



For managing and controlling the water volume in heat exchangers with HydroPads/the hydroBLU system

guntner.com/de

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Version history

This manual describes all the features of the aicore™ hydro controller.

The table below shows the new features depending on the software version of the aicore™ hydro controller.

Operating manual Version	Amendments/supplements	Associated aicore hydro software version(s)
1.0.0	First approved version of the operating manual for GHMnext	1.10.0
1.0.1	Change of the product name (e.g. from “GHMnext” to “aicore™ hydro”)	1.14.0
1.0.2	New features added: • Password protection menu	1.15.0
1.0.3	New features added: • Split wetting (1.18.0) • Surge wetting water flow setpoint (1.18.0) • Surge wetting – enforce specified duration (1.18.0) • Open the humidification controller for draining (1.19.0) • Limit the water volume	1.21.0

Associated products

Controller name up to V1.0.0	Controller name from V1.0.1	ERP number
GHMnext	aicore™ hydro.1	5208719
GHMnext PAD	aicore™ hydro	5215578
GSCnext EC Split controller	aicore™ fusion	5215594
GSCnext	aicore™ fusion.1	5208718

Associated products

1 General notes

1.1 Safety information

In order to prevent serious physical injuries or major material damage, work on/with the units may only be performed by authorised persons with the appropriate training and qualifications who are familiar with the set-up, installation, commissioning and operation of controllers. These persons must read the operating instructions carefully before installing and commissioning the units. In addition to the instructions and national accident prevention regulations, all recognised technical rules (safety and professional work under UVV, VBG, VDE etc.) must be followed.

Repairs to the unit may only be made by the manufacturer or a repair centre authorised by the manufacturer.

UNAUTHORISED AND IMPROPER INTERVENTIONS WILL INVALIDATE THE WARRANTY!

While the controller is open, hazardous electrical voltages are exposed; if the unit is open its protection class is IP00! The applicable national accident prevention regulations must be followed when working on controllers under voltage.

1.2 Intended use

Ensure that fuses are always replaced by fuses with the specified rating. Note that fuses should never be repaired or bridged. Only a double-pole circuit tester may be used to check that the unit is free of voltage. The unit is intended only for the purposes agreed in the order confirmation. Any other application or use for any additional purpose, is not a proper intended use. The manufacturer accepts no liability for any injury or damage arising from unintended use. Use according to the intended purpose is also contingent on compliance with the installation, operating and maintenance procedures described in these instructions. The technical data and the details of the connection assignments can be found on the name plate and in the instructions, and must be complied with.

Electronic equipment is not fundamentally failsafe! The user must therefore ensure that the system reverts to a safe condition in the event of failure of the unit. The manufacturer accepts no responsibility for any damage to life and limb or to material goods and assets in the event of failure to comply with this provision and in the event of improper use.

The electrical installation must be performed in accordance with the relevant regulations (e.g. wire cross-sections, fuses, earth conductor connections etc.). Additional information is included in the documentation. If the controller is used in a particular area of application, the required standards and regulations must be complied with.

1.3 Start-up notes

Prior to start-up of the control device, check whether any residual moisture (condensation) has formed in the housing. If so, the unit must be dried out. The same applies if the sachet of silica gel (desiccant) has discoloured as this indicates that it is no longer providing any protection against moisture. If there are large volumes of condensation (droplets on the interior walls and components), they must be removed manually. Once the unit has been commissioned for the first time, the power supply and the internal control voltage must no longer be switched off for a long period. If this should nevertheless be necessary for operational reasons, suitable moisture protection must be provided.

The aicore hydro automatically detects whether commissioning is necessary when it is switched on. If this is the case, the commissioning menu is launched and the user is guided through the commissioning process.

The aicore hydro has the following inputs and outputs:

- 5 analogue inputs (AI1 to AI5), each one variably configurable
- 2 analogue outputs (AO1 to AO2)
- 5 digital inputs (DI1 to DI5)
- 5 digital relay outputs (DO1+ DO2 changeover contacts, DO3 to DO5 closers).

The input and output profiles and functions can be set via the IO configuration menu and the corresponding functions. The digital inputs are designed for positive voltages of a nominal +24 V.

NOTICE

Please note that connecting the wrong voltage (e.g. 230 V) may seriously damage the controller.

1.4 Classification

An aicore hydro controller is used to control a hydroBLU (HydroPAD) system. The controller itself is a DIN rail controller, which is supplied mounted in plastic housing (min. IP54).

It is not intended for use on so-called multi-circuit units.



aicore hydro controller for DIN rail mounting

1.5 Transport and storage, copyright notes

The controllers are packaged appropriately for transport and may only be transported in their original packaging. Avoid any impacts and collisions. Unless otherwise noted on the packaging, the maximum stacking height is 4 packs. When you receive the unit, check for any damage to the packaging or the controller.

Store the unit in its original packaging and protected from the weather, and avoid extremes of heat and cold.

Products are subject to technical changes in the interests of further development. Therefore no claims may be derived from information, images and drawings; errors excepted!

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Fürstenfeldbruck

1.6 Warranty and liability

The current General Terms and Conditions of Sales and Delivery of Güntner AG & Co. KG apply.

See the homepage at <https://guntner.com>

1.7 Manufacturer and shipping address

Should you have a problem with any of our units, or any questions, suggestions or special requests, simply contact

Güntner GmbH & Co. KG
Hans-Güntner-Straße 2 - 6
82256 FÜRSTENFELDBRUCK
GERMANY

Service line:Germany:
0800 48368637
0800 GUENTNER

Service telephone worldwide:
+49 (0)8141 242-4815

service@guentner.com
www.guentner.com

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1.8 EMC-compliant installation

Controllers in the aicore hydro series fulfil the requirements of EN 61000-6-2 as regards resistance to EMC interference and those of EN 61000-6-3 as regards emissions. They also comply with standards IEC 61000-4-4/-5/-6/-11 for grid-bound interference. In order to guarantee EM compatibility, the following points must be noted:

- The unit must be properly grounded (with at least 1.5 mm²).
- All measurement and signalling lines must be connected via shielded cables.
- The shielding of measuring, signal and bus lines must be earthed at one end only.
- Suitable shielding and routing measures must be taken to ensure that mains cables and motor cables do not cause any interference in signal and control lines.

NOTICE

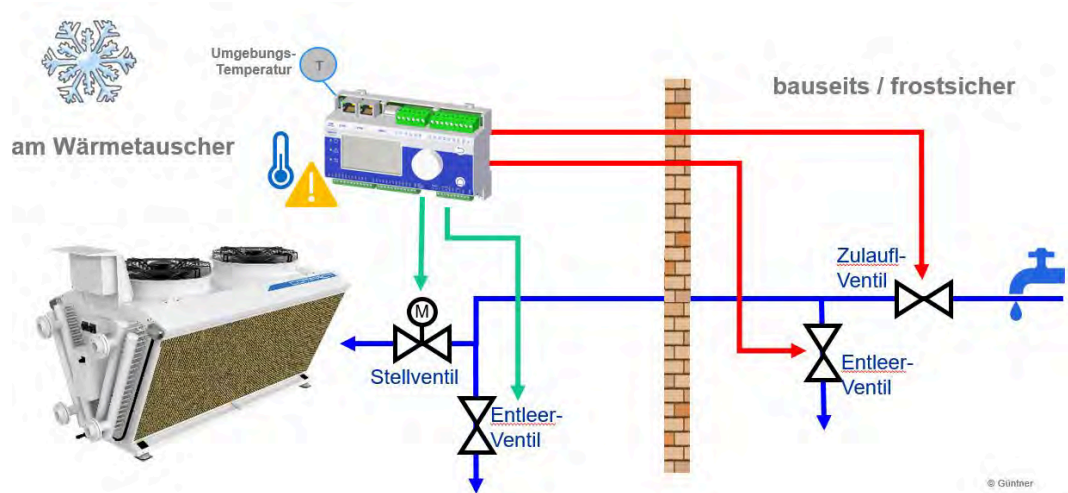
If the equipment is installed in a switch cabinet, the temperature inside the switch cabinet must be heeded. Sufficient switch cabinet ventilation is provided in Güntner switch cabinets.

2 Description of functions

The humidification system is used for increasing the capacity of the heat exchanger at peak load times with high ambient temperatures and for more efficient heat dissipation with moderate ambient temperatures. The adiabatic evaporation of the water on the HydroPads cools the air sucked in by the heat exchanger, which improves the heat exchanger's performance.

The aicore hydro humidification controller assumes the management role for controlling the wetting. The required water volume is calculated on the basis of the load state, the ambient temperature and the humidity. The aicore hydro sets the appropriate water volume using the control valve. The fan speed of 0 – 100% is transferred to the aicore hydro via a 0 – 10 VDC analogue signal as the load state of the heat exchanger. The frost protection and hygiene regulations of the system are ensured by automatic draining. The water supply to the unit must be protected separately on site against frost. The aicore hydro also controls valves that are to be provided on site, i.e. are not included in the scope of delivery, and are to be installed in the frost-proof area.

This is particularly important if several units are operated in combination (master-slave operation) and supplied by a joint water supply line.



An analogue output is used to control a steady control valve that governs the amount of water on the humidification pads. The water volume is measured by the water meter of the aicore hydro.

The aim is to consume only the necessary amount of water and minimize the amount of water which is applied to the pads. As far as possible, all water should evaporate before it reaches the bottom of the pads.

For settings see ["Humidification \(parameter\)"](#)

2.1 Other functions

2.1.1 Cleaning cycle

The cleaning cycle for the pads is a system operating state in which the water valve is 100% open. This makes the system more efficient because the pads are thoroughly soaked and cleaned in specific intervals. When transitioning from dry to humidified operation the system first carries out a cleaning cycle for the pads. This function is active as a default. It can be de-

activated at any time via the Service menu. The cleaning cycle is normally carried out completely, even if the conditions for humidification are no longer met, but it will be aborted if the controller's clearance is withdrawn or if the humidification condition "Ambient temperature" no longer applies. For the cleaning cycle, both a duration for humidification and an interval (between cleaning cycles) can be specified via the following menu. The cleaning cycle is only possible if humidification is active.

The function can be activated in the *Service menu* → *Pad humidification function* → *Cleaning cycle*.

The duration and interval can also be set

For settings see "[Cleaning cycle](#)"

2.1.2 Draining

a) Depending on the external temperature (frost protection)

If the temperature falls below the specified temperature the system is drained to prevent freezing. The drain valve on the heat exchanger is opened, while the customer's own drain and supply valves are switched.

The temperature can be set in the *Service menu* → *Control* → *Draining* → *Ambient temperature*.

For settings see "[Draining](#)"

b) Depending on the downtime

After the specified downtime, the drain valve is opened automatically and the system is drained.

NOTICE

Legionella bacteria can form if water is left standing in the system for long periods.

The downtime can be set in the *Service menu* → *Control* → *Draining* → *Downtime*.

For settings see "[Draining](#)"

c) Externally

Draining can be started via a fieldbus interface or digital input. The digital input must be configured accordingly.

For settings see "[Draining](#)"

d) Refilling the system

The system will only be refilled if there is a need for adiabatic cooling. If, for example, the system is drained because the downtime has been exceeded, the system is not filled immediately afterwards, but only when there is an additional requirement for humidification. The valves will remain in drain position until this point.

2.1.3 Service interval

The service interval function is used to check pad wear depending on the humidification time and operating time. At the end of the operating or humidification time, the condition of the

pad should be checked by a technician on site and the pad should be replaced if necessary. The amount of wear depends on the environmental conditions, the water quality and the wetting frequency. For information regarding the service life of the pad, refer to the operating manual for the unit or the hydroBLU manual.

For settings see ["Service interval"](#)

2.1.4 Manual mode

If the controller is in manual mode, it will stop completely and only follow the settings in manual mode. The control valve can be set manually and the NC/NO valves can also be switched.

A digital input can be configured in order to switch to manual mode. The set parameters will be retained.

To be found on the controller in the "Manual mode" menu. If frost protection is activated, manual mode will be deactivated.

For settings see ["Manual mode"](#)

3 Tips regarding operation and FAQs

BOOT TIME

How long the controller takes to boot:

⇒ 55 seconds from power on until it is ready for operation

4 Commissioning aicore hydro

When the aicore hydro is switched on, it automatically detects whether commissioning has taken place. If it has, the start-up menu is skipped and normal controlled operation continues.

aicore controllers mounted on a heat exchanger are commissioned at the factory.

If the aicore hydro detects that this has not yet been done, it initiates the commissioning procedure. When this procedure has been completed, all the specified parameters are saved. All values that are set during commissioning can also be viewed and changed individually later on in the menus.

After commissioning the controller for the first time, the settings can be saved under "Factory settings". If the controller has been commissioned at the factory, these values are saved as "Factory settings". See ["Factory settings"](#)

NOTICE

The controller will be in configuration mode until the start-up is complete. In this mode, controlled operation is not possible and the valve will be controlled with a 0 % control value. The communication interfaces and protocols are still preconfigured as follows:

- The ETH1 Ethernet interface is configured with the static IPv4 address "169.254.1.1" and the network mask "255.255.0.0".
- The RS485-1 interface is configured with the baud rate "9600 Bd" and "8N1" framing.
- The Modbus RTU and TCP protocols are activated and configured with the unit ID "1" and the TCP port "502".

If a number of controllers are commissioned in a network at the same time, conflicts can occur in the network owing to duplicate IP addresses. You can avoid this problem by ensuring that the network cable is not connected or only one controller is actively connected to the network.

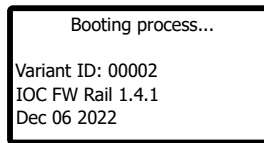
Once the commissioning process has been completed successfully, the controller automatically switches to the set operating mode and the communication interfaces and protocols are configured in accordance with the parametrisation, see also ["Network settings"](#) and ["Fieldbus settings"](#).

