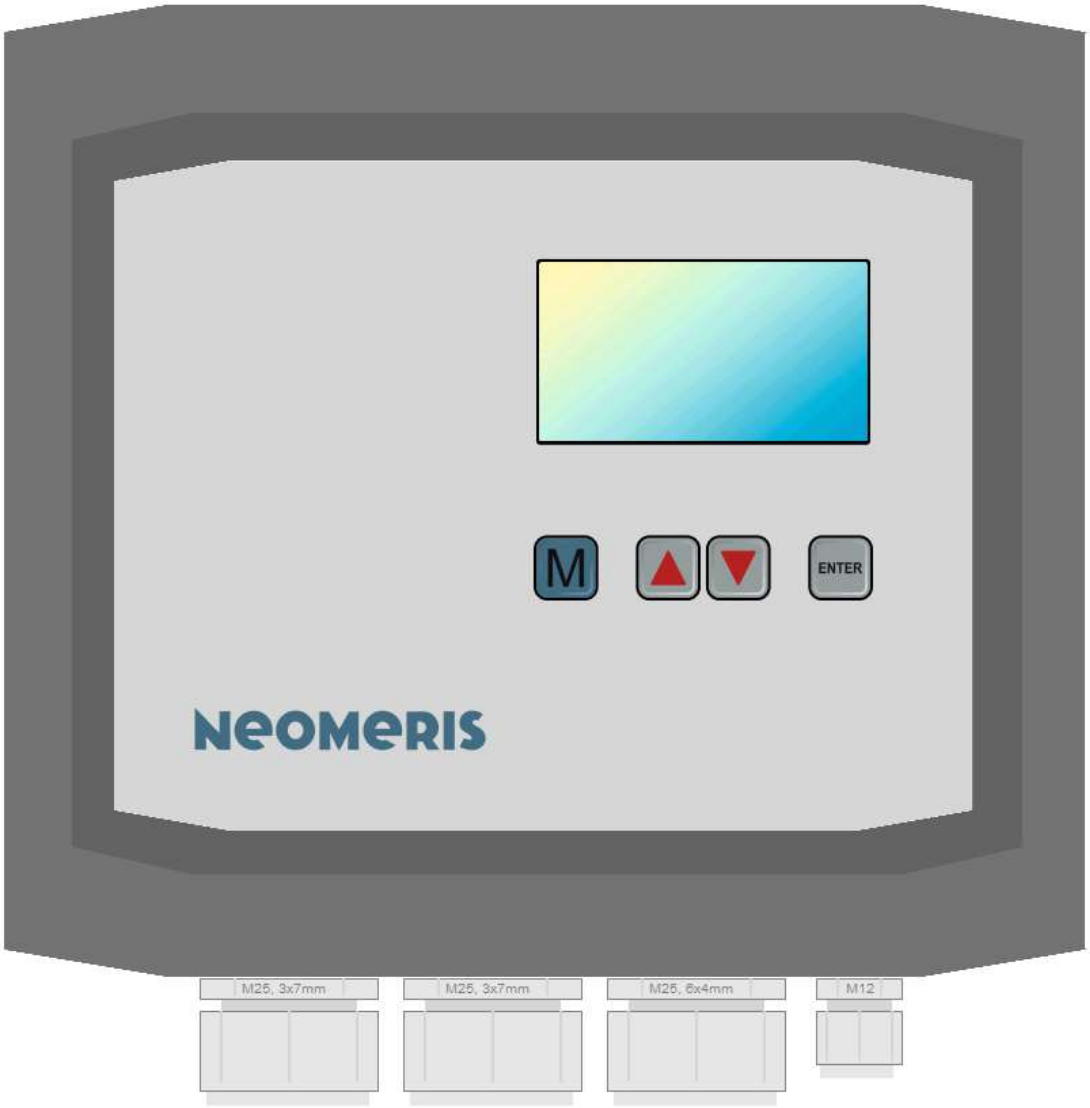

NEOMERIS CONTROL DES
Bleed off process

Version 1.12

Manual

Contact:

If you have questions or problems, please contact:

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This manual relates to the following control unit / version:

Devide type	NEOMERIS CONTROL DES
Device category	Bleed off process

Device ersion	1.12

Build:20220331-171353-9873335NSt

Inhalt

1 Important safety information

- As a basic requirement, staff must be familiar with the basic **meaning** of safety notes and safety instructions to ensure safe handling and fault-free operation of this system.
- The operating manual contains important instructions for safely operating the system. Please read the complete operating instructions carefully prior to working with the device.
- Ensure that the operating instructions are accessible to all users at all times.
- Always include these operating instructions when handing the device to third parties.
- Everyone working on the system needs to observe this operation manual, in particular the section on safety notes. This applies to the company responsible for installation as well as to the system owner.

1.1 Hazards during system handling

This system has been built according to the state of the art and to accepted technical safety rules. Nevertheless, its use may pose a hazard to life and limb of the user or of third parties and may also cause damage to the system and other property. Only use the system

- for its intended purpose and
- if all of its safety equipment is in perfect working order.

Immediately remove any faults that may impact safety. This is the responsibility of the owner themselves or of a company commissioned by the owner.

1.2 Duties of the owner

The owner is obligated to ensure that all people working on the system

- are familiar with the basic occupational safety and accident prevention regulations and have been instructed in the handling of the system,
- have read and understood the section on safety and the warnings described in this operation manual and confirmed this with their signature, and
- have their performance in terms of safety checked regularly.

The owner themselves are responsible for complying with this obligation.

1.3 Duties of the staff

Everyone commissioned to perform work on the system or who performs work on it independently, is obligated to do the following prior to starting any work:

- Read the section on safety and the warnings described in this operation manual and confirm with their signature that they have understood this.
- Observe the basic occupational safety and accident prevention regulations.

1.4 Staff qualifications

Installing and starting up the system requires basic electrical and process knowledge as well as knowledge of the associated technical terms. This is why only specialists or trained staff under the direction and supervision of a specialist are allowed to install and start up the system.

- Clearly define the responsibilities of staff concerning installation, start-up, operation, maintenance, and repair of the system.
- A specialist is someone who, based on their qualified training, knowledge and experience of their knowledge of relevant regulations, is able to assess the tasks they have to perform, to recognise potential hazards, and to take adequate protective measures. A specialist is required to comply with the relevant technical rules.
- Staff in training may only work on the system whilst under the supervision of experienced staff.

1.5 Warnings in this manual

This manual includes warnings preceding prompts for action where there may be a hazard of bodily harm or material damage. The structure of warnings is as follows:

- The signal word "**HAZARD**" is used to indicate an imminent danger. Failing to avoid it will result in serious injury or even death.

- The signal word "**WARNING**" is used to indicate a potential danger. Failing to avoid it may result in serious injury, harmful health effects, or even death.

- The signal word "**CAUTION**" is used to indicate a potentially dangerous situation. Failing to avoid it may result in moderate or mild bodily harm or material damage.

- The signal word "**NOTE**" is used to indicate important information about intended use. Failing to comply with this information may impair or disrupt the machine's operation or its surroundings.

2 Notes and instructions to be observed

2.1 General notes

- Observe the regulations for accident prevention as well as the safety regulations for operating electrical devices and systems, and for environmental protection in the country of use and at the installation site.
- Observe the country-specific and location-dependent regulations for installation and start-up.
- Make sure to protect the device against moisture and humidity. Keep the device away from splashing water and condensation by any means.
- Make no changes and manipulations to the device beyond the handling described in this manual, or else the warranty will expire.

2.2 During installation

- Always disconnect the relevant system component from the mains before installing or connecting and/or disconnecting the device to the mains. Secure the system against unauthorised re-start.
- Only connect the device to a mains voltage as specified on the rating plate.
- Follow the specifications and the ambient parameters.
- The device needs a fault-free and stable supply voltage. If necessary, use a line filter to keep interference voltage, which may get into the line from, e.g., solenoid valves or large motors, away from the control system.
- Never lay the connection lines parallel to the mains cable.

2.3 During operation

- Place the system in a location that allows easy access to the operating and control elements at any time. Floor, ceiling, and walls need to be flat and clean.
- Ensure that the control outputs stay below the maximum admissible rating.
- In case of malfunctions switch the device off immediately and notify the service personnel. Never attempt to repair the device. This will cause the warranty to expire. Only authorised qualified service personnel are allowed to perform repairs.

2.4 During cleaning

- Use only a dry, lint-free cloth.

2.5 During disposal

- Follow local guidelines in your country when disposing of the device.

2.6 Safeguards

- Ensure that all of the system's safeguards have been fitted properly and are in working condition prior to switching it on.
- Never remove safeguards prior to switching off the machine and without securing it against re-start.
- The owner needs to provide the operating staff with the required personal protective equipment (PPE), and the operating staff have to use it when working on the system.
- The owner or a company commissioned by them needs to check all the existing safeguards regularly.

2.7 Informal safety measures by the owner

- Always keep the operating manual near the machine's site of use.
- In addition to the operating manual, provide and observe generally applicable and local regulations on accident prevention and environmental protection.
- Always make sure that all of the safety and hazard notes on the system and the labels on operating and control elements are legible.

2.8 Safety measures during normal operation

- Never operate the system if not all of the safeguards are fully functional.
- Prior to switching on the machine ensure that it poses no danger to anyone during start-up.
- Check the system at least once every shift for visible external damage to the safeguards.

2.9 Hazards from electrical energy

- Only authorised electrical experts are allowed to perform work on electrical supplies.
- Regularly check the electrical equipment of the system. Immediately remove loose connections and braised cables.
- Always keep the system closed. Only authorised staff are allowed access to the system.
- Involve a second individual, who may actuate the main circuit breaker in an emergency, if tasks need to be performed on live parts.

2.10 Hazards from hydraulic energy

- Depressurise the sections of the system and the pressure lines to be opened before starting any repair work.
- Regularly inspect fittings and piping.

2.11 Intended use

Only use the device for measuring, controlling, and regulating blowdown systems in open cooling circuits and in humidifiers.

Any other use or any use beyond the intended purpose is considered unintended. The manufacturer/supplier assumes no liability for damage resulting from such use.

Intended use also includes:

- Observing all of the instructions provided in this operation manual and
- Adhering to the specified inspections and maintenance intervals.

2.12 Unconventional use

The statements as per Item 2.11 apply.

Any other use as well as any use outside of the specifications is considered unintended.

2.13 Structural modifications to the controller / system

- Modifications, extensions, or remodelling to/off the controller / system require the consent of the manufacturer / supplier.
- Any remodelling measures require the written consent of the manufacturer / supplier.
- Immediately replace system parts that are not in perfect condition and only use original spare parts.
- Externally sourced parts lack the guarantee that they have been designed and manufactured in line with function, wear, and safety requirements.

2.14 Warranty and liability

Bodily harm and material damage as well as damage to the system itself are excluded from warranty and liability claims if they can be traced back to one or more of the following causes:

- Incorrect use of the system.
- Improper installation, start-up, operation, and maintenance of the system.
- Operation of the system with defective or improperly attached or non-functioning safety devices and safeguards.
- Failure to observe the notes in the operation manual with regard to transport, storage, installation, start-up, operation, and maintenance of the system.
- Unauthorised structural modifications to the system.
- Unauthorised changes to the control parameters.
- Poor monitoring of system parts prone to wear and tear.
- Improperly executed repair work.
- Failure to keep, or incompletely kept, maintenance logs.
- Disaster situations caused by foreign objects or force majeure.

Our General Terms and Conditions apply.

2.15 Copyright

3 Delivery scope

The controller is supplied with the cable glands specified below and a user manual.

3.1 Unpacking and checking the delivery

NOTE Check the system for transport damage after unpacking it.

In order to secure your claims in case of transport damage, please note the following:

1. Immediately inspect goods for damage!
2. Ensure claims against third parties: Call on shipping companies, railway operators, postal services, lorry companies, other carriers, hauliers, stockists, customs and port authorities to inspect the damage together! Have them accept their liability in writing, specifically:
   a. In case of visible external damage - prior to accepting the goods.
   b. In case of invisible external damage - promptly following detection (stop unpacking) but no later than within the following time limits:
      I. Postal services: 24 hours
      II. Hauliers: 6 days after acceptance
      III. Shipping companies: 3 days after unloading
      IV. Other carriers: 1 week after delivery
3. Promptly involve the claims agent named on the insurance document or policy.

NOTE Should you realise that parts are defective or missing, please contact your supplier within 7 days.

3.2 Component list

The control unit consists of the following components in the given quantity. Quantity numbers putted in parantheses are sub components, that are already included in other components.

Identifier	Comp.-Id	Quant.	Type / Usage	Notes
Complete System	Base	1	Base System	
Cable 10 Pins, no 3V3	Bus Cable	1	Connection Cable	Ribbon Cable
CPU / Display	CPU-Board/-Unit	(1)	CPU-Board/-Unit	
Housing	Housing	(1)	Housing	
Cable Gland	M12	(1)	Gland	M12
Cable Gland	M25, 3x7mm	(1)	Gland	M25, 3x7mm
Cable Gland	M25, 6x4mm	(1)	Gland	M25, 3x7mm
Cable Gland	M25, 6x4mm	(1)	Gland	M25, 6x4mm
Mounting plate for board	Patchboard	(1)	Patch Board	
Supply Board	eB0	(1)	Power-Brick	mounted on patch board/rail enclosure
Relay Board	eB1	1	I/O-Brick	mounted on patch board/rail enclosure
LF/Temp Board	eB2	1	I/O-Brick	mounted on patch board/rail enclosure

3.3 Sensors and Accessories

For proper operation the following additional components might be required (e.g. sensors, cable sets etc.).

