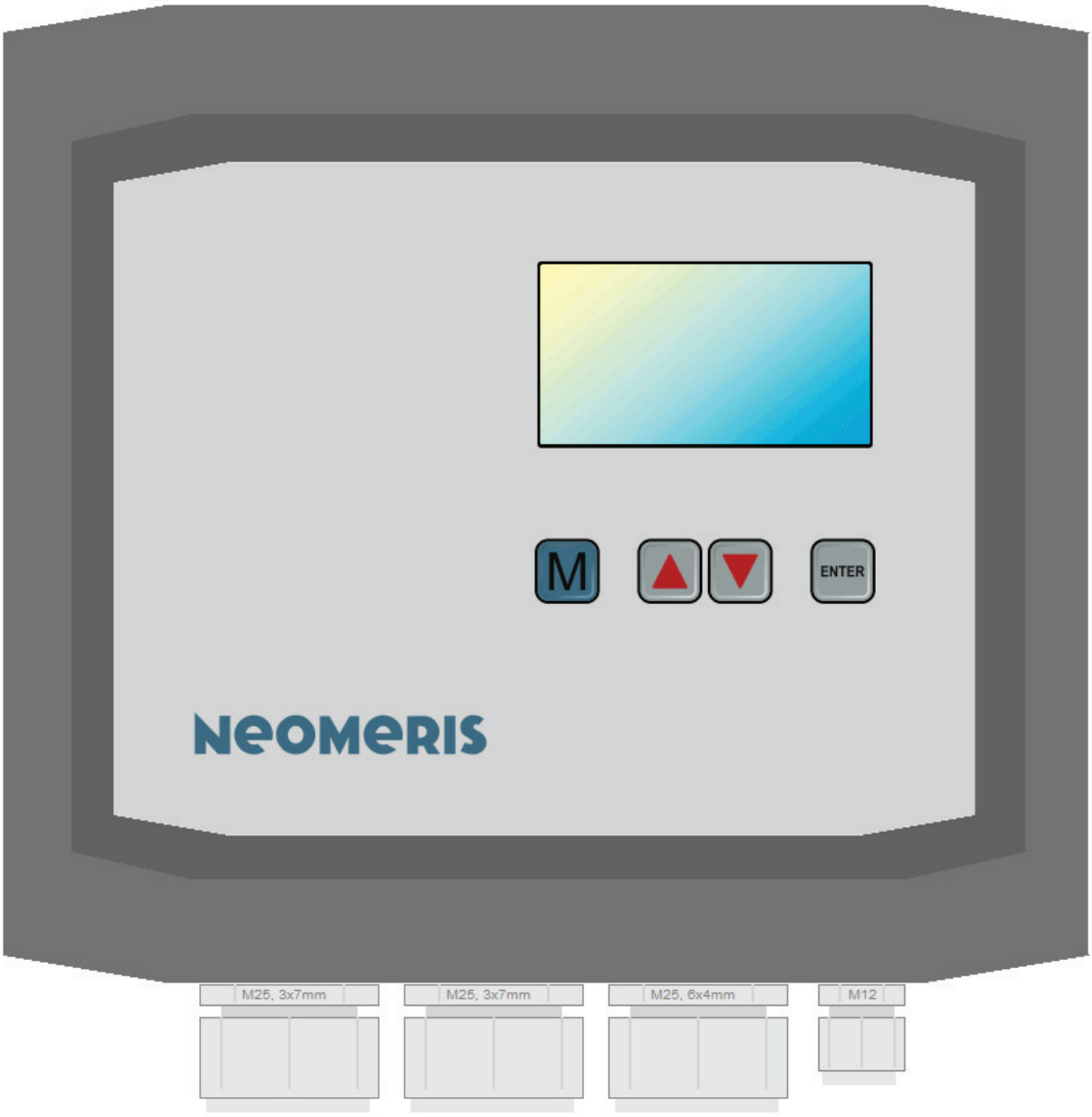
NEOMERIS



NEOMERIS CONTROL DES

Stand Rev. 1.05

Manual

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This manual relates to the following control unit / version:

Control device	NEOMERIS CONTROL DES

Software version	1.05

Build:20190115-104402-4025035NSt

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Contents

1. Important safety information 5
1.1 Hazards during system handling 5
1.2 Duties of the owner 5
1.3 Duties of the staff 5
1.4 Staff qualifications 6
1.5 Warnings in this manual 6
2. Notes and instructions to be observed 7
2.1 General notes 7
2.2 During installation 7
2.3 During operation 7
2.4 During cleaning 7
2.5 During uninstallation 8
2.6 During disposal 8
2.7 Safeguards 8
2.8 Informal safety measures by the owner 8
2.9 Safety measures during normal operation 8
2.10 Hazards from electrical energy 9
2.11 Hazards from hydraulic energy 9
2.12 Intended use 9
2.13 Unconventional use 9
2.14 Structural modifications to the controller / system 9
2.15 Warranty and liability 10
2.16 Copyright 10
3. Delivery scope 11
3.1 Unpacking and checking the delivery 11
3.2 Component list 11
3.3 Sensors and Accessories 12
4. Specifications 14
4.1 General characteristics 14
4.1.1 Housing 14
4.1.2 Operation panel/User-Interface 14
4.1.3 Power Supply (injected from external) 14
4.1.4 Power Supply (provided to external) 14
4.1.5 Digital Inputs 15
4.1.6 Digital Outputs 15
4.1.7 Analog Inputs 17
4.1.8 Analog Outputs 18
4.1.9 Pulse and Counting Inputs 18
4.1.10 Environmental Conditions 18
4.2 Standards and Regulations 19
4.3 Views and dimensional drawings 20
4.3.1 Front film layout 20
4.3.2 Housing Bottom and Drill Pattern 21

5. Installation 22
5.1 Preparing for installation 22
5.1.1 Setup location 22
5.1.2 Setup area 22
5.1.3 Power supply 22
5.1.4 Cabling 22
5.2 Installation process 23
5.2.1 Installing the controller 23
5.2.2 Installation of measuring probes 23
5.3 Cabling 24
5.4 Terminal connection 25
5.4.1 Connectors (X) - overview 25
5.4.2 Terminal block (TB) - overview 25
5.4.3 Terminal assignments 25
5.4.4 Component Inside view (below) 27
5.5 Input-/Output Schema 28
5.6 Configuration/Jumper 29
6. Functional description 30
6.1 System overview/-structure 30
6.2 Module: System 30
6.2.1 Info: 30
6.2.2 Comment: 30
6.2.3 Internal elements of module: 31
6.2.4 Artefacts 31
6.3 Module: MDesalModule2 31
6.3.1 Info: 31
6.3.2 Comment: 31
6.3.3 Internal elements of module: 32
6.4 Module: MDesal2 32
6.4.1 Info: 32
6.4.2 Comment: 32
6.4.3 Internal elements of module: 32
6.5 Module: MDosProp 33
6.5.1 Info: 33
6.5.2 Comment: 33
6.5.3 Internal elements of module: 33
6.6 Module: MDosTime 34
6.6.1 Info: 34
6.6.2 Comment: 34
6.6.3 Internal elements of module: 34
7. Operation 36
7.1 Operating and Display Elements 36
7.2 Navigation and Programming 36

7.2.1 General information 36
7.2.2 Key functions 36
7.2.3 Automatic reset 37
7.2.4 Passwords 37
7.2.5 Setup of Parameters and Values 37
7.3 Calibration 38
7.3.1 Analog Input 38
7.3.2 Analog Output 40
7.4 Diagnostics 41
7.5 Alarm Handling and Messages 42
7.6 Firmware-Update 42
7.7 Factory settings 42
7.8 HMI-overview 43
8. Appendix 50
8.1 Overview of Parameters 50
8.2 Maintenance and Repair 59
8.2.1 Maintenance of the Lithium Battery 59
8.2.2 Cleaning Instructions 59
8.3 Software Update, change Firmware 60
8.3.1 Installing firmware using a PC 60
8.3.2 Installing firmware using microSD-Card 60
8.4 PC-Software 61
8.4.1 System Requirements / Installation 61
8.4.2 Functionality of Visualization / Simulation 61
8.4.3 View of the Main Screen 61
8.5 EC Declaration of Conformity 62

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 uninstallation

- If the device is defective, it is imperative to note down the type of error (error effects) prior to uninstallation. Repair (regardless of the warranty period) is only possible with an uninstalled device and with such an error description. Use the enclosed error log for describing the error and place the log with the device when returning it. You can also download the error log from the Internet at www.heylneomeris.de.