4.1 Start-up menu

Switch on the power supply for the aicore hydro. At the start of the boot process, the Güntner logo will appear for 5 seconds.

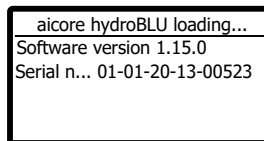


As booting progresses, the firmware version of the IO controller will be shown (approx. 25 seconds). This is not the firmware version of the controller. See also ["System slots/firmware version"](#)



A black start screen with a cursor will then be shown for a short time (approx. 20 seconds).

Each time that the system starts, the software version of the application that is starting as well as the serial number of the controller will be shown briefly.

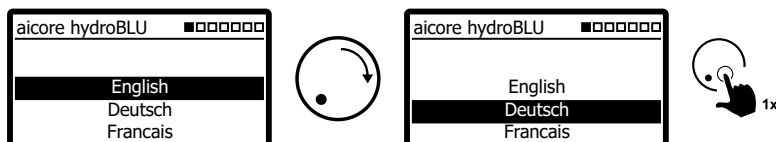


At the beginning of start-up, the language for start-up can be selected. This language setting is not permanent – it is only for start-up. After start-up, the default language for the menu is always English. The language can then be selected on a permanent basis in the Language menu.

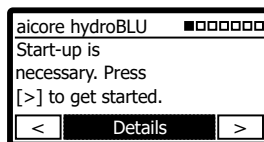
The progress bar at the top right of the display shows your progress during start-up.



Use the rotary selection knob as well as the "Back and "Home buttons to navigate in the menu.

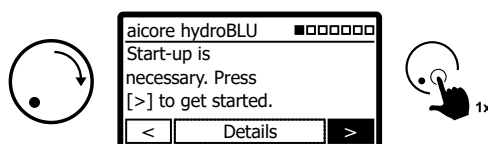


A note regarding start-up will then be shown.



During standard commissioning, a heat exchanger can be parametrised with up to two control loops. During start-up, the analogue and digital inputs and outputs are automatically configured and assigned standard functions. An overview of the I/O configuration after start-up is available in the ["Annex"](#).

Please follow the instructions in the display. To initiate start-up, scroll to the right [>].



4.1.1 General commissioning procedure

The following is a systematic list of the commissioning steps:

Section	Parameter	Description
aicore hydro	Language	Selection of the language for commissioning.
Introduction	-	Note that a new commissioning is required.
Date and time	Date	Setting the system date.
	Time	Setting the system time.
System of units	System of units	The units system used to show values in the display is shown. See "System of units"
Pad humidification	Pad humidification	Pad humidification option can be activated here.
	Height above sea level	The geodetic installation height must be entered in order to calculate the water volume.
	Airflow volume	The airflow volume must be entered in order to calculate the water volume.
	Maximum valve flow	The maximum valve flow must be set in accordance with the valve data sheet so that the control deviation and the control variable of the water valve can be calculated.
	Limit the water volume	You can activate the water volume limit here.
	Maximum water volume	Set the maximum water volume at the control valve here in l/h.
	Water meter pulse unit	Setting of the water meter's pulse unit. See "Water meter"
	Water meter pulse rate	Enter the water meter pulse rate.
	Open the humidification valve for draining	Activates the humidification controller to open during draining.
	-	Indication that commissioning has been carried out successfully.

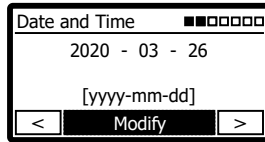
Commissioning procedure

If you would like to carry out start-up again, you can reset the controller to its delivery state in the service menu.

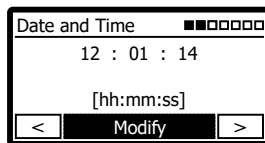
4.1.2 Detailed start-up procedure

The **system date** and the **time** are set first.

In the event of a power cut, the system clock will remain set for 4 – 7 days depending on the external temperature. The system time may need to be set again (e.g. after the Güntner unit is delivered ex works until it is actually commissioned). Press [Modify] or [➤] to continue.

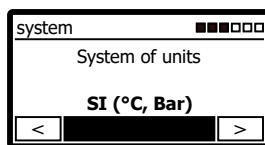


Date and Time ■■■■■■
2020 - 03 - 26
[yyyy-mm-dd]
< Modify >



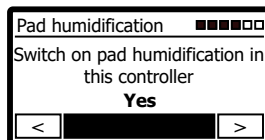
Date and Time ■■■■■■
12 : 01 : 14
[hh:mm:ss]
< Modify >

The **system of units** shown on the display is set next.



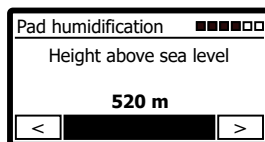
system ■■■■■■
System of units
SI (°C, Bar)
< >

Next, decide whether **pad humidification** will be switched on.



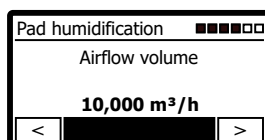
Pad humidification ■■■■■■
Switch on pad humidification in
this controller
Yes
< >

The **height above sea level** is needed now. It must be entered in order to calculate the water volume.



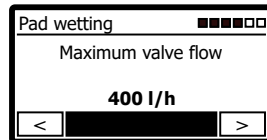
Pad humidification ■■■■■■
Height above sea level
520 m
< >

The maximum **airflow volume** is set here in order to calculate the water volume needed.



Pad humidification ■■■■■■
Airflow volume
10,000 m³/h
< >

Next, the **maximum valve flow** is set so that the control deviation and the control variable of the water valve can be calculated.



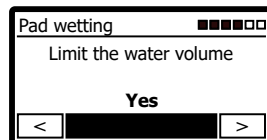
Pad wetting ■■■■□□

Maximum valve flow

400 l/h

< >

You can activate the water volume limit here.



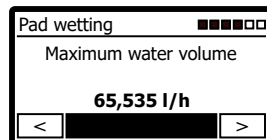
Pad wetting ■■■■□□

Limit the water volume

Yes

< >

The maximum water volume at the control valve, in l/h, must be set.



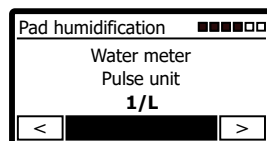
Pad wetting ■■■■□□

Maximum water volume

65,535 l/h

< >

The **pulse unit** does not usually need to be changed. The setting can be found in the data sheet for the water meter.



Pad humidification ■■■■□□

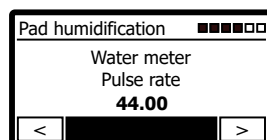
Water meter

Pulse unit

1/L

< >

The **pulse rate** does not usually need to be changed. The setting can be found in the data sheet for the water meter.



Pad humidification ■■■■□□

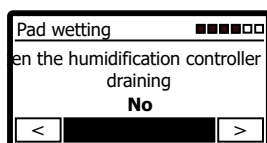
Water meter

Pulse rate

44.00

< >

Activates the humidification controller to open during draining.



You have now entered all the necessary information for operating the controller and the start-up process is **complete**. After start-up, the menu language once again switches to English. This can be set under "Language" in the menu.

If you would like to carry out start-up again, you can reset the controller to its delivery state in the service menu.

5 Operating mode

The controller calculates the water volume on the basis of the ambient conditions and the speed of the fans. If the external temperature and the fan speed are above the set start value for humidification (*Service menu → Pad humidification → Control → Humidification*) humidification is enabled. If the speed or external temperature falls below the set value, humidification is deactivated.

Water volume calculation can be selected or set from two modes:

1. Partial load mode

- The fans are in controlled mode. → Indicates that the setpoint has been reached.
- The humidification controller calculates the useful water volume according to the ambient conditions so that, as far as possible, 100% of the supplied water will evaporate.

If the speed is higher than the set value at the start of humidification (*Service menu → Pad humidification → Control → Humidification*) and lower than the threshold value for full load mode, the controller will work in partial load mode. In partial load mode only as much water as can evaporate from the pads is applied.

The controller is in full load mode or partial load mode, depending on whether the setpoint was reached or not.

2. Full load mode:

- The fans run at full speed. → Indicates that the setpoint (pressure/temperature) has not been reached.
- The water volume will be increased further in full load mode to achieve greater air cooling. The aim of evaporating 100% of the water if possible is of secondary importance here.

If the speed reaches the full load mode threshold value (*Service menu → Pad humidification → Control → Full load mode*) extended water supply will begin. If, after the set delay time (*Service menu → Water parameters → Delay time*) the speed is still higher than the value set for full load mode, the water volume will gradually be increased.

This will occur up to a max. H₂O supply (*Service menu → Pad humidification → Control*) under the condition that the speed is still higher than the value for full load mode.

If a digital input is also configured (*Service menu → Pad humidification → Control → Full load mode*) full load mode will not start until the DIx input is switched and the speed has reached the threshold value for full load mode.

If the speed drops below the threshold value the controller will switch back to partial load operation and the quantity of water will be gradually reduced.

If the full load mode bypass is activated (*Service menu → Pad humidification → Control → Full load mode → Bypass*) the gradual increase of the water application rate will be skipped and the maximum water application rate will be activated immediately.

6 Structure of the aicore hydro

6.1 Installing the aicore hydro

6.1.1 Installing the controller, ventilation

If the unit has been taken from a very cool storage location, leave it at room temperature for 1- 2 hours before installation with the lid open to allow any residual moisture to disperse and hence avoid malfunctions during start-up. The unit may only be commissioned when it is absolutely dry. The sachet of silica gel (desiccant sachet) must be removed.

Once the unit has been commissioned for the first time, the power supply and the internal control voltage must no longer be switched off for a long period. If this should nevertheless be necessary for operational reasons, suitable moisture protection must be provided.

There are 4 drill holes in the housing for mounting. The equipment may only be fixed at these points, any manipulation of the housing (e.g. drilling new mounting holes) is prohibited.

The cable entries must always be underneath; installation with cable entries at the side or even on top is not permitted!

If moisture problems occur in the housing owing to considerable external heating and cooling, the moisture must be dispersed by means of an air equalisation (cable gland with equalisation opening).

Keep an eye on good accessibility! The unit must be easily accessible for any maintenance work.

Please note:

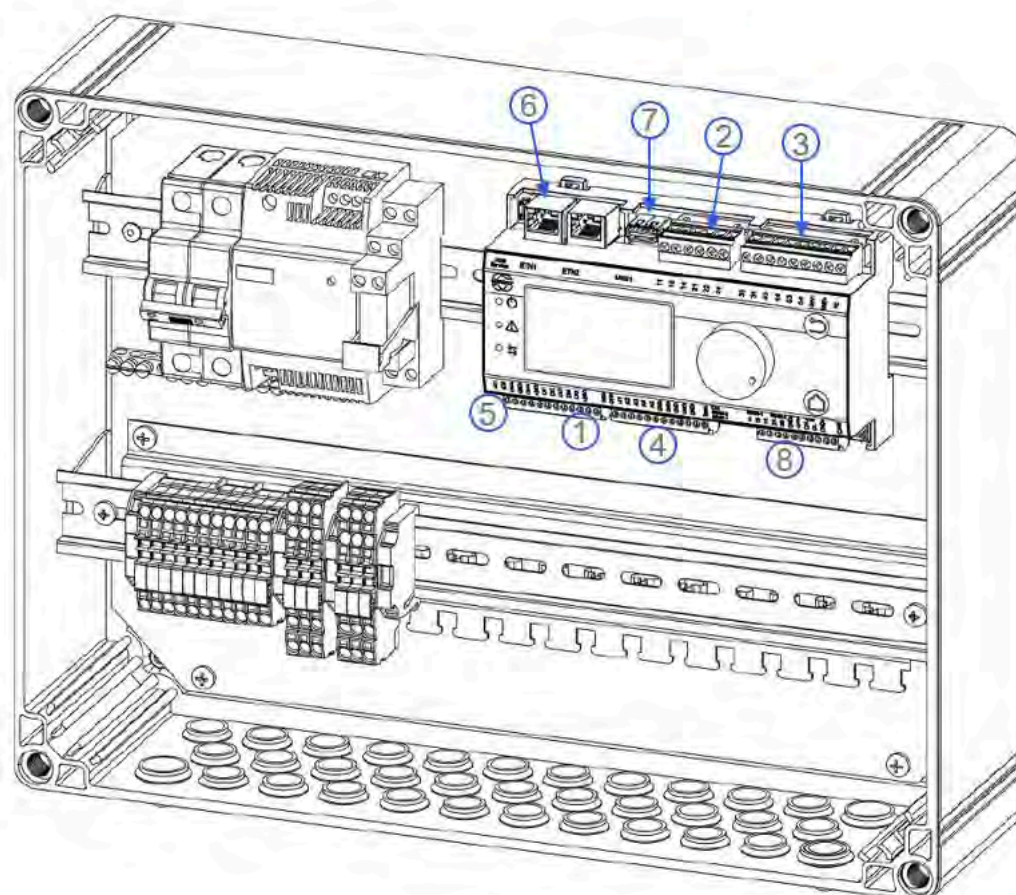
- If the unit is installed in a switch cabinet, **proper attention must be paid to the temperature** inside the cabinet (see "[Electrical properties](#)").
- A hood is required if the equipment is installed in the open air.
- Install the aicore hydro out of direct sunlight and choose a location with the best possible protection against the elements.

6.2 Connecting the aicore hydro

The connector terminals for the potential-free signalling outputs, the control inputs (controller clearance etc.) and analogue inputs for sensors etc. are located on the DIN rail controller.