Identifier	**EV220B, 018F6701**
Type / Usage	Solenoid Valve
Quant.	0/1
Details / Picture	Adaption via 2-wire: Pin 1, Pin 2
Adaption	Pin 1 => eB1.9 Pin 2 => eB1.11
Item Number	Danfoss
Identifier	**VCZAP1000, VC4012**
Type / Usage	Solenoid Valve
Quant.	0/1
Details / Picture	Adaption via Molex-Connector: Pin 2 (N) Pin 3 (L, permanent supply) Pin 6 (L, control input)
Adaption	Pin 2 => eB1.9 Pin 3 => eB0.5 Pin 6 => eB1.11
Item Number	Honeywell

Identifier	**STE5/PT100 EG**
Type / Usage	Cond. Probe (conductive)
Quant.	0/1
Details / Picture	K=0.5 with PT100, stainless steel V4A, 1.4571, integral thread 3/4", without cable, Range of application: 0...2000µS/cm, max. 130°C
Adaption	
Required accessories	cable (customer-supplied)
Item Number	310126
Identifier	**Neomeris Select conductivity sensor with C= 1.0; PT100**
Type / Usage	Cond. Probe (conductive)
Quant.	0/1
Details / Picture	C=1.0 Graphite electrodes w. temperature sensor PT100; CPVC; for installation in T-piece, Range of application: 0...5000µS/cm, max. 60°C
Adaption	
Required accessories	Connection cable 3m (890827)/ 6m (890828); T-piece 1" with 3/4" female thr. NPT (890821)
Item Number	890817
Identifier	**Neomeris Select conductivity sensor with C= 0.1; PT100**
Type / Usage	Cond. Probe (conductive)
Quant.	0/1
Details / Picture	C= 0.1 Graphite electrodes w. temperature sensor PT100; CPVC; for installation in T-piece, Range of application: 0...500µS/cm, max. 60°C
Adaption	
Required accessories	Connection cable 3m (890827)/ 6m (890828); T-piece 1.5" with 1" female thr. NPT (890861)
Item Number	890826

4 Specifications

4.1 General characteristics

4.1.1 Housing

The control unit is placed in the following housing:

Type	**Bocard 160 high, gray/light gray**
Producer	Bopla GmbH
Size / Dimensions	199mm x 179mm x 106,5mm (WxDxH)
Protection Class	IP65
Material	ABS
Weight	approx. 750g

4.1.2 Operation panel/User-Interface

The control unit has the following display and operating components:

Display Type	**Graphic Display**
Display Size	2.8 Inch
Display Resolution	128x64 Pixel, monochrome
Backlight	colored backlight (RGB-LED)
Operation Elements	4 foil keys
Options	

4.1.3 Power Supply (injected from external)

The control unit requires the following electrical supply from external:

Description	**Main Supply form external**
Information	
Voltage	100 ... 240V AC
max. Current	5A AC
Inactive Current	30mA AC
Frequency	50 ... 60Hz
Remark	external Fuse: max. 10A

4.1.4 Power Supply (provided to external)

The control unit provides the following electrical supply (for example to the sensor / actuator supply):

Description	**Supply sourcing 230V AC for externals**

Information	
Voltage	like incoming main supply
max. Current	5A AC
max. Power	nom. 1100VA
Remark	reduced wit inductive load
Description	**Supply sourcing 24V DC for externals**
Information	
Voltage	24V DC
max. Current	600mA DC
max. Power	15W
Remark	

4.1.5 Digital Inputs

The control unit has the following digital inputs / switch inputs:

Identifier	**DosProp.1 Tank empty**
Information	
Type	Input for ext. isolated contact, npn-switching against GND
Low Volt.	> 1MOhm
High Volt.	< 100Ohm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal
Identifier	**System enable**
Information	
Type	Input for ext. isolated contact, npn-switching against GND
Low Volt.	> 1MOhm
High Volt.	< 100Ohm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal
Identifier	**TimeDosing Tank empty**
Information	
Type	Input for ext. isolated contact, npn-switching against GND
Low Volt.	> 1MOhm
High Volt.	< 100Ohm
Input Current	< 5mA @ 24V
Component	-
Remark	Input is supplied internal

4.1.6 Digital Outputs

The control unit has the following digital outputs / switching outputs:

Identifier	**Alarm signal**
Information	Alarm signal
Type	Relay, change over contact, isolated

max. Switching Volt.	250V AC
max. Switching Cur.	5A AC, Contact 6A
max. Perm. Current	3A AC
nom. Cycles	see datasheet
Component	FTR, LYCA024V
Remark	-
Identifier	**Bleed off valve**
Information	Bleed off valve
Type	Relay, change over contact, power switching
max. Switching Volt.	250V AC
max. Switching Cur.	8A AC, contact 10A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Takamisawa, JS24N-K
Remark	with snubber
Identifier	**Circulation Pump**
Information	Circulation Pump
Type	Relay, normally open contact, power switching
max. Switching Volt.	250V AC
max. Switching Cur.	10A AC, Contact 16A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Schrack, RT33L024
Remark	with snubber
Identifier	**Dosing Pump**
Information	Dosing Pump
Type	Puls Output open connector
max. Switching Volt.	< 24V DC
max. Switching Cur.	< 5mA DC
max. Perm. Current	< 5mA DC
nom. Cycles	< 100 Imp./s
Component	-
Remark	-
Identifier	**Dosing Valve**
Information	Dosing Valve
Type	Relay, change over contact, isolated
max. Switching Volt.	250V AC
max. Switching Cur.	8A AC, contact 10A
max. Perm. Current	5A AC
nom. Cycles	see datasheet
Component	Takamisawa, JS24N-K
Remark	with snubber
Identifier	**Operating Signal**
Information	Operating Signal
Type	Relay, change over contact, isolated
max. Switching Volt.	250V AC
max. Switching Cur.	5A AC, Contact 6A
max. Perm. Current	3A AC
nom. Cycles	see datasheet
Component	FTR, LYCA024V
Remark	-

4.1.7 Analog Inputs

The control unit has the following analogue inputs / measuring inputs:

Identifier	**Cond. Probe (conductive)**
Information	
Type	Conductivity, conductive sensor
Range	0 ... 5000µS/cm
Input Resistance	-
Resolution	0.2%
Accuracy	2%
Linearity	1%
Filter	Tau = 1s
Linearization	Temperature compensation 2.2%/K
Model / Type	for cell constant K=0.01 ... 10
Remark	-
Identifier	**Cond. Probe (inductive)**
Information	
Type	Current Input
Range	0 ... 20mA, 2/3-wire
Input Resistance	175 Ohm
Resolution	10Bit
Accuracy	0.5%
Linearity	0.2%
Filter	-
Linearization	-
Model / Type	-
Remark	-
Identifier	**Temperature Sensor**
Information	Temperature input, PT100, 0...100°C
Type	Temperature input, PT100, 0...100°C
Range	0 ... 50°C
Input Resistance	-
Resolution	0.1%
Accuracy	2%
Linearity	1%
Filter	Tau = 1s
Linearization	-
Model / Type	PT100
Remark	-
Identifier	**unused**
Information	
Type	Power measuring
Range	0 ... 500A
Input Resistance	-
Resolution	0.5%
Accuracy	2%
Linearity	1%
Filter	-
Linearization	-
Model / Type	ind. transformer
Remark	4% ripple

4.1.8 Analog Outputs

The control unit has the following analog outputs:

Identifier	**Get conductivity in mA**
Information	
Type	Current Output
Range	0 ... 20mA
Input Resistance	> 12V (under Load = 600 Ohm)
max. Current	25mA
Filter	1st order, fcut off = approx. 2Hz
Component	-
Remark	

4.1.9 Pulse and Counting Inputs

The control unit has the following pulse inputs / counter inputs:

Identifier	**Flow meter**
Information	
Type	Impuls/Digital input, universal 2/3 wire
Threshold	0.6 / 1V
Input Circuit	n-switching
Sensitivity	rising slope
Gate Time (Frequ.Mode)	10ms ... 65s
Resolution (Per.Mode)	1 ... 50ms
Filter	hardware, 1st order, fcut off = approx. 1.5kHz
Component	-
Remark	-

4.1.10 Environmental Conditions

The control unit works under the following environmental conditions or requires them for correct operation:

Ambient Temp. Operation	rel. humidity	Vibration	Shock Load	Anbient Temp, Storage
0 ... 40°C	15 .. 80% (n. condens)	-	-	-10 ... 50°C

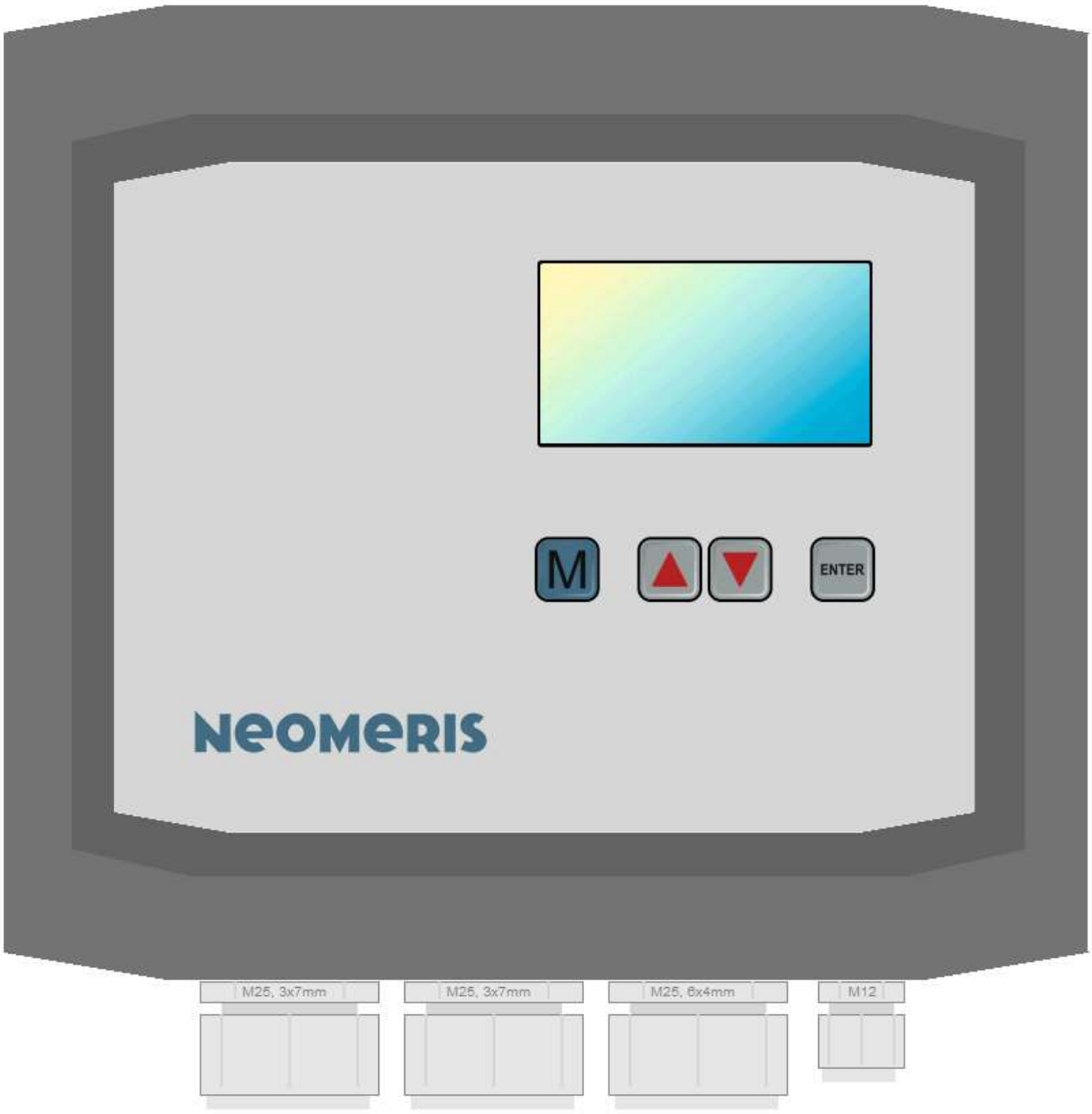
4.2 Standards and Regulations

The control unit complies with the following standards / specifications / qualifications:

Type	Standard	Specification
EC Declaration of Conformity	CE-Mark	conform
EMC Directive	EMV 2014/30/EG	conform
Low Voltage Directive	2014/35/EG	conform
Standard	EN 61000-6-2	applied
Standard	EN 61000-6-4	applied
Standard	EN ISO 12100-1	applied
Standard	EN ISO 12100-2	applied

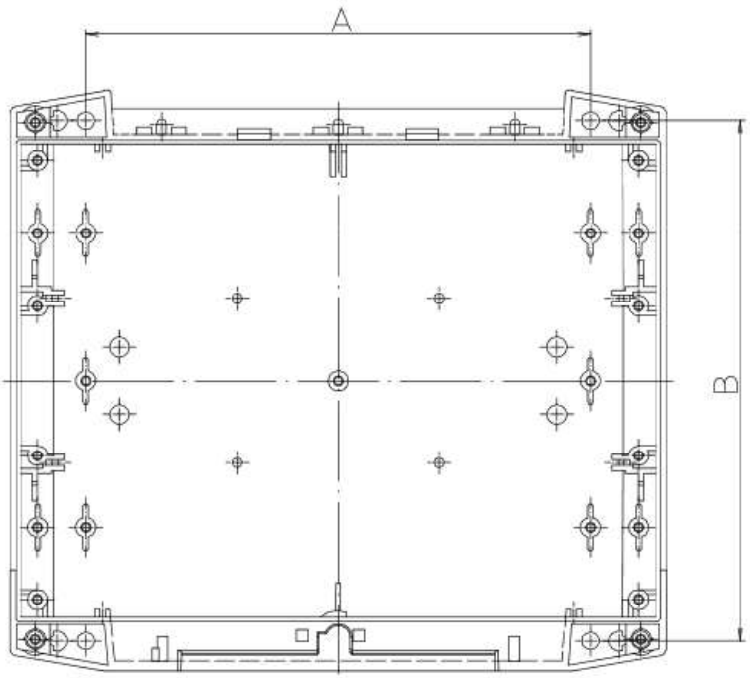
4.3 Views and dimensional drawings

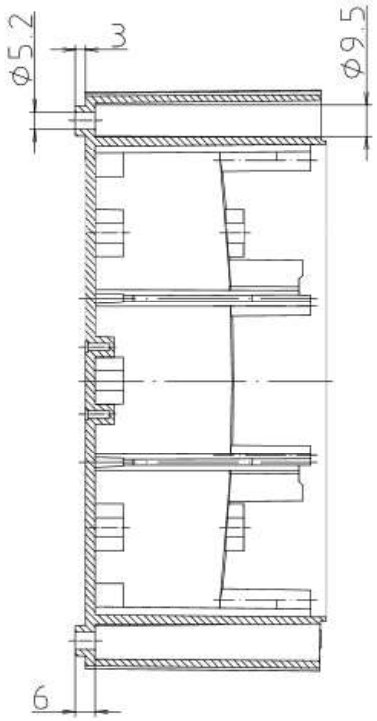
4.3.1 Front film layout



4.3.2 Housing Bottom and Drill Pattern

For mounting use the following pattern (measurements see marked line below)





	A	B
● BCD 160	150	155
BCD 200	180	180
BCD 250	215	210

5 Installation

5.1 Preparing for installation

NOTE

For setup and installation, please refer to the existing plans and drawings as in chapter 4 "Specifications."