2.6 During disposal

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

2.7 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.

2.8 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.

2.9 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.

-

2.10 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.

2.11 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.

2.12 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.

2.13 Unconventional use

The statements as per Item 2.12 apply.

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

2.14 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.

2.15 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.

2.16 Copyright

The manufacturer / supplier retains the copyright to this operation manual. This operation manual is only intended for the owner and their staff.

It contains regulations and notes exempt from any of the following, neither fully nor partially:

- Duplication,
- Distribution, or
- any other form of communication.

Contraventions may be prosecuted.

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 still included in other components.

Identifier	Item Number	Quant.	Type / Usage	Details / Picture	Comp.-Id
CAE_P_5Rel5DiPow_02	VIM0-0198-00	1	I/O-Brick	on patch board	eB1
CAE_P_LfTmpAoDAioImp_03	VIM0-0113C01	1	I/O-Brick	on patch board	eB2
CAE_X-10Wire20-no3V3	C45U0-0041E00	(1)	Connection Cable	Ribbon Cable	Bus Cable
CAE_X_Inject230_20SM_10	VIM0-0223-00	(1)	Power-Brick	on patch board	eB0
CAE_Y-CHBoc160	D12Z0-0060-00	(1)	Patch Board		Patchboard
CAH_Boc160gl-28-uC	D12G0-0179-01	(1)	Housing		Housing
CAH_Cg12-01	C49K0-0023-00	(1)	Gland	M12	M12
CAH_Cg25-03	C49Z0-0002-00	(1)	Gland	M25, 3x7mm	M25, 3x7mm
CAH_Cg25-03	C49Z0-0002-00	(1)	Gland	M25, 3x7mm	M25, 6x4mm

CAH_Cg25-06	C49Z0-0001-00	(1)	Gland	M25, 6x4mm	M25, 6x4mm
CBB_CPU-unCORE-1-28M	VIM0-0186C00	(1)	CPU-Board		CPU-Board
CCB_CORE1-B160gl-28M	VIM0-0233-00	1	Base System		Base

3.3 Sensors and Accessories

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

Identifier	STE5/PT100 EG
Item Number	310126
Quant.	0/1
Type / Usage	Cond.-Probe (conductive)
Details / Picture	K=0.5 with PT100, stainless steel V4A, 1.4571, integral thread 3/4", without cable, 0...2000µS/cm, max. 130°C
Adaption	

Identifier	LMZ-03-1.0/PT100
Item Number	880454
Quant.	0/1
Type / Usage	Cond.-Probe (conductive)
Details / Picture	K=1.0 with PT100, DN32 PVC-U with graphite electrode and 2.1m cable set, 0...5000µS/cm, max. 60°C
Adaption	

Identifier	LMZ-03-0.1/PT100
Item Number	890623
Quant.	0/1
Type / Usage	Cond.-Probe (conductive)
Details / Picture	K=0.1 with PT100, DN32 PVC-U with stainless steel electrodes, 2.1m cable set, 0...500µS/cm, max. 60°C
Adaption	

Identifier	EV220B, 018F6701
Item Number	Danfoss
Quant.	0/1
Type / Usage	Solenoid Valve
Details / Picture	Adaption via 2-wire: Pin 1, Pin 2
Adaption	Pin 1 => eB1.9 Pin 2 => eB1.11

Identifier	VCZAP1000, VC4012
Item Number	Honeywell

Quant.	0/1
Type / Usage	Solenoid Valve
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

4. Specifications

4.1 General characteristics

4.1.1 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

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

4.1.3 Power Supply (injected from external)

Description	Main Supply form external
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)

Description	Supply sourcing 230V AC for externals
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
Voltage	24V DC
max. Current	600mA DC
max. Power	15W
Remark	

4.1.5 Digital Inputs

Identifier	DosProp.1 Tank empty
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	DosTime.1 Tank empty
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	Equ. Enable
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

Identifier	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
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
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 1
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 1
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	On operation
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

Identifier	Analog Input
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	Conductivity
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	Current Sensor
Type	Power measuring
Range	0 ... 500A
Input Resistance	-
Resolution	0.5%
Accuracy	2%
Linearity	1%
Filter	-
Linearization	-
Model / Type	ind. transformer
Remark	4% ripple

