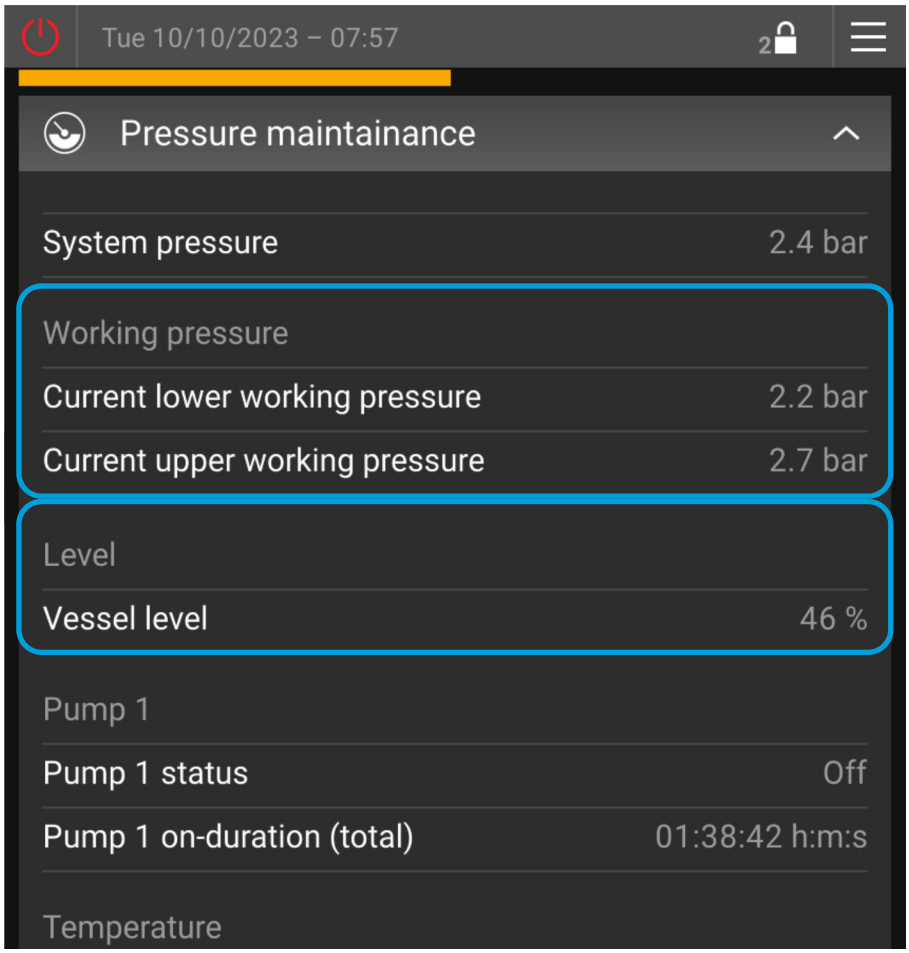


Image 9: Display field groups

4.3. Display level menu structure

LVL … Settings level required for display visibility (2, 3, ...)
Note … Notes (see legend for meaning [1])

DISPLAY LEVEL	LVL	REMARK [1]
├ Pressure maintenance		
│ ├ System pressure	2	
│ ├ Working pressure (Group)		
│ │ ├ Current lower working pressure	2	
│ │ ├ Current upper working pressure	2	
│ │ ├ Manual upper working pressure	3	14
│ │ ├ External upper working pressure (Busmodule)	3	14, 15
│ │ └ External upper working pressure (analog input)	3	15
│ ├ Level (Group)		
│ │ ├ Vessel level	2	
│ │ ├ Vessel level operation mode	2	8
│ │ ├ Vessel level source	2	8
│ │ ├ Vessel level L1	2	

│	│	└─	Vessel level L2	2	8
│	├─	Pump operation mode		2	1, 3
│	├─	Current priority pump		2	1
│	├─	Pump 1 (Group)			
│	│	├─	Pump 1 status	2	
│	│	├─	Pump 1 speed	2	14
│	│	└─	Pump 1 on-duration (total)	2	
│	├─	Pump 2 (Group)			
│	│	├─	Pump 2 status	2	
│	│	├─	Pump 2 speed	2	1
│	│	└─	Pump 2 on-duration (total)	2	1
│	├─	Valve operation mode		2	1, 14
│	├─	Current priority valve		2	1, 14
│	├─	Valve 1 status		2	14
│	├─	Valve 2 status		2	1, 14
│	└─	Temperature (Group)			
│		├─	Temperature T1	2	
│		└─	Temperature T2	2	7
├─	Makeup				
│	├─	Makeup state		2	2
│	├─	Makeup state remaining duration		2	2
│	├─	Vessel level		2	
│	├─	Targeted value (Group)			
│	│	├─	Makeup upper targeted amount (automatic filling)	3	
│	│	├─	Makeup lower targeted amount (automatic filling)	2	
│	├─	Makeup total amount (total)		2	2
│	├─	Makeup remaining amount		2	2
│	├─	Water preparation remaining capacity		2	2, 11
│	├─	Makeup remaining duration		2	2
│	└─	Makeup operation mode		3	2
├─	MCA makeup				
│	├─	MCA operation mode		2	16
│	├─	Manual upper working pressure		2	4, 16
│	├─	System pressure		2	
│	├─	Vessel level		2	
│	├─	Enable contact		2	16
│	├─	Pump 1 (Group)			
│	│	├─	Pump 1 status	2	
│	│	└─	Pump 1 on-duration (total)	2	
│	├─	Temperature (Group)			
│	│	├─	Temperature T1	2	
│	│	└─	Temperature T2	2	7
│	├─	MCA diverter valve status		2	16
│	├─	MCA state		2	2

├		Makeup total amount (total)		2	2
├		Makeup remaining amount		2	2
├		Remaining makeup duration		2	2
└		Makeup operation mode		3	2
├	Degassing				9
├		Current phase (Group)			
├			Degassing state	2	
└			Degassing state remaining time	2	
├		Fast degassing (Group)			
└			Fast degassing state remaining time	2	10
├		Degassing on-duration (total)		3	
├		Degassing operation mode		3	
├		Degassing enabled by time program		2	5
└		Temperature T2		2	7
├	Monitoring				13
├		System pressure lower monitoring limit		3	
├		System pressure below lower monitoring limit		3	
├		System pressure upper monitoring limit		3	
├		System pressure above upper monitoring limit		3	
├		Vessel level lower monitoring limit		3	
├		Vessel level below lower monitoring limit		3	
├		Vessel level upper monitoring limit		3	
├		Vessel level upper monitoring limit		3	
├		Temperature T1 lower monitoring limit		3	
├		Temperature T1 below lower monitoring limit		3	
├		Temperature T1 upper monitoring limit		3	
├		Temperature T1 above upper monitoring limit		3	
├		Temperature T2 lower monitoring limit		3	7
├		Temperature T2 below lower monitoring limit		3	7
├		Temperature T2 upper monitoring limit		3	7
└		Temperature T2 above upper monitoring limit		3	7
├	Statistics				
├		Pump 1 (Group)			
├			Duration of Pump 1 (Resettable)	2	
└			Duration of Pump 1 (Resettable) counter cleared	2	
├		Pump 2 (Group)			1
├			Duration of Pump 2 (Resettable)	2	
└			Duration of Pump 2 (Resettable) counter cleared	2	
├		Degassing (Group)			9
├			Degassing duration (Resettable)	2	
└			Degassing duration (Resettable) counter cleared	2	
├		Temperature measurement T1 (Group)			
├			Minimum temperature T1	2	
├			Minimum temperature T1 measured on	2	

		├─	Minimum temperature T1 counter cleared	2	
		├─	Maximum temperature T1	2	
		├─	Maximum temperature T1 measured on	2	
		└─	Maximum temperature T1 counter cleared	2	
	├─	Temperature measurement T2 (Group)			7
		├─	Minimum temperature T2	2	
		├─	Minimum temperature T2 measured on	2	
		├─	Minimum temperature T2 counter cleared	2	
		├─	Maximum temperature T2	2	
		├─	Maximum temperature T2 measured on	2	
		└─	Maximum temperature T2 counter cleared	2	
	├─	Pressure measurement P1 (Group)			
		├─	Minimum pressure P1	2	
		├─	Minimum pressure P1 measured on	2	
		├─	Minimum pressure P1 counter cleared	2	
		├─	Maximum pressure P1	2	
		├─	Maximum pressure P1 measured on	2	
		└─	Maximum pressure P1 counter cleared	2	
	├─	Makeup (Group)			2
		├─	Makeup total amount (Resettable)	2	
		└─	Makeup total amount (Resettable) counter cleared	2	
	├─	Water preparation (Group)			
		└─	Water preparation cartridge last replaced on	2	
		Pressure maintenance (Group)			
		└─	Last pressure setting on	2	
	├─	Level L1 (Group)			
		├─	Minimum level L1	2	
		├─	Minimum level L1 measured on	2	
		├─	Minimum level L1 counter cleared	2	
		├─	Maximum level L1	2	
		├─	Maximum level L1 measured on	2	
		└─	Maximum level L1 counter cleared	2	
	├─	Level L2 (Group)			8
		├─	Minimum level L2	2	
		├─	Minimum level L2 measured on	2	
		├─	Minimum level L2 counter cleared	2	
		├─	Maximum level L2	2	
		├─	Maximum level L2 measured on	2	
		└─	Maximum level L2 counter cleared	2	
	├─	Temperature measurement T1 < blocking temperature (Group)			
		├─	Blocking temperature (cold) 1	2	
		├─	Number of times system temperature below blocking temperature T1	2	
		├─	Number of times system temperature below blocking temperature T1 counter cleared	2	

		├─	Duration of T1 < Blocking temperature	2	
		└─	Duration of T1 < Blocking temperature counter cleared	2	
	├─	Temperature measurement T1 > Temperature limit (Group)			
		├─	Temperature limit (Hot) 1	2	
		├─	Number of times T1 limit has been exceeded	2	
		├─	Number of times T1 limit has been exceeded counter cleared	2	
		├─	Duration of T1 > Temperature limit	2	
		└─	Duration of T1 > Temperature limit counter cleared	2	
	├─	Temperature measurement T2 < blocking temperature (Group)			7
		├─	Blocking temperature (Cold) 2	2	
		├─	Number of times system temperature below blocking temperature T2	2	
		├─	Number of times system temperature below blocking temperature T2 counter cleared	2	
		├─	Duration of T2 < blocking temperature	2	
		└─	Duration of T2 < blocking temperature counter cleared	2	
	└─	Temperature measurement T2 > Temperature limit (Group)			7
		├─	Temperature limit (Hot) 2	2	
		├─	Number of times T2 limit has been exceeded	2	
		├─	Number of times T2 limit has been exceeded counter cleared	2	
		├─	Duration of T2 > Temperature limit	2	
		└─	Duration of T2 > Temperature limit counter cleared	2	
├─	General				
	├─	EderControl software version		2	
	├─	EderControl time		2	
	├─	Device model		2	
	└─	External clearance (Busmodule/Webmodule)		2	
├─	SMS-Module				12
	├─	SMS-Module state		2	
	├─	Network status (Group)			
		├─	SMS-Module signal quality	2	
		└─	SMS-Module network name	2	
	└─	Number of SMS in history		2	

[1] LEGEND FOR THE REMARKS

1	only with Modell Duo or Maxi	11	only with activated Water preparation
2	only with activated EMCF makeup module	12	only with activated SMS-Module
3	Operation mode according to "Settings" menu	13	only if at least 1 value is being monitored
4	depending on operation mode selected	14	only with TopControl
5	only with "Enabled by time program " operation mode	15	only with activated Busmodule
6	only with "Time controlled" operation mode	16	only with EMCA
7	only with activated sensor T2		
8	only with activated level L2		
9	only with activated degassing (without bypass)		
10	only with active fast degassing		

4.4. Description of individual menu items on the display level

4.4.1. Display level -> Pressure maintenance ->

System pressure
Current system pressure measured at system pressure sensor of the pressure maintenance system.

Working pressure

Current lower working pressure
Resulting lower working pressure on the basis of the working pressure setting.

Current upper working pressure
Upper Working pressure defined with the working pressure setting.

Manual upper working pressure
Display of the manually configured upper working pressure in systems with the option of setting working pressure directly by entering value (only TopControl and EMCA).

External upper working pressure (busmodule)
Display of the upper working pressure by external specification from the busmodule (only TopControl).

External upper working pressure (analog input)
Display of the upper working pressure specified via an analog signal (4-20 mA) (only TopControl)

Level

Vessel level
Current vessel level. If level L2 is activated, the level will be displayed according to the level source.

Vessel level operation mode
Current operation mode of the level according to "Settings" menu. There is a display only if level L2 has been activated in the "Device setup" menu.

Vessel level source
Current source for level. There is a display only if level L2 has been activated in the "Device setup" menu.
Vessel level L1 … level for first vessel
Vessel level L2 … level for second vessel

Vessel level L1
Current level in the 1st vessel (fitted main vessel with MultiControl, compact devices or first EP(X)-R with MultiControl modular devices). There is a display only if the level L2 has been activated in the "Settings" menu.