WARNING

We recommend interconnecting alerts with the control room. Ignoring or failing to acknowledge the fault over a longer period of time may lead to severe damage to the system or even a complete production downtime.

5.1.1 Setup location

Ensure that the setup location is frost-free and sufficiently ventilated, well lit and clean.

CAUTION

Condensation in the controller may ruin it!

5.1.2 Setup area

Ensure that the wall space is flat. Place the controller in a well-lit and easily accessible place so that operating and display elements are easily visible and accessible.

CAUTION

Do not place the controller on surfaces with high vibration (e.g., cooling tower walls). This may damage the electronic system!

5.1.3 Power supply

Ideally, connect the controller to a power supply with a 6A (10A max.) fuse. We recommend protecting the in-house mains installation from lightning. In any case, it is necessary to protect the power supply from lightning.

5.1.4 Cabling

NOTE

It is not admissible to use the same cable for measuring lines (or control signals) and mains supply, even if there is a sufficient number of unused wires!

NOTE

Hazard of damage or disruptions from electro-magnetic fields!

- Installing the device or the connection lines parallel to the mains cable or near strong electro-magnetic fields may damage the device or cause disruptions during measurement.

- It is imperative to ensure that the measuring and control lines are installed at a maximum distance to power cables. This will prevent undesirable irradiation. Keep connection lines as short as possible.
- Lay connection lines well away from the mains cable.
- Connect the device to the protective earth (in case of 230/115V AC).
- Shield the device from strong electro-magnetic fields.

5.2 Installation process

The IP 65 protection class is only guaranteed if lid and cable screw connections are closed.

5.2.1 Installing the controller

Proceed as follows for attaching the controller on a vertical surface:

- Drill four holes according to the drill pattern.
- Fully open the housing.
- Insert top screws into the top gap between housing and wall and tighten almost all the way.
- Insert bottom screws into the bottom gap between housing and wall and tighten them, plus the top screws, all the way.
- Close housing lid.

5.2.2 Installation of measuring probes

NOTE

The measuring fitting / probe must be installed in such a way that it is not possible for the dirt to dry out on the electrode surfaces, even when the system is switched off.

5.3 Cabling

Injury hazard from live installation!

If you fail to switch off the power supply prior to installation, you risk injuring yourself, ruining the product, or damaging system components.

Observe the following prior to working on the electrical equipment and prior to commencing conversions, maintenance, servicing, and similar tasks:

1. Switch off the main switch of the master system and secure it against re-start (e.g. by locking it).
2. Attach a clearly visible sign prohibiting anyone from switching on the machine, including the following information:
   a. Do not switch on! Work is being performed!"

b. Working location
c. Date
d. Name of party responsible

3. For connection purposes, exclusively use tested lines with sufficient line cross-sections.

A qualified electrician complying with VDE and EVU installation guidelines and company standards is required for performing electrical installations.

Notes on terminal assignment can be found in chapter 5.4.4.

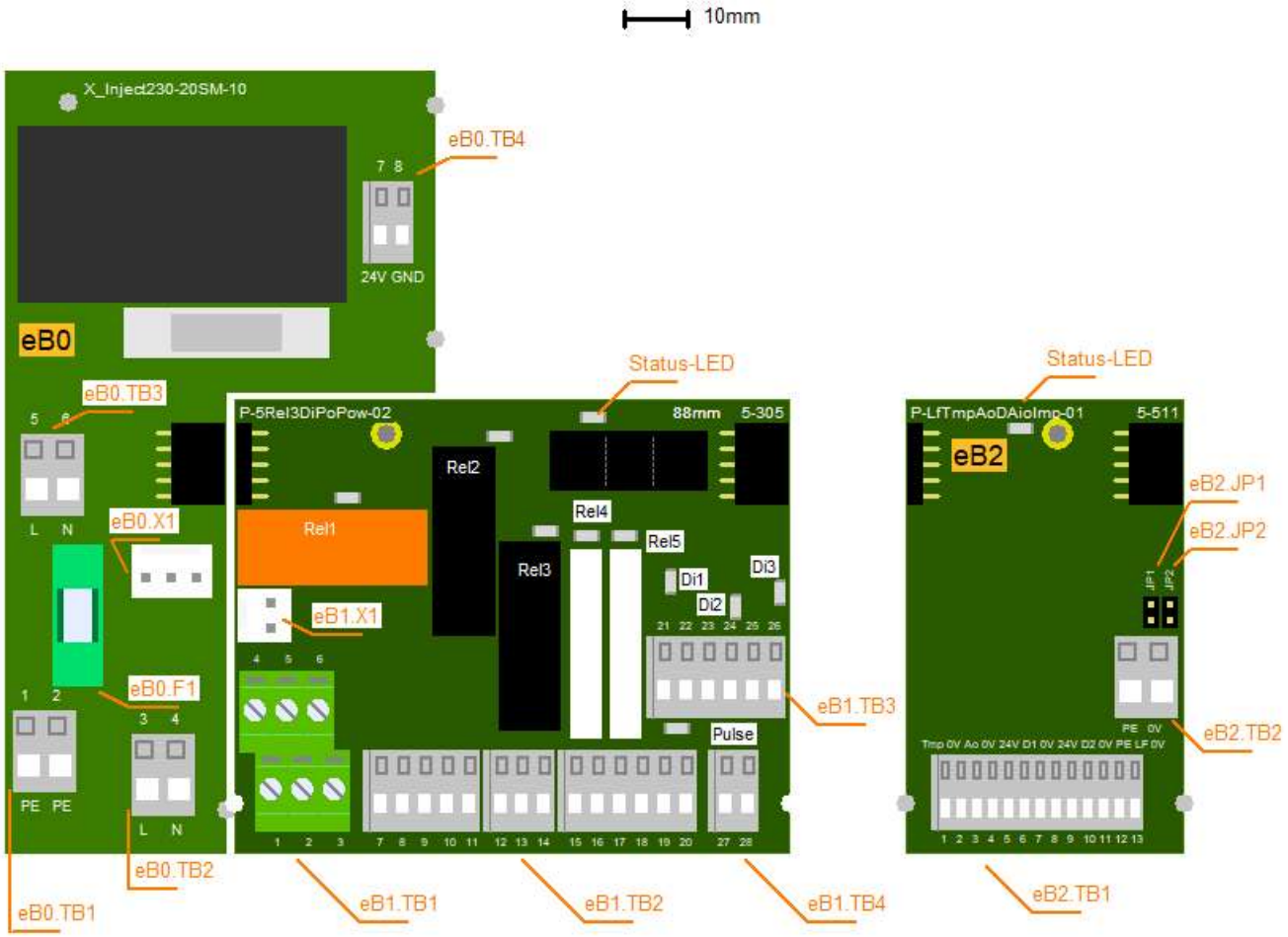
To connect the cables, please proceed as follows:

- Pass the cable through one of the cable glands on the underside of the housing into the housing interior.
- Fix the respective cable gland and connect the required wires to the desired terminals.
- To do this, insert the conductors into the rectangular cable entry funnels on the terminal block. Make sure that the wires are fully and firmly seated in the terminals.
- To release the connection, insert a screwdriver without lateral force into the square opening to open the clamping point. Pull out the conductor with the clamping point open.

5.4 Terminal connection

5.4.1 Component Inside view (below)

The following diagram indicates the major operation, configuration and adaption elements.



5.4.2 Connectors (X) – overview

ID	Model / Type	Grid	Type	Num. Clamps	Wire	el. Spec
eB0.X1	MTA-156	3.96mm	Print Connector	3	-	275V / 6A AC
eB1.X1	MTA-156	3.96mm	Print Connector	2	-	275V / 6A AC

5.4.3 Terminal block (TB) – overview

ID	Model / Type	Grid	Type	Num. Clamps	Wire	el. Spec
eB0.TB1	Wago250	5mm	Cage Terminal	2	up to 1.5mm²	PE
eB0.TB2	Wago250	5mm	Cage Terminal	2	up to 1.5mm²	250V, 8A
eB0.TB3	Wago250	5mm	Cage Terminal	2	up to 1.5mm²	250V, 8A
eB0.TB4	Wago250	3.5mm	Cage Terminal	2	up to 1.5mm²	24V, 2A
eB1.TB1	WE2337	5mm	Screw Terminal	6	up to 2.5mm²	PE
eB1.TB2	Wago250	3.5mm	Cage Terminal	14	up to 1.5mm²	250V, 8A
eB1.TB3	Wago250	3.5mm	Cage Terminal	2	up to 1.5mm²	250V, 8A
eB1.TB4	Wago250	3.5mm	Cage Terminal	6	up to 1.5mm²	250V, 8A
eB2.TB1	Wago250	2.5mm	Cage Terminal	13	up to 0.5mm² or 0,8mm	50V/1A
eB2.TB2	Wago250	3.5mm	Cage Terminal	2	up to 1.5mm²	250V, 8A

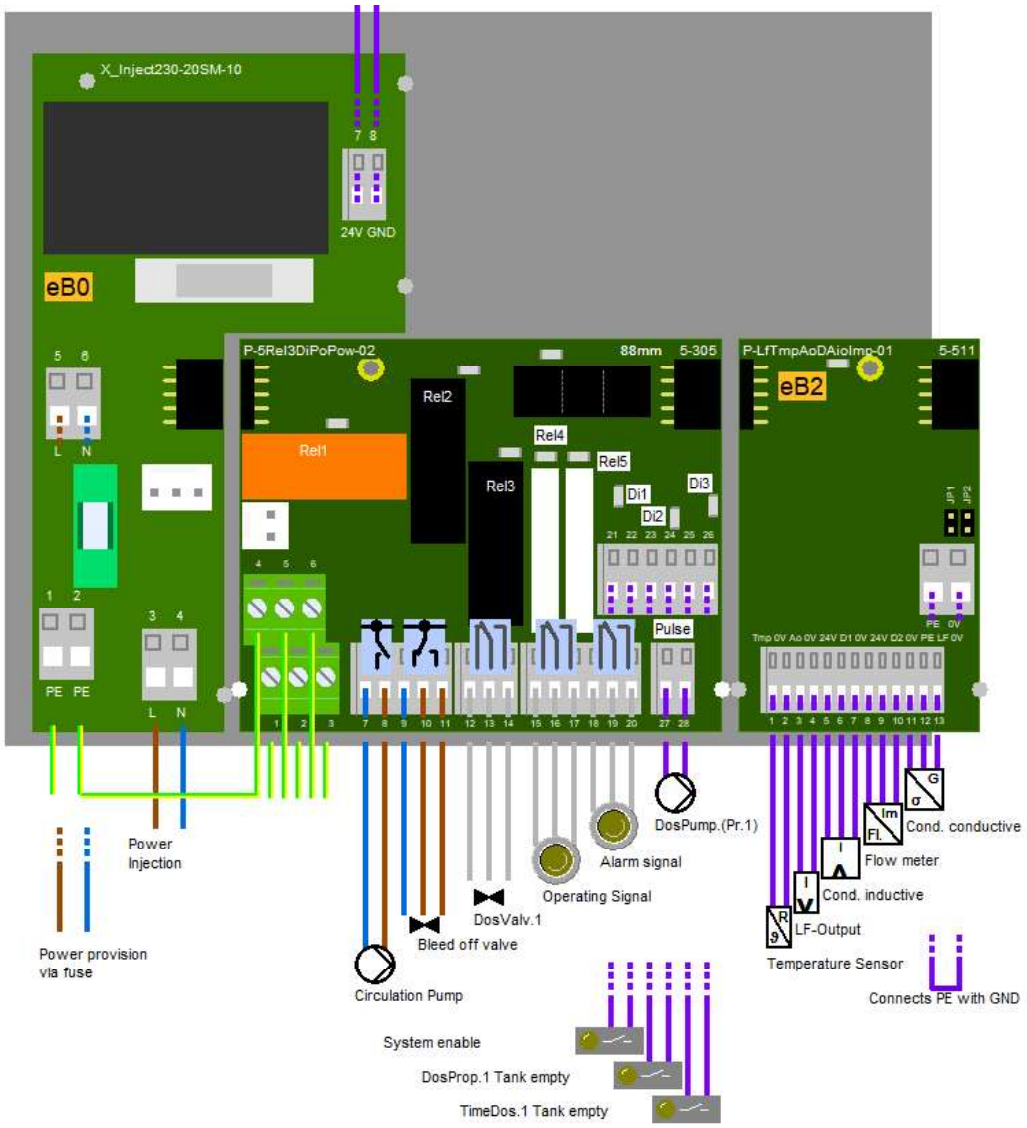
5.4.4 Terminal assignments

Te block	Te no.	Te id.	Type / Usage	Function
		PE	Protective Earth	-
		PE	Protective Earth	-
		PE	Protective Earth	-
		PE	Protective Earth	-
		PE	Protective Earth	-
		PE	Protective Earth	-
eB0.TB1	1	PE	Protective Earth	-
eB0.TB1	2	PE	Protective Earth	-
eB0.TB2	3	L	Phase, Supply	-
eB0.TB2	4	N	Neutral, Supply	-
eB0.TB3	5	L	Phase, Consumer	-
eB0.TB3	6	N	Neutral, Consumer	-
eB0.TB4	7	+24V	Supply sourcing 24V DC for externals	-
eB0.TB4	8	GND	Ground	-
eB1.TB2	7	N	Neutral, Consumer	Circulation Pump
eB1.TB2	8	Lno	Relay, normally open contact, power switching	Circulation Pump
eB1.TB2	9	N	Neutral, Consumer	Bleed off valve
eB1.TB2	10	Lnc	Relay, normally close contact, power switching	Bleed off valve
eB1.TB2	11	Lno	Relay, normally open contact, power switching	Bleed off valve
eB1.TB2	12	NC	Relay, normally close contact, isolated	Dosing Valve
eB1.TB2	13	C	Relay, change over contact, isolated	Dosing Valve
eB1.TB2	14	NO	Relay, normally open contact, isolated	Dosing Valve