Identifier	Temperature
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	

4.1.8 Analog Outputs

Identifier	Analog Output
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

Identifier	Puls Input
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

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

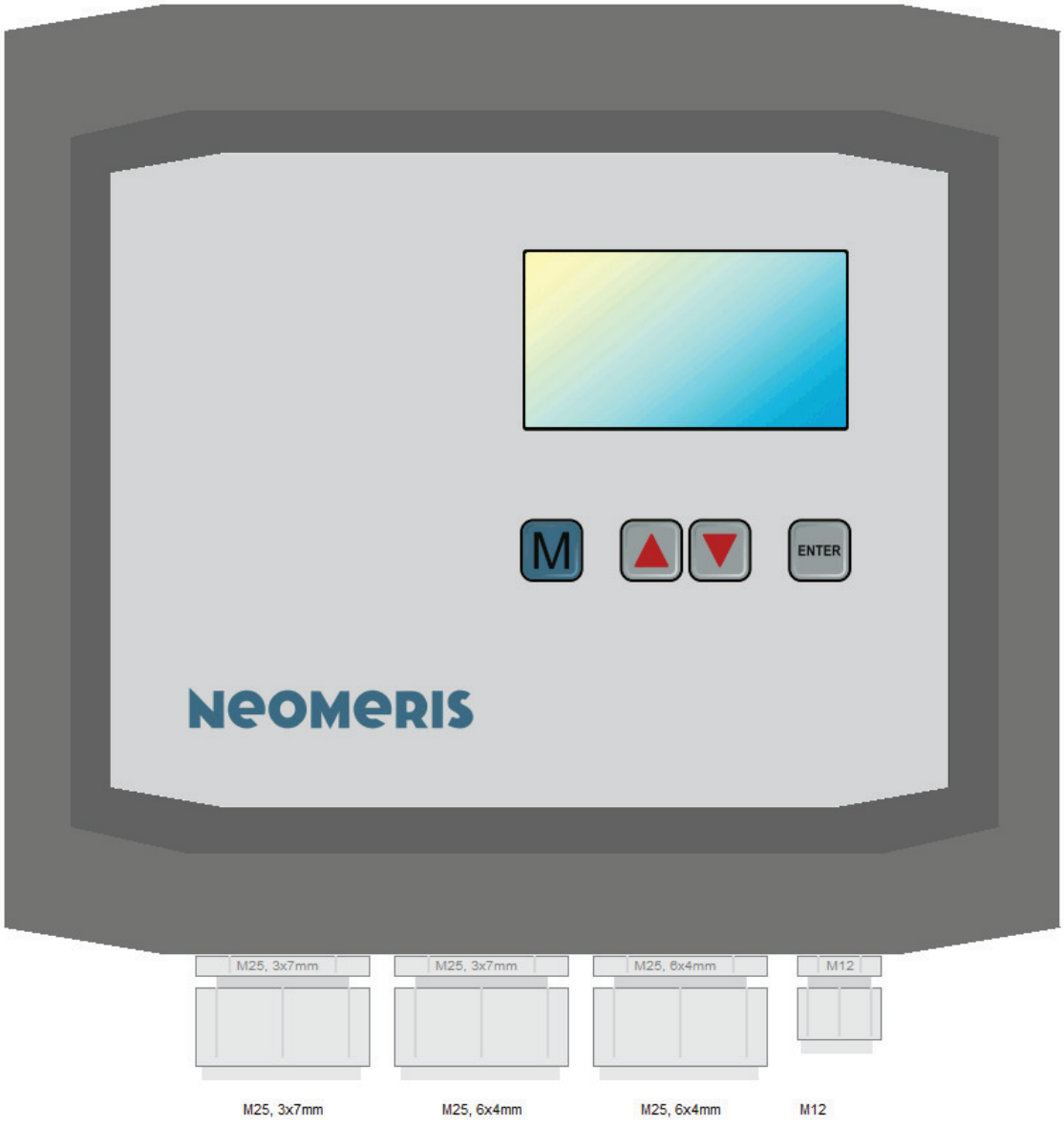
4.2 Standards and Regulations

The present control unit compiles with the following standards:

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

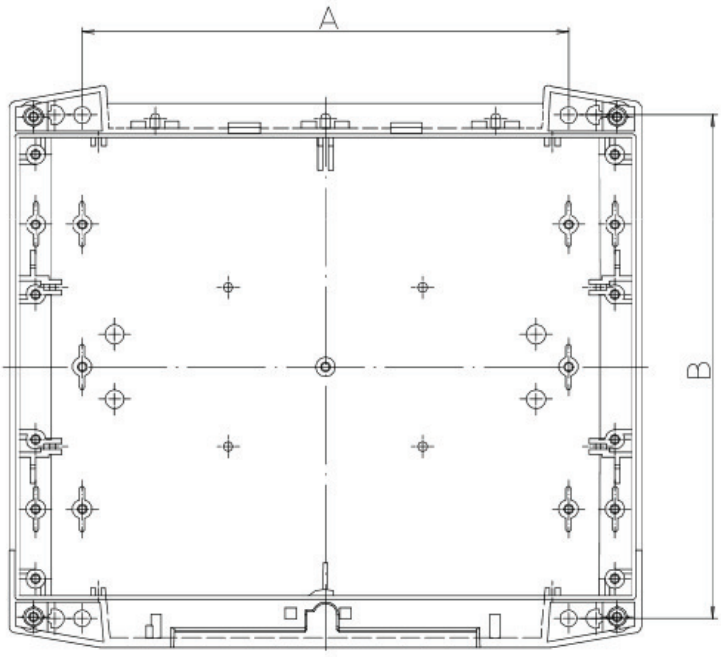
4.3 Views and dimensional drawings

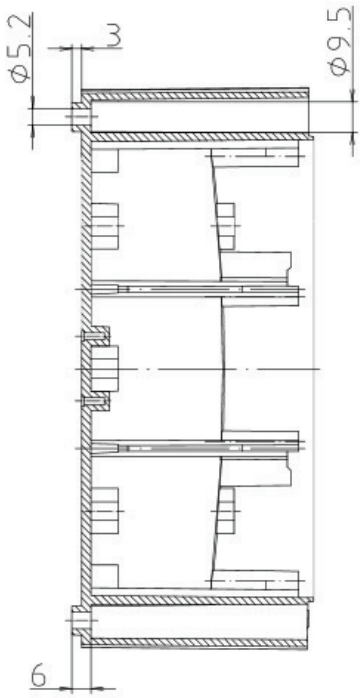
4.3.1 Front film layout



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 per "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 5.2

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 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

5.4.2 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 KI1	Wago250	2.5mm	Cage Terminal	13	up to 0.5mm² or 0,8mm	50V/1A
eB2 KI2	Wago250	3.5mm	Cage Terminal	2	up to 1.5mm²	250V, 8A

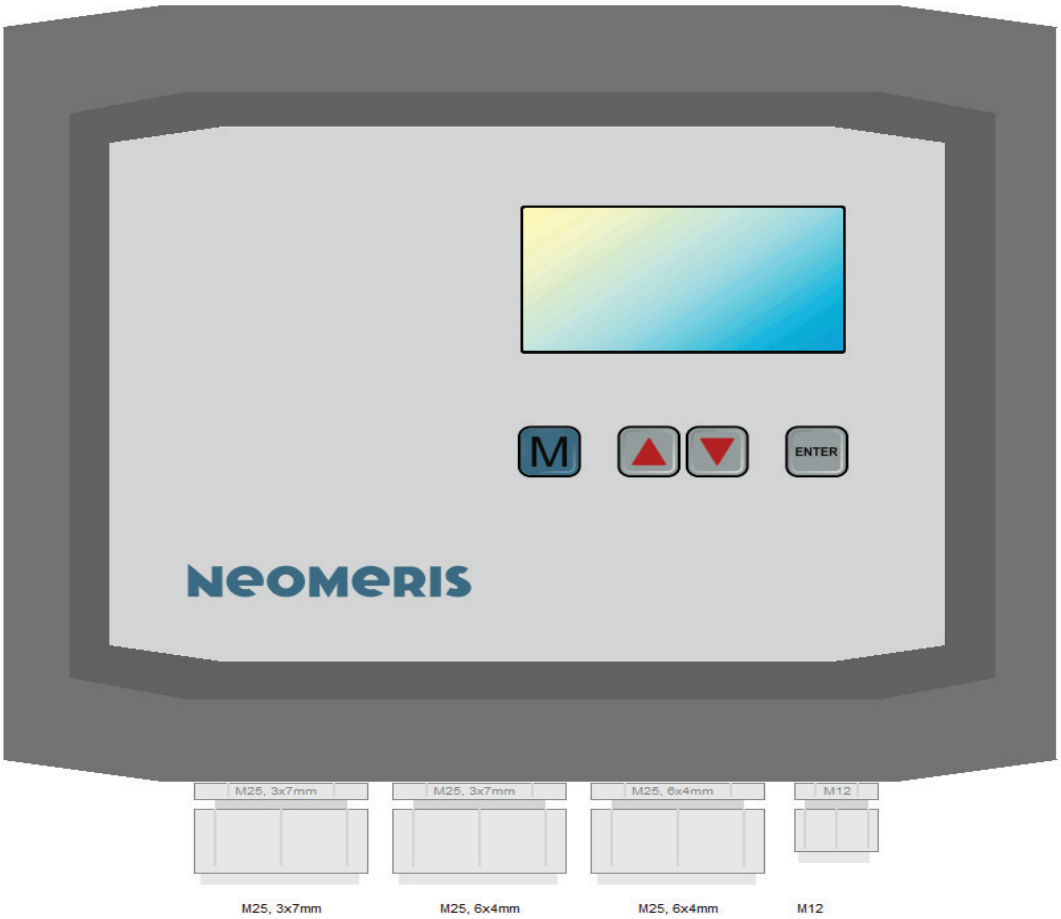
5.4.3 Terminal assignments

Term.Block	Term.No.	Term.Id.	Type / Usage	Function
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.TB1	1	PE	Protective Earth	-
eB1.TB1	2	PE	Protective Earth	-
eB1.TB1	3	PE	Protective Earth	-
eB1.TB1	4	PE	Protective Earth	-
eB1.TB1	5	PE	Protective Earth	-
eB1.TB1	6	PE	Protective Earth	-