Vessel level L2
Current level in 2nd vessel (additional EP(X)-R with EMCM devices) There is a display only if the level L2 has been activated in the "Settings" menu.

Pump operation mode
Current operation mode for the pumps according to "Settings" menu. There is a display only with Duo or Maxi models.

Current priority pump
The Current priority pump is the pump that starts up first when the system pressure falls just below that of the set Lower working pressure. There is a display which is only available with Duo and Maxi models.

Pump 1

Pump 1 status
Current operating status of Pump 1 ("On" or "Off")

Pump 1 speed
Current speed of Pump 1 in % (Only with TopControl).

Pump 1 on-duration (total)
Operating hours counter for total run-time of Pump 1

Pump 2

Pump 2 status
Current Operating status of Pump 2 ("On" or "Off")
There is a display only with Duo or Maxi models.

Pump 2 speed
Current speed of Pump 2 in % (Only with TopControl or Maxi).

Pump 2 on-duration (total)
Operating hours counter for total run-time of Pump 2
There is a display only with Duo or Maxi models.

Valve operation mode
The following operation modes can be selected with the "Duo Twin" and "Maxi Twin" models of TopControl devices:

"Staggered mode" (factory setting)
… The first valve opens depending on pressure. The second takes over in the event of error, but opens also depending on pressure after a delay.

"Parallel mode"
… Both valves always open at the same time.

"Redundancy mode"
… The first valve opens depending on pressure. The second takes over in the event of error, but does not open depending on pressure.

"Valve 1 only"
… Valve 2 (-Y4) is permanently disabled (e.g. for maintenance).

"Valve 2 only"
… Valve 1 (-Y3) is permanently disabled (e.g. for maintenance).

Current priority valve
Current priority valve is the valve that opens first on request.
Display only with "Duo Twin" and "Maxi Twin" models of TopControl

Valve 1 status
Current Valve 1 status ("Mechanically closing", "Stop", "Opening", "Closing")
There is a display only with TopControl.

Valve 2 status
Current Valve 2 status ("Mechanically closing", "Stop", "Opening", "Closing")
Display only with "Duo Twin" and "Maxi Twin" models of TopControl

Temperature

Temperature T1
Current temperature in the overflow hose in the device.

Temperature T2
Current temperature at mounting of sensor T2 in the system. Display only if "Sensor T2 equipped" has been activated in the "Device setup".

4.4.2. Display level -> Makeup ->

Makeup state
Operating status of the makeup

"Off"
"Locked"
"Locked (T1)"
"Locked (T2)"
"Locked (Time)"
"One-time filling"
"On"

Makeup state remaining duration
Display of the remaining time that may result based on the operating status of the makeup.

"---"
… no remaining time effective

"00:00:27 h:m:s"
… remaining time effective [1)]

[1)] Depending on the status of the makeup, the remaining time has different meanings.

With status "Locked (time)", this means a makeup procedure will be requested again within a minute following the end of the last makeup procedure. The remaining time in this case causes a corresponding delay until a fresh makeup procedure can be enabled.

With the status "One-time filling", the remaining time means the maximum time that the initiated action "One-time filling" can still take. If the level for one-time filling is not reached within the remaining time, the action "One-time filling" will be terminated automatically without error notification.

Vessel level
Current vessel level in percent (%)

Setpoint" to "Targeted value

Makeup upper targeted amount (automatic filling)
Automatic makeup stops when the water level value goes above this set value.

Makeup lower targeted amount (automatic filling)
Automatic makeup starts when the water level value falls below this set value.

Makeup total amount (total)
Display of the total makeup amount thus far.

Makeup remaining amount
Display of the water amount still available since the last amount acknowledgement.

Makeup remaining time (time controlled)
Display of the remaining makeup amount within the remaining time displayed. No display with "amount-controlled" operation mode

Water preparation remaining capacity
Display of the remaining capacity of the water preparation cartridge. There is a display only if "Water preparation" has been activated.

Makeup remaining duration
Display of the remaining time within which a running makeup procedure must be completed at the latest.

When the makeup switches on, this time starts to count down. The makeup must be able to raise the level and switch off again within the remaining time. If this does not happen within this time, the error notification E27 Maximum makeup duration exceeded

If a makeup procedure has been completed successfully, the remaining makeup duration resets to the initial value.

Makeup operation mode
Display of the operation mode configured of the makeup according to the "Settings" menu
- "Amount-controlled" (Factory setting)
- "Time-controlled"

4.4.3. Display level -> Makeup MCA -> (only with EMCA devices)

MCA operation mode
Display of the current operational state of the EMCA device.

"Contact controlled"
"Pressure controlled"

Manual upper working pressure
Display of the upper working pressure configured with use of the EMCA in combination with ancillary tank (MCA operation mode configured to "Pressure controlled").

System pressure
Current system pressure measured at system pressure sensor of the pressure maintenance system.

Vessel level
Current vessel level.

Enable contact
Current information whether there is a request for makeup.

Pump 1 status
Current operating status of Pump 1 (“On” or “Off”)

Pump 1

Pump 1 on-duration (total)
Operating hours counter for total run-time of Pump 1.

Temperature

Temperature T1
Current temperature in the overflow pipe in the device.
Current temperature at the vessel connection unit in the reservoir (with EMCA).

Temperature T2
Current temperature at the mounting of sensor T2.
There is a display only if "Sensor T2 equipped" has been activated in the "Device setup" menu.

MCA diverter valve status
Current setting of the MCA (-Y5) diverter valve.

"Opening" … for Makeup
"Closing" … for circulation

MCA state
Display of the device’s current operational state.

"Off"
"Makeup"
"Circulation"
"Circulation paused"
"Locked"
"Diverter valve opening"
"Diverter valve closing"

Makeup total amount (total)
Display of the total makeup amount thus far.

Makeup remaining amount
Display of the water amount still available since the last amount acknowledgement.

Makeup remaining time (time-controlled)
Display of the remaining makeup amount within the remaining time displayed. No display with "Amount-controlled" operation mode.

Makeup remaining duration
Display of the remaining time within which a running makeup procedure must be completed at the latest.

When the makeup switches on, this time starts to count down. The makeup must be able to raise the level and switch off again within the remaining time. If this does not happen within this time, the error notification E27 Maximum makeup duration exceeded.

If a makeup procedure has been completed successfully, the remaining makeup duration resets to the initial value.

Makeup operation mode
Display of the operation mode configured of the makeup.

- "Amount-controlled" (Factory setting)
- "Time-controlled"
Current operation mode according to "Settings" menu

4.4.4. Display level -> Degassing ->
(Menu item only if "Degassing" has been activated in "Device setup").

Current phase

Degassing state
Current operational state of the degassing or fast degassing.

"Paused"
… Pause of the current degassing cycle

"Locked"
… Locked owing to excessive temperature (T1 or T2) or pressure (P)

"Pressure buildup"
… Pump increases the pressure necessary for the degassing (with systems with pump degassing)

"Degassing"
… Degassing cycle active

"Opening valve"
… opening the valve for degassing

"Opening valve (pressure release)" (only in systems with degassing module)

Degassing state remaining time
Display of the remaining time for the current degassing operational state.

Fast degassing

Fast degassing state remaining time
Display of how long fast degassing will still be active, until automatic switchover to normal degassing again.
Display only with active "Fast degassing"

Degassing on-duration (total)
Total degassing time elapsed thus far.

Degassing operation mode
Current Operation mode of the degassing according to "Settings" menu.

"Disabled"
"Always enabled"
"Enabled by time program"

Degassing enabled by time program

"Enabled"
"Locked"

Temperature T2
Current temperature at the mounting of sensor T2. Display only if "Sensor T2 equipped" has been activated in the "Device setup".

4.4.5. Display level -> Monitoring ->

Display of values at which monitoring through entering limit values (e.g. "System pressure lower monitoring limit" or "Temperature 1 upper monitoring limit") has been activated.
Display of current status: OK or warning.

The menu item "Monitoring" is there only if at least 1 value has been configured for monitoring and in addition can be accessed only from Settings level 3.

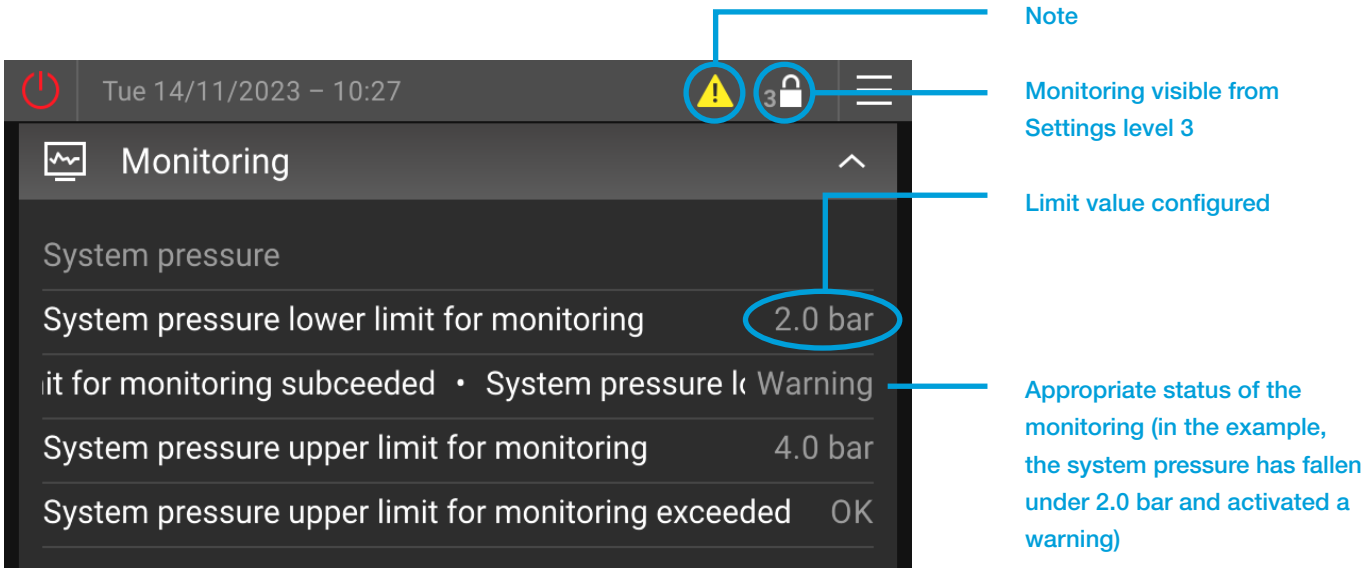


Image 10: Display level -> Monitoring ->

4.4.6. Display level -> Statistics ->

Display of operating hours, peak values, lows, etc.
Offers the option of targeted monitoring of specific operational conditions via defined time intervals (resettable).

> Resetting the resettable durations resets the times since the last reset to 00:00:00. The totals are not reset by this!

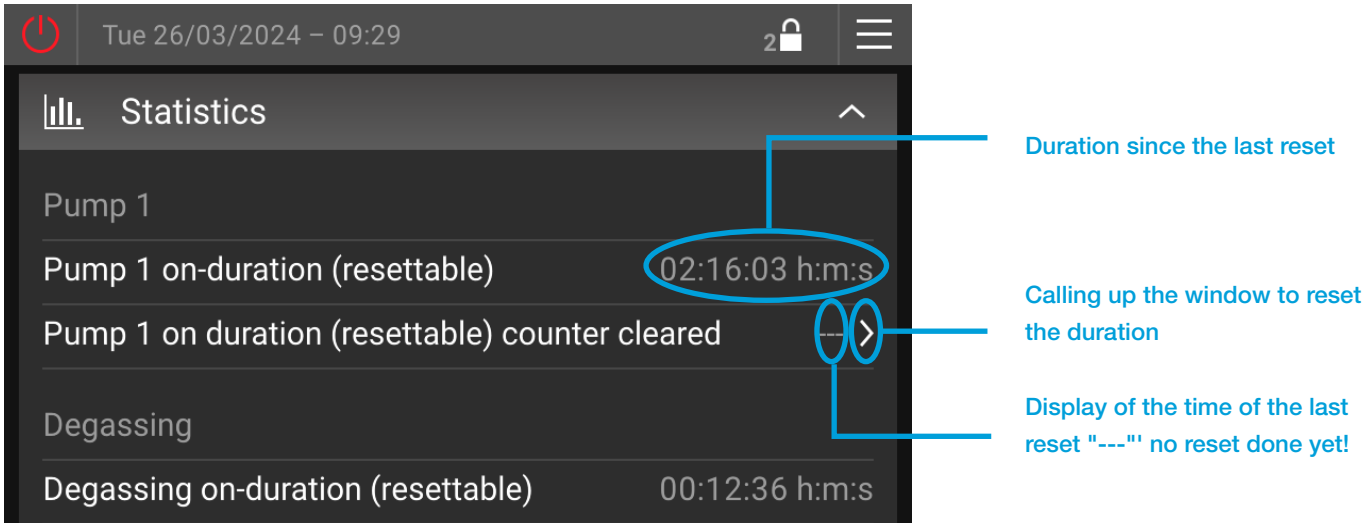


Image 11: Display level -> Statistics ->

4.4.7. Display level -> General ->

EderControl software version
Display of the current touchscreen operating unit software version received

EderControl time
Display of the current date and the current time

Device model
Display of the device type configured

External clearance (enable contact)
Display of the current state of the enable contact (display only if the item "External notification input (digital input)" has been activated in the device setup menu).