eB1.TB2	15	NC	Relay, normally close contact, isolated	Operating Signal
eB1.TB2	16	C	Relay, change over contact, isolated	Operating Signal
eB1.TB2	17	NO	Relay, normally open contact, isolated	Operating Signal
eB1.TB2	18	NC	Relay, normally close contact, isolated	Alarm signal
eB1.TB2	19	C	Relay, change over contact, isolated	Alarm signal
eB1.TB2	20	NO	Relay, normally open contact, isolated	Alarm signal
eB1.TB3	27	PoC	Optocoupler Collector	Dosing Pump
eB1.TB3	28	PoE	Optocoupler Emitter	Dosing Pump
eB1.TB4	21	IN	Input for ext. floating contact	System enable
eB1.TB4	22	GND	Ground	System enable
eB1.TB4	23	GND	Ground	DosProp.1 Tank empty
eB1.TB4	24	IN	Input for ext. floating contact	DosProp.1 Tank empty
eB1.TB4	25	IN	Input for ext. floating contact	TimeDosing Tank empty
eB1.TB4	26	GND	Ground	TimeDosing Tank empty
eB2.TB1	1	Tmp	Input Temperature Sensor	Temperature Sensor
eB2.TB1	2	0V	Ground	Temperature Sensor
eB2.TB1	3	Out	Current Output	Get conductivity in mA
eB2.TB1	4	0V	Ground	Get conductivity in mA
eB2.TB1	5	24V	Sensor Supply +24V	Cond. Probe (inductive)
eB2.TB1	6	IN	Input	Cond. Probe (inductive)
eB2.TB1	7	0V	Ground	Cond. Probe (inductive)
eB2.TB1	8	V+	Sensor Supply +24V	Flow meter
eB2.TB1	9	IN	Input	Flow meter
eB2.TB1	10	0V	Ground	Flow meter
eB2.TB1	11	PE	Shield	Cond. Probe (conductive)
eB2.TB1	12	LF	Input Conductivity Sensor (Cond.)	Cond. Probe (conductive)
eB2.TB1	13	0V	Ground	Cond. Probe (conductive)
eB2.TB2	14	PE	Shield	Potential equalization
eB2.TB2	15	0V	Ground	Potential equalization

5.5 Input-/Output Schema

The following diagram shows the adaption of the control unit. To avoid overlapping, some wires are displayed interrupted and dashed.



5.6 Configuration/Jumper

This chapter contains general information about configuring the hardware.

ID	Type / Usage	used Jumper	Selections	Effect
eB2.JP-LF	Cond. Range Selection	eB2.JP1 eB2.JP2	A: JP1=o JP2=o B: JP1=x JP2=o C: JP1=o JP2=x	Selection of the possible measuring range: Depending on which measuring range you want to measure, the jumper must be plugged in accordingly. This depends firstly on the K value of the probe used and secondly on the set measurement gain. Example: Probe with a K-value of 1.0 Conductivity to be measured max. Approx. 1000µS / cm From the list below, option B would be suitable. Jumper 1 must be plugged in and the Meas.-Ampl./Gain set to 10% in the Conductivity Sensor menu so that a measurement range up to 1000 µS/cm can be measured with a K = 1.0 probe. A: 250µS/cm (K=1.0 with Meas.-Ampl./Gain = 10%), ADC-Value: approx. 395 25µS/cm (K=0.1 with Meas.-Ampl./Gain = 10%), ADC-Value: approx. 395 25µS/cm (K=1.0 with Meas.-Ampl./Gain = 100%), ADC-Value: approx. 395 B: 1000µS/cm (K=1.0 with Meas.-Ampl./Gain = 10%), ADC-Value: approx. 410 100µS/cm (K=0.1 with Meas.-Ampl./Gain = 10%), ADC-Value: approx. 410 100µS/cm (K=1.0 with Meas.-Ampl./Gain = 100%), ADC-Value: approx. 410 C: 4300µS/cm (K=1.0 with Meas.-Ampl./Gain = 10%), ADC-Value: approx. 410 430µS/cm (K=0.1 with Meas.-Ampl./Gain = 10%), ADC-Value: approx. 410 The jumper is usually plugged once into the basic configuration of the device. If the jumper is changed after calibrations have been made, they must be redone.

6 Functional description

This chapter describes the structure and details of the control functions and their parameters.

6.1 System overview/-structure

- NEOMERIS CONTROL DES (System), DES_128
  - Device (MDesalDevice2Ext), Control Unit
    - Data Transfer (MSDCard), Logging of remnant data
    - Data Acquisition (MProtocolSdcCsv), Logging of data elements
      - Protocol show (MProtShowCsv), Displays logged data
      - Logging protocol (MProtRecordCsv), Logs data in a csv file
    - Bleed off (MDesal2), Control of the desalting process
      - Conductivity Sensor (MAbsConductivityCompTemp), Measures the conductivity
        - Temp.Sensor (MTemperature), Measures the temperature
      - Bleedoff Valve Control (MValveDes), Control of the bleedoff valve
      - Blowd. flow (MFlowMeter2), Flow calculation
    - Prop. dosing 1 (MDosProp), Proportional dosing
      - Tank prop. Dos. 1 (MTankAlarms), Tank with chemicals
        - Alarm empty (MAlarm), Sends alarm if the tank is empty
        - Alarm full (MAlarm), Sends alarm if the tank is full
      - Add Flow (MFlowMeter2), Measure the water volume
      - Dosing Pump 1 (MPumpPuls), Dosing of chemicals
    - Time Dosing 1 (MDosTimeExt), Time controlled dosing
      - Starting Date 1 (MStartData), Time dosage
      - Starting Date 2 (MStartData), Time dosage
      - Starting Date 3 (MStartData), Time dosage
      - Starting Date 4 (MStartData), Time dosage
      - Tank Time Dos. 1 (MTankAlarms), Monitoring of the chemical level
        - Alarm empty (MAlarm), Sends alarm if the tank is empty
        - Alarm full (MAlarm), Sends alarm if the tank is full
      - Dosing Valve 1 (MValve), Feeding chemicals
    - System enable (MUnlock), Externally enable signal
    - Operating Signal (MOperation), Signalling of system status
    - Blowdown Analog Output (MUniAnaOutExt), Get conductivity in mA
    - Operating Time (MOpTime), Counts operating time
    - Circulation Pump (MDelPump), Mainpump to get water into system

6.2 Module: MDesalDevice2Ext

6.2.1 Info:

Control Unit

6.2.2 Comment:

This module forms the functional core of the control unit and contains all process-related functions and processes of the control, which are formed by the various (sub) function modules (s.b.).
The various function modules are listed below and are explained in detail in sections (s.b.) with parameters, inputs / outputs and functionality:

MDesal2: Blowdown
Actual desalination process, i.e. the conductivity-dependent control of the blowdown valve. Furthermore, the so-called desalination status is determined here, which affects other functional parts.

MDosProp: Volume proportional dosage
This module controls the proportional dosage.

MDosTime: Time dosage
This module controls the timed dosing.

MUnlock: Unlock (plant)
This module manages the release of the unlock.

MOperation: Operation signal
Control of the operating signal. This will be activated if the desalination status does NOT have the status <Off> .

MDelPump: Circulating pump
Control of the circulation pump. It will be delayed if the desalination status is NOT <off> .

MUniAnalOut: Analog output
This module outputs an adjustable current based on the measured conductivity of the process water.

MOpTime: Operating time
This module counts the operating hours of the system.

MAbsConductivityCompTemp: Sensor conductivity
This module measures the conductivity of the process water and performs temperature compensation.

MTemperature: Temperature sensor
This module captures temperature using the temperature sensor.

MFlowMeter2: Flow meter

This module measures the flow rate in liters per hour.

MTankAlarms: Tank with 2 alarms
This module manages a tank with tank level sensors.

MPumpPuls: Dosing pump
This module controls a pump with pulse control.

MStartData: Time Dosing Record
This module creates the schedule for time dosing.

MAlarmMgrDOs: Alarm Manager
This module collects and detects information, alerts and alarms of each module.

MProtocolSdcCsv: Logging
This module logs events in a CSV file on the SD card.

6.2.3 Internal elements of module:

6.2.3.1 Parameters

»Scroll Time (Num.)	Time interval between view calls in display
	Range: 0 ... 999 s Default: 10 s
»Standard page (Num.)	Number of the page to be displayed fixed. If 0 then the is scrolling is active.
	Range: 0 ... 99 Default: 5

6.3 Module: MDesal2

6.3.1 Info:

Control of the desalting process

6.3.2 Comment:

Control of the actual desalination. There are the following *desal states* :

Off = manual forced-off selected or missing unlock
On = manual forced-on selected
Standby = bleed off valve closed because conductivity is below limit
desalination =bleed off valve open because conductivity is over limit
pre-desalination = pre-desalination (s.b.)
interlock = bleed off valve open as dosing takes place

If the measured conductivity of the process water exceeds the set limit (parameter: desalination start), the bleed off valve is opened.
The bleed off valve remains open until the setpoint of the process water conductivity falls below the set hysteresis (parameter: hysteresis).

In addition, the conductivity of the process water can be reduced by pre-desalination (parameter: pre-start) by opening the bleed off valve before a time dosing is to start. Pre-desalination is completed when:
- the conductivity value of the process water is lower than the set limit value of the parameter Pre. Begin
- the max. Duration of pre-desalination has been reached (parameter: Durat. prebleed.)

The following subfunctions are included:

MAbsConductivityCompTemp: Measures the conductivity

MValveDes: Control of the bleedoff valve

MFlowMeter2:

6.3.3 Internal elements of module:

6.3.3.1 Parameters

Bleed off mode (Sel.)	Type of control of the bleed off valve		
	Default: Process contr.		
	0	Process contr.	control according process
	1	Off	Always off
	2	On	Always on
Bleed off start (Num.)	Conductivity threshold above which the desalination starts		

	Range: 0 ... 5000 µS/cm Default: 2500 µS/cm
Hysteresis (Num.)	Conductivity hysteresis for the desalination start
	Range: 0 ... 5000 µS/cm Default: 20 µS/cm
Pre Bleed start (Num.)	Reduction of the conductivity threshold before a time dosing
	Range: 0 ... 5000 µS/cm Default: 800 µS/cm
Durat. prebleed. (Num.)	Max. duration of the pre desalination
	Range: 0 ... 999 min Default: 60 min

6.4 Module: MDosProp

6.4.1 Info:

Quantitatively proportional dosing

6.4.2 Comment:

The proportional dosing is responsible for the proportional addition of chemicals to the process water by a dosing pump.
The dosing pump is controlled by pulses generated by the flow meter.

The flow meter measures the flow rate in liters per hour, generating the appropriate flow rate.
The incoming pulses from the flow meter are counted and output pulses are generated depending on the pulse ratio (parameter: pulse ratio).
By setting the length of an output pulse (parameter: pulse) and the pause duration (parameter: pause) between two output pulses, the amount of chemicals is determined.
Then, according to the settings made, the desired amount of chemicals is added by the metering pump.

Due to the lockdown (parameter: time lock) after a time dosing there is no actively dosing, therefore the impulses of the dosing pump are recorded (parameter: impulse limit). When the lock time is over the chemicals are added accordingly to the recorded impulses.
For the proportional dosing tank, the contact type (used / n.used), debouncing during filling and the alarm behavior can be set.

Submodules:

MTankAlarms: Tank for prop. Dosing

MFlowMeter2: Flow measurement

MPumpPuls: Dosing Pump

6.4.3 Internal elements of module:

6.4.3.1 Parameters

Mode prop. (Sel.)	Activate the proportional dosage		
	Default: ON		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
Pulse relation (Num.)	Number of output pulses per input pulse		
	Range: 0.00 ... 99.99 Default: 1.00		
Low duration (Num.)	Pause duration between 2 pulses of prop. dosing output		

	Range: 0.00 ... 9.99 s Default: 0.25 s		
High duration (Num.)	Period duration of proportional dosing output impuls		
	Range: 0.00 ... 9.99 s Default: 0.25 s		
Pulse limit (Num.)	Limit of stored impulses		
	Range: 0 ... 99999999 Default: 10000		
Error behavior (Sel.)	Reacting to errors		
	Default: Save		
	0	Save	Save impulse
	1	No save	Dont save impuls

6.5 Module: MDosTimeExt

6.5.1 Info:

Time dosage

6.5.2 Comment:

Time Dosing (typically Biocide Dosing) .

The time dosing has the following operating modes:
Off - There is no timed dosing, the dosing valve remains closed.