The DIN rail controller has a 24V power supply connected to "+24V" / "GND" / "PE" on terminal strip X1. In the supplied solution, mounted in the casing, the 230V/24V power supply is included.

6.2.1 Position of the connections on the aicore hydro



Position of the connections on the aicore hydro

Type	Number	Description
Digital input (DI1...DI4)	1	Digital inputs +24V, GND as reference potential
Digital output (DO1, DO2)	2	Digital outputs, potential-free, NC-COM-NO
Digital output (DO3...DO5)	3	Digital outputs, potential-free, NO-COM
Analogue input (AI1...AI5)	4	Analogue inputs, depending on configuration
Analog output (AO1, AO2)	5	Analogue outputs, depending on configuration
Ethernet connection	6	Modbus TCP
USB connection	7	USB2.0, software update
RS485	8	Modbus RTU

6.2.2 Controller mains connection

The mains connection for the controller is on terminal X10:

+24V1 = Power supply

GND1 = Earth

PE = Earth conductor

The connector terminals are designed for a maximum wire cross-section of 2.5 mm².

The supply line must be fused with suitable automatic circuit breakers.

NOTICE

The humidification system may not be switched on or off by connecting/disconnecting the mains, but only via the clearance contact.

7 Inputs and outputs (IO interface)

The aicore hydro has the following inputs and outputs:

- 5 analogue inputs (AI1 to AI5), each one variably configurable
- 2 analogue outputs (AO1 to AO2)
- 5 digital inputs (DI1 to DI5)
- 5 digital relay outputs (DO1+ DO2 changeover contacts, DO3 to DO5 closers)

The functions (signal source) for the inputs and outputs, a signal inversion and, for analogue signals, the interval (scaling) can all be set flexibly via the IO configuration menu.

NOTICE

Please note that connecting the wrong voltage (e.g. 230 V) may seriously damage the controller.

7.1 Configuration table

NOTICE

The following table shows a "standard configuration" of the controller following start-up.

	I/O	Signal/profile	Function
X1	DI1	24V	No function
	DI2		No function
	DI3		Humidification clearance
	DI4		External drain
	DI5		Water meter
X2	AI1	4-20mA	No function
	AI2		No function
	AI3	0...10V	Humidity sensor
	AI4		Control value for fan pad humidification
	AI5		Ambient temperature
X1	AO1	0...10V	No function
	AO2		Control value humidification valve

Configuration table aicore hydro

	I/O	Signal/profile	Function
X9	DO1	Potential-free relay	Alarm message Prio 1 (contact 11/12 closed)
	DO2		Warning message Prio 2 (contact 21/22 closed)
X10	DO3		No function
	DO4		Humidification active
	DO5		Close drain valve

Configuration table aicore hydro

7.2 Digital inputs DI1...DI5 (control inputs)

The control inputs are designed as a low-voltage connection and are connected via a potential-free contact (relay, contactor contact, switch etc...).

The potential-free contact must be connected to one of the +24 volt terminals on the aicore hydro and the respective control inputs DI1...DI5.

+24 volts at the input corresponds to the signal level "HIGH" or, logically, 1.

An open input or 0 volts corresponds to the signal level "LOW" or, logically, 0.

The specific set function (signal source), a signal inversion and the current status can be viewed in the actual values menu. If necessary, you can change this function in the service menu/IO configuration.

By default, a number of basic functions, e.g. controller clearance, are assigned to the inputs.

See "[Configuration table](#)".

7.3 Analogue inputs AI1...AI5

The analogue inputs on the aicore hydro offer particular flexibility. They can be switched for various input signals via the IO configuration.

In the process, the following analogue input profiles can be assigned to the relevant input:

- Voltage 0... 10 V
- Voltage 2... 10 V
- Current 0... 20 mA
- Current 4... 20 mA
- Resistance thermometer (PT1000)
- Custom voltage
- Custom Current
- Custom Resistance

As a result, a large number of usable measurement ranges are possible, e.g.:

- 0...10 V, 2...10 V, 0...5 V
- 0...20 mA, 4...20 mA
- PT1000 (and KTY210 compatibility with previous-generation GHM models)

In turn, these input signals can be assigned to various sensors for temperature, pressure, ambient humidity or other signals for e.g. setpoint setting, setpoint displacement or fan control value. These sensors can likewise be generated and configured freely in the sensor menu.

If a voltage or current profile was selected, the signal can also be inverted.

As a result, user-defined sensors/signals such as

- control value signals 0...100 % from 10...2 V or
- a setpoint displacement 0...2.0 K from 0...10 V or
- a temperature for the actual value of the PID controller -10,0...+60 °C from 4...20 mA can be generated

flexibly.

The configuration is carried out in a simplified form during the start-up procedure or can also be carried out later on in the IO configuration and sensor configuration.

7.4 Digital outputs DO1...DO5 (potential-free)

The outputs DO1...DO5 are designed as potential-free relay contacts (changeover contacts or closers). The following table gives details of the contacts:

Name	Design	Connection	Description
DO1	Relay 1 Changeover contact	11 (COM)	Shared connection
		12 (NC)	Opener contact (normally closed)
		14 (NO)	Closer contact (normally open)
DO2	Relay 2 Changeover contact	21 (COM)	Shared connection
		22 (NC)	Opener contact (normally closed)
		24 (NO)	Closer contact (normally open)
DO3	Relay 3 Closer contact	31 (COM)	Shared connection
		34 (NO)	Closer contact (normally open)
DO4	Relay 4 Closer contact	41 (COM)	Shared connection
		44 (NO)	Closer contact (normally open)
DO5	Relay 5 Closer contact	51 (COM)	Shared connection
		54 (NO)	Closer contact (normally open)

Various functions can be assigned to the outputs. You can also configure whether the relay should be energized or deenergized when the respective functional status is reached.

The specific set function (signal source), a signal inversion and the current status can be viewed in the actual values menu. If necessary, you can change this function in the service menu/IO configuration.

By default, a number of basic functions, e.g. alarm message, warning, operating message or threshold value function, are assigned to these outputs.

See ["Configuration table"](#).

NOTICE

All alarm messages, warning messages and group messages are **wire break-proof signals**, i.e. these signals are inverted by default. A fault status is always signalled with a low signal = deactivated output (relay not energised). This ensures that a fault is signalled even if the controller is not connected to the power supply. See "[Digital outputs DO1...DO5 \(potential-free\)](#)".

7.5 Analogue outputs AO1...AO2

The aicore hydro has 2 analogue outputs with 0... 10 V output voltage.

The following analogue output profiles can be assigned to these outputs:

- Voltage 0... 10 V
- Voltage 2... 10 V
- Custom voltage

In the user-defined profile, the signal minimum and signal maximum can be configured freely.

As a result, a large number of usable measurement ranges are possible, e.g.:

- 0...10V
- 2...10V
- 0...5V

The output signal can be assigned to the humidification valve.

The output signal can also be inverted.

8 Display and operation

Information is shown on the graphic display. Coloured LEDs indicate various operating statuses.

The controller is operated using the multifunctional wheel and the operating buttons.

8.1 Operation



Rotary selection knob

- Left or right movement: allows you to move up or down in the menu or change the parameter you are configuring.
- Short press: for function selection; change to EDIT mode and accept value
- Long press (2 seconds): brings up the relevant context menu/help menu.



Home button

Takes you back to the home menu



Back button

Takes you back to the previous menu

8.1.1 Home menu

Depending on the controller configuration, the most important information regarding the individual circuits is shown in the home menu. The information is automatically scrolled through in a time-controlled manner.

To get to the home menu, press the home button at any time .

	Pad humidification	14:32
<	Humidification off	>
	Fan control value	39 %
	Humidification valve	0 %
	Drain valve clos..	Yes

NOTICE

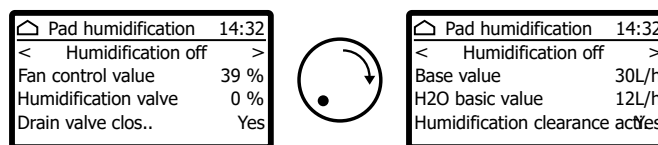
The display's background lighting is switched off after 5 minutes of inactivity. It is switched on again when you press a button or turn the rotary selection knob.

NOTICE

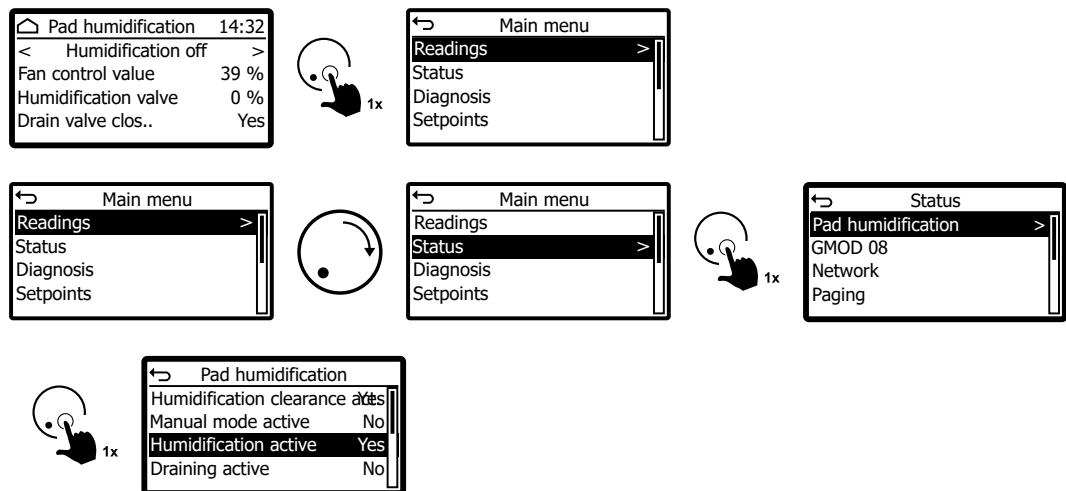
Pressing the Home button in the Home menu will pause automatic scrolling. Pressing it again will activate scrolling again. Indicated by filled in home symbol at the top left with pause sign "II".

8.1.2 Navigation in the menu

When information is shown in the home menu at set times, you can switch between the individual displays by turning the knob to the left or right.



Pressing the rotary selection knob for a short time in the home menu takes you to the menu navigation level. From here, you can navigate to the individual menu items by turning the knob to the left or right. If you press the knob again for a short time, you can switch to the respective submenu and call up information or configure settings there.

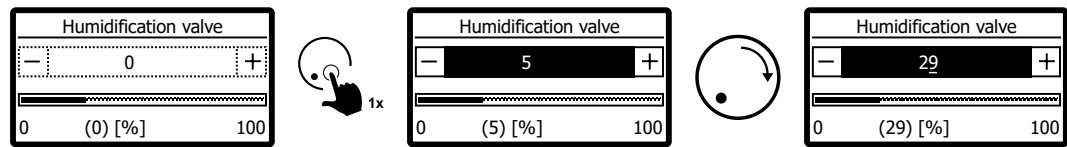


To switch to the previous menu or exit an editing function, simply press the back button .

8.2 Edit mode

After you select a parameter or a function by pressing the rotary selection knob for a short time, you will enter Edit mode.

Various information will be shown on the display. To change the parameter or function, turn the rotary selection knob to the left or right.



NOTICE

When changing a numerical value, you can **press and hold the rotary selection knob (2s)** to change the cursor and then select which digit you wish to change.

8.3 LED status display

About the LEDs:

- Top LED **“General operating state”**: lights up green as soon as the application is running on the aicore hydro and flashes green as soon as the pad wetting is running.
- Middle LED **“Alarm status”**: see below
- Bottom LED **“Internal/external communication”**: not currently used.

The middle LED with the designation **“Alarm status”**:

- If an **“Alarm Prio 1”** is present, the LED lights up **red**.
- If no **“Alarm Prio 1”** is present but an **“Alarm Prio 2”** is present, the LED lights up **orange**.

“Alarm Prio 1” is active as soon as at least one of the following conditions applies:

- Power supply problem
- Communication fault to the master

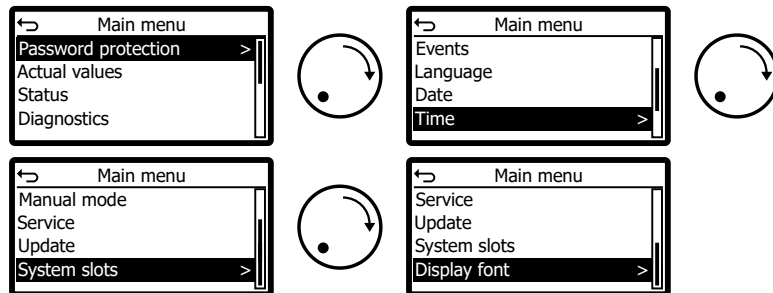
“Alarm Prio 2” is active as soon as at least one of the following conditions applies:

- A sensor or an analogue input reports a warning.
- A valve reports a warning.

9 Main menu

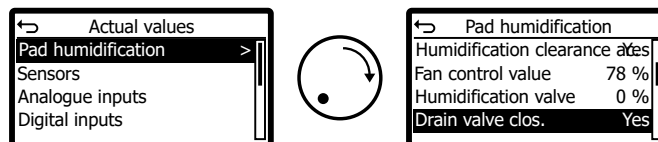
From the top menu, the home menu, you can get to the main menu by pressing the rotary selection knob for a short time. From there, you can navigate to the individual submenu points and the service menu.

The following submenu points can be found in the main menu:



9.1 Actual values menu

In the Actual values menu, the current values for the input signals, sensors as well as the statuses of digital and analogue inputs and outputs are shown.



NOTICE

The number of entries in this menu depends on the system configuration.