"Locked"
… Function of the device blocked via enable contact.

"Enabled"
… Function of the device has been enabled via enable contact.

External clearance (Busmodule/Webmodule)
Display of the current state of the device clearance via Busmodule/Webmodule (Display only if the items "Process incoming data" and "Enable device clearance by Busmodule" have been activated in the menu).

"Locked"
… Function of the device locked by Busmodule/Webmodule.

"Enabled"
… Function of the device has been enabled by Busmodule/Webmodule.

4.4.8. Display level -> SMS-Module ->

Described in greater detail in the document "Instruction manual MultiControl SMS-Module", included in scope of delivery of each SMS-Module.

5. SETTINGS SECTION

5.1. General

... Menu button

Tapping on the menu button in the system bar takes you into the settings section. Depending on the activation code, the settings section allows setting of the language, deletion of actions, implementation of settings, manual mode (override) and adjusting the system settings.

The settings levels corresponding to the activation code entered are effective in the settings section as well. Settings level 2 is enabled as standard. No settings affecting the function are possible on this level. This protects against unwanted changes to settings by unauthorised users.

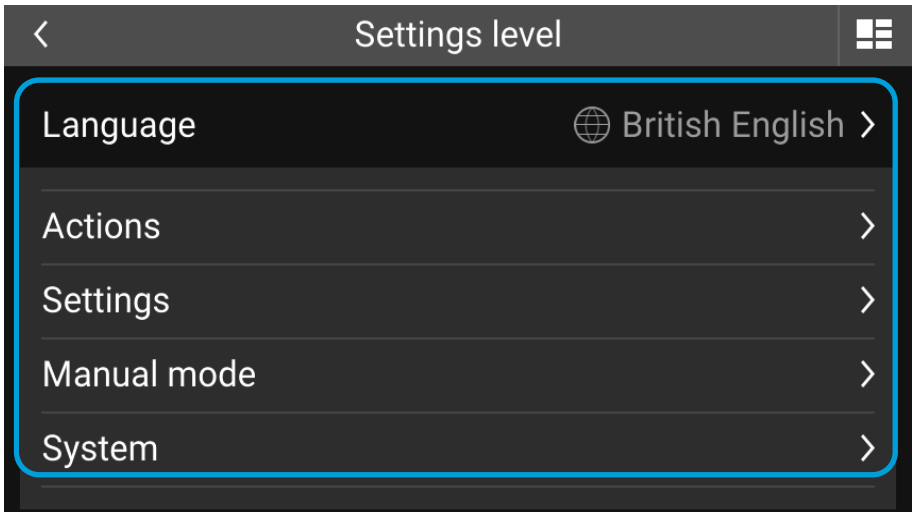


Image 12: Settings section

5.2. Menu structure of the settings section

LVL … Settings level
Remark … Remarks

SETTINGS LEVEL	LVL	RE-MARK
Language		
Actions		
One-time filling	2	
Stop one-time filling	2	
Start fast degassing	2	9
Stop fast degassing	2	9
Reset makeup amount	2	2
Water preparation cartridge changed	3	2, 11
Reset statistics	3	
Settings		
Pressure maintenance		
Working pressure		
Manual upper working pressure	3	14
Working pressure difference	3	
Working pressure hysteresis (TopControl)	3	14
Pump operation mode	2	
Vessel level operation mode	2	2
Valve operation mode	2	14
Minimum upper working pressure (Analog input)	3	
Maximum upper working pressure (Analog input)	3	
Minimum upper working pressure (Busmodule)	3	15
Maximum upper working pressure (Busmodule)	3	15
Makeup		
Makeup operation mode	3	2
Maximum makeup amount	3	2
Makeup interval duration (time controlled)	3	2
Makeup lower targeted amount (automatic filling)	3	2
Incoming water hardness	2	11
Incoming water conductivity	2	11
Makeup (MCA)		16
Makeup operation mode	3	
Maximum makeup amount	3	
Makeup interval duration (time controlled)	3	
MCA operation mode	3	
Manual upper working pressure	3	17
Working pressure difference	3	17
Circulation operation mode	3	
Circulation duration	3	
Circulation pause duration	3	
Degassing		9
Degassing operation mode	2	
Degassing time program		

		├─	Regular degassing cycle duration		3	
		├─	Fast degassing cycle duration		3	
		└─	Fast degassing duration		3	
	├─	Monitoring				
		├─	System pressure			
			├─	System pressure lower monitoring limit	2	
			└─	System pressure upper monitoring limit	2	
		├─	Vessel level			
			├─	Vessel level lower monitoring limit	2	
			└─	Vessel level upper monitoring limit	2	
		├─	Temperature T1			
			├─	Temperature T1 lower monitoring limit	2	
			└─	Temperature T1 upper monitoring limit	2	
		└─	Temperature T2			7
			├─	Temperature T2 lower monitoring limit	2	
			└─	Temperature T2 upper monitoring limit	2	
	├─	Busmodule/Webmodule (See device specific manuals for settings)				15
	├─	SMS-Module (See device specific manuals for settings)				12
	├─	Device setup				18
		├─	Vessel code		2	
		├─	Upper vessel pressure transmitter/sensor 1 PL1o correction value		3	
		├─	Lower vessel pressure transmitter/sensor 1 PL1u correction value		3	
		├─	System pressure transmitter P1 correction value		3	
		├─	Makeup equipped		3	
		├─	Water preparation		3	
		├─	Degassing		3	
		├─	Binary signalling expansion module equipped		3	
		├─	Allow remote acknowledgement by binary signalling expansion module		3	
		├─	Analog signalling expansion module equipped		3	
		├─	Sensor T2 equipped		2	
		├─	Level L2 equipped		2	
		├─	Upper vessel pressure transmitter/sensor 2 PL2o correction value		3	
		├─	Lower vessel pressure transmitter/sensor 2 PL2u correction value		3	
		├─	Communications accessories		2	
		├─	External enable contact device function		3	
		├─	External upper working pressure (analog input) equipped		3	
		└─	External notification input (digital input)		3	
	└─	General				
		├─	Date			
		├─	Time			
		├─	Time zone			
		├─	Home screen			
		├─	Display brightness			
		└─	Screensaver			

├─	Manual mode			3	
│	├─	Set all overrides to auto			
│	├─	Outputs			
│	│	├─	Pump 1 (-M1)		
│	│	├─	Pump 2 (-M2)		1
│	│	├─	Makeup valve (-Y1)		2
│	│	├─	Degassing valve (-Y2)		
│	│	├─	Clutch of overflow valves (-Y3 and -Y4)		14
│	│	├─	Overflow valve 1 (-Y3)		14
│	│	├─	Overflow valve 2 (-Y4)		1, 14
│	│	└─	Diverter valve MCA (-Y5)		16
│	├─	Binary signals			
│	│	├─	Aggregated warning		
│	│	├─	Aggregated error		
│	│	├─	Currently making up		2
│	│	├─	Device clearance given		
│	│	├─	Pump 1 malfunction		
│	│	├─	Pump 2 malfunction		1
│	│	├─	Pump running		
│	│	├─	Vessel level below the minimum level		
│	│	├─	Vessel level above the maximum level		
│	│	├─	System pressure below the minimum pressure		
│	│	├─	System pressure above the maximum pressure		
│	│	└─	Water meter amount impulse		2
│	└─	Analog signals			
│		├─	Current system pressure P1		
│		├─	Current vessel level L		
│		├─	Pump 1 speed		14
│		├─	Pump 2 speed		1, 14
│		├─	Upper working pressure		
│		├─	Lower working pressure		
│		├─	PLo1 Upper vessel pressure 1		
│		├─	PLu1 Lower vessel pressure 1		
│		├─	PLo2 Upper vessel pressure 2		8
│		├─	PLu2 Lower vessel pressure 2		8
│		├─	Temperature T1		
│		├─	Temperature T2		7
│		├─	Vessel level L1		
│		├─	Vessel level L2		8
│		├─	Makeup amount [%]		19
│		├─	Cartridge capacity [%]		20
│		└─	Maintenance interval [%]		
└─	System				
	└─	Open-Source Licences			

[1] LEGEND FOR THE REMARKS			
1	only with Modell Duo or Maxi	11	only with activated Water preparation
2	only with activated EMCF makeup module	12	only with activated SMS-Module
3	Operation mode according to "Settings" menu	13	only if at least 1 value is being monitored
4	depending on operation mode selected	14	Only with TopControl
5	only with "enabled by time program" operation mode	15	only with Busmodule installed
6	only with "time controlled" operation mode	16	only with EMCA
7	only with activated sensor T2	17	only with "pressure controlled" operation mode
8	only with activated level L2	18	higher LVL necessary for value change
9	only with activated degassing (without bypass)	19	related to the maximum makeup amount
10	only with active fast degassing	20	related to the full capacity of the cartridges installed

5.3. Description of individual menu items on the settings level

5.3.1. Settings level -> Language ->

Language selection for operating the touchscreen operating unit.

5.3.2. Settings level -> Actions ->

Start/stop one-time filling
Fill vessel once to a defined level or stop one-time filling procedure (factory standard: 60 %).

Start/stop fast degassing
Start fast degassing with shortened pauses or stop an active fast degassing again (normal degassing).

Reset makeup amount
The makeup amount used is reset and the entire remaining amount set is enabled again.

Water preparation cartridge changed
After changing the softening or desalination cartridge, water preparation cartridge changed must be confirmed here. The remaining capacity of the softening EMWE or desalination EMVE is reset again in this way, based on the configured incoming water hardness or conductivity.

Reset statistics
All the statistics fields in the display level in the "Statistics" menu are reset in one. Depending on the relevant statistics field, the reset of the values proceeds differently (e.g. set to 0, set to internally defined value, set to the current time). The action "Reset statistics" should as a rule be implemented following successful commissioning and/or device maintenance.


If the action "Device maintenance OK" is selected by the expert following successful maintenance, the action "Reset statistics" takes place at the same time.

5.3.3. Settings level -> Settings ->

5.3.3.1. Pressure maintenance

Working pressure
Setting the working pressure required must be implemented differently, depending on the device type. For a description, see the chapter "Commissioning" in the machine manual for the relevant device type.

Pump operation mode
With double pump systems (Duo and Maxi models), the following operation modes can be selected:

- "Pump 1 only"
Pump 2 is permanently disabled (e.g. for maintenance work).

- "Pump 2 only"
Pump 1 is permanently disabled (e.g. for maintenance work).

- "Redundancy mode"
Only the current priority pump starts, depending on pressure. The extra pump takes over only in the event of malfunction of the priority pump, but does not switch on in addition depending on pressure.

- "Staggered mode" (Factory setting with Duo and Maxi systems)
Current priority pump starts, depending on pressure. The auxiliary pump takes over in the event of malfunction of the priority pump, but also switches on after a delay, depending on pressure.

- "Parallel mode"
The priority pump and auxiliary pump always run simultaneously.

Vessel level operation mode
Selection of the levels used for the function of the device with systems with second level L2:

- "Automatic change"
Automatic use of the second level L2 in the case of electrical faults found in level L1 (i.e. at least one of the error notifications E12, E13, E14, E15 raised)

- "Only level L1"
The measurement L1 is always used as level value

- "Only level L2"
The measurement L2 is always used as level value

Valve operation mode
(Only with TopControl)
The following operation modes can be selected with the "Duo Twin" and "Maxi Twin" models:

- "Valve 1 only"
Valve 2 is permanently disabled (e.g. for maintenance)

- "Valve 2 only"
Valve 1 is permanently disabled (e.g. for maintenance)

- "Redundancy mode"
The first valve opens depending on pressure. The second takes over in the event of error, but does not open depending on pressure.

- "Staggered mode" (Factory setting (FS))
The first valve opens depending on pressure. The second takes over in the event of error, but opens also depending on pressure after a delay.

- "Parallel mode"
Both valves always open at the same time.

Minimum upper working pressure (analog input)
(Only with TopControl)

Limiting the upper working pressure to a minimum value. Regardless of the size of the external setpoint signal from the analog input of the basic circuit board, the pressure setpoint configured here can never go below this value.

(FS = 0.0 bar)
For details, see the chapter "External Setpoint" in the TopControl machine manual.

Maximum upper working pressure (analog input)
(Only with TopControl)
Limiting the upper working pressure to a maximum value. Regardless of the size of the external setpoint signal from the analog input of the basic circuit board, the pressure setpoint configured here can never be exceeded.

(FS = 40.0 bar)
For details, see the chapter "External Setpoint" in the TopControl machine manual.