On - The time dosing is switched on forcibly without checking the process specifications. It will be continuously dosed until the total time per day is reached.

Automatic - Compares the current time with the set start time and starts the time dosing if necessary. The time dosing takes process specifications into account, such as the fill level of the biocide tank before the start of the time dosing.
If the biocide tank is empty, no planned time dosing starts.

There are four start times settable for the time dosing (Parameter: Start time / Wochentage).
The set time always has priority over the current conductivity value.
During and after dosing of biocide into the process water, the desalination is locked for the set time (parameter: Time Lock).
The length of the dosage (parameter: dosing time) and the max. time of all time doses per day (parameter: total time) can also be set.

The tank is monitored by the process. A time dosing can only start if the biocide is also detected by the level sensor.
For the tank of the time dosing the contact type (used / n.used), debounce during filling and the alarm behavior can be set.

Submodules:

MStartData: Time dosage

MTankAlarms: Tank for time dosing

MValve: Feeding chemicals

6.5.3 Internal elements of module:

6.5.3.1 Parameters

»Time Dos. mode (Sel.)	Mode of time proportional dosing		
	Default: Process contr.		
	0	Process contr.	control according process
	1	Off	Always off

	2	On	Always on
»Dosage duration (Num.)	Duration of the dosing		
	Range: 0 ... 999 min Default: 2 min		
»Time lock (Num.)	Locking time after dosing		
	Range: 0 ... 999 min Default: 15 min		
»Total Time (Num.)	Max. possible dosing time per day		
	Range: 0 ... 999 min Default: 0 min		

6.6 Module: MUnlock

6.6.1 Info:

System enable

6.6.2 Comment:

The switching input must be active (s.b.) for the plant to start operation. The contact type can be freely selected. When (occupied = active), closing the input activates the operation. When (occupied = inactive), opening the input will activate the operation.

6.6.3 Internal elements of module:

6.6.3.1 Parameters

»Contact Type (Sel.)	Kind of contact (used/n.used)		
	Default: not occupied=active		
	0	occupied=active	-
	1	not occupied=active	-

6.6.3.2 Digital input (DI)

»System enable	eB1: 21=Di1, 22=GND (Digital-Input 1)		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active

6.7 Module: MUniAnaOutExt

6.7.1 Info:

Analog Outp.

6.7.2 Comment:

Based on the determined conductivity value of the process water, a corresponding current is output.
This current can be between 0mA to 20mA or 4mA to 20mA depending on the set range.
The value of the output current depends on the range of conductivity.
This range is defined by setting the lower limit (parameter: lower limit) and the upper limit (parameter: upper limit) .

At a lower limit of 0µS/cm and an upper limit of 2000µS/cm, the range is 2000µS/cm.
Accordingly, at 0µS/cm the output is approximately 0mA and at 2000µS/cm approximately 20mA.
As a result, e.g. 500µS/cm is approx. 5mA. 1000µS/cm is approx. 10mA. 1500µS/cm is approx. 15mA etc.

With a lower limit of 1000µS/cm and an upper limit of 2000µS/cm the range is 1000µS/cm.
Accordingly, at 1000µS/cm the output is approx. 0mA and at 2000µS/cm the output is approx. 20mA.
As a result, e.g. 1250µS/cm is approx. 5mA. 1500µS/cm is approx. 10mA. 1750µS/cm is approx. 15mA etc.

6.7.3 Internal elements of module:

6.7.3.1 Parameters

»Range (Sel.)	Range of current		
	Default: 4..20 mA		
	0	0..20 mA	-
	1	4..20 mA	-
»Upper Limit (Num.)	Maximal possible value of the conductivity		
	Range: 0 ... 5000 µS/cm Default: 2000 µS/cm		
»Lower Limit (Num.)	Minimal possible value of the conductivity		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		

6.7.3.2 Analog output (AO)

»LF-Output	eB2: 3=Output, 4=GND (Analog-Output 1)

	Output range: 0.00 ... 20.00 mA

6.8 Module: MOpTime

6.8.1 Info:

Operating Time

6.8.2 Comment:

Counts the operating hours of the plant and stores them in permanent memory.

6.8.3 Internal elements of module:

This module contains no elements.

6.9 Module: MDelPump

6.9.1 Info:

Pump Relay

6.9.2 Comment:

The pump has an adjustable start-up delay of 15 seconds by default (parameter: switch-on delay). The pump is always energized as long as the desalination is active or the desalination mode is either process-controlled or on.

6.9.3 Internal elements of module:

6.9.3.1 Parameters

Switch On Delay (Num.)	Delay of pump start after internal enable		
	Range: 0 ... 999 s Default: 15 s		
»Contact Type (Sel.)	Kind of contact (energised/off)		
	Default: active=energized		
	0	active=energized	-
	1	active=not energized	-

6.9.3.2 Digital output (DO)

»Circulation Pump	eB1: 7=N, 8=Lno (Relay 1)		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active

6.10 Module: MAbsConductivityCompTemp

6.10.1 Info:

Sensor Conduct.

6.10.2 Comment:

Measures the conductivity of the process water.
Due to the determined temperature of the temperature sensor, a temperature compensation can take place.

There are three ways to compensate for the conductivity value:
1. Temperature compensated using the connected temperature sensor (calibrate the temperature sensor!).
2. Fix Compensated to the reference value (25 degrees celsius)
3. Not compensated

Submodules:

MTemperature: Measures the temperature

6.10.3 Internal elements of module:

6.10.3.1 Parameters

»Reference (Num.)	Reference temperature for compensation		
	Range: 0.0 ... 99.9 °C Default: 25.0 °C		
»Sensor type (Sel.)	Type of the connected conductivity sensor		
	Default: Conductive		
	0	Conduc-tive	Conductive
	1	Inductive	Inductive
»Amplifying (Num.)	Amplifying of conductivity measurement signal		
	Range: 0 ... 100 % Default: 10 %		
»Temp.-Comp. (Sel.)	Switching temperature compensation		
	Default: Temp.Sensor		
	0	without	no temp. compensation
	1	Temp.Sen-sor	compensation according act. tem-perature
	2	fix value	fix compensation
	3	external	compensation according external temperature sensor
»Min(Warn.) (Num.)	Warning low limit		

	Range: 0 ... 5000 µS/cm Default: 50 µS/cm		
»Min(Alarm) (Num.)	Alarm low limit		
	Range: 0 ... 5000 µS/cm Default: 25 µS/cm		
»Max(Warn.) (Num.)	Warning high limit		
	Range: 0 ... 5000 µS/cm Default: 2800 µS/cm		
»Max(Alarm) (Num.)	Alarm high limit		
	Range: 0 ... 5000 µS/cm Default: 3000 µS/cm		
»Hysther.(Warn.) (Num.)	Hysteresis, used as +/- from threshold		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
»Hysther.(Alarm) (Num.)	Hysteresis, used as +/- from threshold		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
»Prio Warn. (Num.)	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.)	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.)	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.)	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.)	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown

6.10.3.2 Analog input (AI)

»Cond. conductive	eB2: 11=PE, 12=LF, 13=0V (Conductance Input 1)
	Input range: 0 ... 5000 µS/cm
»Cond. inductive	eB2: 5=24V, 6=D1, 7=0V (Analog-Input 1 (with supply))
	Input range: 0 ... 5000 µS/cm

6.10.3.3 Analog output (AO)

»LF-Mess.Voltage	LF-Measuring Voltage
	Output range: 0 ... 100 %

6.11 Module: MTemperature

6.11.1 Info:

Temp. Sensor

6.11.2 Comment:

The temperature sensor measures the temperature in a range of 0.0 to 99.9 ° C.

6.11.3 Internal elements of module:

6.11.3.1 Parameters

»Min(Warn.) (Num.)	Warning low limit Range: 0.0 ... 99.9 °C Default: 10.0 °C
»Min(Alarm) (Num.)	Alarm low limit Range: 0.0 ... 99.9 °C Default: 3.0 °C
»Max(Warn.) (Num.)	Warning high limit Range: 0.0 ... 99.9 °C Default: 60.0 °C
»Max(Alarm) (Num.)	Alarm high limit Range: 0.0 ... 99.9 °C Default: 80.0 °C
»Hysther.(Warn.) (Num.)	Hysteresis, used as +/- from threshold Range: 0.0 ... 99.9 °C Default: 5.0 °C
»Hysther.(Alarm) (Num.)	Hysteresis, used as +/- from threshold Range: 0.0 ... 99.9 °C Default: 5.0 °C
»Prio Warn. (Num.)	Set warning priority Range: 0 ... 99 Default: 50
»Prio Alarm (Num.)	Set alarm priority Range: 0 ... 99 Default: 20
»Delay Warn. (Num.)	Delay of warning triggering Range: 0 ... 999 s Default: 0 s
»Delay Alarm (Num.)	Delay of alarm triggering Range: 0 ... 999 s Default: 0 s

»Reac. Sys. (Sel.)	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown

6.11.3.2 Analog input (AI)

Temperature Sensor	eB2: 1=Tmp, 2=0V (Temp.-Input 1)
	Input range: 0.0 ... 99.9 °C

6.12 Module: MFlowMeter2

6.12.1 Info:

Flow Meter

6.12.2 Comment:

The flow meter measures the flow rate in liters per hour and is generating the appropriate pulses for the measured flow rate.
The incoming pulses from the flow meter are counted and output pulses are generated depending on the pulse ratio (parameter: pulse ratio).
By setting the length of an output pulse (parameter: pulse) and the pause duration (parameter: pause) between two output pulses, the amount of chemicals to be mixed is determined.
Then, according to the settings made, the desired amount of chemicals is added by the dosing pump.

The flow meter measures the total volume that has flowed through it in cubic meters (m^3) .
It also measures the flow rate in liters per hour, producing output pulses corresponding to the flow.

The flowmeter can be flexibly set to either pulses per liter (Pls / Ltr) or liters per pulse (Ltr / Pls) according to the hardware used.

There are three measurement methods:
Automatic - Automatically selects between pulse counter measurement and pulse length measurement based on the frequency of measurement errors that occur.
Pulse Counter Measurement - Counts the number of pulses that occur in a given time.
Pulse Length Measurement - Counts the time between two pulses.

Please set the various parameters with the following points in mind:

Set the parameter resolution and units as indicated on the flowmeter datasheet.

Parameter measuring method
If you are using a flowmeter with mechanical contacts, it is strongly recommended to select pulse length as the measurement method.
Debouncing is only available for pulse length measurement.

If your signal does not bounce and has an input frequency greater than 10 Hz then you should use the counter method.

Use Automatic if you are not sure which method works best. If set to Auto, the system will determine the method at startup depending on the other settings.
In this case, care must be taken that min. flow and max. flow is set to meaningful values.

Min. flow is the minimum flow that must be measured correctly.
This value is used to determine the measurement method when Auto is selected as the measurement method.

It is therefore strongly recommended that min. flow should be set to logical values.
Simply set to 1 will lead to a bad behavior of the measurement.

Max flow is the maximum flow that must be measured correctly.
This value is used to determine the measurement method when Auto is selected as the measurement method.

In order to achieve good accuracies, we recommend the ratio between max. flow and min. flow not greater than 1:10.

Gate time is only relevant if pulse counter measurement is used.
Gate time specifies the length of the time window in which the occurring pulses are counted.
This also results in the update rate for the flow value.
Higher gate values will increase accuracy, but the flow value will not update as often.
Gate times below 2 times the lowest operating frequency must be avoided, in which case the measurement results are not reliable.

Debouncing is only relevant for pulse length measurement.
Pulses that are consecutively registered in less time than the set debounce time are considered just as one impulse.
This prevents the bouncing of the contact from registering more pulses than there are actually present.
A value of 10 to 20 ms is sufficient in most cases for mechanical contacts.
For turbines or for electronic contacts, the value to be set may be 0 ms.

6.12.3 Internal elements of module:

6.12.3.1 Parameters

Measure Res. (Num.)	Measuring resolution of water amount (impuls per liter)		
	Range: 0.001 ... 999.999 pls/Ltr Default: 1.000 pls/Ltr		
Measure Res. (Num.)	Measuring resolution of water amount (liter per impuls)		
	Range: 0.001 ... 99.999 Ltr/pls Default: 1.000 Ltr/pls		
Units (Sel.)	Choice of the measurement resolution		
	Default: Pls/Ltr		
	0	Pls/Ltr	-
	1	Ltr/Pls	-
Minim. flow (Num.)	Minimal working reach of the flow		
	Range: 1 ... 32767 l/h Default: 400 l/h		
Maxim. flow (Num.)	Maximal working reach of the flow		
	Range: 0 ... 32767 l/h Default: 5000 l/h		

Mesrg. Method (Sel.)	Measuring method(process controlled, pulscount or pulslength)		
	Default: Counter		
	0	Automatic	-
	1	Counter	-
	2	Puls Length	-
Gate Time (Num.)	Time periode for counting of impulses		
	Range: 0 ... 9999999 ms Default: 1000 ms		
Debounce (Num.)	Stabilisation time of impuls		
	Range: 0 ... 999 ms Default: 10 ms		
»Min(Warn.) (Num.)	Warning low limit		
	Range: 0 ... 32767 l/h Default: 0 l/h		
»Min(Alarm) (Num.)	Alarm low limit		
	Range: 0 ... 32767 l/h Default: 0 l/h		
»Max(Warn.) (Num.)	Warning high limit		
	Range: 0 ... 32767 l/h Default: 900 l/h		
»Max(Alarm) (Num.)	Alarm high limit		
	Range: 0 ... 32767 l/h Default: 3900 l/h		
»Hysther.(Warn.) (Num.)	Hysteresis, used as +/- from threshold		
	Range: 0 ... 32767 l/h Default: 10 l/h		
»Hysther.(Alarm) (Num.)	Hysteresis, used as +/- from threshold		
	Range: 0 ... 32767 l/h Default: 10 l/h		
»Prio Warn. (Num.)	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.)	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.)	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.)	Delay of alarm triggering		

	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.)	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown

6.12.3.2 Analog input (AI)

Flow meter	Water amount per houer.
	Input range: 0 ... 32767 l/h

6.12.3.3 Counter (CNT)

Volume (Num.)	Absolut value of water counter. How match impuls were counted.
	Range: 0 ... 99999 m³ Default: 0 m³

6.13 Module: MTankAlarms

6.13.1 Info:

Tank using 2 Alarms

6.13.2 Comment:

The controller can manage a tank with one or two sensors.
For the tank level sensor full or low, the contact type (occupied / n.occupied) can be set.
Debouncing during filling ensures that the sensor does not deflect directly when the level changes, but waits for a certain time to prevent false readings from moving liquid.
The parameter Tank type can be used to set whether the tank has an overflow or not.