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 1
eB1.TB2	13	C	Relay, change over contact, isolated	Dosing Valve 1
eB1.TB2	14	NO	Relay, normally open contact, isolated	Dosing Valve 1
eB1.TB2	15	NC	Relay, normally close contact, isolated	Alarm signal
eB1.TB2	16	C	Relay, change over contact, isolated	Alarm signal
eB1.TB2	17	NO	Relay, normally open contact, isolated	Alarm signal
eB1.TB2	18	NC	Relay, normally close contact, isolated	On operation
eB1.TB2	19	C	Relay, change over contact, isolated	On operation
eB1.TB2	20	NO	Relay, normally open contact, isolated	On operation
eB1.TB3	27	PoC	Optocoupler Collector	Dosing Pump 1
eB1.TB3	28	PoE	Optocoupler Emitter	Dosing Pump 1
eB1.TB4	21	IN	Input for ext. floating contact	Equ. Enable
eB1.TB4	22	GND	Ground	Equ. 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	DosTime.1 Tank empty
eB1.TB4	26	GND	Ground	DosTime.1 Tank empty
eB2.TB1	1	Tmp	Input Temperature Sensor	Temperature
eB2.TB1	2	0V	Ground	Temperature
eB2.TB1	3	Out	Current Output	Analog Output
eB2.TB1	4	0V	Ground	Analog Output
eB2.TB1	5	V+	Sensor Supply +24V	Puls Input
eB2.TB1	6	IN	Input	Puls Input
eB2.TB1	7	0V	Ground	Puls Input
eB2.TB1	8	24V	Sensor Supply +24V	Analog Input
eB2.TB1	9	IN	Input	Analog Input
eB2.TB1	10	0V	Ground	Analog Input
eB2.TB1	11	PE	Shield	Conductivity
eB2.TB1	12	LF	Input Conductivity Sensor (Cond.)	Conductivity
eB2.TB1	13	0V	Ground	Conductivity
eB2.TB2	14	PE	Shield	Potential equalization
eB2.TB2	15	0V	Ground	Potential equalization

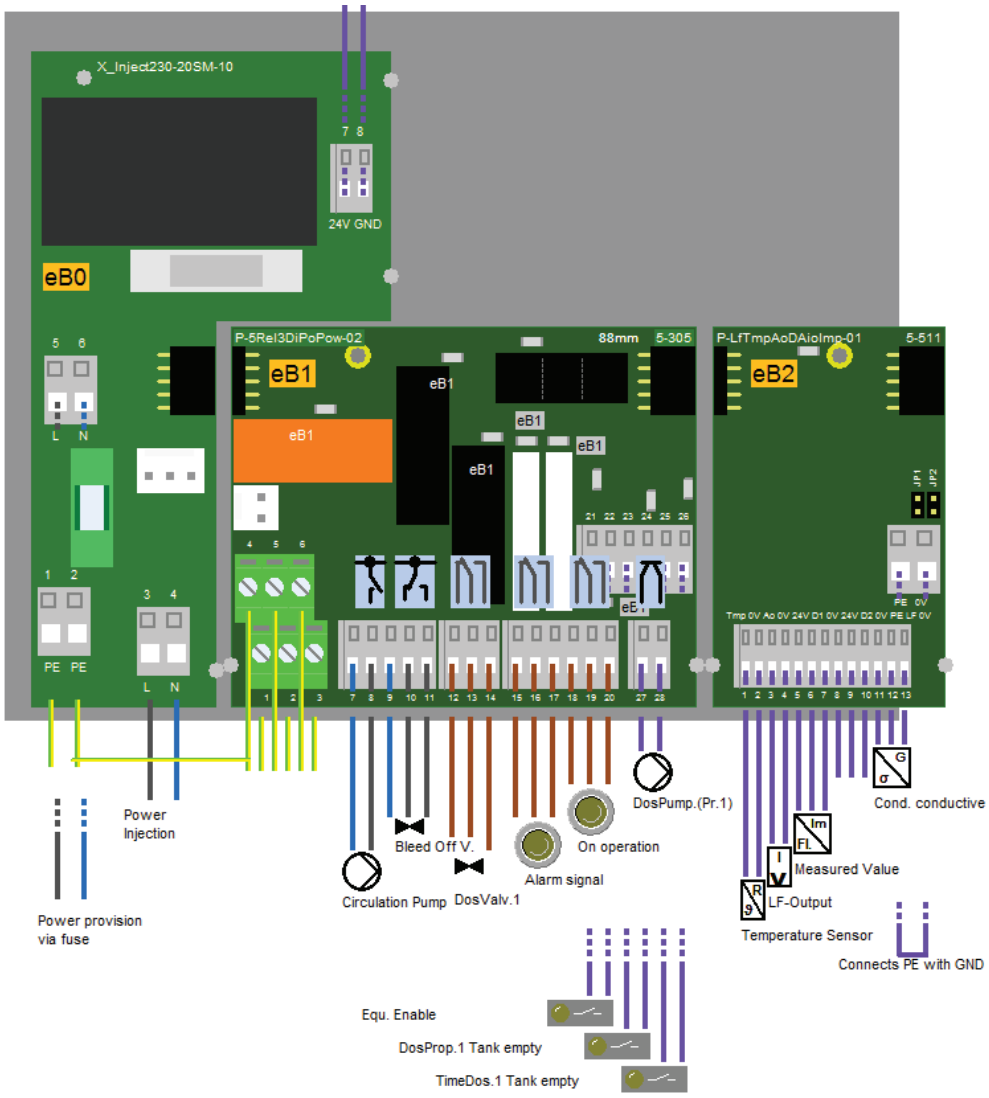
5.4.4 Component Inside view (below)

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



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

The conductivity is compensated to 25 degrees celsius.

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	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

6. Functional description

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

6.1 System overview/-structure

- Desalination Control DES 128 (System), DES_128
  - Device (MDesalModule2), Control Unit
    - Bleed off (MDesal2), Bleed off process
      - Conductivity Sensor (MAbsConductivityCompTemp), Measures the conductivity
        - Temp.Sensor (MTemperature), Measures the temperature
      - Bleed Off V. (MValve), Extraction of the water
      - 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 (MDosTime), 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
    - Equ. Enable (MDigIn), Externally enable signal
    - On operation (MDigOut), Signalling of system status
    - Blowdown Analog Output (MUniAnalOut), Get conductivity in mA
    - Operating Time (MOpTime), Counts operating time
    - Circulation Pump (MDelPump), Mainpump to get water into system
  - Data Transfer (MSDCard), Export and import of remanent data
  - Data Acquisition (MProtocolSdcCsv), Logging of data elements
    - Protocol show (MProtShowCsv), Displays logged data
    - Logging protocol (MProtRecordCsv), Logs data in a csv file

6.2 Module: System

6.2.1 Info:

Desalination Control DES 128

6.2.2 Comment:

Control of the bleeding and chemical dosing for cooling systems including the additional peripheral functions like lock down and pre bleed off.