Minimum upper working pressure (Busmodule)
(Only with TopControl)
Limiting the upper working pressure to a minimum value. Regardless of the size of the external setpoint via Busmodule, the pressure setpoint configured here can never go below this value.

(FS = 0.0 bar)
For details, see the chapter "External Setpoint" in the TopControl machine manual.

Maximum upper working pressure (Busmodule)
(Only with TopControl)
Limiting the upper working pressure to a maximum value. Regardless of the size of the external setpoint via Busmodule, the pressure setpoint configured here can never be exceeded.

(FS = 40.0 bar)
For details, see the chapter "External Setpoint" in the TopControl machine manual.

5.3.3.2. Makeup

Makeup operation mode
Selection of the operation mode with activated makeup module EMCF/EPCF.

- "Amount-controlled" (Factory setting)
A defined makeup amount (see "Maximum Makeup amount") is available. Once this has been used up, the error notification E26 is activated and the makeup locked.

- "Time controlled"
Within the time interval "Makeup interval duration", the makeup amount "Maximum makeup amount" is available. If more is used within the time interval, the error notification E26 is activated and the makeup locked. Otherwise, at the end of the interval, the full amount "Maximum makeup amount" is enabled for a new interval.

Maximum makeup amount
Setting the max. makeup amount in litres.

Makeup interval duration (time controlled)
Setting the time intervals for the operation mode "time controlled".

Makeup lower targeted amount (automatic filling)
Makeup starts below this level (Hysteresis: +10%).

Incoming water hardness
Measured incoming water hardness of the water to EMCF/EPCF.

Incoming water conductivity
Measured incoming water conductivity of the water to EMCF/EPCF.

5.3.3.3. MCA makeup

(Only with EMCA devices)

Makeup operation mode

Selection of the operation mode with activated makeup module EMCF/EPCF.

- "Amount-controlled" (Factory setting)
A defined makeup amount (see "Maximum Makeup amount") is available. Once this has been used up, the error notification E26 is activated and the makeup locked.

- "Time controlled"
Within the time interval "Makeup interval duration for amount", the makeup amount "Maximum makeup amount" is available. If more is used within the time interval, the error notification E26 is activated and the makeup locked. Otherwise, at the end of the interval, the full amount "Maximum makeup amount" is enabled for a new interval.

Maximum makeup amount
Setting the max. makeup amount in litres.

Makeup interval duration (time controlled)
Setting the time intervals for the operation mode "time controlled".

MCA operation mode
Selection of the operation mode of the EMCA device function.

- "Contact controlled"
Can be used in combination with a pump pressure maintenance unit. If the water level in the expansion vessel of the pressure maintenance system concerned falls below the set minimum limit, a makeup request is sent to the EMCA control unit. The makeup procedure starts once the "Enable contact" is in the "On" position.

- "Pressure controlled"
Is used in combination with an ancillary tank. The makeup procedure is started when the pressure falls below the configured set point.

Manual upper working pressure
Setting of the upper working pressure with use of the EMCA in combination with ancillary tank (MCA operation mode configured to "Pressure controlled").

Working pressure difference
Setting the difference between the manual upper working pressure configured and the pump activation pressure (lower working pressure).

Circulation mode
Setting whether and how circulation takes place.

- "None"
Circulation is disabled, and there is no mixing of the makeup medium in the reservoir.

- "Periodic"
The circulation is started automatically at regular time intervals. Circulation duration and pause between the individual circulation procedures can be configured individually.

- "Before makeup"
Before each makeup procedure, the medium is first circulated for a defined time. The duration can also be configured, and the makeup procedure is delayed for this time interval.

Circulation duration
Defines the duration of the individual circulation cycles.

Circulation pause duration
Can only be configured with circulation mode "Periodic". Defines the delay between the individual circulation cycles.

5.3.3.4. Degassing

Degassing operation mode

Selection of the operation mode with activated degassing.

- "Disabled"
Degassing switched off, no degassing

- "Always enabled"
Degassing occurs always, independently of time and time program

- "Enabled by time program"
Degassing occurs only during the enabled times configured

Degassing time program
For setting the enable times for degassing function in operation mode "According to time program", see also the chapter "Time programs".

Normal degassing cycle duration
Degassing period with normal degassing

Fast degassing cycle duration
Degassing period during fast degassing

Fast degassing duration
Time for how long fast degassing remains active
(factory pre-setting: 48 h)

5.3.3.5. Monitoring

Option to enter maximum and minimum limit values for the relevant measurement values. A warning activated after a limit is exceeded.
(Factory setting: No monitoring takes place)

5.3.3.6. Busmodule/Webmodule

For more detailed information, see Busmodule or Webmodule instruction manuals.

5.3.3.7. SMS-Module

For more detailed information, see SMS-Module instruction manual.

5.3.3.8. Device setup

The device setup serves to adjust the touchscreen operating unit to the actual device model.

The device setup contains both obligatory inputs for proper functioning of the device and optional inputs related to the inbuilt accessories.

In the course of commissioning, the settings in the device setup must be carried out corresponding to the actual device model.

Vessel code [1)]
- Value input according to sticker on the vessel

Upper vessel pressure transmitter/sensor 1 PL1o correction value [1)]
- Value input according to sticker on the upper vessel pressure transmitter

Lower vessel pressure transmitter/sensor 1 PL1u correction value [1)]
- Value input according to sticker on the lower vessel pressure transmitter

Vessel code and correction values with EMCK have been preconfigured at the factory

System pressure transmitter P1 correction value [1)]
- Value input according to sticker on the system pressure transmitter

[1)] Obligatory inputs for proper functioning of the device!

Makeup equipped
- No (Factory setting)
- Yes

Water preparation
- Not equipped (Factory setting)
- MWE6 Water softening
- MWE12 Water softening
- MVE2 Desalination
- MVE4 Desalination
- MVE14 Desalination

Degassing
Depending on the device model, the following settings are possible.

- Not equipped
- Pump degassing
- Valve degassing
- Degassing module

Binary signalling expansion module equipped (only with inbuilt module)
- Not equipped (Factory setting)
- Without remote acknowledge
- With remote acknowledge

Allow remote acknowledgement by binary signalling expansion module
Setting whether with inbuilt MultiControl expansion module "binary signals & remote acknowledge" are allowed.

- No (Factory setting)
- Yes

Analog signalling expansion module equipped (only with inbuilt module)
- No (Factory setting)
- Yes

Sensor T2 equipped
- No (Factory setting)
- Yes

Level L2 equipped [1)]
- No (Factory setting)
- Yes

Upper vessel pressure transmitter/sensor 2 PL2o correction value
- Value input according to sticker on the upper pressure transmitter
(Display only if level L2 activated)

Lower vessel pressure transmitter/sensor 2 PL2u correction value
- Value input according to sticker on the lower pressure transmitter
(Display only if level L2 activated)

Communications accessories
- Not equipped (Factory setting)
- SMS-Module
- ASCII log writer
- Busmodule/Webmodule

External enable contact function of the device
Allows enabling of the device function via the potential free contact (Terminal 82) of an external point (e.g. enabling by control system).

- Not equipped (Factory setting)
- Equipped

External Setpoint (analog input) [1)]
(Only with TopControl)

- Not equipped (Factory setting)
- Equipped

[1)] Simultaneous use of the functions "Level L2" and "External Setpoint" is not possible.

When "Level L2" is active and "External Setpoint" is then activated, "Level L2" is then automatically disabled ("not equipped").
To activate "Level L2" subsequently, "External Setpoint" must be disabled!

External notification input (digital input) (not with EPCK, not with EMCA)
- Not equipped

No function (Factory setting)

- Warning when contact is open

When the potential free contact between digital input (Terminal 83) and AGND is open, the warning "W23: ext.Warning via digital input!" appears.

- Warning when contact is closed (0V)

When the potential free contact between digital input (Terminal 83) and AGND is closed, the warning "W23: ext. Warning via digital input!" appears.

- Error when contact open

When the potential free contact between digital input (Terminal 83) and AGND is open, the error notification "S43: ext. Error via digital input!" appears.

- Error when contact is closed (0V)

When the potential free contact between digital input (Terminal 83) and AGND is closed, the error notification "S43: ext. Error via digital input!" appears.

As with all other notifications, these notifications are also passed on with the potential free notification inputs "Warning" or "Error", or via Busmodule, Webmodule and SMS-Module.

5.3.3.9. General

Date
Allows setting of the date

Time
Allows setting of the time

Time zone
Allows setting of the time zone

Home screen
Option of changing the factory defined home screen on the display and adjusting individually to the system user's requirements.
From a large number of selection options, a total of six (6) display fields can be configured in the home screen.

Arranging the fields is done by moving the positions as follows:
- Keep the display field to be moved pressed.
- After a brief period (ca. 1 sec), this display field is deleted from the original position and can now be moved to the required position
- Releasing the display field fixes it in the new position
- The original position is filled by a subsequent display field

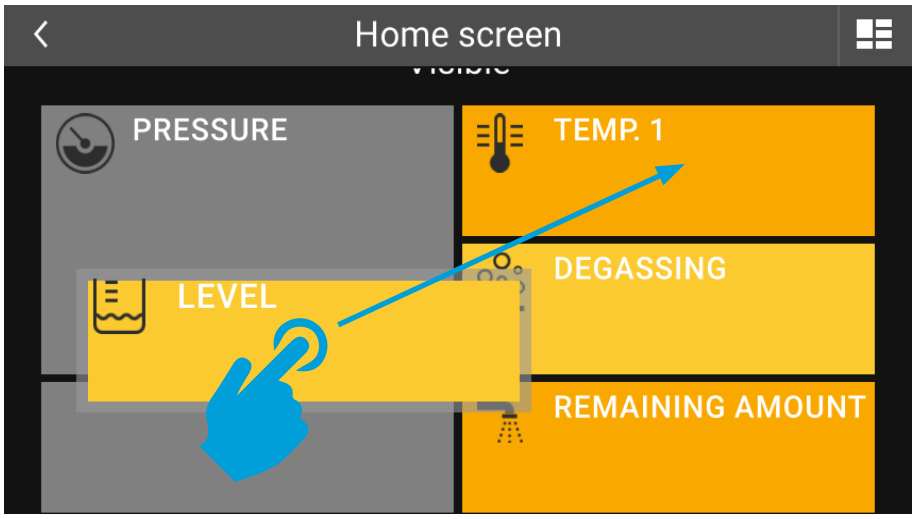


Image 13: Position of display fields in home screen

Changing positions on the main display field (PRESSURE) is not possible!

Display brightness
Option of adjusting display brightness (background lighting).

Screensaver
Option of setting the delay for starting the screensaver.

The screensaver starts automatically when the touchscreen surface is left untouched for this period.

An active screensaver can be seen from a black touchscreen in which the values for Pressure and Level are displayed with running position change.
In the event of an error and/or warning notification, the relevant notification symbol is also displayed. If there are both error and warning notifications, the symbol for the error notification is displayed.

Touching the touchscreen surface terminates the screensaver.

Through setting the delay to "0:00:00 s" the screensaver is disabled.

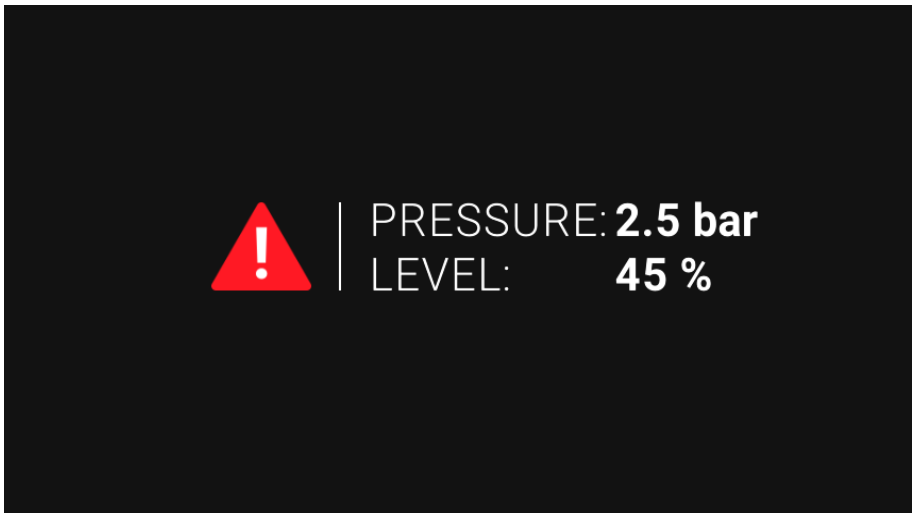


Image 14: Active screensaver with fault or fault and alarm notification

Deactivation of the screensaver may over the years lead to a so-called "Burn-in" of the screen (factory setting = screensaver activated).

5.3.4. Settings level -> Manual mode (override) ->

Manual mode (override) allows the function of the device to be bypassed and individual outputs to be input.

Manual mode (override) is intended for testing and servicing purposes!

Settings carried out in manual mode (override) (e.g. Pump 1 "Manual 1"), remain set until reversed. The manual mode (override) settings are retained even after the power supply has been cut!