6.13.3 Internal elements of module:

6.13.3.1 Parameters

»Contact Up (Sel.)	Kind of contact (used/n.used)		
	Default: occupied=active		
	0	occupied=active	-
	1	not occupied=active	-
»Contact Low (Sel.)	Kind of contact (used/n.used)		
	Default: occupied=active		
	0	occupied=active	-
	1	not occupied=active	-
»Debouncing Fill (Num.)	Delay to accept the tank level		
	Range: 0.0 ... 99.9 s Default: 2.0 s		

6.13.3.2 Digital input (DI)

»Level Full	DI(High-Level sensor).		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
»DosProp.1 Tank empty	eB1: 23=Di2, 24=GND (Digital-Input 2)		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active

6.14 Module: MPumpPuls

6.14.1 Info:

Pump

6.14.2 Comment:

Pump with pulse control.
Usually used as a dosing pump in conjunction with a flow meter, as the flow meter generates pulses that can be processed this way.

6.14.3 Internal elements of module:

6.14.3.1 Parameters

»Contact Type (Sel.)	Kind of contact (Imp.avail/Imp.n.avail.)		
	Default: active=Impulse available		
	0	active=Impulse available	-
	1	active=Impulse not available	-

6.14.3.2 Digital output (DO)

»DosPump.(Pr.1)	eB:1 27=PoC, 28=PoE (Pulse-Output 1)		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active

6.15 Module: MStartData

6.15.1 Info:

Dataset for time dosing

6.15.2 Comment:

By setting the start time and the corresponding days of the week, a record is created according to the time metering.
This record is compared to the current time.
If the set start time matches the current time and the set weekdays are the same as the current day of the week, a time dosing is started.

6.15.3 Internal elements of module:

6.15.3.1 Parameters

Starting time (Zeit)	Start time for dosing		
	Default: 00:00		
Days of week (Sel.)	Weekly grid for start time		
	Default: 000-0000		
	0	Sunday	Sunday
	1	Monday	Monday
	2	Tuesday	Tuesday
	3	Wednesday	Wednesday
	4	Thursday	Thursday
	5	Friday	Friday
	6	Saturday	Saturday

6.16 Module: MAlarmMgrDOs

6.16.1 Info:

Alarm-Manager + DO's

6.16.2 Comment:

Alarm Manager Module which detects alerts and alarms of each module.

This allows the system to respond to warnings or alarms as follows:
- No shutdown: The system reports the error but continues to run normally.
- Shutdown with permanent retries: The system reports the error and stops the process as long as the condition of the alarm is present. When the alarm is cleared, the process restarts.
- Shutdown with defined number of retries: Like Shutdown with permanent retries, however, the process will only be restarted as often as it is set in the Cyclic Retry menu.
- Durable shutdown: If there is a fault, the process is stopped until the user acknowledges the errors.

The behavior is usually set in the limit menu of the respective sensor.

6.16.3 Internal elements of module:

6.16.3.1 Parameters

This module contains no elements.

6.17 Module: MProtocolSdcCsv

6.17.1 Info:

Protocol

6.17.2 Comment:

A header is created and written to the file. The header contains the Element names and units of values.

The CSV file has the following categories:
1. System date of the recording
2. System time of recording
3. ID of the recording (normally D for cyclic recording, A + / A- for alarm
4. Information, e.g. alarm text

6.17.3 Internal elements of module:

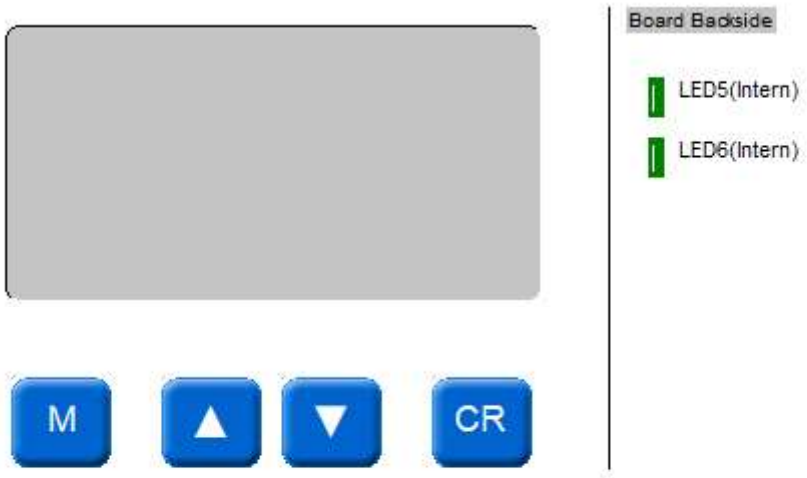
6.17.3.1 Parameters

»Record. Interval (Num.)	Time interval at which the records are executed		
	Range: 0 ... 999 min Default: 1 min		
»New file-interval (Num.)	Time interval between the generation of new files		
	Range: 0 ... 99 d Default: 1 d		
»New file monthly (Sel.)	New file every month		
	Default: No		
	0	No	-
	1	Yes	-
»Recording (Sel.)	Recording data		
	Default: ON		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
»Delimiter (Sel.)	A character to separate the data from each other		
	Default: ;		
	0	TAB	-
	1	,	-
	2	;	-

7 Operation

7.1 Operating and Display Elements

The user interfaces is arranged as follows:



7.2 Navigation and Programming

7.2.1 General information

Use keyboard and display for programming the control system.

WARNING **Incorrect programming may lead to a failure of crucial controller functions!**

7.2.2 Key functions

Press the 

key to open the main menu.

Use the  <↑> and  <↓> keys to change parameters.

Press 

<Enter> to confirm your entry.

If you are entering parameters, pressing <Enter> will cause the cursor to move one position further right. If you are changing parameters, use the arrow keys to select the requested digit and then press <Enter> to confirm. Select all the parameters to apply the values.

The  <M> (or <ESC>) key is used to return from a sub-menu or to cancel an entry.

7.2.1 Automatic reset

If no keys have been pressed for 5 minutes, the system will automatically quit the menu view und return to the main display.

7.2.2 Passwords

The device has 3 password levels with the following factory settings:

- User password: 1111
- Technician password: 2222
- Operator password: 3333

We recommend changing and noting down passwords immediately after start-up.

7.2.3 Setup of Parameters and Values

Any parameters / values that can be set are accessible through the control menu. Editing dialogs are used to change the individual parameters. These dialogs can be modified with the ↑/↓-keys. After entering the changes, they can be confirmed with the **Enter**-key.

Example of an editing dialog:

7.3 Configuration of modules / functions

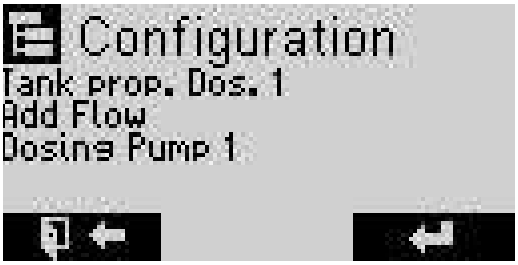
If this menu exists, it is possible to disable unneeded / wanted modules / functions.
This is done in a configuration menu.
In this menu all disconnectable modules / functions are listed.

NOTE

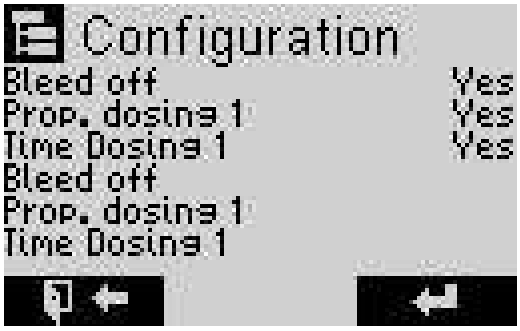
The following shown masks contains exemplary elements/channels, which are currently not existing in this present control unit.

It is possible that several configuration menus exist.
There could be a configuration menu in the main menu which shuts off all modules.
Similarly, a configuration menu could occur in the module itself, which disables only a certain function of the module.

Sample of a selection mask:



The module/function to be activated/deactivated is selected using the ↑/↓-buttons and set to either "yes" or "no" for the module / function to be activated.



NOTE

It is strongly recommended to restart the device after saving the changes made in order to avoid unwanted behavior when changing the configuration menus.

7.4 Type of contact or inversion

It is possible to invert the type of contact (NC / NO) of the connected sensors or buttons / switches.

NOTE

The following shown masks contains exemplary elements/channels, which are currently not existing in this present control unit.

The contact type is usually a sub-item in a menu that indicates a function of the controller. In the picture below you can see that the contact type is part of the tank menu.

Sample of a selection mask:

Example tank level:

Our tank has a Normally Open (NO) contact as a water level sensor at the top of the tank.
This means that if the contact type is set to NO, the tank will be reported as full as soon as the water reaches the sensor.

If we want to use the same sensor to indicate that the tank is empty, we have to set the type of contact to NC.
Because if we do not, the device will report as soon as the sensor touches the water that the tank is empty. But we need the opposite.
Therefore, we invert the signal by setting the contact type to normally closed.
Now it is shown that the tank is empty as soon as the sensor no longer touches water.

The contact type is usually set in the settings menu of the respective sensor.

7.5 Calibration

To compensate for measurement errors due to deviations in sensors and measuring amplifiers, the analog inputs and outputs can be calibrated using reference measurements. In this case, the value of a lower and an upper known reference variable is “assigned” (learned) and interpolated linearly between these points (if necessary, there is an additional compensation / linearization).

NOTE

The following shown masks contains exemplary elements/channels, which are currently not existing in this present control unit.

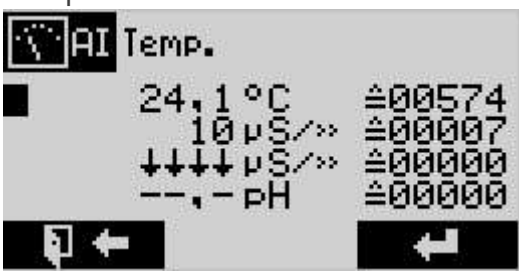
Further Notes:

- When calibrating a temperature depending value (i.e. conductivity, pH-Value) a correct temperature measurement (of the associated sensor) must be possible. Therefore, prior to LF calibration, perform a temperature calibration.
- For the temperature compensation to work, the temperature sensor must capture the current process water temperatures and should not fluctuate.
- Assigning/teaching the lower and upper calibration points can be independent.
- The calibration overview can also be used for the pure representation of the logical measured values as well as the converter value.

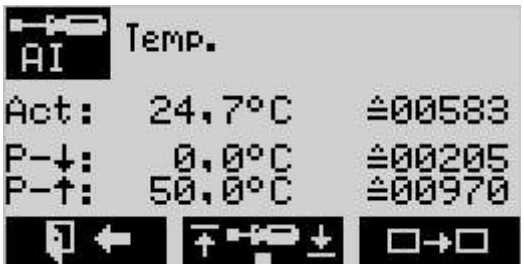
7.5.1 Analog Input

After calling up the calibration menu ("Calibration AI"), an overview mask of all analogue inputs is displayed. In addition to the input designation, the current measured value ("log.") and the converter raw value ("phys.") are displayed.

Sample of a selection mask:



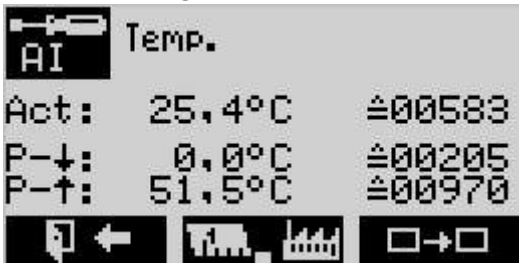
The input to be calibrated is selected with the aid of the ↑/↓-keys and branched to the following calibration mask. Here, the current measured value as well as the lower and upper calibration point are displayed as logical as well as converter raw value.



The current assignment appears:
The current temperature Act: 24.7 °C is assigned to a converter value of 00583. Press the ↑ key to enter the upper point. (Press ↓ to enter the lower point.)

Change the value with the keys ↑ or ↓, with **Enter** a digit is moved to the right. After entering the value, exit the mask with **Enter**.

The new assignment Act: 25.4 °C to the converter value 00583 is displayed.



Calibration takes place in the following steps:

1. Specifying a reference value to the sensor. In this case, the value must be able to settle for a sufficiently long time (until the converter value no longer changes).
2. Press the ↑/↓-key to adjust the upper / lower calibration point.
3. Measure the real measured value applied to the sensor (with an external reference measuring device) and enter it (numerical editing).
4. Press the **Enter**-key to accept the new calibration point - the **M** key is used to cancel the adjustment.

7.5.2 Analog Output

Similar to the input calibration, the output calibration takes place.
In the channel list it is possible to force the output value via the ↑/↓-keys while inside the calibration.

7.6 Diagnostics

The hardware diagnostics allow the direct manipulation or representation of the outputs and inputs of the control unit.