9.1.1 Pad humidification

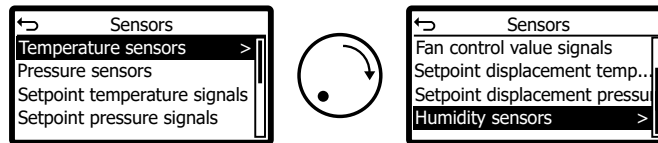
The current values for pad humidification are shown here.

- Humidification clearance active
- Fan control value
- Ambient temperature
- Ambient humidity
- Humidification valve
- Drain valve closed

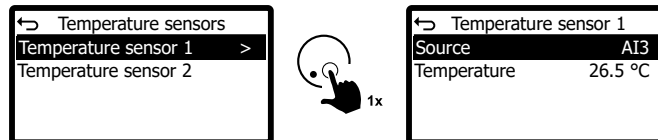
- Water flow setpoint
- Water flow

9.1.2 Sensors

All sensors, the source of the signals and the current values are shown here.



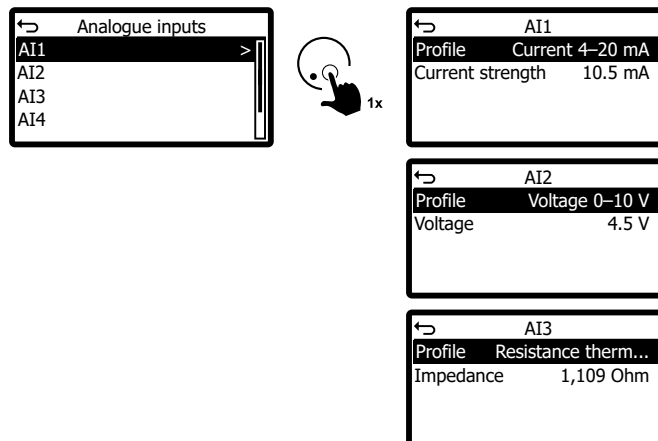
If these sensors are set up, both the signal source and the sensor value currently measured can be displayed here. Here is an example for a temperature sensor:



9.1.3 Analogue inputs

The profile and the value currently measured are shown for each of the analogue inputs.

Depending on which profile is set for the relevant input, the current, voltage or resistance value is shown.

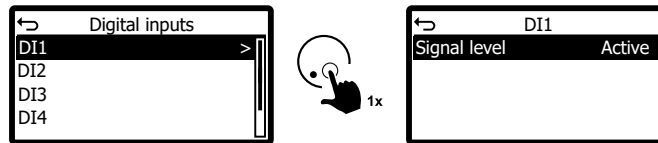


9.1.4 Digital inputs

The current signal level is shown for each digital input.

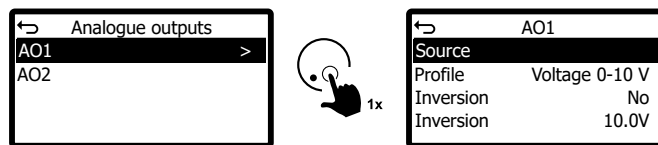
Signal level "active" means that there is a high signal (logically 1, +24 volts) at the input.

Signal level "inactive" means that there is a low signal (logically 0, input open or 0 volts) at the input.



9.1.5 Analogue outputs

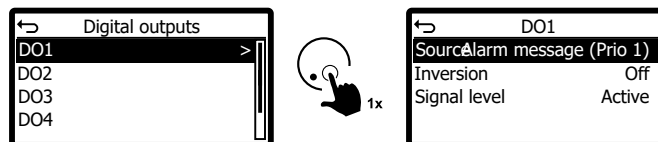
The source of the signal, the selected profile, information as to whether the signal is inverted and the voltage currently output are shown for each analogue output.



9.1.6 Digital outputs

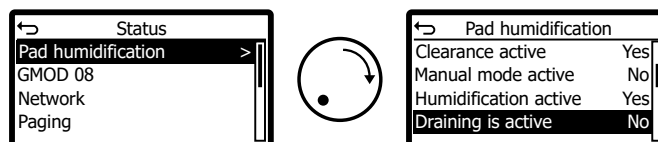
The source of the signal, information as to whether the signal is inverted and the current status are shown for each digital output.

“active” means that the digital output (relay) is energized.



9.2 Status menu

The operating statuses and configuration settings as well as the serial and software version number are shown.



NOTICE

The number of entries in this menu depends on the system configuration and the type of fans connected.

9.2.1 Pad humidification

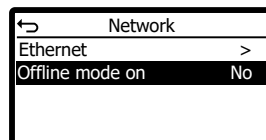
The operating statuses for pad humidification are shown here.

- Humidification clearance active (yes/no)
- Manual mode active (yes/no)
- Humidification active (yes/no)
- Draining active (yes/no)
- External draining active (yes/no)
- BUS draining active (yes/no)
- Full load mode clearance active (yes/no)
- Cleaning cycle on (yes/no)
- Cleaning cycle active (yes/no)
- External BUS surge wetting on (Yes/No)
- External surge wetting active (Yes/No)
- Bypass on (yes/no)
- Full load mode active (yes/no)
- Humidification time since service
- Absolute humidification time
- Operating time since service
- Absolute humidification time
- Water consumption

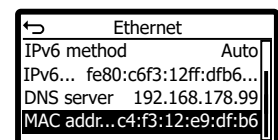
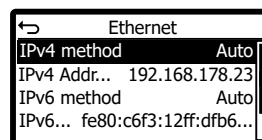
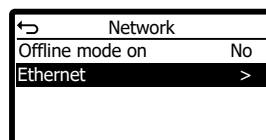
9.2.2 Network

Information about the network interface ETH 1 and possibly ETH 2 is shown (see also "[Net-work settings](#)").

If offline mode is on, the network interface is deactivated (offline).



The configuration parameters set, the IP addresses and the MAC address are shown for the Ethernet interface.



9.2.3 Paging

In this submenu, you can see how the so-called "pages" for sensors are configured on the Modbus interface. For more details, see the corresponding Modbus interface specification.

In the example shown here, the information for temperature sensor 1 is shown on page 1 while the information for temperature sensor 2 is shown on page 2. The other pages are empty.

Paging	
Page 1	Temperature sensor 1
Page 2	Temperature sensor 2
Page 3	Not selected
Page 4	Not selected

9.2.4 Serial number

The serial number of the controller is shown.

Status	
Night setback active	No
Subcooler on	No
Subcooler active	No
Serial n...	01-01-20-13-00523

9.2.5 Software version

The software version in (Major.Minor.Patch) format is shown.

Status	
Subcooler on	No
Subcooler active	No
Serial n...	01-01-20-13-00523
Software version	1.0.0

9.2.6 System of units

The units system used to show values in the display is shown (see also "[System of units](#)").

NOTICE

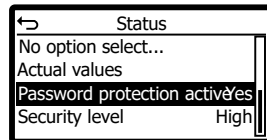
Internally, the controller processes all parameters and process data using the SI system.

You can also select the units system which is used to provide values for the fieldbus interface regardless of how the values are shown in the display (see also "[System of units](#)").

Status	
Subcooler active	No
Serial n...	01-01-20-13-00523
Software version	1.0.0
System of units	SI (°C, Bar)

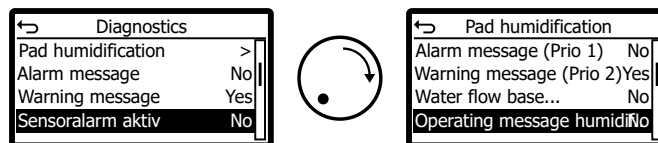
9.2.7 Password protection

It is indicated whether password protection is active and which security level has been selected. (see also "Password protection").



9.3 Diagnostics

The diagnostics menu provides a central overview of the controller system status. Parameters as well as group messages such as alarm, warning and operating messages are shown.



9.3.1 Pad humidification

The following statuses are shown here:

- Alarm message (Prio 1) active (yes/no)
- Water flow setpoint incorrect (yes/no)
- Warning message (Prio 2) active (yes/no)
- Operating message humidification active (yes/no)
- Water flow warning message active (yes/no)
- Service interval warning message active (yes/no)

9.3.2 Alarm message (Prio 1)

The alarm message (Prio 1) is a collective fault message which indicates a system-critical pad humidification status. This message is generated if the water flow setpoint cannot be calculated. The alarm message can be output via a digital output.

9.3.3 Warning messages (Prio 2)

The warning message (Prio 2) is a collective fault message which is issued if there is a fault but the pad humidification can continue to operate (possibly with restrictions). A warning can

be caused by a sensor fault for example. The warning message can be output via a digital output.

9.3.4 Operating message

The operating message is active when wetting is running. That means if a control value (analogue signal) is being output to the control valve.

9.3.5 Sensor alarm

If there is a warning message concerning at least one sensor, this is signalled.

9.4 Event menu

In the event memory, both temporary and one-off events are permanently recorded with a time stamp (see "[Error messages and warnings](#)").

Temporary events are for example sensor faults. Such events are active when the fault occurs and end when the fault is rectified.

One-off events are for example system commissioning time points.

You can navigate horizontally (left/right) and vertically (up/down) within the event memory. On the horizontal level, the events are shown in chronological order from left to right.

Active events are left-justified. These are then followed by events which have ended.

If you navigate to an event, you can press the rotary selection knob to switch to the event itself. By turning the rotary selection knob, you can scroll through the entire event entry.

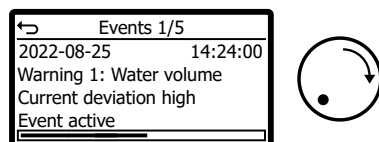
If you press the rotary selection knob again, you will jump back to the horizontal selection level.

The time stamp for the event is the point at which the event became active.

If an event is active, this is indicated by the icon.

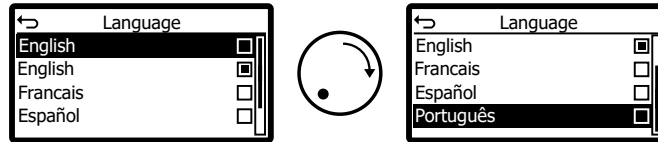
Example:

Alarm No. 1 is present here. The event occurred at 14:25:00 on 25.04.2022. In addition, icons for active/inactive are shown, the event is currently still active.



9.5 Language

The display language can be changed by selecting your desired language.



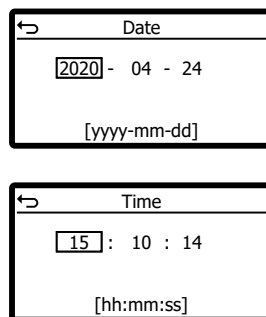
9.6 Date/time

The system time (date and time) can be set here. The time is used to enter the event times in the event memory or for time-controlled functions (e.g. night setback or inverse operation).

The date and time shown are country-specific depending on the set language.

In the event of a power cut, the system clock will remain set for 4 - 7 days depending on the ambient temperature.

The date and clock are set in the formats year/month/day and hour/minute/second.



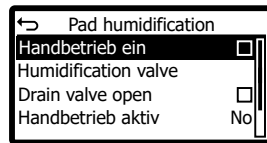
9.7 Manual mode

Manual mode is used to start up the control valve and drain valve manually. If it is activated, the control valve will regulate the system to the manual mode control value. The drain valve can be switched manually.

ATTENTION

Manual mode does not depend on a clearance signal. It has the highest priority and switches off all other regulation modes. If frost protection takes effect, manual mode will be deactivated permanently!

Active manual mode is saved permanently, in other words it is active again even after switching the power supply off and on.

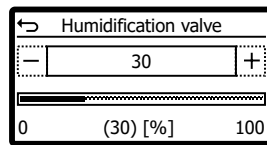


9.7.1 Manual mode on

Manual mode can be switched on and off here.

9.7.2 Humidification valve

Here, you can configure the control value for humidification which is output to the control valve when manual mode is active (switched on manually or with a control signal).



9.7.3 Drain valve open

The drain valve can be opened manually here.

9.8 Service

In the service menu, the central configurations for the controller can be carried out.

You will find the individual subfunctions in a separate section ["Service menu,"](#).

9.9 Update

The aicore hydro software can be updated with the help of a USB storage medium with no additional hardware or software. The update procedure is error-resistant because the system is a multi-partition system (system0 and system1). See also "System slots".

During the update process, the new software will first be installed on the inactive partition and the new partition will only be started at the end of a successful update procedure. If for example there should be a power failure during the update process or the USB stick is pulled out, the previously active partition will remain unharmed and will be started again.

A standard USB storage stick should be used when carrying out an update. This storage stick must be formatted as follows:

- The stick should have a classic DOS partition table.
- There should be exactly one partition on the stick.
- The partition must be FAT32 formatted.
- The size of the assignment units must be 8192 bytes.
- The label for the partition must be **NEXO_RAUC**.

You can do this from Windows-Explorer by selecting the recognized stick, opening the context menu with the right mouse button, selecting the aforementioned points and then starting the formatting process.

You must then copy the update file to the main directory on the USB storage stick. The file name must be as follows:

update-bundle-guentner-image-nexo-guentner-nexo-ec-1.raucb

The update file is available for download via the Güntner customer portal.

9.9.1 Update procedure

⚠ WARNING

The current firmware for the controller is available via the online portal *myguentner* or the *Güntner homepage* → *Service & support* → *Software updates*

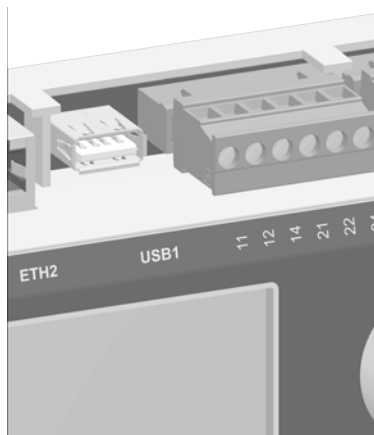
ATTENTION

First of all, ensure that the date and time are set correctly.