Once at least one output has the status in manual mode (override) of Auto "0", the information notification "Manual mode (override) at least one output" is displayed. In addition the notification "All manual modes (overrides) set to auto" is displayed in the menu.

This notification "Manual mode (override) at least 1 output" is automatically acknowledged as soon as all outputs are again in automatic operation (Auto "1").

Warning and error notifications may be activated by setting outputs to manual mode (override), as the automatic function of the device is bypassed!

Note should be taken that consequential damage could occur through manual mode (override)!

Set all overrides to auto
By selecting "All overrides to auto" all outputs are in any case set to automatic.

Outputs
The output displayed in each case can be activated manually for testing or maintenance purposes.
Setting options:

- Auto "1"
Standard setting, state of output is automatic based on the MultiControl function of the device.

- Auto "0"
Output is in manual mode (override). The actual state of the output (On/Off) depends on the settings "Manual" or "Test".

- "Manual"
Switch output on or off permanently

- "Test"
Output can be activated in test operation. Pressing the test button switches the output on; releasing it switches the output off again immediately.

Binary signals
Individual binary signal outputs may be activated manually for testing or maintenance purposes.
Setting options: Auto, Manual, Test.

Analog signals
Individual analog signal outputs may be activated manually for testing or maintenance purposes.

Setting options:

- Auto "1"
Standard setting, state of signal output is automatic based on the MultiControl function of the device.

- Auto "0"
Signal output is in manual mode (override). The actual Signal specification (0…100% ≙ 4 … 20 mA) depends on the setting "Manual".

- "Manual"
Specification of the analog signal output between 0 … 100%. This setting is effective in the setting Auto "0" (0% = 4 mA, 100% = 20 mA).

5.3.5. Settings level -> System ->

Open-Source Licences
The touchscreen operating unit uses open-source software components among others. The relevant licences can be viewed here.

5.4. Time programs

Time programs allow entering of enable times for the relevant function (e.g. degassing clearance only at the times required).

The menu item "Time program" allows time programs to be configured, with in each case up to three blocks that can be allocated to one or more than one weekday.

The on and off clearance switching times are defined in the individual blocks.

The enable times entered into a time program defined by the user will be displayed by colour-coded status bars. The days or the defined blocks on which these enable times apply are also displayed in colour.

Setting up further time programs (Time program 2, Time program 3, …) can be done until enable times have been assigned for all the days of the week.

Setting up a time program:

- Open time program settings menu (e.g. Menu -> Settings -> Degassing -> Time program).

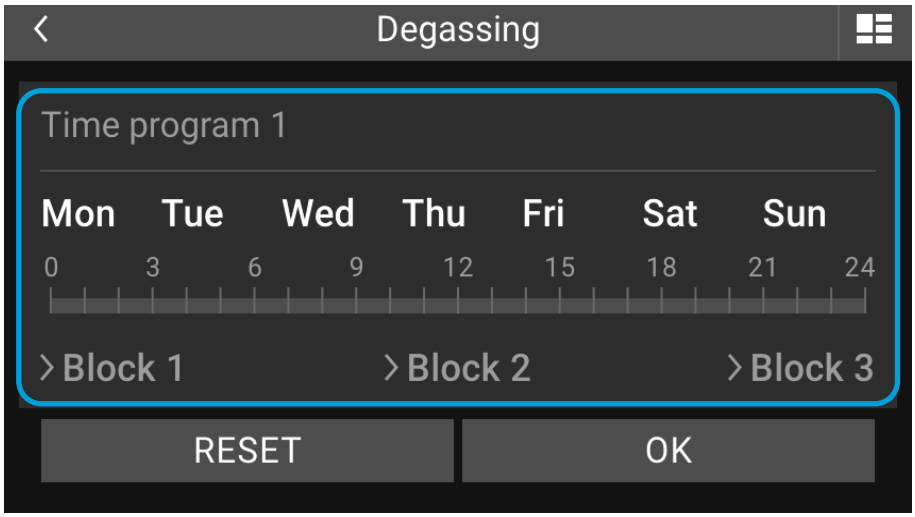


Image 15: Time program setting menu

- Select day(s) (e.g. Mon, Tue, etc.)
  selected days will be recorded in colour

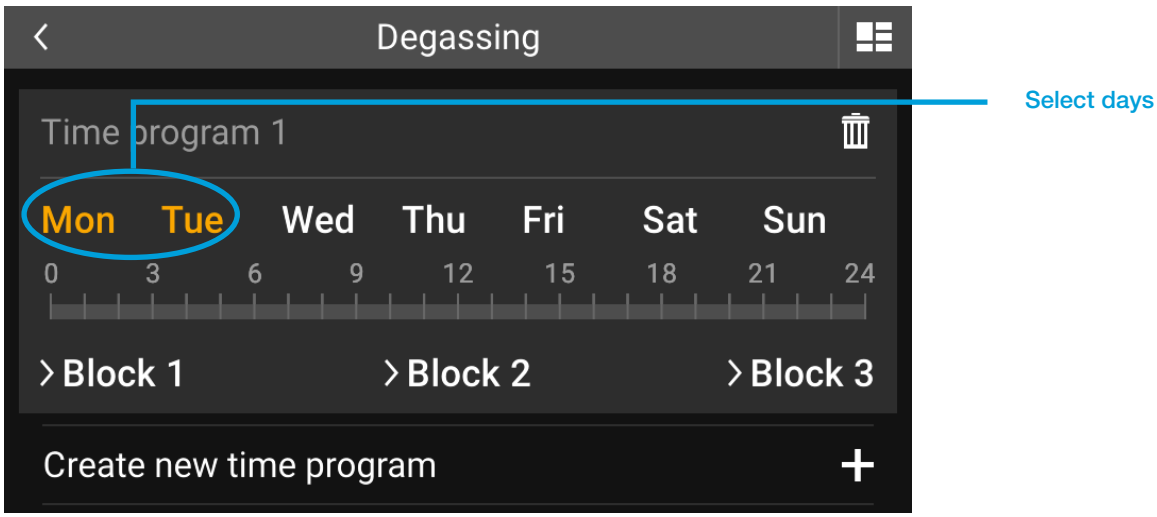


Image 16: Select day(s) for the time program

- Setting blocks (Block 1, Block 2, Block 3)
  Select the block to be created by keying in (e.g. Block 1).

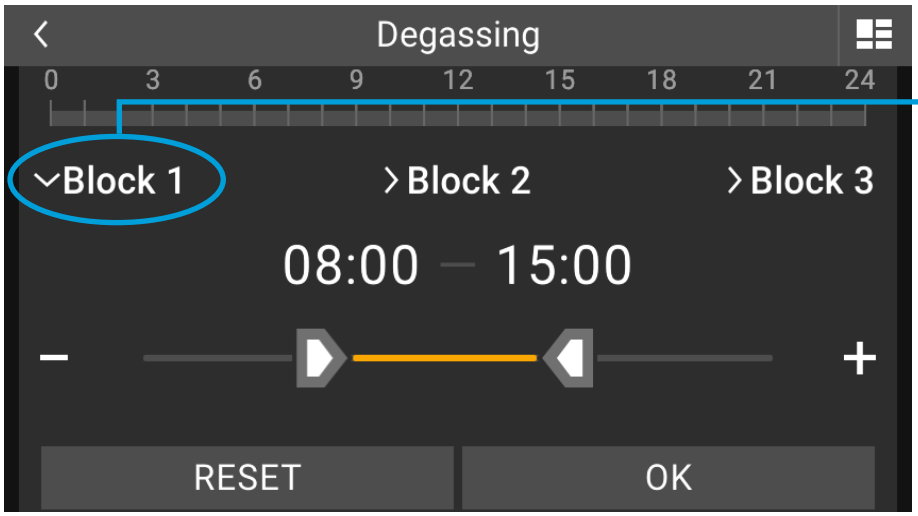


Image 17: Set up time program blocks

- The enable times of this block can now be set roughly by moving the slider for preselected days. Fine adjustment of the time is done by tapping the buttons "-" or "+".

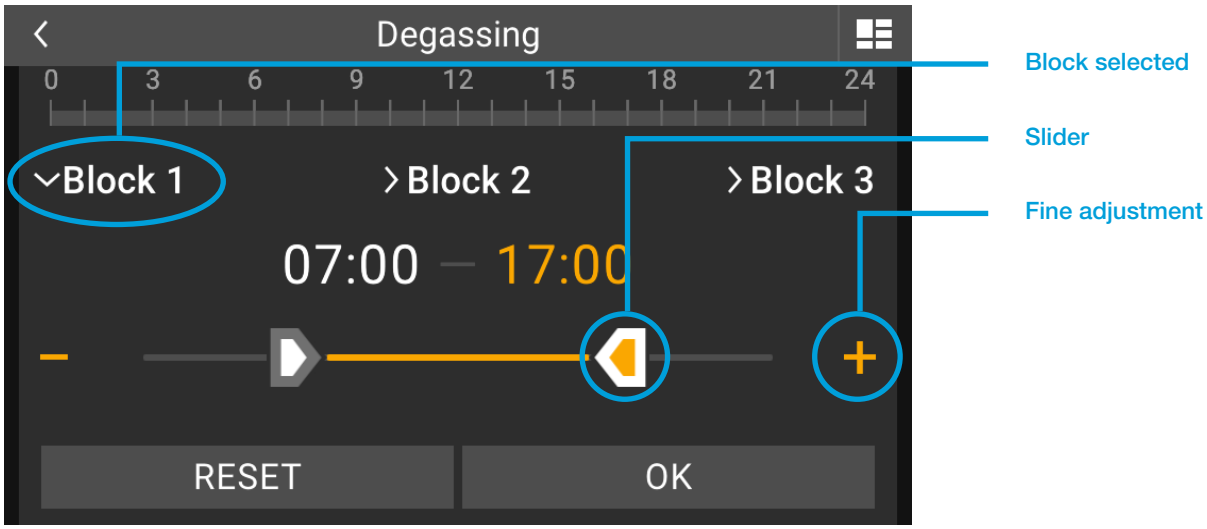


Image 18: Set up time program blocks

Tapping the time opens a window for entering the time directly.

- Confirm the time entries by "OK".
  If more than one time block is needed for the preselected days, blocks 2 and 3 can be defined where necessary.

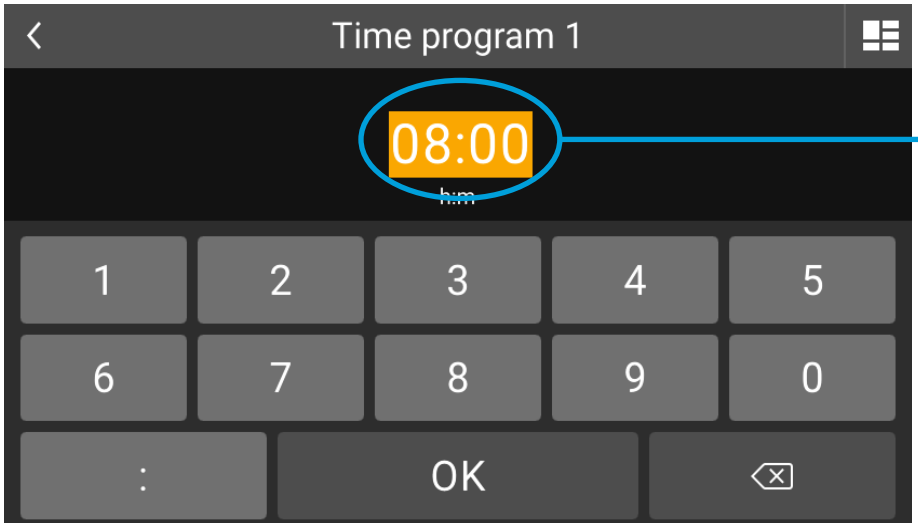


Image 19: Enter times for time program

- Setting up further time programs in the time program menu is done by tapping "Configure another time program +". This allows different enable times depending on the day.

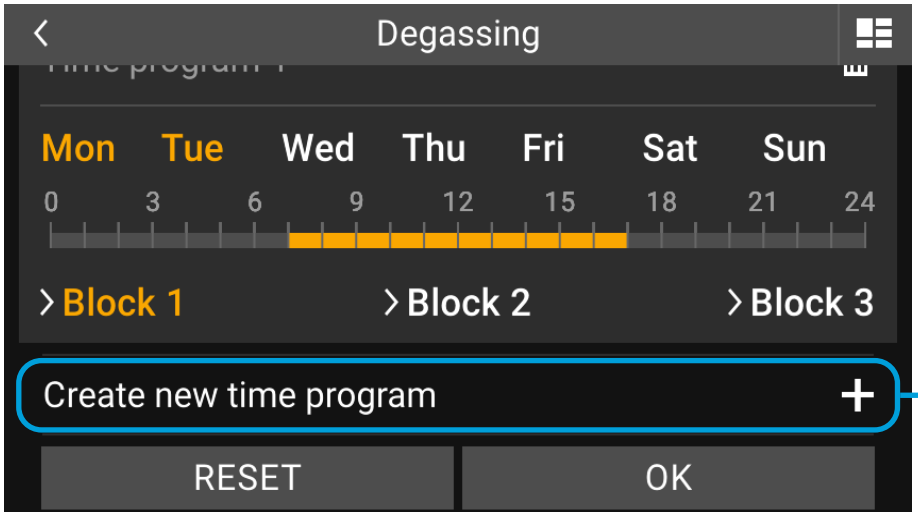


Image 20: Set up another time program

Days for which a time program has already been set up are blanked. All other days are still available for setting up new time programs.