The system can respond to warnings or alarms as follows:

Continue: Do not shut down. No effect on the ongoing process.

Shutdown: Continuous shut down i.e. the shut down signal is applied to the process as long as the alarm condition persists.

Cycl. shutdown: Like Shutdown, however, the process is only attempted to restart as often as it is set in the menu item Cyclic Retry.

Dur. shutdown : Shut down permanently. The shut down signal and alarm persist until the alarm is acknowledged by the operator.

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

6.2.3 Internal elements of module:

6.2.3.1 Parameters

»DLS autom. (Sel.)	Automatic daylight saving times switching		
	Default: On		
	0	Off	-
	1	On	-

6.2.4 Artefacts

6.2.4.1 IdDevice

Control device	NEOMERIS CONTROL DES

6.2.4.2 IdVersion

Software version	1.05

6.3 Module: MDesalModule2

6.3.1 Info:

Bleed off module

6.3.2 Comment:

This module contains subordinately all process functions and flows of the control unit.
Typical usage is the desalination / blowdown for cooling or evaporation systems and its attached dosing of chemicals for stabilization and disinfection.

6.3.3 Internal elements of module:

6.3.3.1 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

6.4 Module: MDesal2

6.4.1 Info:

Bleed off

6.4.2 Comment:

If the conductivity of the system water increases the given desalination threshold (parameter: Bleed off start), the bleeding valve will be opened.
The bleeding continues till the conductivity falls below the threshold minus the hysteresis (parameter: Hysteresis), caused by the dilution of the system water with fresh water.
Then the bleeding valve will be closed.

Furthermore it is possible to lower the conductivity threshold of the system water befor the time dosing starts by using the pre bleed off (parameter: Pre Bleed start).
The circulating pump is always active when desalination is active.

6.4.3 Internal elements of module:

6.4.3.1 Parameters

Bleed off mode (Sel.)	Type of control of the bleed off valve		
	Default: Automatic		
	0	Automatic	Automatic
	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

6.5 Module: MDosProp

6.5.1 Info:

Quantitatively proportional dosing

6.5.2 Comment:

The proportional dosing controls the addition/dosing of chemicals according to the fresh water supply.
Hereby a flowmeter detects the amount of fresh water to the system water cycle and the dosing pump injects accordingly to this.

The pulses from the flowmeter are measured and accordingly to the adjusted pulse relation (parameter: Pulse relation) there will be output pulses generated.
The amount of dosed chemicals are controlled through setting the period duration (parameter: High Duration) of the output pulse and setting the pause duration (parameter: Low Duration) between two output pulses.
There is a constant replenishment. During the lockdown there is no active dosing, therefore the impulses from the flowmeter are saved (parameter: Pulse limit) and when the lockdown is reversed the chemicals are dosed accordingly to the saved impulses.

6.5.3 Internal elements of module:

6.5.3.1 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 behav. (Sel.)	Reacting to errors		
	Default: Save		
	0	Save	Save impulse
	1	No save	Dont save impuls

6.6 Module: MDosTime

6.6.1 Info:

Time dosage

6.6.2 Comment:

The time dosing is typically used for biocide dosing.

Four starting times (parameter: Starting Time/Days of week) can be selected for the dosing.
The set time always has priority over the current conductivity value.

During and after the dosing, the bleeding will be locked accordingly to the adjusted time (parameter: Time lock).
The duration of the dosing (parameter: Dosage duration) and the max. time of all time dosings (parameter: Total Time) of the day combined together can also be set.

For the tank of the time dosing, the contact type, debouncing during filling and the alarm behavior can be set.
Likewise, the contact type of the dosing valve can be selected.

6.6.3 Internal elements of module:

6.6.3.1 Parameters

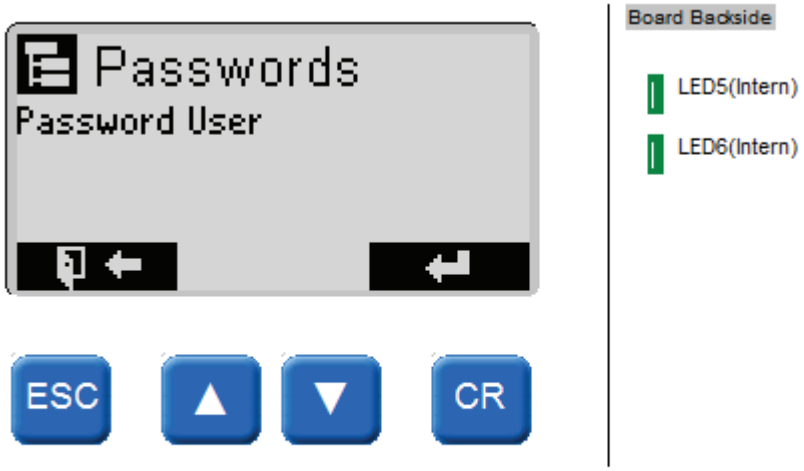
Time Dos. mode (Sel.)	Mode of time proportional dosing		
	Default: Automatic		
	0	Automatic	Automatic
	1	Off	Always off

	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		

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.

7.2.3 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.

7.2.4 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.

7.2.5 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 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.

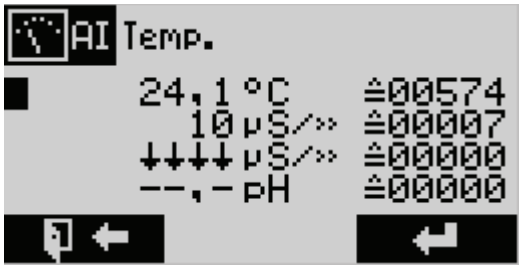
Further Notes:

- 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.
- 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.

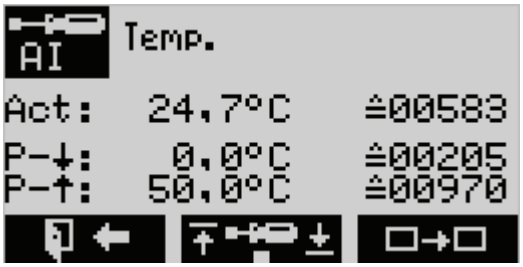
7.3.1 Analog Input

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.

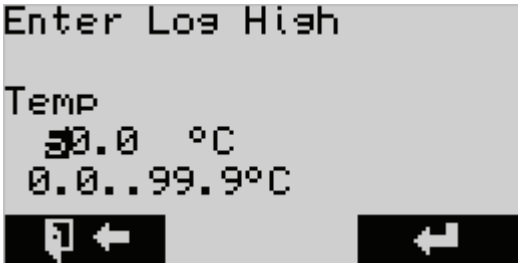
Sample of a selection mask:

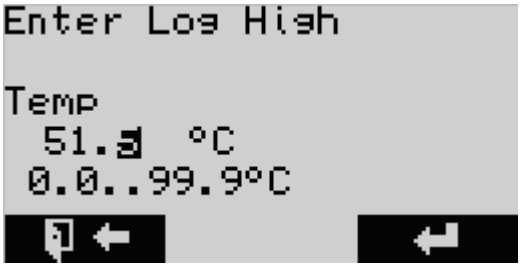


The input to be calibrated is selected with the aid of the ↑/↓-keys and branched to the following calibration mask. Here, the current measured value as well as the lower and upper calibration point are displayed as logical as well as converter raw value.