NOTE

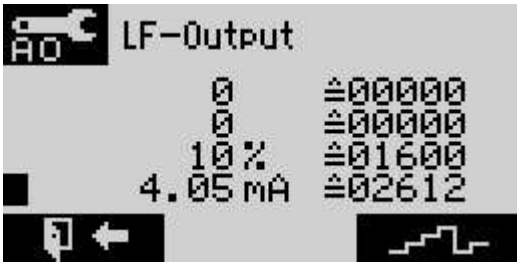
The following shown masks contains examplary elements/channels, which are currently not existing in this present control unit.

Using the ↑/↓-keys, you can use a cursor to select one of the digital inputs or outputs whose name and status are displayed in verbal form. The manipulation (off / on) is done via the **Enter**-key. This feature gives the technician the opportunity to test the hardware

Example of a digital output:

The analogue outputs can be selected with the ↑/↓-keys, as with the digital inputs or outputs. Manipulation is possible via the **Enter**-key.

Example of an analog output:



All values that are changed in the hardware diagnostics reset the control unit when exiting the menu.

Some menus can not be changed and only show actual values. For example, the CNT menu which shows the values of the pulse input.

7.7 Alarm Handling and Messages

The control unit has an alarm manager. The operating errors are detected by the control unit and displayed as a text message. The messages of the alarm manager can be reached via the menu of the control unit.

Current Alarms, Warnings and Infos can be selected and acknowledged (depending on the desired software setting).

The display changes its backlight depending on the message:

Green: there are no messages.
Blue: information is available.
Yellow: there are warnings.
Red: there are alarms

The numbers indicate the number of Info / Warnings / Alarms. If more than one message is present, the messages can be selected with the ↑ or ↓ keys and, if necessary, acknowledged with Enter. Each message must be selected separately.

7.8 Firmware-Update

See chapter 8.4

7.9 Factory settings

During the boot process / switching on a number of special functions are available. In order to enable these functions, keep the required keys pressed while powering up the device.

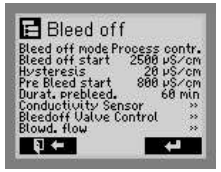
Reset (factory settings): Keep  and  pressed down.
Switch the device off and then switch it back on.

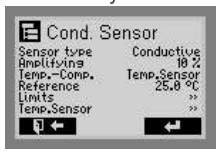
7.10 HMI-overview

Logo / Version → Main View → Start/Stop

Main Menu → Messages

Settings → Bleed off → Conductivity Sensor → Limits →

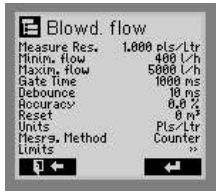




Temp.Sensor → Limits →

Bleedoff Valve Control →

Add Flow

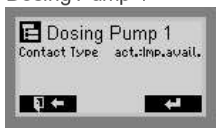


Limits

Prop. dosing 1

Tank Time Dos. 1

Dosing Pump 1

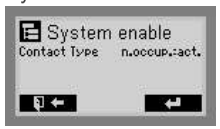


Time Dosing 1

Dosing Valve 1

Starting Date 1

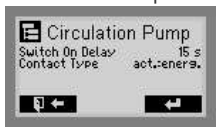
System enable



Operating Signal

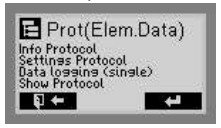
Blowdown Analog Output

Circulation Pump



Data Transfer

Data Acquisition

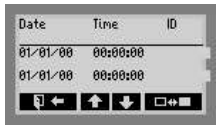


Wait

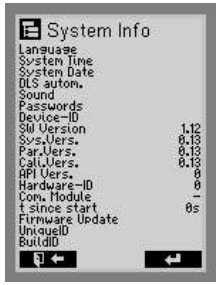
Info Protocol

Settings(Prot.)

Show Protocol → Protocol data →



Service → NEOMERIS CONTROL DES → NEOMERIS CONTROL DES

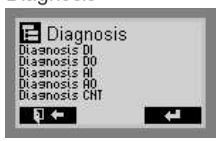


UniqueID

NEOMERIS CONTROL DES

Master → Brick Overview

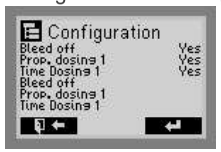
Diagnosis

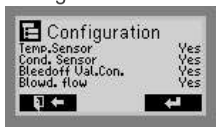


Calibration

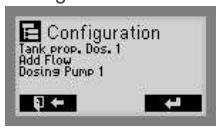
Cyclic Retry →

Configuration → Configuration →





Configuration → Tank Time Dos. 1 →



Add Flow →

Dosing Pump 1

Configuration

Dosing Valve 1

Factory Settings

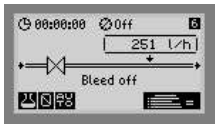
Main View

Main View

Main View

Main View

Main View



8 Anhang

8.1 Übersicht der Parameter

8.1.1.1 Parameters

»DLS autom. (Sel.) NEOMERIS CONTROL DES	Automatic daylight saving times switching		
	Default: On		
	0	Off	-
	1	On	-
»Scroll Time (Num.) NEOMERIS CONTROL DES, Device	Time interval between view calls in display		
	Range: 0 ... 999 s Default: 10 s		
»Standard page (Num.) NEOMERIS CONTROL DES, Device	Number of the page to be displayed fixed. If 0 then the is scrolling is active.		
	Range: 0 ... 99 Default: 5		
»Delimiter (Sel.) NEOMERIS CONTROL DES, Device, Data Transfer	A character to separate the data from each other		
	Default: ;		
	0	TAB	-
	1	,	-
	2	;	-
»Record. Interval (Num.) NEOMERIS CONTROL DES, Device, Data Acquisition	Time interval at which the records are executed		
	Range: 0 ... 999 min Default: 1 min		
»New file-interval (Num.) NEOMERIS CONTROL DES, Device, Data Acquisition	Time interval between the generation of new files		
	Range: 0 ... 99 d Default: 1 d		
»New file monthly (Sel.) NEOMERIS CONTROL DES, Device, Data Acquisition	New file every month		
	Default: No		
	0	No	-
	1	Yes	-
»Recording (Sel.) NEOMERIS CONTROL DES, Device, Data Acquisition	Recording data		
	Default: ON		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
»Delimiter (Sel.) NEOMERIS CONTROL DES, Device, Data Acquisition	A character to separate the data from each other		
	Default: ;		

	0	TAB	-
	1	,	-
	2	;	-
Bleed off mode (Sel.) NEOMERIS CONTROL DES, Device, Bleed off	Type of control of the bleed off valve		
	Default: Process contr.		
	0	Process contr.	control according process
	1	Off	Always off
	2	On	Always on
Bleed off start (Num.) NEOMERIS CONTROL DES, Device, Bleed off	Conductivity threshold above which the desalination starts		
	Range: 0 ... 5000 µS/cm Default: 2500 µS/cm		
Hysteresis (Num.) NEOMERIS CONTROL DES, Device, Bleed off	Conductivity hysteresis for the desalination start		
	Range: 0 ... 5000 µS/cm Default: 20 µS/cm		
Pre Bleed start (Num.) NEOMERIS CONTROL DES, Device, Bleed off	Reduction of the conductivity threshold before a time dosing		
	Range: 0 ... 5000 µS/cm Default: 800 µS/cm		
Durat. prebleed. (Num.) NEOMERIS CONTROL DES, Device, Bleed off	Max. duration of the pre desalination		
	Range: 0 ... 999 min Default: 60 min		
»Reference (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Reference temperature for compensation		
	Range: 0.0 ... 99.9 °C Default: 25.0 °C		
»Sensor type (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Type of the connected conductivity sensor		
	Default: Conductive		
	0	Conductive	Conductive
	1	Inductive	Inductive
»Amplifying (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Amplifying of conductivity measurement signal		
	Range: 0 ... 100 % Default: 10 %		
»Temp.-Comp. (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Switching temperature compensation		
	Default: Temp.Sensor		
	0	without	no temp. compensation
	1	Temp.Sensor	compensation according act. temperature
	2	fix value	fix compensation
	3	external	compensation according external temperature sensor

»Min(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Warning low limit		
	Range: 0 ... 5000 µS/cm Default: 50 µS/cm		
»Min(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Alarm low limit		
	Range: 0 ... 5000 µS/cm Default: 25 µS/cm		
»Max(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Warning high limit		
	Range: 0 ... 5000 µS/cm Default: 2800 µS/cm		
»Max(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Alarm high limit		
	Range: 0 ... 5000 µS/cm Default: 3000 µS/cm		
»Hysther.(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Hysteresis, used as +/- from threshold		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
»Hysther.(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Hysteresis, used as +/- from threshold		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
»Prio Warn. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown
	Warning low limit		

»Min(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Range: 0.0 ... 99.9 °C Default: 10.0 °C		
»Min(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Alarm low limit		
	Range: 0.0 ... 99.9 °C Default: 3.0 °C		
»Max(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Warning high limit		
	Range: 0.0 ... 99.9 °C Default: 60.0 °C		
»Max(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Alarm high limit		
	Range: 0.0 ... 99.9 °C Default: 80.0 °C		
»Hysther.(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Hysteresis, used as +/- from threshold		
	Range: 0.0 ... 99.9 °C Default: 5.0 °C		
»Hysther.(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Hysteresis, used as +/- from threshold		
	Range: 0.0 ... 99.9 °C Default: 5.0 °C		
»Prio Warn. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown
	Kind of contact (energised/off)		
	Default: active=energized		

»Contact Type (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Bleedoff Valve Control	0	active=ener-gized	-
	1	active=not en-ergized	-
Measure Res. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Measuring resolution of water amount (impuls per liter)		
	Range: 0.001 ... 999.999 pls/Ltr Default: 1.000 pls/Ltr		
Measure Res. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Measuring resolution of water amount (liter per impuls)		
	Range: 0.001 ... 99.999 Ltr/pls Default: 1.000 Ltr/pls		
Units (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Choice of the measurement resolution		
	Default: Pls/Ltr		
	0	Pls/Ltr	-
	1	Ltr/Pls	-
Minim. flow (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Minimal working reach of the flow		
	Range: 1 ... 32767 l/h Default: 400 l/h		
Maxim. flow (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Maximal working reach of the flow		
	Range: 0 ... 32767 l/h Default: 5000 l/h		
Mesrg. Method (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Measuring method(process controlled, pulscount or pulslength)		
	Default: Counter		
	0	Automatic	-
	1	Counter	-
	2	Puls Length	-
Gate Time (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Time periode for counting of impulses		
	Range: 0 ... 9999999 ms Default: 1000 ms		
Debounce (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Stabilisation time of impuls		
	Range: 0 ... 999 ms Default: 10 ms		
»Min(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Warning low limit		
	Range: 0 ... 32767 l/h Default: 0 l/h		
»Min(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Alarm low limit		
	Range: 0 ... 32767 l/h Default: 0 l/h		
	Warning high limit		

»Max(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Range: 0 ... 32767 l/h Default: 900 l/h		
»Max(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Alarm high limit		
	Range: 0 ... 32767 l/h Default: 3900 l/h		
»Hysther.(Warn.) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Hysteresis, used as +/- from threshold		
	Range: 0 ... 32767 l/h Default: 10 l/h		
»Hysther.(Alarm) (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Hysteresis, used as +/- from threshold		
	Range: 0 ... 32767 l/h Default: 10 l/h		
»Prio Warn. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.) NEOMERIS CONTROL DES, Device, Bleed off, Blowd. flow	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown
Mode prop. (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1	Activate the proportional dosage		
	Default: ON		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
Pulse relation (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1	Number of output pulses per input pulse		
	Range: 0.00 ... 99.99 Default: 1.00		

Low duration (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1	Pause duration between 2 pulses of prop. dosing output		
	Range: 0.00 ... 9.99 s Default: 0.25 s		
High duration (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1	Period duration of proportional dosing output impuls		
	Range: 0.00 ... 9.99 s Default: 0.25 s		
Pulse limit (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1	Limit of stored impulses		
	Range: 0 ... 99999999 Default: 10000		
Error behavior (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1	Reacting to errors		
	Default: Save		
	0	Save	Save impulse
	1	No save	Dont save impuls
»Contact Up (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1	Kind of contact (used/n.used)		
	Default: occupied=active		
	0	occupied=active	-
	1	not occupied=active	-
»Contact Low (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1	Kind of contact (used/n.used)		
	Default: occupied=active		
	0	occupied=active	-
	1	not occupied=active	-
»Debouncing Fill (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1	Delay to accept the tank level		
	Range: 0.0 ... 99.9 s Default: 2.0 s		
Priority (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Set priorities of alarm		
	Range: 0 ... 99 Default: 20		
React. Signal (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	How should be reacted to the message?		
	Default: None		
	0	None	no reaction at all
	1	Info	show info icon, but no other reaction
	2	Warning	generate warning, normally does not affect process

	3	Alarm	alarm, affects process according to setting
Reac. Sys. (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Reaction of the system to an alarm-type message		
	Default: Continue		
	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown
Delay (Num.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Alarm delay time		
	Range: 0 ... 999 s Default: 0 s		
»Contact Type (Sel.) NEOMERIS CONTROL DES, Device, Prop. dosing 1, Dosing Pump 1	Kind of contact (Imp.avail/Imp.n.avail.)		
	Default: active=Impulse available		
	0	active=Impulse available	-
	1	active=Impulse not available	-
»Time Dos. mode (Sel.) NEOMERIS CONTROL DES, Device, Time Dosing 1	Mode of time proportional dosing		
	Default: Process contr.		
	0	Process contr.	control according process
	1	Off	Always off
	2	On	Always on
»Dosage duration (Num.) NEOMERIS CONTROL DES, Device, Time Dosing 1	Duration of the dosing		
	Range: 0 ... 999 min Default: 2 min		
»Time lock (Num.) NEOMERIS CONTROL DES, Device, Time Dosing 1	Locking time after dosing		
	Range: 0 ... 999 min Default: 15 min		
»Total Time (Num.) NEOMERIS CONTROL DES, Device, Time Dosing 1	Max. possible dosing time per day		
	Range: 0 ... 999 min Default: 0 min		
Starting time (Zeit) NEOMERIS CONTROL DES, Device, Time Dosing 1, Starting Date 1	Start time for dosing		
	Default: 00:00		
Days of week (Sel.) NEOMERIS CONTROL DES, Device, Time Dosing 1, Starting Date 1	Weekly grid for start time		
	Default: 000-0000		
	0	Sunday	Sunday