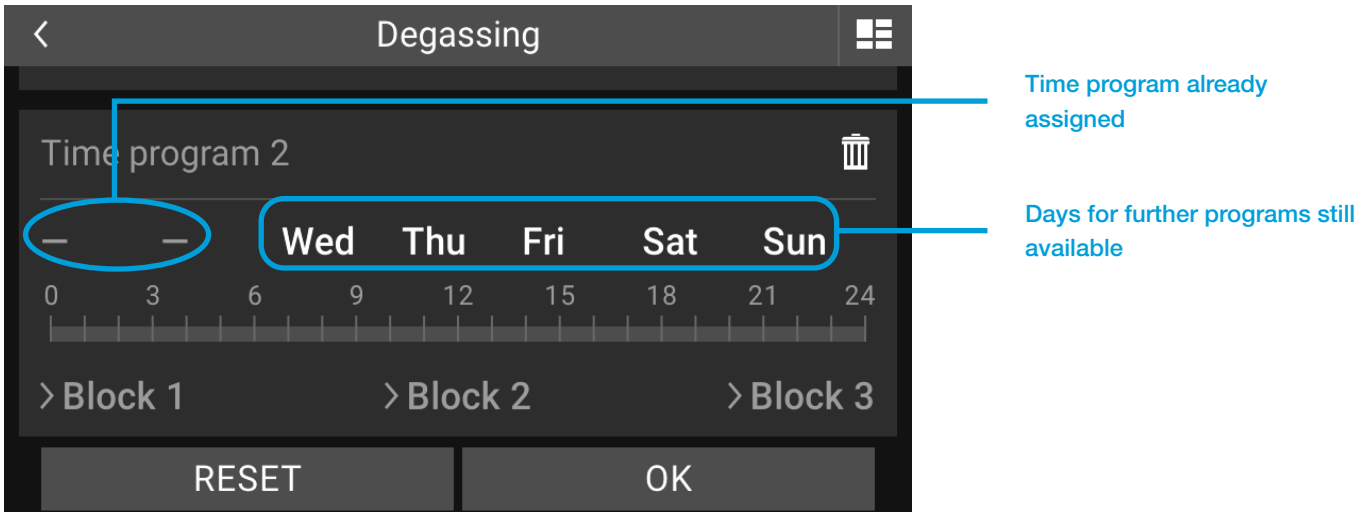


Image 21: Times available for the time program

- All time program settings are confirmed with "OK"

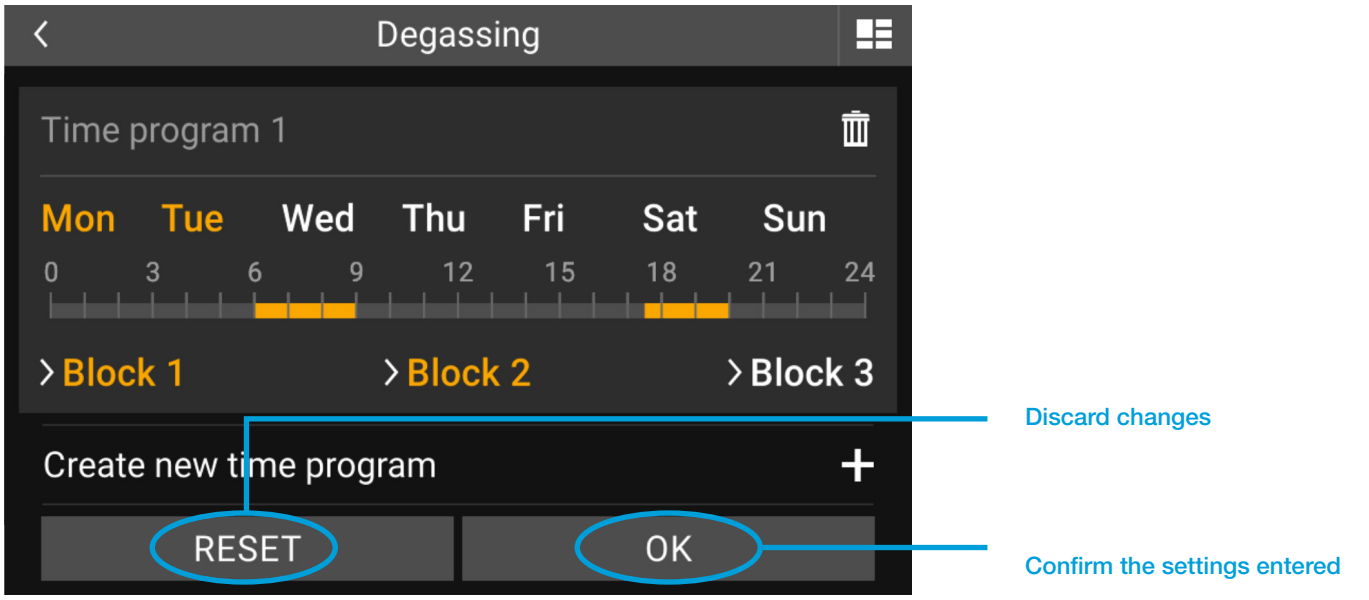


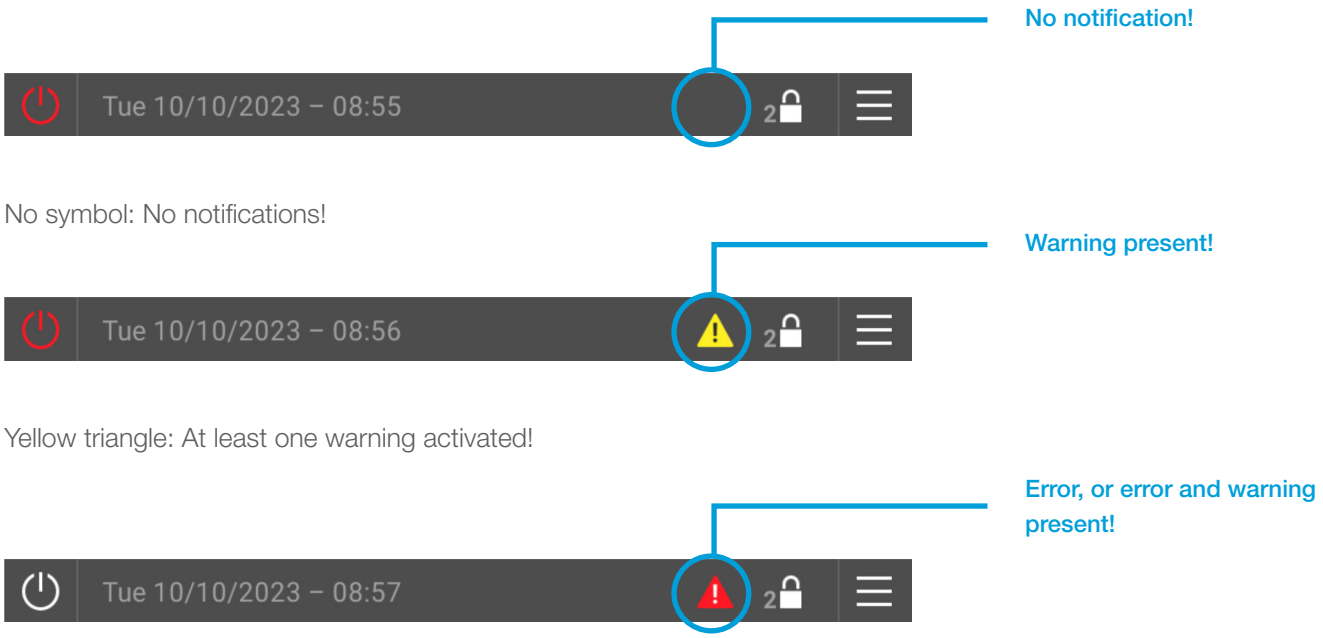
Image 22: Apply time program settings

"RESET" discards all changes implemented since the relevant window was opened.

6. WARNING AND ERROR NOTIFICATIONS

Once at least one warning and/or error notification has been activated, this is displayed in the system bar as device status.

Device status:



No symbol: No notifications!

Yellow triangle: At least one warning activated!

Red triangle: At least one error notification activated! One or more warnings may be activated in addition.

Only the triangle with the higher priority is displayed: Error ahead of warning.

6.1. Event log

Tapping the device status symbols opens the window "Warning and error notifications".
All current warning and error notifications are listed there in the event log.

If there are no warning and/or error notifications, the event log cannot be called up!

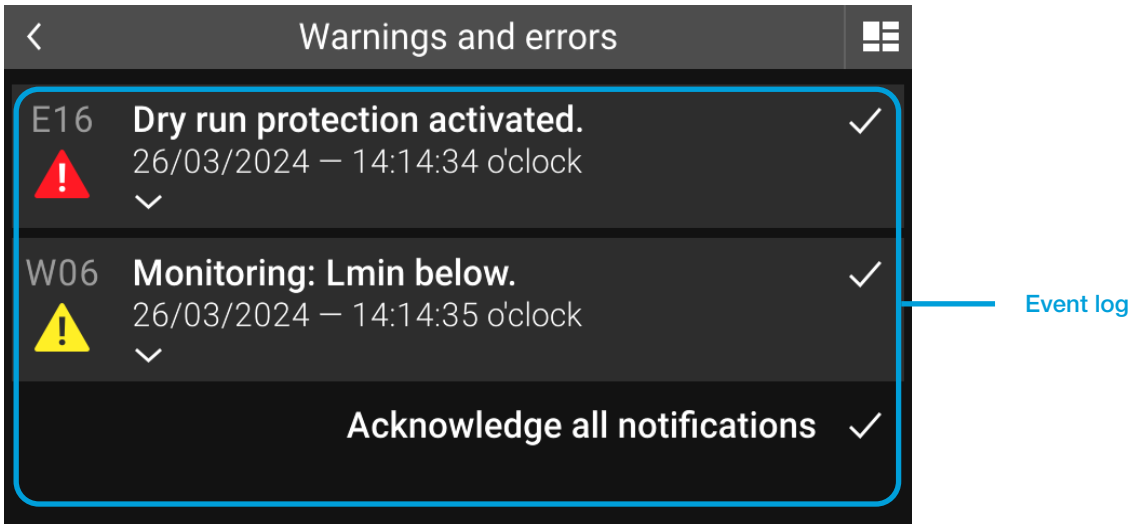


Image 23: Event log

Listing the notifications occurs after the time they are activated. This is part of the notification and is displayed along with the date and time. New notifications are always listed on top, irrespective of whether they are error or warning.

Every notification in the event log contains:
- Notification number (e.g. E16, W06, etc.)
- Symbol (yellow or red triangle with exclamation mark)
- Notification text (e.g. Dry run protection activated!)
- Activation point – date and time
- Tick on acknowledgement of this notification

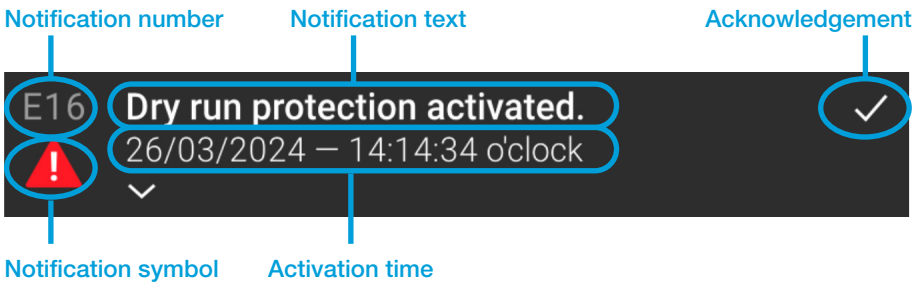


Image 24: Individual notifications in the event log

6.2. Notifications in detail

Tapping on a notification in the event log opens up the detailed view of the relevant notification. Detailed information on the notification is displayed there, along with options for rectifying the error.

Clicking on the notification leads to the detailed view of this notification closing.