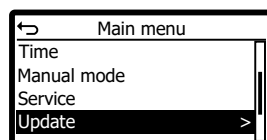
This is essential to ensure that the update certificate can be checked successfully.

See also "[Date/time](#)".

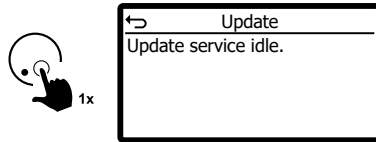
Now switch to the "Update" submenu before you insert the USB storage stick.



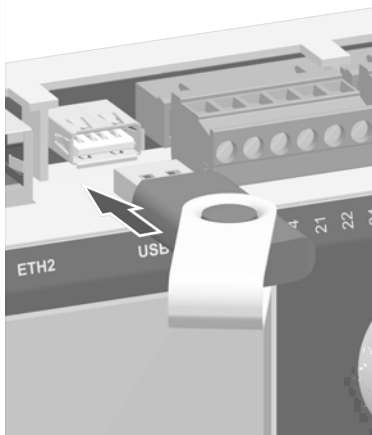
USB1 port on the aicore hydro



The update service status is then “inactive”, which means that no update procedure is currently under way.

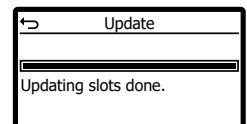
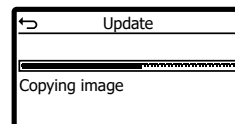
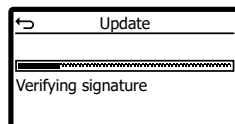
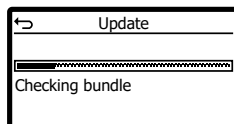


Do not insert the prepared USB storage stick into the USB port USB1 until now.

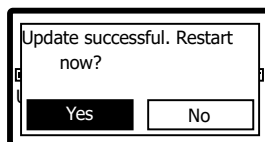


Insert the USB storage medium into the aicore hydro

The update procedure will start automatically. The various stages in the update process will be shown. A progress display will show how far the update process has progressed.

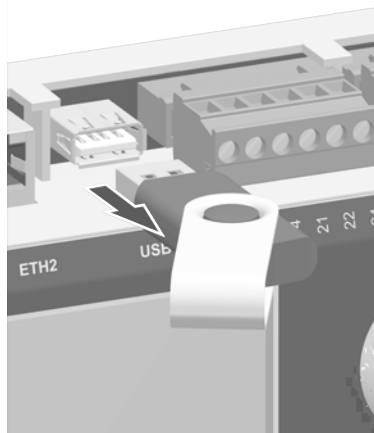


When the update including any data migration is complete, a message will appear:



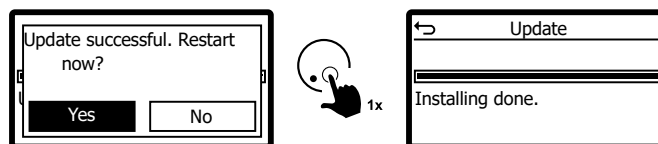
ATTENTION

Remove the USB stick before restarting the system!



Remove the USB storage medium from the aicore hydro

Now confirm your selection by clicking on “Yes” for “Restart now”.

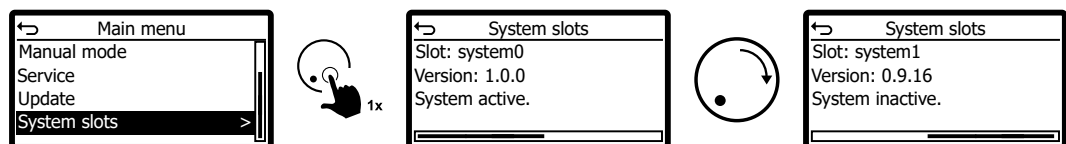


The system will now automatically restart.

9.10 System slots/firmware version

The software architecture of the aicore hydro features 2 system slots (system0 and system1), which are independent of each other. These are 2 separate areas where the system and application software as well as the database are installed. Only one of these system slots is ever active – the other one is inactive. This architecture allows an error-resistant software update and data migration.

This menu shows the statuses of the system slots and the software versions of the system slots.

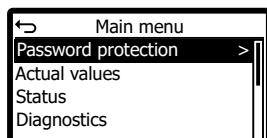


9.11 Display font

You can temporarily change the display font and the font size if necessary. The standard font is Helvetica size 11.

9.12 Password protection

It is possible to activate password protection in the Password protection menu. This enables critical menu options to be hidden at various security levels.



Overall, password protection in aicore™ air systems helps to ensure the security and reliability of these systems. Password protection prevents unauthorised access to the system, which is particularly important if the system performs critical functions or is responsible for controlling sensitive applications. In environments where many people have access to the system, password protection helps to prevent misuse or unauthorised configuration of the system.

The password protection function is responsible for local protection. Remote access via field-bus protocols such as Modbus is excluded from this protection.

On the one hand, the password can be set individually to limit access to authorised users. On the other hand, the security level setting allows you to restrict access to different menu areas for different user groups. User-friendliness is also improved by hiding protected parts of the menu and only displaying them after the password has been entered.

In addition, the recording of important processes such as password changes/resets and changes to the security level in the event log supports troubleshooting and monitoring of the system.

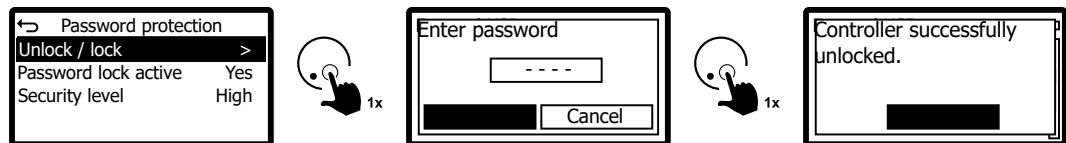
The following overview shows which menu options remain hidden in the main menu depending on the security level (X = not visible).

No security level	“High” security level	“Standard” security level
Password protection	Password protection	Password protection
Actual values	Actual values	Actual values
Status	Status	Status
Diagnostics	Diagnostics	Diagnostics
Setpoints	X	Setpoints
Events	Events	Events
Language	X	Language
Date	X	Date
Time	X	Time
Manual mode	X	Manual mode
Service	X	X
Update	Update	Update
System slots	System slots	System slots
Display font	X	X

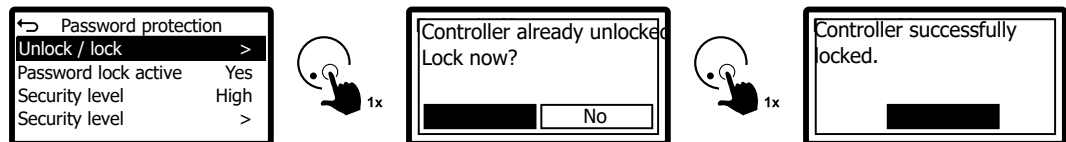
Menu options in the main menu depending on the security level

9.12.1 Unlock

The controller lock is cancelled or reactivated in this menu. After unlocking, all menu options are available without restriction. The lock is automatically reactivated after 15 minutes of inactivity, e.g. turning the rotary encoder or pressing a button. The correct password must be entered to unlock the unit:

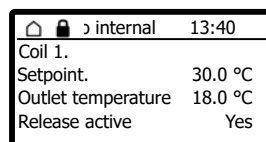


It is possible to reactivate the password lock manually. To do this, the security prompt in the corresponding dialogue must be confirmed.

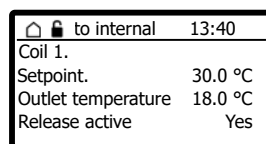


The status of the password lock is also displayed in the Home menu. A closed lock is displayed when the controller is locked and an open lock is displayed alternately with the home symbol when the controller is unlocked:

Controller locked

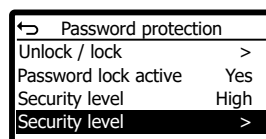


Controller unlocked



9.12.2 Security level

Access to the various menu areas is defined via the security level. Three levels are available: None, High and Standard. The “High” level offers the highest level of protection and the “None” option switches off the password protection function. The currently set level can be viewed both in the unlocked and locked state via the Status and Password protection menus:



If the controller is unlocked or if the security level is set to “None”, the desired protection level can be selected here:

Security level	
None	☐
High	☒
Standard	☐

The change to the security level is logged in the event log.

9.12.3 Change password

This menu can be used to set a new password, for example, if the default password needs to be replaced or the old password needs to be changed for security reasons. If the controller is unlocked, the user can set a new 4-position password via a dialogue-guided entry. For security reasons, the current password is requested first:

Password protection	
Password lock active	No
Security level	High
Security level	>
Change password	>

 1x

Enter current password	
Cancel	

 1x

The new password can then be entered and confirmed by entering it again:

Enter new password	
Cancel	

 1x

Repeat new password	
Cancel	

 1x

New password successfully set.	

The password change is logged in the event log.

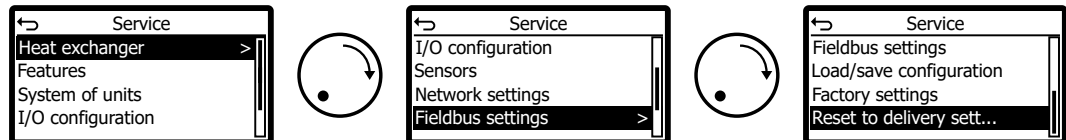
On delivery, the password is preset to 3795.

The password reset is logged in the event log.

10 Service menu,

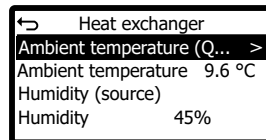
Via the Service menu, all settings for the controller can be configured.

The following main categories can be found in the menu and are described in subsequent sections.



10.1 Heat exchanger

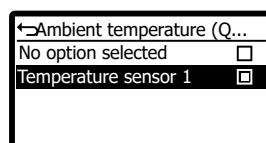
All settings which have an effect on the entire heat exchanger can be configured here.



Note: If an external temperature or ambient humidity sensor is configured and connected, the current measured values will also be shown here.

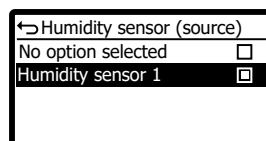
10.1.1 Ambient temperature

The ambient temperature is assigned to a temperature sensor and the current value shown here.



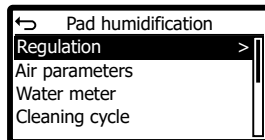
10.1.2 Ambient humidity

For the humidity, the humidity sensor is assigned and the current value is shown.



10.2 Features

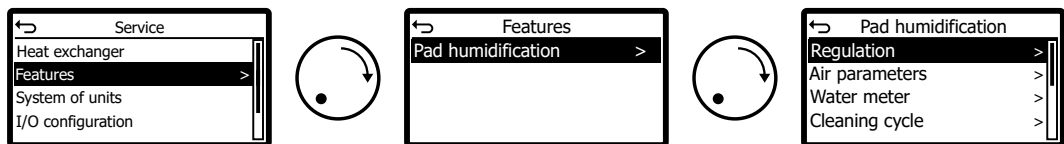
With this item in the service menu, you can activate and configure special functions if necessary.



10.2.1 Pad humidification

10.2.1.1 Regulation

The settings for operating pad humidification are configured here.



10.2.1.1.1 Control parameters

The control parameters can be set here.

Kp gain factor:

The Kp factor specifies the control gain. It is the proportion of the control path following the input signal.

Ti hold time:

The I part of the regulation constantly changes the degree of regulation until the actual value reaches the setpoint.

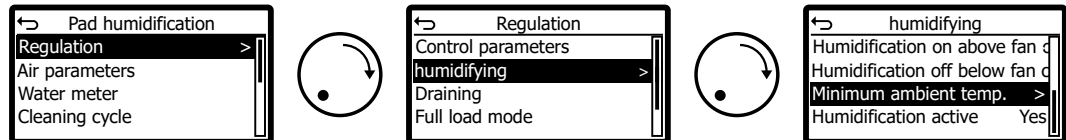
10.2.1.1.2 Humidification (parameter)

The following settings should be configured here:

- The fan control value from which the aicore hydro is enabled,
Humidification on from fan control value
- The fan control value below which the aicore hydro switches off again,
Humidification off below fan control value
- The ambient temperature from which the aicore hydro is enabled.
Minimum ambient temperature

The following is also shown:

- whether humidification is active,
- current fan control value,
- current ambient temperature.



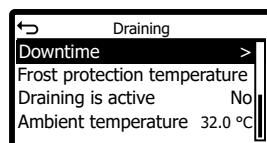
10.2.1.1.3 Draining

The settings for the following should be configured here:

- Drain event “**External temperature undershot**”,
Frost protection temperature
- Excessively long standing, i.e. the water in the lines has stood for too long without moving.
Downtime

An external control signal can also be configured. That means a DI can be defined as clearance for externally requested draining.

Control signal (external draining)



10.2.1.1.4 Open the humidification valve for draining

If this function is activated, the humidification valve opens during draining. This reduces the risk of water build-up and allows the system to drain more quickly.

This function must only be activated if the water supply (piping) to the heat exchanger has been installed in accordance with Güntner's specifications. This means that every heat exchanger must be fitted with a supply and drain valve on site.

If several heat exchangers are connected and are supplied by a joint water supply line, the hydroBLU control systems must be operated in master-slave mode.

If the function is activated contrary to these specifications, there is a risk of a major accident.