	1	Monday	Monday
	2	Tuesday	Tuesday
	3	Wednesday	Wednesday
	4	Thursday	Thursday
	5	Friday	Friday
	6	Saturday	Saturday
»Contact Type (Sel.) NEOMERIS CONTROL DES, Device, Time Dosing 1, Dosing Valve 1	Kind of contact (pulled/released)		
	Default: active=energized		
	0	active=energized	-
	1	active=not energized	-
»Contact Type (Sel.) NEOMERIS CONTROL DES, Device, System enable	Kind of contact (used/n.used)		
	Default: not occupied=active		
	0	occupied=active	-
	1	not occupied=active	-
»Contact Type (Sel.) NEOMERIS CONTROL DES, Device, Operating Signal	Kind of contact (pulled/released)		
	Default: active=pulled		
	0	active=pulled	-
	1	active=drop off	-
»Range (Sel.) NEOMERIS CONTROL DES, Device, Blowdown Analog Output	Range of current		
	Default: 4..20 mA		
	0	0..20 mA	-
	1	4..20 mA	-
»Upper Limit (Num.) NEOMERIS CONTROL DES, Device, Blowdown Analog Output	Maximal possible value of the conductivity		
	Range: 0 ... 5000 µS/cm Default: 2000 µS/cm		
»Lower Limit (Num.) NEOMERIS CONTROL DES, Device, Blowdown Analog Output	Minimal possible value of the conductivity		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
Switch On Delay (Num.) NEOMERIS CONTROL DES, Device, Circulation Pump	Delay of pump start after internal enable		
	Range: 0 ... 999 s Default: 15 s		
»Contact Type (Sel.) NEOMERIS CONTROL DES, Device, Circulation Pump	Kind of contact (energised/off)		
	Default: active=energized		
	0	active=energized	-

	1	active=not energized	-

8.2 Maintenance and Repair

NOTE

To ensure the perfect function of the control unit a regular maintenance is necessary (six-monthly, annual)!

- clean up the sensor, especially the electrodes
- check if the sensors are still water-proof
- calibrate sensor
- exchange battery

8.2.1 Maintenance of the Lithium Battery

The Lithium battery is only used to supply the real time clock (the parameters, settings, calibration will be stored without battery). A used battery has to be replaced by the same type. Therefore, the control unit has to be switched-off before. After changing the battery, the RTC has to be set correct again.

Used batteries have to be disposed of without polluting the environment.

8.2.2 Cleaning Instructions

The surface of the control unit is untreated. Therefore, contaminations with oil or fat should be avoided. However, if the housing becomes soiled, please clean the surface with a commercially available plastic cleaner (never use other solvents).

8.3 Software Update, change Firmware

You can use the device with different software to run a variety of controlling jobs with varied types of behaviour. Ensure that the correct software is installed.

An update can enhance an existing software or giving the control unit a complete new functionality/usage. The update can be done via transfer from a PC (with a cable set or adapter) or by a microSD-card.

8.3.1 Installing firmware using a PC

1. Switch off control unit.
2. Connect the PC with the control unit via a USB-cable.
3. Set (connect) the boot jumper. It can be found on the backside of the CPU board of the control unit.
4. Switch on the control unit. The PC will show a new removable storage with the file “Firmware.bin” inside.
5. Delete the File “Firmware.bin”. After this no file on the removable storage will be shown.
6. Copy the software update file (name must be “Cortex.bin”) from the PC to the new shown removable storage. Wait, till the copy process is finished.
7. Switch off the control unit.
8. Remove the boot jumper.
9. Switch on the control unit.
10. The control unit starts with the new software. In some cases, some parameter messages have to be confirmed.
11. Settings and parameters can be modified after an update and have to be checked in all cases.

8.3.2 Installing firmware using microSD-Card

1. Switch off control unit.
2. Insert the micorSD-card with the update file (name must be “Cortex.bin”) in the main directory of the microSD-card into the microSD-card slot on the backside of the CPU board.
3. Set (connect) the boot jumper. It can be found on the backside of the CPU board.
4. Switch on the control unit. The red led right beside the boot jumper stays lit.
5. Wait, till the green LED beneath the battery stops flashing.
6. Power off the control unit and remove the boot jumper.
7. The control unit starts with the new software. In some cases, some parameter messages have to be confirmed.
8. Settings and parameters can be modified after an update and have to be checked in all cases.

8.4 PC-Software

8.4.1 Obtaining the software and drivers

You will find the suitable software and possibly required drivers at the following web address:

www.heylneomeris.de/mediathek/software/

8.4.2 Requirements / Installation

For "installation" on a PC (Windows 7 or higher), the PC software ZIP file associated with the device with the corresponding revision of the previously mentioned web address must be unpacked onto a data carrier of the PC. A software installation in the traditional Windows sense with admin rights is not required.

The connection between PC and controller is made in the standard case by a USB cable (USB-A PC side and USB mini control side).

Furthermore, with Windows 7 and Windows 8, a corresponding driver must be installed, which is available for download with installation instructions on the previously mentioned web address. Starting with Windows 10, no separate driver is required.

Optionally, in addition to the USB connection, communication via Bluetooth, LAN, WLAN or a mobile connection is possible with the help of corresponding pluggable COM modules.

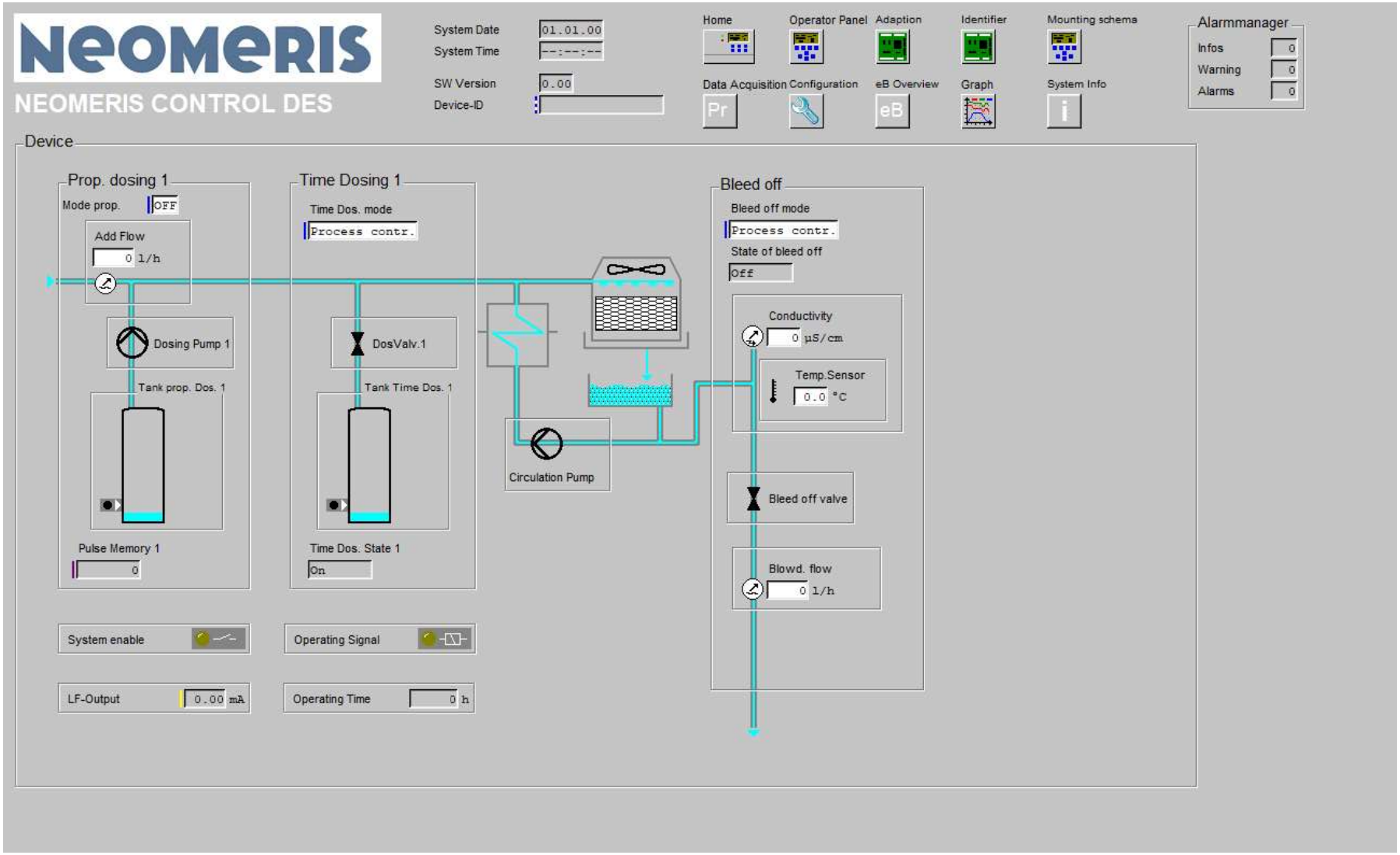
8.4.3 Function of the Visualization / Simulation

The software will be started by using the “vis.bat”, “sim.bat” or radMON.exe directly from the installation directory.

With the visualization it is possible to see the actual control status of the connected control unit, record all activities and change/save/restore parameters by remote. With the simulation no connected control unit is required. It will be simulated completely and realistic by the PC software and can be used for demonstration, tests or education purposes.

A detailed instruction manual is available from the previously mentioned web address.

8.4.4 View of the Main Screen



8.5 Software History

Date	Entry scope (HW, SWappl, SWapi, Release)	Entry type (Enhancement, Improvement, Bugfix, Release)	Version	Status (development, implemented, tested)	Responsible	Reason for the modification	Items of the modification	Impact for (end-)customer	Comment	location in model/source
2018-12-14		Release	1.04	tested	AFo					
2018-12-28	SWappl	Improvement		tested	AFo	new customer requirement	The editing of the new standard page parameter can be changed	StandardPage can be modified		NEOMERIS CONTROL DES, Improve2
2018-12-28	SWappl	Improvement		tested	AFo	new customer requirement	add backlight color switching	display backlight change color in dependency of system status (ok=lightblue, warning=yellow, alarm=red, ...)		NEOMERIS CONTROL DES, Improve1
2019-01-15	SWappl	Improvement		tested	AFo	new customer requirement	remove pH an Redox	removement from documentation		NEOMERIS CONTROL DES, Improve3
2019-01-15 (2)		Release	1.05	tested	AFo					
2019-02-08	SWapi	Bugfix		tested	AFo	The digits of the conductivity value were not shown iin the main display.	corrected	Digits are now shown		NEOMERIS CONTROL DES, Bugfix1
2019-02-08 (2)		Release	1.06	tested	AFo					
2019-04-09	SWappl	Bugfix		Implementierung	NSt	Leitfähigkeit wurde mit der Temperatur kalibriert aber der eingelernte Wert wurde nicht zurück nominiert	Fehlende Aufruf in Modul MDialog128x64 in kaliset_ai() hinzugefügt	Leitfähigkeit wird korrekt zurück nominiert		NEOMERIS CONTROL DES, Bugfix1
2019-04-11	SWappl	improvement		tested	NSt	new customer requirement	Module ab/anschaltbar gemacht	Module lassen sich Einblenden/Ausblenden		NEOMERIS CONTROL DES, Improve4
2019-04-12		Release	1.07	tested	NSt					
2019-04-24		Release	1.08	tested	NSt					
2019-04-24	SWappl	Improvement		tested	NSt	new customer requirement	Display colors (yellow/blue) changed for states.	The yellow of the display is better to recognize and the saturation of the blue was increased.		NEOMERIS CONTROL DES, Improve5
2019-04-29	SWappl	Improvement		tested	NSt	new customer requirement	Reaction message of the tanks was set default to no message. Unlock is activated as standard.	Tank will no longer issue an error message. Unlock is always given with open terminals.		NEOMERIS CONTROL DES, Improve6
2019-04-30		Release	1.09	tested	NSt					
2019-05-02	SWappl	Bugfix		tested	NSt	During scrolling, blank pages were displayed due to disabled modules.	Software adapted to skip the blank pages.	No more blank pages during the roll.		NEOMERIS CONTROL DES, Bugfix2
2019-05-03		Release	1.10	tested	NSt					
2019-08-01	SWappl	Bugfix		tested	NSt	The analog output that outputs the conductivity value in mA was without function.	Overwritten line in the code that sets the output restored.	Analog output outputs the conductivity value in mA.		NEOMERIS CONTROL DES, Bugfix3
2019-08-05	SWappl	Improvement		tested	NSt	To prevent bug updatet to new radLib version	Surfaces of the application revised	Menu is more structured and the possible bug was excluded		NEOMERIS CONTROL DES, Improve7
2019-08-07		Release	1.11	tested	NSt					

2020-07-10		Release	1.12	tested	NSt					
2020-07-10	SWappl	Bugfix		tested	NSt	The area of the analog output was not saved because the element was a SYS and not a PAR.	Element type changed from SYS to PAR.	The range of the analog output is saved correctly.		NEOMERIS CONTROL DES, Bugfix4
2021-10-22	SWappl	Improvement		tested	NSt	new customer requirement	Improved description of sensors	sensors easier to understand		NEOMERIS CONTROL DES, Improve8
2022-03-31	SWappl	Improvement		tested	NSt	new customer requirement	Improved description of time dosing	time dosing easier to understand		NEOMERIS CONTROL DES, Improve8

8.6 EC-Declaration of Conformity

See next page.