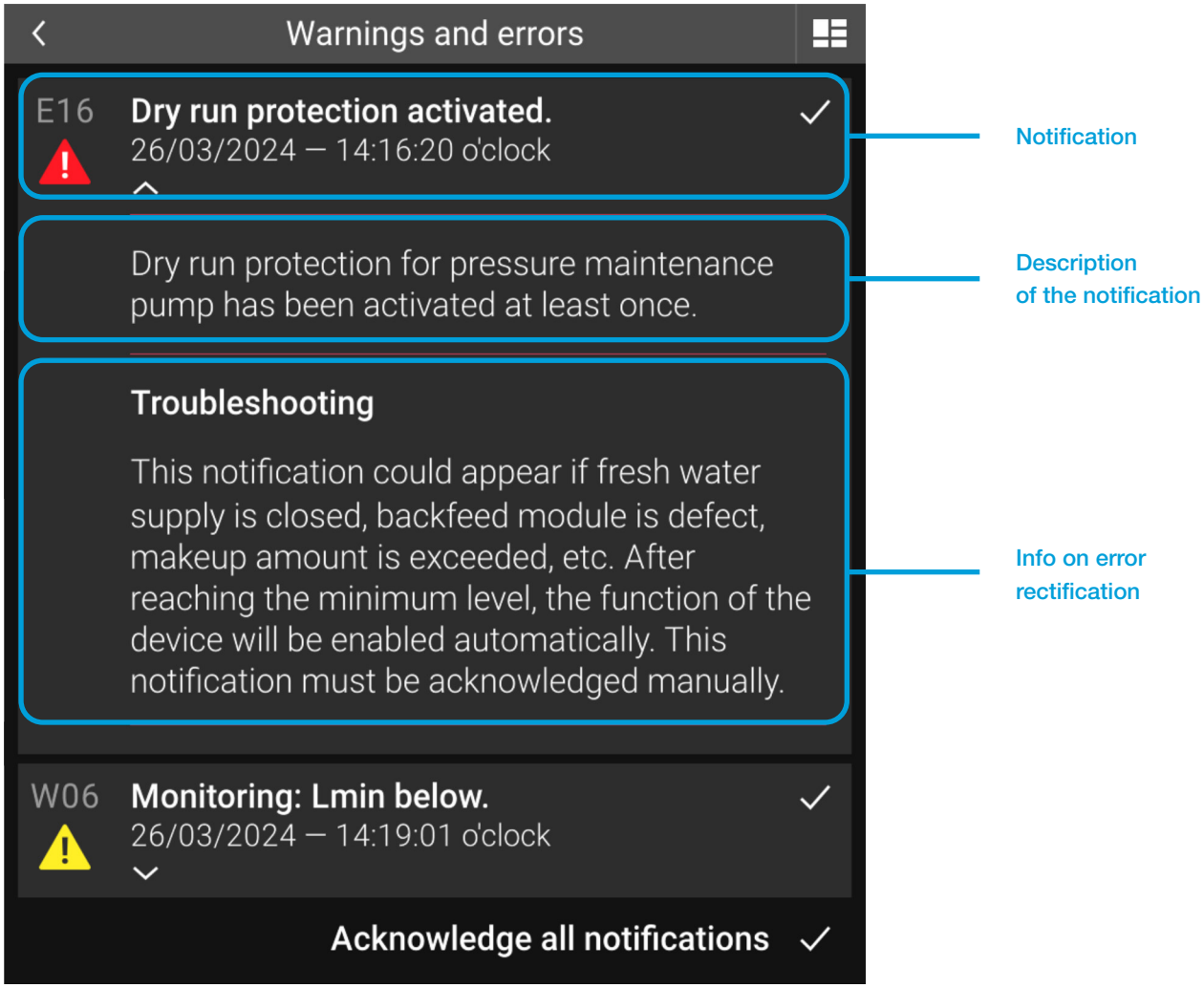


Image 25: Detailed view of a notification

6.3. Acknowledging (deleting) notifications

Tapping the button with the tick in a notification leads to acknowledgement of precisely this notification (Acknowledge = Delete/Reset).
If the cause of the error is not rectified before the acknowledgement, the notification will reappear after a brief delay.

All current notifications can be acknowledged simultaneously with the "Acknowledge all notifications" button. This button is displayed when more than one notification is open.

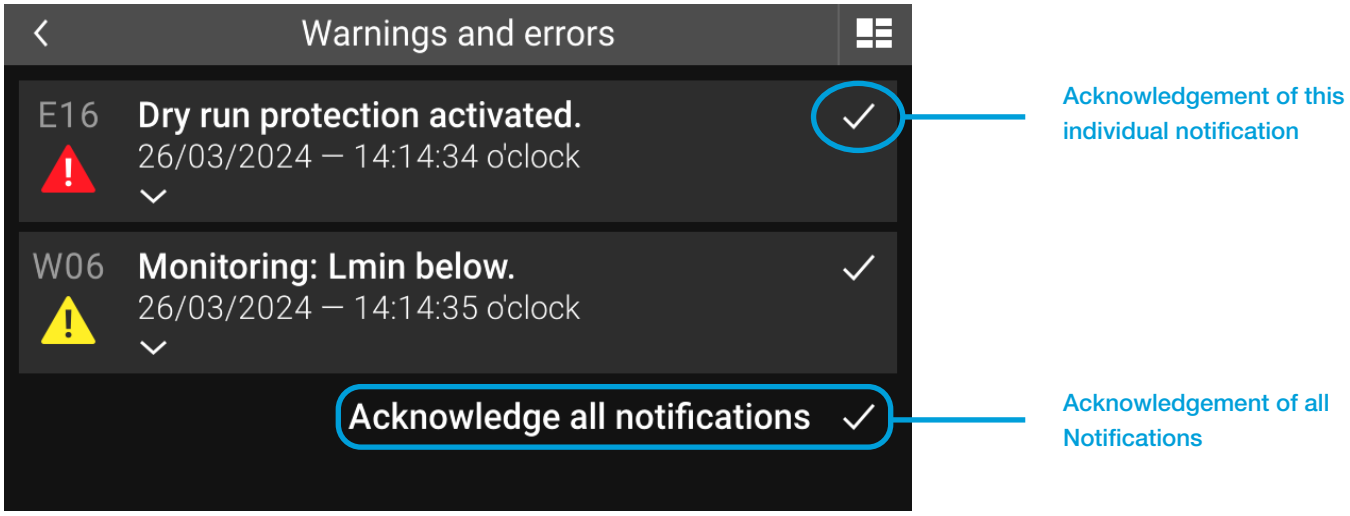


Image 26: Acknowledging notifications

⚠ Acknowledgement of warning and error notifications without prior rectification of the error may cause damage.

6.4. Warnings

Warnings indicate that something should be noticed and investigated soon. With warnings, normal operation of the system remains assured, but failure to act within the foreseeable future is likely to result in problems and function failures arising.

6.4.1. Warning notification list

NO	NOTIFICATION	DESCRIPTION	RECTIFICATION/ TROUBLESHOOTING
W01	Water preparation remaining capacity ≤20%.	The water preparation cartridge has capacity of 20% or less remaining. No makeup can occur once this is used up.	Provide spare cartridge in time and change it at latest if the old capacity is completely used.
W02	Manual mode at least 1 output.	At least one output is not set to "Auto".	This notification is automatically acknowledged after setting all overrides to "Auto". For this use settings level, manual mode (override) to switch individual outputs over.
W03	Perform periodic maintenance.	This notification is activated after 2500 operating hours of the pressure maintenance pump. It indicates a necessary maintenance.	Arrange maintenance according to instruction manual, then acknowledge the notification.
W04	Temperature limit T1 above.	Maximum temperature at sensor T1 has been exceeded. Degassing is disabled as long as the temperature is too high. After this it will be enabled again.	Repeated exceedances of the limit of temperature T1 indicate that temperatures at the point of connection are too high! On site tasks could be necessary (EV cooling vessels etc.) to avoid damages of the device (defective components, membrane, etc.).

W05	Monitoring: Lmax above.	Built-in monitoring has been activated: The configured maximum vessel level has been exceeded.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W06	Monitoring: Lmin below.	Built-in monitoring has been activated: The vessel water level has fallen below the set minimum level.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W07	Monitoring: P1max above.	Built-in monitoring has been activated: The configured maximum system pressure has been exceeded.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W08	Monitoring: P1min below.	Built-in monitoring has been activated: The system pressure has fallen below the set minimum value.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W09	Monitoring: T1max above.	Built-in monitoring has been activated: The configured maximum temperature T1 has been exceeded.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W10	Monitoring: T1min below.	Built-in monitoring has been activated: The temperature at T1 has fallen below the set minimum value.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W11	Time changed due to daylight-saving.	The time has been changed due to daylight-saving.	Check time and date before acknowledging this notification.
W12	Underpressure in vessel 1 (PL1o).	Low-pressure has been detected in vessel 1 (upper transmitter of level measurement L1). Thus, pumps have been disabled.	Pumps get enabled again, if pressure is in allowed range. Notification must be acknowledged. First, check if the hose to the outside of the membrane is clear.
W13	Temperature limit T2 above.	Maximum temperature at sensor T2 has been exceeded. Degassing is disabled as long as the temperature is too high. After this it will be enabled again.	This notification is purely advisory. Degassing is disabled while temperature T2 is too high, but otherwise, the system will operate normally.
W14	Monitoring: T2max above.	Built-in monitoring has been activated: The configured maximum temperature T2 has been exceeded.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.
W15	Monitoring: T2min below.	Built-in monitoring has been activated: The temperature at T2 has fallen below the set minimum value.	This notification is purely advisory and does not affect the function of the device. Check configured limit value where necessary.

W16	Makeup remaining amount ≤20%.	The remaining amount for makeup is at 20% or less.	This notification is purely advisory and does not affect the function of the device. Check if water consumption is within the usual range of the system. Only if consumption is ok, reset the amount so that the full amount is available again.
W18	Underpressure in vessel 2 (PL1o).	Low pressure is detected at the upper pressure transmitter in the expansion vessel with level measurement L2 and the pumps have been disabled.	Pumps get enabled again, if pressure is in allowed range. Notification must be acknowledged. First, check if the hose to the outside of the membrane is clear.
W19	SMS-Module: No network.	The SMS-Module has no reception and cannot register in the network.	Check if the GSM Antenna is mounted correctly. - temporary network failure, try again later - temporary poor reception at the point where the antenna is mounted.
W21	Temperature T1 below blocking temperature.	The temperature at T1 has fallen below the minimum set value. Degassing is disabled while the temperature remains too low. Once increased by the correct margin, degassing will be enabled again.	Repeated occurrences of falling below the limit of temperature T1 indicate that temperatures at the point of connection are too low! On site tasks could be necessary (EV cooling vessels etc.) to avoid damages of the device (defective components, membrane, etc.).
W22	Temperature T2 below blocking temperature.	The temperature at T2 has fallen below the minimum set value. Degassing is disabled while the temperature remains too low. Once increased by the correct margin, degassing will be enabled again.	This notification is purely advisory. Degassing is disabled while temperature T2 is too low, but otherwise, the system will operate normally.
W23	External warning via digital input.	Warning is activated according to the setting of the digital input in device set-up. "Warning: Contact open": Potential-free contact between terminal 83 and AGND is open. "Warning: Contact closed": Potential-free contact between terminal 83 and AGND is closed.	Check the current (switching) status and function of the device connected to the digital input. - Check the electrical wiring between terminal 83 and AGND.

6.5. Error notifications

If error notifications are open, faultless operation of the system is no longer assured. The error must be rectified immediately!
In the event of failure to act, this may lead to damage to the device itself, and to the entire system!

6.5.1. Error notification list

NO	NOTIFICATION	DESCRIPTION	RECTIFICATION/TROUBLE-SHOOTING
E00	Device is disabled.	Device has been disabled by pressing the manual clearance button (ON/OFF) and confirming the request.	The notification is automatically acknowledged after enabling the device by pressing the manual clearance button (ON/OFF). First, check the reason for the deactivation and if an enabling is possible again.
E01	Data link error to basic circuit Board.	Communication between the touchscreen operating unit and the basic circuit board failed.	Basic circuit board: The yellow LED indicates operation of the basic circuit board and must blink continuously. The green LED indicates data transfer and must flash irregularly or at least once every second. Check connections. Otherwise, the touchscreen operating unit or basic circuit board is damaged.
E02	Pump 1 start failed.	Device control enabled the output (A_PHASE_0) for pump 1, but the feedback signal for the pump motor (DI_0) did not arrive in time.	- integrated motor temperature switch Z1/Z2 has been activated (after cooling down pump can restart if necessary) - Cable disconnected or damaged - faulty contact - Defective output A_PHASE_0 - Defective input DI_0.
E03	Pump 1 stop failed.	Device control disabled the output (A_PHASE_0) for pump 1, but the feedback signal for the pump motor (DI_0) did not cease in time.	- faulty contact - Defective output A_PHASE_0 - Defective input DI_0.
E04	Read error basic circuit board (I^2C).	Internal communication on the basic circuit board at the I2C Bus has failed.	- Acknowledge this notification. If it reappears, the basic circuit board is defective.
E05	Pump 1 maximum run-time exceeded.	When pump 1 starts, a timeout is started, during which the pump must be able to increase the system pressure to the point where the pump stops. If the timeout elapses, this notification is activated and the pump is disabled.	- Check if a permanent decrease of system pressure occurs - Configuration of the upper working pressure has been changed without using the pressure settings function of the control electronics. Check pressure settings and confirm message.