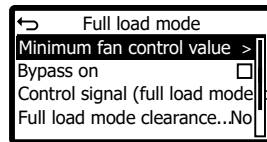
10.2.1.1.5 Full load mode

The following settings should be configured here:

- Threshold above which full load mode is activated,
- Whether bypass mode is activated in order to skip increasing the water application rate.

An external control signal can also be configured. This means a digital input (DI) can be configured as additional clearance for full load mode.

Control signal (full load mode clearance)



10.2.1.1.6 Maximum control value

The maximum control value for the humidification valve can be set here. This setting influences controlled operation and manual operation. The specified control value is not exceeded.

The following settings should be configured here:

- Maximum control value in %

10.2.1.1.7 Maximum valve flow

The maximum valve flow, as specified in the manufacturer's data sheet, must be set. This serves as a reference value for calculating the control deviation and the control variable of the water valve.

This parameter does not limit the actual amount of water applied to the pads and has no direct influence on water consumption.

The following settings should be configured here:

- Maximum flow of the control valve in l/h

10.2.1.1.8 Limit the water volume

You can activate the water volume limit here.

10.2.1.1.9 Maximum water volume

If the "Water Volume Limit" function is activated, the amount of water supplied to the humidification pads via the control valve is limited to the set maximum value.

Set the following here:

- Maximum water flow at the control valve in l/h

This parameter limits the actual amount of water applied to the pads and has a direct influence on water consumption.

10.2.1.1.10 Base value

Humidification is only enabled when the calculated water volume is above the base value. This prevents the amount of water from being too low and thus having no effect.

The following settings should be configured here:

- Base value in l/h

10.2.1.1.11 H₂O offset

The correction factor for the calculated water volume can be influenced. The H₂O offset is a correction factor for the water volume calculated by the controller. With a factor of >1 the calculated water volume can be increased, and reduced with a factor of <1.

Example: A factor of 1.2 corresponds to a 20% excess of water compared with the calculated water volume.

The following settings should be configured here:

- Correction factor

10.2.1.1.12 Max. H₂O supply (in full load mode)

Increase in the water supply rate during full load operation (fan speed 100%).

The calculated amount of water that can be evaporated is increased in stages by the set factor during full load operation.

The following settings should be configured here:

- Factor for increasing the water supply rate: 1–5

10.2.1.1.13 Increment (in full load mode)

Increment for increasing the water application rate in full load mode.

The following settings should be configured here:

- Increment for increase [%]

10.2.1.1.14 Delay (in full load mode)

Delay for the water application rate increment in full load mode.

The following settings should be configured here:

- Delay time

10.2.1.1.15 Clearance

The clearance for humidification can be assigned to a digital input here.

The following settings should be configured here:

- Control signal (humidification clearance)

10.2.1.2 Air parameters

The height above sea level at the installation site of the heat exchanger and the air flow rate must be set here.

The geodetic height for calculating the water volume required

- Height above sea level in metres

Air flow rate for calculating the water volume required

- Air flow rate (GPC data sheet) in m³/h

10.2.1.3 Water meter

The settings for the connected water meter should be configured here.

Service → Functions → Pad humidification → Water meter

- Water meter (source): The digital input that receives the pulses from the water meter
- Pulse rate of the water meter
- Pulse unit of the water meter

The current water consumption and flow figures are displayed here.

10.2.1.4 Cleaning cycle

Settings for the surge wetting can be configured here.

Adjustable parameters:

- Surge wetting ON
- Duration: How long the surge wetting should run → Duration in minutes
- Interval → Pause between surge wettings

The surge wetting can be enabled or disabled via a Modbus data point.

Prerequisite for activating the surge wetting:

- Enabling for the pad wetting system has been granted.
- The anti-freeze system is not active.

10.2.1.4.1 Activate/deactivate cleaning cycle

The surge wetting can be activated or deactivated here.

10.2.1.4.2 Water flow mode

Adjustable parameters:

- Maximum flow: The humidification controller is fully open.
- Regulated flow: The setpoint for the water flow for the surge wetting can be set here.

10.2.1.4.3 Water flow setpoint

Adjustable parameters:

- Water flow setpoint in l/h

10.2.1.4.4 Time

How long the cleaning cycle will be active → Time in minutes

10.2.1.4.5 Interval

This parameter determines the interval at which the surge wetting is automatically started.

Adjustable parameters:

→ Interval in minutes

10.2.1.4.6 Enforce the set duration

Once the automatic flushing has started, it must always run until the end of the set time.

The following conditions are then ignored:

- Enable signal
- Ambient temperature below the minimum value

10.2.1.5 Fan control value

The fan control value is needed in order to calculate the evaporation.

Configurable parameters:

- Fan control value (source) is determined in this menu

The control value currently effective is also shown in [%].

10.2.1.6 Monitoring

Deviations in the water flow and service intervals can be specified and monitored here.

10.2.1.6.1 Water flow (water fault message)

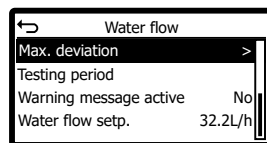
The max. deviation and the testing period are set here.

If the control deviation is above the set max. deviation for the entire testing period, a fault report is made.

Setpoint - actual value > max. deviation → Fault

Configurable parameters:

- Max. deviation in [%]
- Testing period



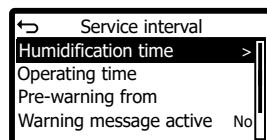
The following is also shown:

- Whether the fault message is active
- Water flow setpoint
- Water flow (current)

10.2.1.6.2 Service interval

The settings for the service interval can be configured here.

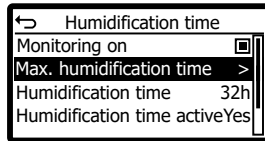
There are two possible intervals which are monitored. Humidification time and operating time. If the set max. times are exceeded, a warning (Prio2) is issued.



Humidification time

The maximum humidification time in hours after which a warning message will be generated can be specified here. Configurable parameters:

- Monitoring ON
- Max. humidification time until the warning



The following is also shown:

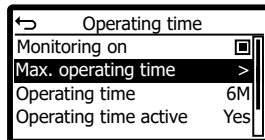
- Total humidification time
- Remaining service time until the max. humidification time is reached

Operating time

The maximum operating time in months after which a warning message will be generated can be specified here.

Configurable parameters:

- Monitoring ON
- Max. operating time until the warning

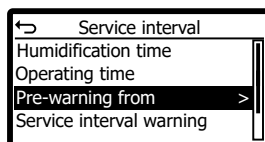


The following is also shown:

- Total operating time
- Remaining service time until the max. operating time is reached

Pre-warning

A pre-warning can be generated. A pre-warning is issued once the percentage set humidification time and operating time have been reached. If the pre-warning is active, it can be acknowledged.



10.2.1.7 Split wetting

The split wetting function allows the calculated water requirement to be divided between two separate sections. This allows for more precise control of water distribution within the system and helps to reduce hydraulic imbalances. This helps to optimise wetting and ensures more consistent process stability.

10.2.1.7.1 Split wetting on

The split wetting function can be activated here.

10.2.1.7.2 Section 1 allocation

This is where the allocation for Section 1 is configured.

The water flow is distributed by section, expressed as a percentage. The total water volume is distributed between humidification controller 1 and humidification controller 2 in accordance with the set percentage distribution.

NOTICE

To use this function, humidification controller 1 and humidification controller 2 must be assigned to the analogue outputs. This is done under Service --> I/O Configuration --> Analogue Outputs --> Source.

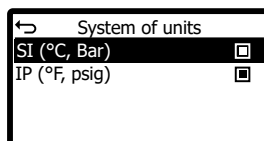
10.2.1.7.3 Water sections

This is where the signal source for the water meter is set and the output values are displayed.

- Water section 1
 - Water meter (source)
 - Water flow setpoint
 - Water flow
 - Humidification valve
 - Water volume flow warning message active
- Water section 2
 - Water meter (source)
 - Water flow setpoint
 - Water flow
 - Humidification valve
 - Water volume flow warning message active

10.3 System of units

Here, you can set the units system which is used to show the values in the display.

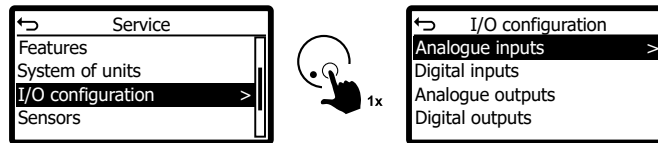


NOTICE

In the IP unit system, the US gallon is used as the unit of volume.

10.4 I/O configuration

In this menu, the analogue and digital inputs/outputs can be configured.



10.4.1 Analogue inputs

The analogue inputs are multifunctional inputs which can measure either current, voltage or resistance.

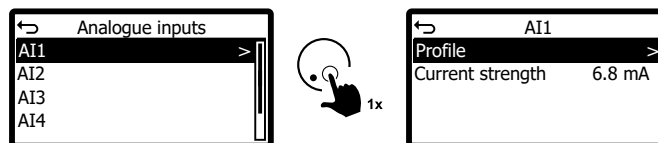
See also "[Analogue inputs AI1...AI5](#)".

A so-called profile can be assigned freely to each of the analogue inputs. Select the relevant input and set your desired profile.

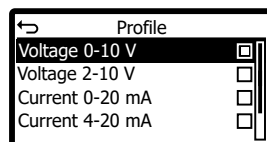
Both standard profiles such as those used in typical control and regulation systems and user-defined profiles are available. As a result, there is a very wide range of signal processing options.

In order to assign the humidity sensor to the analogue input and set the desired signal, proceed as follows in the Service menu:

Select an analogue input...



... and assign your desired profile to the input:



The following profiles can be selected:

- Voltage 0... 10 V
- Voltage 2... 10 V
- Current 0... 20 mA
- Current 4... 20 mA
- Resistance thermometer
- Custom voltage
- Custom Current
- Custom Resistance

With the custom profiles, you can also configure the minimum and maximum value with which the input signal is then converted to the internal signal values 0.0 to 1.0.

Depending on the selected profile, the currently measured value is shown in the corresponding unit.

In order to assign the sensor for the ambient air temperature to the analogue input and set the desired signal, repeat the procedure.

If pad humidification takes place without motor management, the control value for the fans must be specified as a signal on an analogue input.

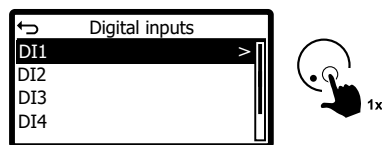
10.4.2 Digital inputs

Only the statuses of the digital inputs can be shown here.

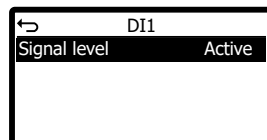
See also ["Digital inputs DI1...DI5 \(control inputs\)"](#).

The control inputs are always assigned for the relevant functions.

Select a digital input...



... and the current signal level will then be shown:



Active means that a "high level = logically 1" is present.

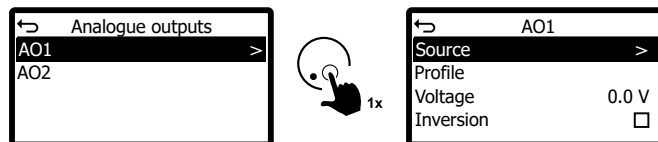
Inactive means that a "low level = logically 0" is present.

10.4.3 Analogue outputs

You can configure the profiles, the signal sources and, if desired, an inversion of the analogue outputs here. The current signal value for the output is also shown here.

See also ["Analogue outputs AO1...AO2"](#).

Select an analogue output...



...and then select the source which is to be output at this output and, possibly, your desired profile.

The following signal sources can be selected:

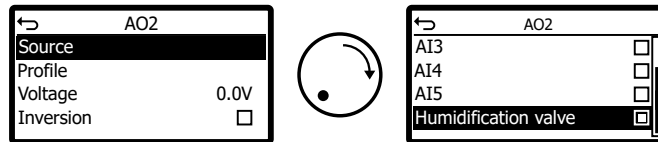
- None
- AI1...AI5
- Humidification valve

The following profiles can be set:

- Voltage 0 – 10 V
- Voltage 2 – 10 V
- Voltage (custom)

Activate "Inversion" if the output signal is to be output inverted with respect to the input signal.

In order to assign the control value for the humidification valve to the analogue output, proceed as follows:



10.4.4 Digital outputs

Here, you can configure the source for controlling the digital outputs and, possibly, a desired inversion of the control signal.

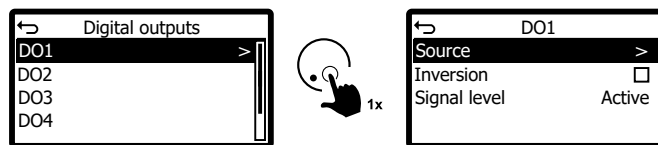
In addition, the current signal level is shown here.

Active means that the digital output is being controlled.

Inactive means that the digital output is not being controlled.

See also "[Digital outputs DO1...DO5 \(potential-free\)](#)".

Select a digital output...



...and assign to this output the signal source which this output is to react to.

The following signal sources can be selected:

- No assignment
- Status of the digital inputs
- Alarm message Prio 1
- Warning message Prio 2
- Operating message Humidification active
- Supply and drain valves humidification

NOTICE

All alarm messages, warning messages and group messages are **wire break-proof signals**, i.e. these signals are inverted by default. A fault status is always signalled with a low signal = deactivated output (relay not energized). This ensures that a fault is signalled even if the control unit is not connected to the power supply.

The collective fault signals for temperature, pressure and humidity exist only once, i.e. all collective faults result in the relevant group messages.

If you would like to invert the status of the digital output, then activate "Inversion".