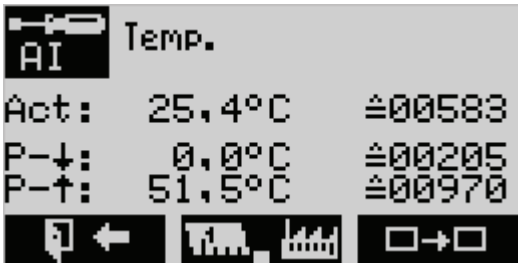
The current assignment appears:
The current temperature Act: 24.7 °C is assigned to a converter value of 00583. Press the ↑ key to enter the upper point. (Press ↓ to enter the lower point.)





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.

7.3.2 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.

7.4 Diagnostics

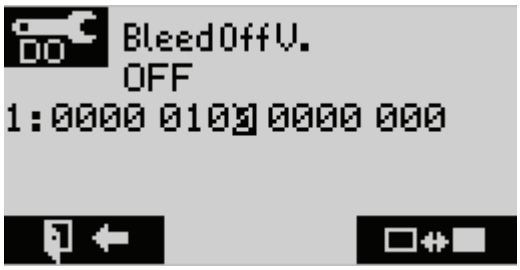
The hardware diagnostics allow the direct manipulation or representation of the outputs and inputs of the control unit.

NOTE

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

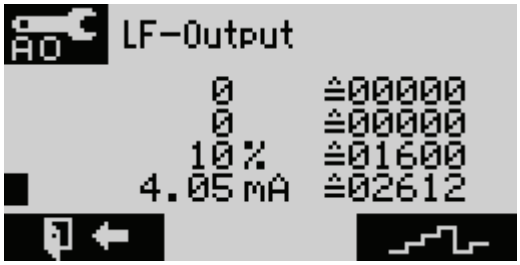
Using the ↑/↓-keys, you can use a cursor to select one of the digital inputs or outputs whose name and status are displayed in verbal form. The manipulation (off / on) is done via the **Enter**-key. This feature gives the technician the opportunity to test the hardware

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.

7.5 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).
If there is at least one warning, the display will always be yellow. If there is at least one alarm, the display will always be red. 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.

7.6 Firmware-Update

See chapter 8.4

7.7 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.

7.8 HMI-overview

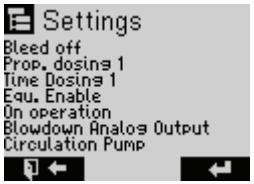
Main View

Start/Stop

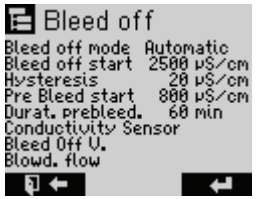
Main Menu

Messages

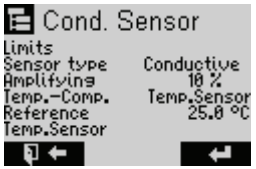
Settings



Bleed off



Conductivity Sensor



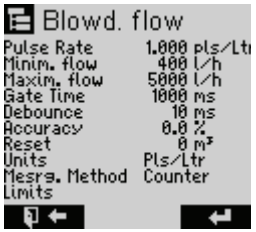
Limits

Temp.Sensor

Limits

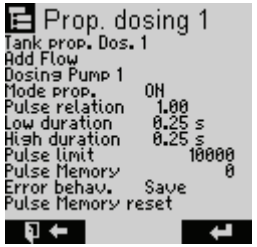
Dosing Valve 1 →

Add Flow →



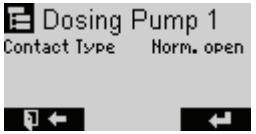
Limits →

Prop. dosing 1 →



Tank Time Dos. 1 →

Dosing Pump 1 →



Time Dosing 1 → Starting Date 1 →

↓

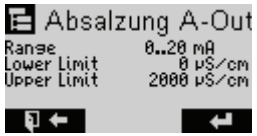
Equ. Enable →

↓

On operation →

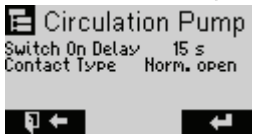
↓

Blowdown Analog Output →



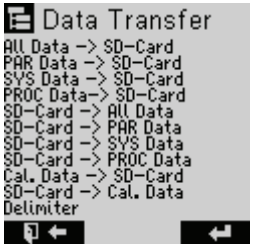
↓

Circulation Pump →



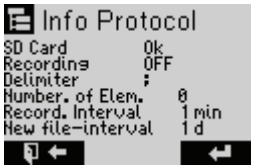
↓

Data Transfer →



↓

Data Acquisition → Wait → Info Protocol

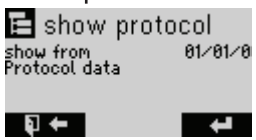


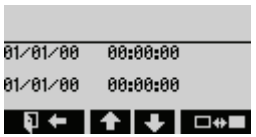
↓

Settings(Prot.)

↓

show protocol → Protocol data →

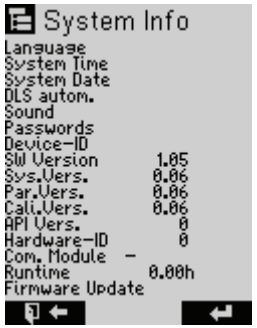




↓

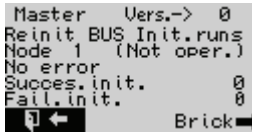
Service

Desalination Control DES 128

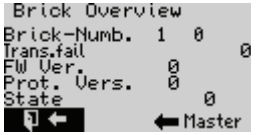


Desalination Control DES 128

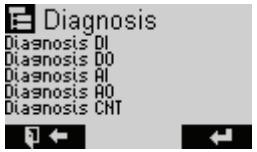
Master



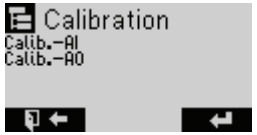
Brick Overview



Diagnosis



Calibration



Cyclic Retry

Factory Settings

Logo / Version

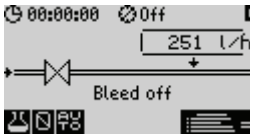
Main View

Main View

Main View

Main View

Main View



8. Appendix

8.1 Overview of Parameters

8.1.1.1 Parameters

»DLS autom. (Sel.) Desalination Control DES 128	Automatic daylight saving times switching		
	Default: On		
	0	Off	-
	1	On	-
»Scroll Time (Num.) Desalination Control DES 128, Device	Time interval between view calls in display		
	Range: 0 ... 999 s Default: 10 s		
»Standard page (Num.) Desalination Control DES 128, Device	Number of the page to be displayed fixed. If 0 then the is scrolling is active.		
	Range: 0 ... 99 Default: 5		
Bleed off mode (Sel.) Desalination Control DES 128, Device, Bleed off	Type of control of the bleed off valve		
	Default: Automatic		
	0	Automatic	Automatic
	1	Off	Always off
	2	On	Always on
Bleed off start (Num.) Desalination Control DES 128, Device, Bleed off	Conductivity threshold above which the desalination starts		
	Range: 0 ... 5000 µS/cm Default: 2500 µS/cm		
Hysteresis (Num.) Desalination Control DES 128, Device, Bleed off	Conductivity hysteresis for the desalination start		
	Range: 0 ... 5000 µS/cm Default: 20 µS/cm		
Pre Bleed start (Num.) Desalination Control DES 128, Device, Bleed off	Reduction of the conductivity threshold before a time dosing		
	Range: 0 ... 5000 µS/cm Default: 800 µS/cm		
Durat. prebleed. (Num.) Desalination Control DES 128, Device, Bleed off	Max. duration of the pre desalination		
	Range: 0 ... 999 min Default: 60 min		
»Reference (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Reference temperature for compensation		
	Range: 0.0 ... 99.9 °C Default: 25.0 °C		
»Sensor type (Sel.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Type of the connected conductivity sensor		
	Default: Conductive		
	0	Conductive	Conductive
	1	Inductive	Inductive