E06	Too many pump requests per period.	When the system pressure falls below the lower working pressure, a pump is requested to start. The number of pump requests per interval is monitored. When the upper limit is exceeded, this notification is activated and the pumps are disabled.	- Check if a permanent decrease of system pressure occurs - Check-valve of pump is defective - Overflow valve defective - Configuration of the upper working pressure has been changed without using the pressure settings function (insufficient working pressure difference).
E07	Write error basic circuit board (I2C).	Internal communication on the basic circuit board at the I2C Bus has failed.	- Acknowledge this notification. If it reappears, the basic circuit board is defective.
E08	Temperature sensor T1 short circuit.	The resistance of the sensor is too low and falls below the valid range.	- Sensor connection is short-circuited or damaged - Sensor element is defective.
E09	Temperature sensor T1 disconnected.	The resistance of the sensor is too high and exceeds the valid range.	Incorrect connection of the sensor at the control electronics. Sensor connection is broken or damaged. Sensor element defective.
E10	Transmitter P1 measured signal too high.	Measurement signal of pressure transmitter P1 (system pressure) is above the normal valid range.	- Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
E11	Transmitter P1 measured signal too low.	Measurement signal of pressure transmitter P1 (system pressure) is below the normal valid range.	- Pressure transmitter is disconnected - Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
E12	Transmitter PL1o measured signal too high.	Measurement signal of pressure transmitter PL1o (vessel pressure top) is above the normal valid range.	- Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
E13	Transmitter PL1o measured signal too low.	Measurement signal of pressure transmitter PL1o (vessel pressure top) is below the normal valid range.	- Pressure transmitter is disconnected - Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective
E14	Transmitter PL1u measured signal too high.	Measurement signal of pressure transmitter PL1u (vessel pressure bottom) is above the normal valid range.	- Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.

E15	Transmitter PL1u measured signal too low.	Measurement signal of pressure transmitter PL1u (vessel pressure bottom) is below the normal valid range.	- Pressure transmitter is disconnected - Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
E16	Dry run protection activated.	Dry run protection for pressure maintenance pump has been activated at least once.	This notification could appear if fresh water supply is closed, backfeed module is defective, makeup amount is exceeded, etc. After reaching the minimum level, the function of the device will be enabled automatically. This notification must be acknowledged manually.
E18	Write error I^2C module: Analog signalling expansion module.	The internal I^2C bus communication between the basic circuit board and the analog signalling expansion module failed.	- Analog signalling expansion module is enabled while it is actually not installed: Fix configuration. - Cable is disconnected or damaged - Expansion module: Power supply is disconnected - Expansion module is defective.
E19	Read error I^2C module: Binary signalling expansion module.	The internal I^2C bus communication between the basic circuit board and the binary signalling expansion module failed.	- Binary signalling expansion module is enabled while it is actually not installed: Fix configuration. - Cable is disconnected or damaged - Expansion module: Power supply is disconnected - Expansion module is defective.
E20	Write error I^2C module: Binary signalling expansion module.	The internal I^2C bus communication between the basic circuit board and the binary signalling expansion module failed.	- Binary signalling expansion module is enabled while it is actually not installed: Fix configuration. - Cable is disconnected or damaged - Expansion module: Power supply is disconnected - Expansion module is defective.
E21	Temperature sensor T2 short circuit.	The resistance of the sensor is too low and falls below the valid range.	- Sensor connection is short-circuited or damaged - Sensor element is defective.
E22	Temperature sensor T2 disconnected.	The resistance of the sensor is too high and exceeds the valid range.	- Incorrect connection of the sensor at the control electronics - Sensor connection is broken or damaged - Sensor element defective - Sensor T2 has been activated while it is not installed.

E23	Pump 2 start failed.	Device control enabled the output (A_PHASE_1) for pump 2, but the feedback signal for the pump motor (DI_1) did not arrive in time.	- integrated motor temperature switch Z1/Z2 has been activated (after cooling down pump can restart if necessary) - Cable disconnected or damaged - faulty contact - defective output A_PHASE_1 - defective input DI_1.
E24	Pump 2 stop failed.	Device control disabled the output (A_PHASE_1) for pump 2, but the feedback signal for the pump motor (DI_1) did not cease in time.	- faulty contact - defective output A_PHASE_1 - defective input DI_1.
E25	Pump 2 maximum run-time exceeded.	When pump 2 starts, a timeout is started, during which the pump must be able to increase the system pressure to the point where the pump stops. If the timeout elapses, this notification is activated and the pump is disabled.	- Check if a permanent decrease of system pressure occurs - Configuration of the upper working pressure has been changed without using the pressure settings function of the control electronics. Check pressure settings and confirm message.
E26	Makeup amount exceeded.	The set maximum makeup (refill) amount has been reached, so makeup has been disabled.	Check if water consumption is within the usual range of the system, or if an extraordinary event happened (leakage, etc.). Only if consumption is ok, reset the amount so that the full amount is available again and makeup is possible.
E27	Maximum makeup duration exceeded.	When makeup starts, a timeout is started, during which makeup must be able to increase the vessel level to the point where makeup stops. If the timeout elapses, this notification is activated.	- No or too little makeup water supply pressure - Shutoff valve of makeup is closed - Makeup valve does not open: damaged or disconnected - Basic circuit board damaged - Vessel level measurement doesn't work correctly.
E28	Transmitter PL2o measured signal too high.	Measurement signal of pressure transmitter PL2o (vessel pressure top) is above the normal valid range.	- Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
E30	Transmitter PL2o measured signal too low.	Measurement signal of pressure transmitter PL2o (vessel pressure top) is below the normal valid range.	- Pressure transmitter is disconnected - Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.

E31	Transmitter PL2u measured signal too high.	Measurement signal of pressure transmitter PL2u (vessel pressure bottom) is above the normal valid range.	- Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
S32	Transmitter PL2u measured signal too low.	Measurement signal of pressure transmitter PL2o (vessel pressure bottom) is below the normal valid range.	- Pressure transmitter is disconnected - Connection from pressure transmitter incorrect or damaged - Pressure transmitter defective - Measurement input of basic circuit board defective.
E33	SMS-Module: No response.	The connection between the SMS-Module and the touchscreen operating unit is broken.	- Check the cable - Unplug and replug the power supply of the GSM terminal.
E34	SMS-Module: Wrong PIN.	The entered PIN does not match the PIN of the inserted SIM card.	SIM locked after 3 wrong attempts. The SIM can be unlocked by inserting it into a phone and entering the PUK.
E35	SMS-Module: SIM Error.	- Funds depleted, - SIM card defective, - no SIM card in GSM terminal - Carrier disabled SIM card Incoming call interfered with sending.	- For prepaid SIM: Check funds - Try different SIM card, - Check if SIM card is inserted properly.
E36	Pump 1 malfunction.	No signal "Ready" received from variable frequency drive of pump 1.	- Cable is disconnected or damaged - no power supply at Pump 1 - Error at variable frequency drive of pump 1 (red control lamp is illuminated).
E37	Pump 2 malfunction.	No signal "Ready" received from variable frequency drive of pump 2.	- Cable is disconnected or damaged - no power supply at Pump 2 - Error at variable frequency drive of pump 2 (red control lamp is illuminated).
E40	External setpoint measured signal too low.	Measurement signal of the external setpoint is below the normal valid range.	- Signal of the external setpoint is too small (<4 mA) - Connection cable (e.g. from superordinate control system) is incorrect or damaged - Measurement input of basic circuit board defective.
E41	External setpoint measured signal too high.	Measurement signal of the external setpoint is above the normal valid range.	- Signal of the external setpoint is too high (>20 mA) - Measurement input of basic circuit board defective.

E43	External error via digital input.	Error is activated according to the setting of the digital input in device set-up. "Error: Contact open": Potential-free contact between terminal 83 and AGND is open. "Error: Contact closed": Potential-free contact between terminal 83 and AGND is closed.	- Check the current (switching) status and function of the device connected to the digital input. - Check the electrical wiring between terminal 83 and AGND.
E51	Replace water preparation cartridge.	The capacity of the water preparation cartridge is depleted. Refilling is disabled because proper water preparation is not ensured anymore.	Replace water preparation cartridge and confirm it in the "Actions" menu, so makeup is enabled again.

7. CLEANING AND MAINTENANCE

7.1. Cleaning the touchscreen operating unit

For cleaning the touchscreens, switching off the electrical power is recommended. Otherwise, the touchscreen will react to contact, and an unwanted operation may be activated as a result.

Never use solvents, scouring agents or scouring pads to clean the touchscreen. These may lead to damage to the touchscreen surface!

Use a soft cloth to clean that can be slightly moistened with water or a mild cleaning agent. The cleaning agent should be sprayed onto the cloth and not directly onto the surface.

Do not apply water directly or spray with liquid agents!

7.2. Changing the battery

At the rear of the touchscreen operating unit there is a battery under the protective cover for buffering the real time clock – see Illustration 2: Touchscreen operating unit - rear view.

This battery provides power to the clock inside when the device is disconnected, so that the time and date continue to update.

A battery is faulty if the date and time are not properly updated when the touchscreen operating unit is switched off and then on again.

None of the device settings are affected by a faulty or discharged battery, they remain permanently saved even when switched off. Changing the battery, battery type needed: CR2032 button cell

Do not use force! Installing the battery incorrectly, replacing the battery with a different type or failure to observe polarity can lead to destruction of the battery or the touchscreen operating unit.

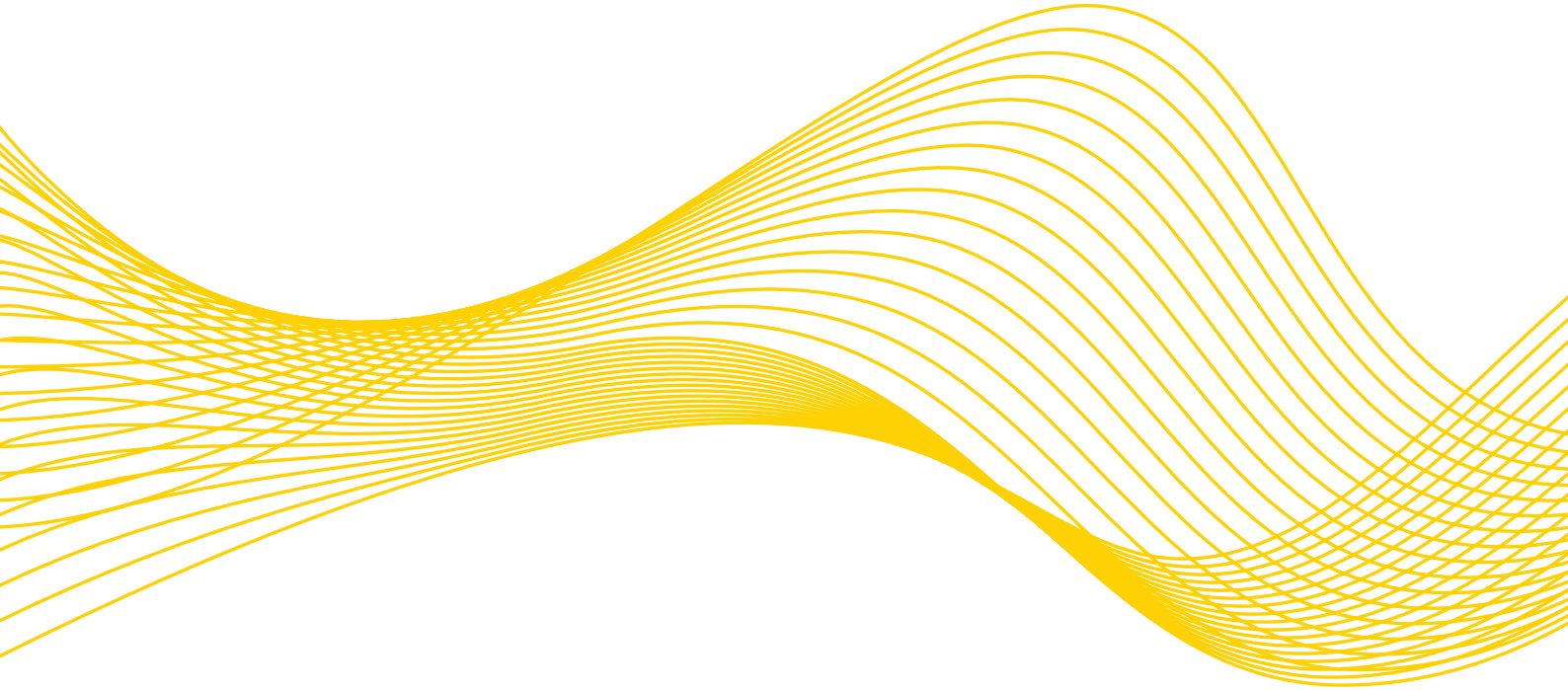
Removing and installing the battery is possible only by removing the protective cover. The device must be switched off before removing the protective cover.

When removing the battery take care that it is levered out on the side opposite the pole clamps. When inserting the battery, first slide it under the pole clamps and then press in completely (applies only when poll clamps are present).

Replace the protective cover after inserting the new battery and supply the device with power once more. The date and time will have in any event to be adjusted after changing the battery.

NOTES

MAXIMISING PERFORMANCE FOR YOU



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