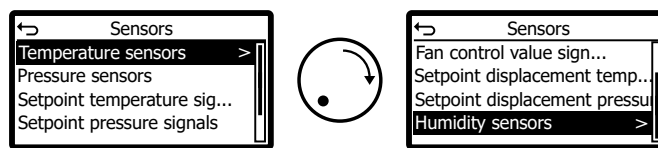
This can also be used to manually switch the status of the digital output on and off for test purposes.

10.5 Sensors

In this menu, you can add or configure sensors. With the exception of the resistance thermometers PT1000 and GTF210 (KTY), all sensors can be freely scaled and the signals can be inverted if necessary. This results in a large number of possible uses.

The sensors set up here can then be selected as signal sources for humidification or other functions. See also ["Analogue inputs AI1...AI5"](#).

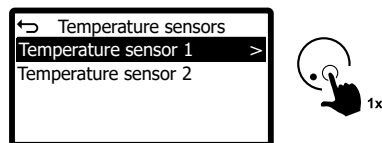
Selecting the correct profile for the analogue input is important in order to ensure that the sensors function correctly. See also ["Analogue inputs"](#).



Sensors can be added here during start-up or later on.

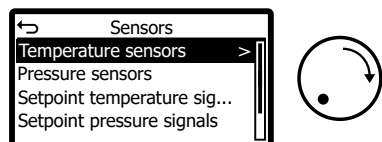
To configure an existing sensor, select the sensor and then change its settings.

If you would like to change the settings for a temperature sensor for example, navigate to the sensor, select it...



...and then make your desired changes.

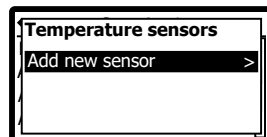
To add a new sensor, select a sensor type in the sensor menu...



...and then press and hold (for at least 2 seconds) the rotary selection knob.



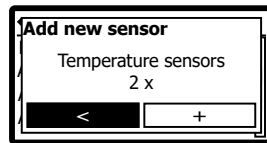
The context menu will now open.



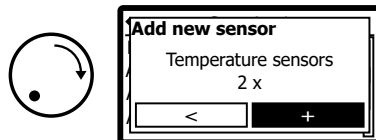
Press the rotary selection knob briefly to continue adding the sensors.



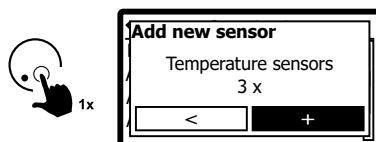
You will also see how many temperature sensors have already been set up.



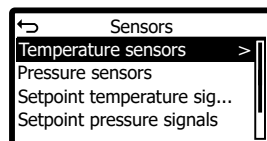
Now select the “+” field by turning the selection knob.



Each time that you press the rotary selection knob briefly, you can add another sensor. The total number of each sensor type will increase and will be shown here.

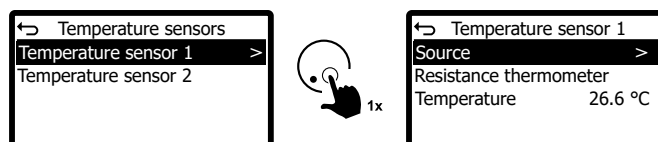


You can exit the context menu by pressing the “Back” button twice.



You can then configure these newly created sensors, e.g. assign the signal source for the analogue input to the sensor.

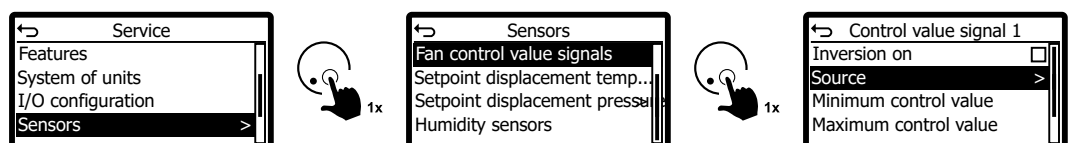
Select the relevant sensor.

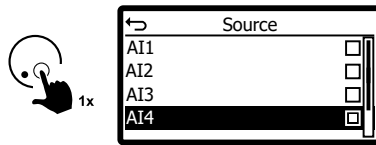


10.5.1 Fan control signal

The fan control value can be specified externally via an analogue signal. The source of the relevant fan control signal should be set.

Any analogue input can be selected as the signal source. You can also configure the minimum and maximum figure for the control value – this is calculated on the basis of the specified analogue source signal. This allows flexible scaling with respect to the input signal.



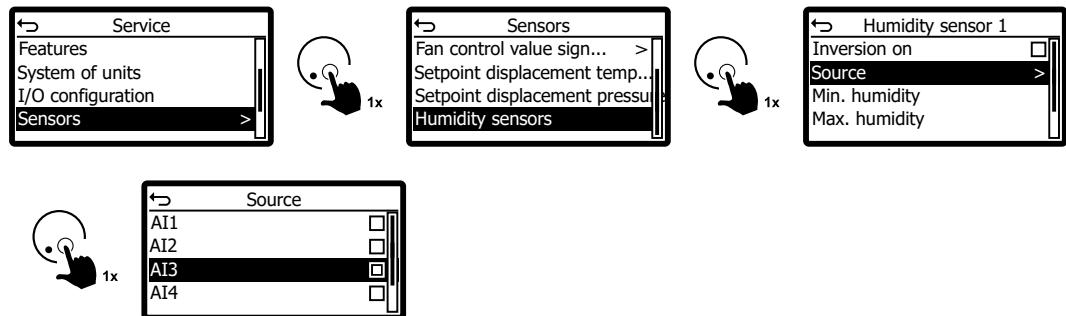


It is also possible to invert the control value signal.

10.5.2 Humidity sensor

You can add humidity sensors here. If necessary, this sensor can be used for displaying, for provision on the field bus or for regulation, just like the ambient temperature.

Any analogue input can be selected as the signal source. You can also configure the minimum and maximum figure for the ambient humidity – this is calculated on the basis of the specified analogue source signal.

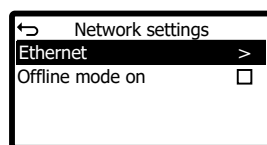


It is also possible to invert the ambient humidity signal.

10.6 Network settings

In this menu, you can configure all network settings.

In addition to the Ethernet-based settings, you will also find configuration points such as WLAN or Cellular in the future.



10.6.1 Offline mode on

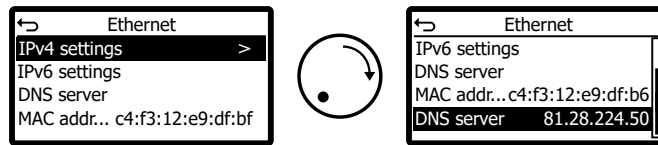
Activate “Offline mode on” if you wish to deactivate **all** network connections completely.

10.6.2 Ethernet

Here, you can configure all settings for the relevant Ethernet connection.

The aicore hydro two Ethernet connections (ETH1 and ETH2). However, ETH2 is not currently supported.

The Ethernet menu therefore depends on the unit type, the available network components and implemented protocols and can thus differ from the following illustration.



10.6.2.1 IPv4 settings

Here, you can configure the settings which apply to the IPv4 protocol.

10.6.2.1.1 IPv4 method

Here, you can set the method for obtaining an IPv4 address.

Select **Off** if you do **not** wish to use the IPv4 protocol.

Select **Auto** if an IPv4 address is to be obtained automatically from a DHCP server when the system starts.

Select **Manual** if you wish to configure an IPv4 address manually.

10.6.2.1.2 IPv4 address (manual)

The IPv4 address set here will be used if you have set the IPv4 method to "Manual".

10.6.2.1.3 IPv4 prefix length

You can set an IPv4 gateway here. Queries whose IP addresses are outside the configured network will be sent to this gateway.

10.6.2.1.4 IPv4 gateway

You can set an IPv4 gateway here. Queries whose IP addresses are outside the configured network will be sent to this gateway.

10.6.2.1.5 IPv4 address (current)

The current IPv4 address for the Ethernet connection is shown here.

10.6.2.2 IPv6 settings

You can configure the settings which apply to the IPv6 protocol here.

10.6.2.2.1 IPv6 method

You can set the method for obtaining an IPv6 address here.

Select **Off** if you do not wish to use the IPv6 protocol.

Select **Auto** if an IPv6 address is to be obtained automatically from a DHCP server when the system starts.

Select **Manual** if you wish to configure an IPv6 address manually.

10.6.2.2.2 IPv6 address (manual)

The IPv6 address set here will be used if you have set the IPv6 method to “Manual”.

10.6.2.2.3 IPv6 prefix length

You can set an IPv6 prefix length here. This value is also referred to as the so-called “mask”.

10.6.2.2.4 IPv6 gateway

You can set an IPv6 gateway here. Queries whose IP addresses are outside the configured network will be sent to this gateway.

10.6.2.2.5 IPv6 address (current)

The current IPv6 for the Ethernet connection is shown here.

10.6.3 DNS server

Here, you can configure a DNS server (domain name server).

10.6.4 MAC address

Here, the MAC address for the Ethernet connection is shown. This address is needed if for example this Ethernet connection is to be integrated into a customer system.

10.6.5 DNS server (current)

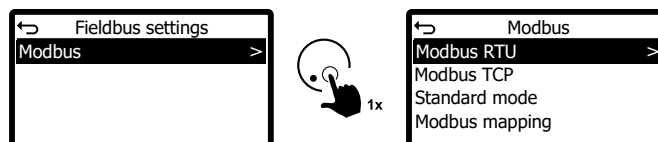
The current IP address for the DNS server is shown here.

10.7 Fieldbus settings

You can configure the available fieldbuses here. The fieldbuses are shown in this menu depending on which ones are available.

10.7.1 Modbus

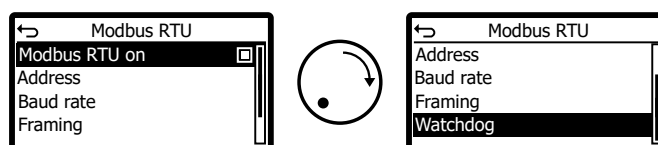
The parameters for the fieldbus protocol Modbus can be configured here.



10.7.1.1 Modbus RTU settings

Modbus RTU is a fieldbus protocol which is offered via the serial RS485 interface.

The aicore hydro works here as a Modbus RTU slave (Modbus server), which means that the data for the aicore hydro can be read out and parameters written by a higher-level Modbus RTU master.



Modbus RTU on

The Modbus RTU protocol can be activated or deactivated here. The Modbus RTU protocol is always switched on when the unit is delivered.

Address

The fieldbus address for the Modbus RTU slave can be set here.

Baud rate

The baud rate can be set here.

Framing

The framing (number of data bits, stop bits, parity) for the fieldbus interface can be set here.

Watchdog timeout

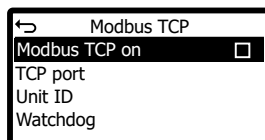
Here, you can configure a watchdog timeout which can be reacted to downstream if no messages are received for the timeout set here.

10.7.1.2 Modbus TCP settings

Modbus TCP is a fieldbus protocol which is offered via the Ethernet interface.

The aicore hydro works here as a Modbus RTU slave (Modbus server), which means that the data for the aicore hydro can be read out and parameters written by a higher-level Modbus RTU master.

The Modbus TCP server on the aicore hydro can be reached via the ETH1 IPv4 address in conjunction with the TCP port and the unit ID configured here.



Modbus TCP on

The Modbus TCP protocol can be activated or deactivated here.

TCP port

The TCP port via which the Modbus TCP server is reached can be set here.
The standard TCP port is **502**.

Unit ID

The unit ID via which the aicore hydro can be reached via Modbus TCP can be set here.

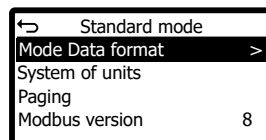
Watchdog timeout (TCP)

Here, you can configure a watchdog timeout which can be reacted to downstream if no messages are received for the timeout set here.

10.7.1.3 Standard mode

The aicore hydro controller offers 2 modes in which data points are offered on the Modbus interface. See also “Modbus mapping”. In the standard mode, you can also conveniently set how data are provided for the Modbus interface.

When doing this, bear in mind the information in the corresponding interface specification.

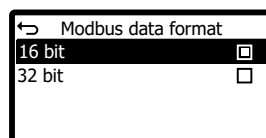


Modbus data format

Here, you can specify how numerical parameters and process data which, in principle, can have decimal places are provided on the Modbus interface. In the “16 bit” data format, a compact fixed point notation which requires only one data word (2 bytes) per value is used.

With the “32 bit” data format, a floating point notation in accordance with the IEEE 754 standard is used. This offers greater accuracy but requires 2 data words (4 bytes) per value.

For further information, see the Modbus interface specification.

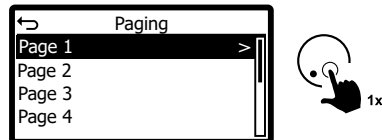


System of units

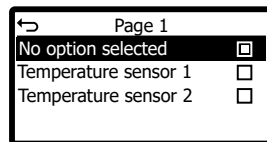
Here, you can specify the units system used when transferring parameters and process data on the Modbus interface. This setting is independent of the units system for the display.

Paging

Here, you can specify which sensors are shown on the relevant pages in the Modbus interface.



To do this select a page and assign the desired sensor to it.



For further information, see the Modbus interface specification.

Modbus version

The internal Modbus version is shown here. It is designed exclusively for internal diagnostic purposes.

Modbus mapping

The new aicore hydro controller provides a much wider range of functions, which is also why the Modbus interface had to be reworked.

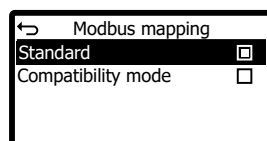
It now allows more IOs, more interfaces, more fans and more functions.