»Amplifying (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Amplifying of conductivity measurement signal		
	Range: 0 ... 100 % Default: 10 %		
»Temp.-Comp. (Sel.) Desalination Control DES 128, 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
»Cond-Meas. Mode (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Specification for sampling the conductivity sensor signal		
	Range: 0 ... 65535 Default: 0		
»Min(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Warning low limit		
	Range: 0 ... 5000 µS/cm Default: 50 µS/cm		
»Min(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Alarm low limit		
	Range: 0 ... 5000 µS/cm Default: 25 µS/cm		
»Max(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Warning high limit		
	Range: 0 ... 5000 µS/cm Default: 2800 µS/cm		
»Max(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Alarm high limit		
	Range: 0 ... 5000 µS/cm Default: 3000 µS/cm		
»Hysther.(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Hysteresis, used as +/- from threshold		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
»Hysther.(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Hysteresis, used as +/- from threshold		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
»Prio Warn. (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		

»Delay Alarm (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor	Reaction of the system on alarm		
	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
»Min(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Warning low limit		
	Range: 0.0 ... 99.9 °C Default: 10.0 °C		
»Min(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Alarm low limit		
	Range: 0.0 ... 99.9 °C Default: 3.0 °C		
»Max(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Warning high limit		
	Range: 0.0 ... 99.9 °C Default: 60.0 °C		
»Max(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Alarm high limit		
	Range: 0.0 ... 99.9 °C Default: 80.0 °C		
»Hysther.(Warn.) (Num.) Desalination Control DES 128, 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.) Desalination Control DES 128, 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.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.) Desalination Control DES 128, Device, Bleed off, Conductivity Sensor, Temp.Sensor	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.) Desalination Control DES 128, Device, Bleed	Reaction of the system on alarm		
	Default: Continue		

off, Conductivity Sensor, Temp.Sensor	0	Continue	No shutdown
	1	Shutdown	Shutdown with permanent retries
	2	Cycl.shutdown	Shutdown with defined number of retries
	3	Dur. shutdown	Durable shutdown
»Contact Type (Sel.) Desalination Control DES 128, Device, Bleed off, Bleed Off V.	Kind of contact (n.open/n.closed)		
	Default: Norm. open		
	0	Norm. open	-
	1	Norm. closed	-
Pulse Rate (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Measurement results of water amount (impuls per liter)		
	Range: 0.001 ... 999.999 pls/Ltr Default: 1.000 pls/Ltr		
Pulse Rate (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Measurement results of water amount (liter per impuls)		
	Range: 0.001 ... 99.999 Ltr/pls Default: 1.000 Ltr/pls		
Units (Sel.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Choice of the measuring unity		
	Default: Pls/Ltr		
	0	Pls/Ltr	-
	1	Ltr/Pls	-
Minim. flow (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Minimal working reach of the flow		
	Range: 1 ... 32767 l/h Default: 400 l/h		
Maxim. flow (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Maximal working reach of the flow		
	Range: 0 ... 32767 l/h Default: 5000 l/h		
Mesrg. Method (Sel.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Measuring method(auto,pulscount or pulslength)		
	Default: Counter		
	0	Automatic	-
	1	Counter	-
	2	Puls Length	-
Gate Time (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Time periode for counting of impulses		
	Range: 0 ... 9999999 ms Default: 1000 ms		
Debounce (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Stabilisation time of impuls		
	Range: 0 ... 999 ms Default: 10 ms		
»Min(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Warning low limit		
	Range: 0 ... 32767 l/h Default: 100 l/h		

»Min(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Alarm low limit		
	Range: 0 ... 32767 l/h Default: 50 l/h		
»Max(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Warning high limit		
	Range: 0 ... 32767 l/h Default: 900 l/h		
»Max(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Alarm high limit		
	Range: 0 ... 32767 l/h Default: 3900 l/h		
»Hysther.(Warn.) (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Hysteresis, used as +/- from threshold		
	Range: 0 ... 32767 l/h Default: 10 l/h		
»Hysther.(Alarm) (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Hysteresis, used as +/- from threshold		
	Range: 0 ... 32767 l/h Default: 10 l/h		
»Prio Warn. (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Set warning priority		
	Range: 0 ... 99 Default: 50		
»Prio Alarm (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Set alarm priority		
	Range: 0 ... 99 Default: 20		
»Delay Warn. (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Delay of warning triggering		
	Range: 0 ... 999 s Default: 0 s		
»Delay Alarm (Num.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Delay of alarm triggering		
	Range: 0 ... 999 s Default: 0 s		
»Reac. Sys. (Sel.) Desalination Control DES 128, Device, Bleed off, Blowd. flow	Reaction of the system on alarm		
	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.) Desalination Control DES 128, Device, Prop. dosing 1	Activate the proportional dosage		
	Default: ON		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
Pulse relation (Num.) Desalination Control DES 128, Device, Prop. dosing 1	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		

Desalination Control DES 128, Device, Prop. dosing 1	output		
	Range: 0.00 ... 9.99 s Default: 0.25 s		
High duration (Num.) Desalination Control DES 128, Device, Prop. dosing 1	Period duration of proportional dosing output impuls		
	Range: 0.00 ... 9.99 s Default: 0.25 s		
Pulse limit (Num.) Desalination Control DES 128, Device, Prop. dosing 1	Limit of stored impulses		
	Range: 0 ... 99999999 Default: 10000		
Error behav. (Sel.) Desalination Control DES 128, Device, Prop. dosing 1	Reacting to errors		
	Default: Save		
	0	Save	Save impulse
	1	No save	Dont save impuls
»Contact Full (Sel.) Desalination Control DES 128, Device, Prop. dosing 1, Tank prop. Dos. 1	Kind of contact (n.open/n.closed)		
	Default: Norm. open		
	0	Norm. open	-
	1	Norm. closed	-
»Contact Low (Sel.) Desalination Control DES 128, Device, Prop. dosing 1, Tank prop. Dos. 1	Kind of contact (n.open/n.closed)		
	Default: Norm. open		
	0	Norm. open	-
	1	Norm. closed	-
»Debouncing Fill (Num.) Desalination Control DES 128, 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.) Desalination Control DES 128, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Set priorities of alarm		
	Range: 0 ... 99 Default: 20		
React. Signal (Sel.) Desalination Control DES 128, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Set reaction signal of alarm		
	Default: Warning		
	0	None	no reaction at all
	1	Info	show info icon, but no other re-action
	2	Warning	generate warning, normally does not affect process
	3	Alarm	alarm, affects process according to setting
Reac. Sys. (Sel.) Desalination Control DES 128, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Set reaction behavior of system		
	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.) Desalination Control DES 128, Device, Prop. dosing 1, Tank prop. Dos. 1, Alarm empty	Alarm delay time		
	Range: 0 ... 999 s Default: 0 s		
»Contact Type (Sel.) Desalination Control DES 128, Device, Prop. dosing 1, Dosing Pump 1	Kind of contact (n.open/n.closed)		
	Default: Norm. open		
	0	Norm. open	-
	1	Norm. closed	-
Time Dos. mode (Sel.) Desalination Control DES 128, Device, Time Dosing 1	Mode of time proportional dosing		
	Default: Automatic		
	0	Automatic	Automatic
	1	Off	Always off
	2	On	Always on
Dosage duration (Num.) Desalination Control DES 128, Device, Time Dosing 1	Duration of the dosing		
	Range: 0 ... 999 min Default: 2 min		
Time lock (Num.) Desalination Control DES 128, Device, Time Dosing 1	Locking time after dosing		
	Range: 0 ... 999 min Default: 15 min		
Total Time (Num.) Desalination Control DES 128, Device, Time Dosing 1	Max. possible dosing time per day		
	Range: 0 ... 999 min Default: 0 min		
Starting time (Zeit) Desalination Control DES 128, Device, Time Dosing 1, Starting Date 1	Start time for dosing		
	Default: 00:00		
Days of week (Sel.) Desalination Control DES 128, 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.) Desalination Control DES 128, Device, Equ. Enable	Kind of contact (n.open/n.closed)		
	Default: Norm. open		
	0	Norm. open	-
	1	Norm. closed	-
Contact Type (Sel.) Desalination Control DES 128, Device, On	Kind of contact (n.open/n.closed)		
	Default: Norm. open		