The new interface comes under the term Modbus mapping = “Standard”.

There is a separate interface specification for this.

In order to offer the greatest possible backwards compatibility, the so-called “compatibility mode” was developed additionally, i.e. you should select compatibility mode, for example, if you install the aicore hydro controller as a replacement unit, or you would like to expand your existing infrastructure without changing the interface programming.

Switching is possible via this menu.



Standard mode is switched on by default.

With the previous version of the aicore air controller (GMM EC), only some parameters and process data were available via the Modbus interface.

With the aicore air generation, all parameters and process data are now always available via Modbus, both via Modbus RTU and Modbus TCP/IP. For this reason, only one interface description is needed for Modbus RTU + TCP/IP.

10.8 Load/save configuration

The aicore hydro allows you to save all settings in the form of a configuration. This configuration can be loaded again later on in order to restore the previously saved aicore hydro settings and thus put the unit into a clearly defined state. However, a configuration can also be used to transfer the settings from one aicore hydro controller to another aicore hydro controller.

Configurations are essentially files whose name ends in “.gmmnext”. The rest of the file name can be selected at will. Configurations can be stored either in the aicore hydro's internal memory or on an external USB storage medium such as a USB stick. Up to 20 configurations can be stored in the internal memory.

When a configuration is saved, it is automatically given a generated file name, which includes information like the date and time when it was created. Because the aicore hydro configurations are sorted according to their file names by default, this implicitly results in sorting according to the date and time of creation. If the configuration is saved or exported to a USB stick, a separate directory containing the configuration will be created for each aicore hydro on the basis of its serial number. This means that the assignment between the configuration and aicore hydro remains unique if the same USB stick is used to manage the configurations of a number of aicore hydro units.

If the file name of a configuration is to be changed, the configuration can first be saved on a USB stick or exported. The USB stick can then be connected to a standard computer in order for the file name to be changed. The renamed configuration can then be imported to the aicore hydro again.

A number of application scenarios can have far-reaching consequences for the current aicore hydro settings. These include the ["Load configuration"](#), the ["Load factory settings"](#) and the ["Resetting the unit to its delivery state"](#). The aicore hydro allows you to first create a backup configuration in the internal memory, which can be accessed later on if necessary. This is a comfort function to make application scenarios with far-reaching consequences as easy and secure as possible. If there is no more space available in the aicore hydro's internal memory for a backup configuration, an existing configuration must first be removed via the “Delete configuration” menu item. Alternatively, you can of course save the current configuration explicitly on a USB stick via the “Save configuration” menu item so that there is no need for a backup configuration in the internal memory.

10.8.1 Save configuration

You first select your desired storage medium on which the current aicore hydro configuration is to be saved. You can choose from the aicore hydro's internal memory or a connected USB stick. After that, you only need to confirm the save procedure. Once you have done this, you will be given the file name under which the configuration was saved on the storage medium.

10.8.2 Load configuration

First of all, you select the storage medium from which you wish to load a configuration. You can choose from the aicore hydro's internal memory or a connected USB stick. After that, you

can view your chosen storage medium with the help of an integrated file manager and select the configuration that is to be loaded. Once you have successfully loaded the configuration, the aicore hydro switches to a shorter commissioning procedure during which the loaded fan settings can be checked and adjusted if necessary.

10.8.3 Import configuration

With the help of the import function, you can copy a configuration from a connected USB stick to the aicore hydro's internal memory without influencing the aicore hydro's current settings. With this facility, you can save a configuration on the aicore hydro and load it from the internal memory later on if required.

10.8.4 Export configuration

With the help of the export function, you can transfer a configuration that was saved in the aicore hydro's internal memory to a connected USB stick. With this function, you can create backup copies of important configurations in case the existing aicore hydro ever needs to be replaced.

10.8.5 Delete configuration

Via this menu item, you can delete existing configurations from the aicore hydro's internal memory and thus free up space, which can then be used to store new configurations.

10.9 Factory settings

The factory settings are order-related settings with which the aicore hydro is preconfigured in the factory. If these factory settings have been recorded and stored on the aicore hydro, the aicore hydro can be reset to use these settings later on. If factory settings are available, the menu will show various information including the date on which the factory settings were saved.

10.9.1 Load factory settings

Via this menu item, you can reset the aicore hydro to its original factory settings.

10.10 Resetting the unit to its delivery state

Via this menu item, you can reset the unit to its delivery state.

In this case, all parameters will be deleted and the unit will need to be commissioned again.

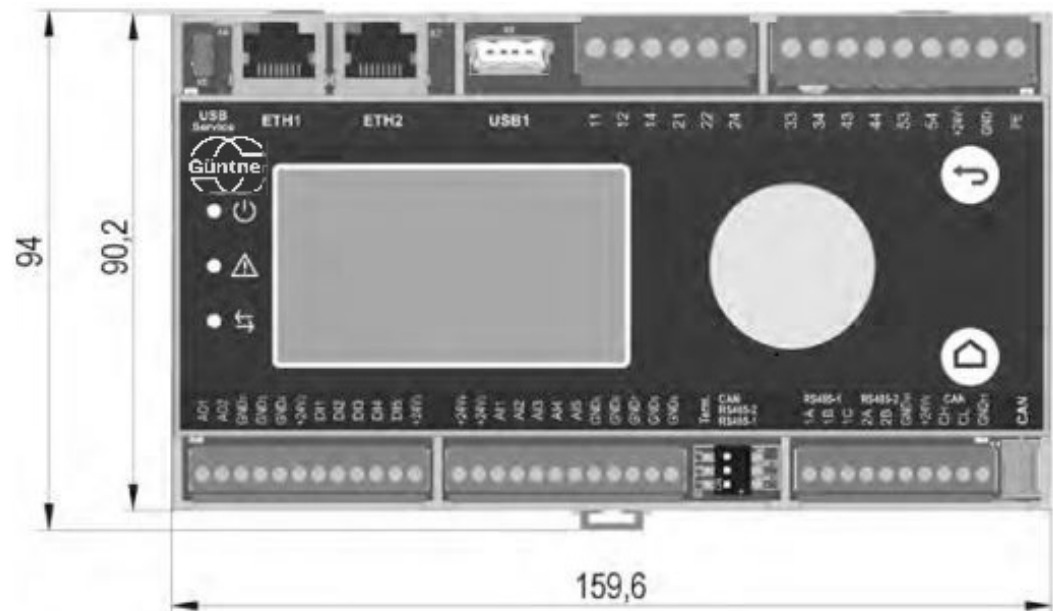
ATTENTION

Select this menu item only if you understand the implications and have all parameters for this step.

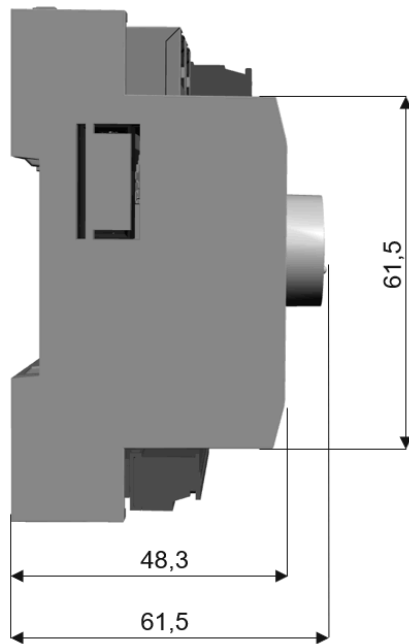
11 Technical data

11.1 Dimensional drawing of aicore hydro

The dimensions of the housing and fixings are shown below. All dimensions are given in millimetres.



Dimensional drawing of aicore hydro



Dimensional drawing of aicore hydro
from the side

12 Electrical properties

Description	Min	Type	Max	Unit
Power supply				
Supply voltage	20	24	28	V
Current consumption (24 VDC) ^{*1)}		200	400	mA
Power consumption ^{*1)}		4.8	9.6	W
Digital inputs				
Potential separation	No			
High level (digital mode) ^{*2)}	16	24	28	V
Low level (digital mode) ^{*2)}	-1	0	5	V
Frequency (digital mode) ^{*2)}			20	kHz
Input resistor	35			kΩ
Relay outputs				
Potential separation	Yes			
Voltage DC		24	30	V
Voltage AC			250	V
Current resistive load (30 VDC)			1.0	A
Current inductive load (30 VDC)			0.45	A
Current resistive load (250 VAC)			1.5	A
Current inductive load (250 VAC)			0.6	A
Switch cycles, mechanical	1*10 ⁵			Switch cycles
Switch cycles, electrical	1*10 ⁵			Switch cycles

^{*1)} The maximum current consumption includes supplying two connected pressure transmitters and one connected temperature sensor.

^{*2)} Digital inputs can be operated in analogue or digital mode. The switching levels in analogue mode are configured via software parameters.

Description	Min	Type	Max	Unit
Analogue input general				
Potential separation	No			
Dielectric strength	-5		30	V
Resolution			12	Bit
Analogue input voltage mode 0..10V				
Measuring range	0		12	V
Error		0.25	0.5	% ^{*3)}
Input resistor	100			kΩ
Analogue input current mode 0..25mA				
Measuring range	0		25	mA
Error		0.25	0.5	% ^{*3)}
Input resistor in the measuring range (without protective circuit)		110	150	Ω
Analogue input PT1000 mode				
Measurement range (resistance)	800		1500	Ω
Error (resistance)		1.5	2.0	Ω
Measuring range (temperature)	-50		130	°C
Error (temperature)		0.4	0.6	K
Measured current		1	1.4	mA
Voltage output 0..10V				
Potential separation	No			
Voltage range	0		10	V
Load resistance		≥5		kΩ
Resolution			12	Bit
Error ($I_{out} \leq 1\text{mA}$)			1	% ^{*4)}
Short circuit protection	Yes			
Short circuit current (I_{out_max})			5	mA
Ethernet interface 1 / 2				
Dielectric strength			2	kV
Transmission rate	10		100	MBit
Autonegotiation	Yes			
Auto MDI-X	Yes			
Galvanic separation	Yes			

^{*3)} Error relating to measuring range end value

^{*4)} Error relating to range end value

Description	Min	Type	Max	Unit
USB service interface				
OTG capability	Yes			
Voltage supply U_{out} (host mode)	4.5	5		V
Voltage supply I_{out} (host mode)			500	mA
Transmission rate	1.5		480	Mbit/s
USB1 interface				
OTG capability	No			
Voltage supply U_{out} (host mode)	4.5	5		V
Voltage supply I_{out} (host mode)			500	mA
Transmission rate	1.5		480	Mbit/s
CXP interface				
Plug and play recognition of expansion module	Yes			

Electrical properties

13 Options / Accessories

The aicore hydro comes with Modbus TCP and Modbus RTU as standard. Additional interface solutions are also offered via the Güntner Product Configurator (GPC).

For technical details, please see the relevant data sheets or interface specifications.

These can be downloaded from the "Controls" area of Güntner's mygüntner portal.

14 Error messages and warnings

The table shows which signal relay (**Priority 1** or **Priority 2**) is assigned to which message on the display in the event memory.

			In the event memory of the aicore hydro	Report relay on the aicore hydro
Code	Component/function	Severity	Text in the event memory (DE)	Prio
53	Measurement monitoring	Warning	Humidity above the interval	Priority 2
54	Measurement monitoring	Warning	Humidity below the interval	Priority 2
55	Measurement monitoring	Warning	Wet bulb temperature above the interval	Priority 2
56	Measurement monitoring	Warning	Wet bulb temperature below the interval	Priority 2
79	Analogue input	Warning	Humidity no value	Priority 2
80	Analogue input	Warning	Web bulb temperature no value	Priority 2
88	GMOD 08 IO	Warning	GMOD 08 IO [No.] current high	Priority 2
89	GMOD 08 IO	Warning	GMOD 08 IO [No.] current low	Priority 2
90	GMOD 08 IO	Warning	GMOD 08 IO [No.] resistance high	Priority 2
91	GMOD 08 IO	Warning	GMOD 08 IO [No.] resistance low	Priority 2
92	GMOD 08 IO	Warning	GMOD 08 IO [No.] voltage high	Priority 2
93	GMOD 08 IO	Warning	GMOD 08 IO [No.] voltage low	Priority 2
94	Info	Info	Humidification time pre-warning acknowledged	-
95	Info	Info	Operating time pre-warning acknowledged	-
96	Info	Info	Service interval reset	-
97	Warning	Warning	Water flow deviation high	Priority 2
110	Password protection	Info	Password changed	-
111	Password protection	Info	Password reset	-
112	Password protection	Info	Security level changed	Priority 2
136	Pad wetting	Warning	Water section %1: Water volume flow deviation high	Priority 2

Error messages and warnings

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18 Annex

18.1 Default I/O configuration

	DI1	DI2	DI3	DI4	DI5
Function	-	-	Clearance humidifying	Draining external	Water meter
Wire break-proof input	No	No	No	No	No

Default configuration of digital inputs after commissioning

	DO1	DO2	DO3	DO4	DO5
Function	-	-	-	humidifying Active	Drain valve Close
Wire break-proof output	Yes	Yes	No	No	No

Default configuration of digital outputs after commissioning

	AO1	AO2
AO profile	0-10V	0-10V
Function	-	Control value Humidification valve

Default configuration of analogue outputs after commissioning

	AI1	AI2	AI3	AI4	AI5
Operating mode	4-20 mA	0-10V	4-20 mA	0-10 V	4-20 mA
AI source	-	-	Humidity sensor	Control value Fans Pad humidification	Ambient temperature

Default configuration of analogue inputs after commissioning for dry cooler and condenser and slave operating modes