operation	0	Norm. open	-
	1	Norm. closed	-
»Upper Limit (Num.) Desalination Control DES 128, Device, Blowdown Analog Output	Maximal possible value of the conductivity		
	Range: 0 ... 5000 µS/cm Default: 2000 µS/cm		
»Lower Limit (Num.) Desalination Control DES 128, Device, Blowdown Analog Output	Minimal possible value of the conductivity		
	Range: 0 ... 5000 µS/cm Default: 0 µS/cm		
Switch On Delay (Num.) Desalination Control DES 128, Device, Circulation Pump	Delay of pump start after internal enable		
	Range: 0 ... 999 s Default: 15 s		
»Contact Type (Sel.) Desalination Control DES 128, Device, Circulation Pump	Kind of contact (n.open/n.closed)		
	Default: Norm. open		
	0	Norm. open	-
	1	Norm. closed	-
»Delimiter (Sel.) Desalination Control DES 128, Data Transfer	A character to separate the data from each other		
	Default: ;		
	0	TAB	-
	1	,	-
	2	;	-
Record. Interval (Num.) Desalination Control DES 128, Data Acquisition	Time interval at which the records are executed		
	Range: 0 ... 999 min Default: 1 min		
New file-interval (Num.) Desalination Control DES 128, Data Acquisition	Time interval between the generation of new files		
	Range: 0 ... 99 d Default: 1 d		
New file monthly (Sel.) Desalination Control DES 128, Data Acquisition	New file every month		
	Default: No		
	0	No	-
	1	Yes	-
Recording (Sel.) Desalination Control DES 128, Data Acquisition	Recording data		
	Default: OFF		
	0	OFF	Switched Off / Inactive
	1	ON	Switched On / Active
»Delimiter (Sel.) Desalination Control DES 128, Data Acquisition	A character to separate the data from each other		
	Default: ;		
	0	TAB	-
	1	,	-
	2	;	-

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

WARNING

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 System Requirements / Installation

For “installation” of the created PC-software ZIP-file in the corresponding release version you must download and unpack the file from the download section of the distributor „www.heylneomeris.de/mediathek/software/“ on a drive of a PC (Windows 7 or higher). A windows-typical installation with admin rights is **not** necessary.

The connection between PC and control unit is assessed in standard case by an USB cable (USB-A on the PC side and USB-mini on the controller side).

Moreover, for Windows 7 and Windows 8, a correspondent device driver is necessary, this can be downloaded with a detailed instruction manual from the download section of the distributor „www.heylneomeris.de/mediathek/software/“.

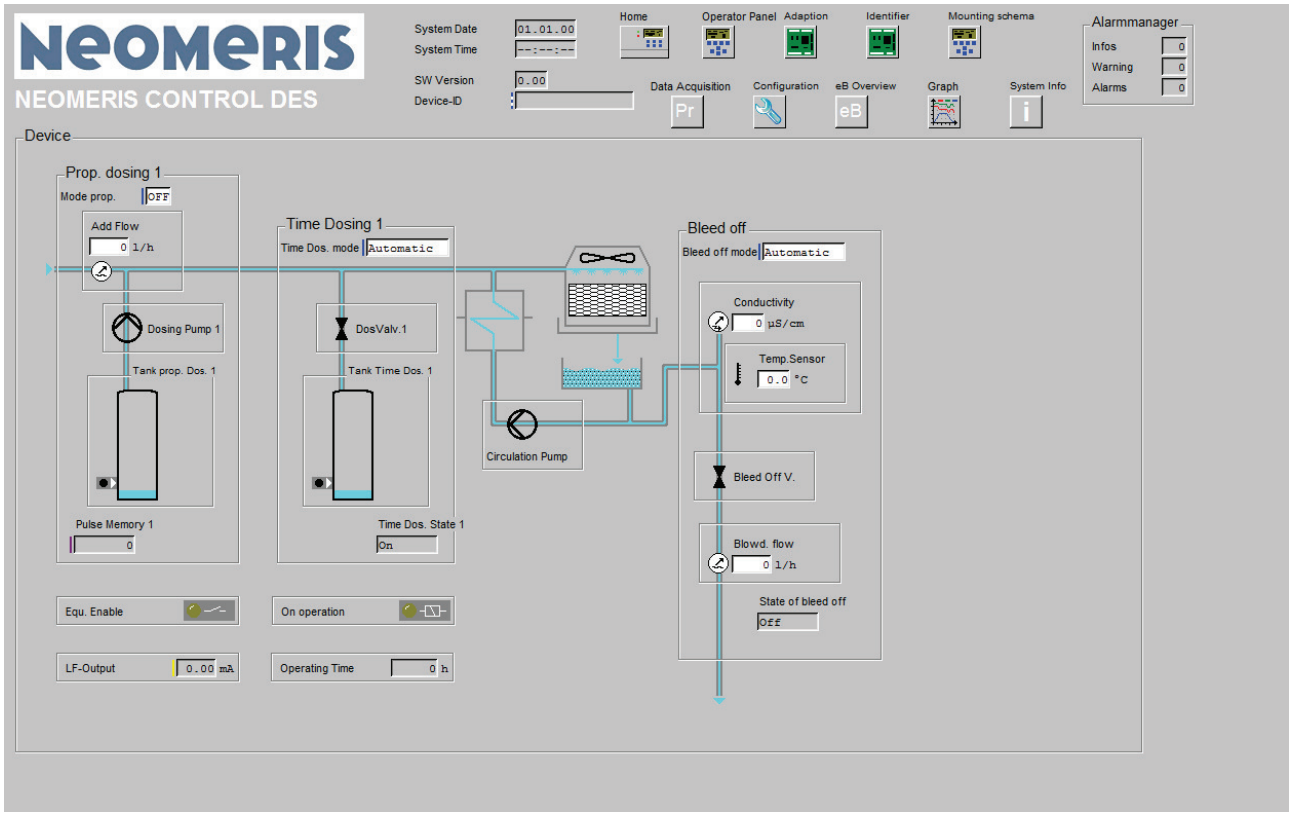
For Windows 10 or higher a separate driver is not necessary.

Beside the USB, the connection can be done optional via Bluetooth, LAN, WLAN or a mobile wireless connection by using pluggable COM-modules.

8.4.2 Functionality of 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 download section of the distributor „www.heylneomeris.de/mediathek/software/“.

8.4.3 View of the Main Screen