

Installation Instruction

Transport | Installation | Operation | Maintenance



Product line:	Adiabatic Cooling System with HydroBlu Technology
Series description:	V-Shape Compact Adiabatic Condensers and Drycoolers
Series:	GFW, GVW, GFD, GVD

guntner.com/us

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1. Warranty statement

The supplier warrants the product to be free from defects in workmanship and materials under normal usage for the period outlined below. The supplier further warrants against defects in workmanship and materials of the product for a period of 24 months from the date of purchase (the "Warranty Period"), provided that the product is correctly installed and operated within the recommended limits of the manufacturer's technical documentation.

The supplier at its option shall repair or replace, free of charge to the purchaser, all components of the product which are or become defective during the Warranty Period as a result of defects in design, workmanship or materials, ordinary wear and tear excluded, provided, however, that:

- The product is applied correctly
- All operating and installation instructions for the product are complied with
- System component and piping design is in accordance with good refrigeration practice
- Nitrogen or an inert gas is introduced into the piping during the brazing of the piping installation

This warranty shall not include ordinary maintenance or cleaning of the product, or defects in the installation of the product. This warranty also does not cover physical damage to the product during transit, after purchase of the product but before installation.

The purchaser must request repair or replacement of the defective component through a written notice to the supplier, and must provide the purchaser with the time and opportunity to make such repair or replacement. Otherwise, the supplier will be freed from liability for the defect.

Any transport and exchange costs for the repair or replacement shall be borne by the purchaser. The supplier shall also not be liable for costs incurred in dismantling or fitting replacement parts or for any independent inspection undertaken by the purchaser.

The purchaser shall return any allegedly defective goods, postage or freight paid, to the supplier at the address below. Upon receipt of the goods and inspection thereof the supplier shall repair or replace, at the supplier's discretion, the defective components and shall return the same to the purchaser, return postage and freight paid. This shall constitute full compliance of the supplier's warranty obligations hereunder.

The seller accepts no liability for the direct or indirect consequences of any modifications of or repairs to the product made out by the purchaser or by a third party without the prior consent of the supplier.

This warranty applies only to the repair or replacement of components of the product and expressly excludes responsibility for damage and consequential damages not occurring to the product itself.

This warranty is the purchaser's exclusive remedy. The supplier expressly acknowledges that it shall not be liable to the purchaser or any client of the purchaser for any direct or indirect damages, injury to persons or property or any consequential damage or loss of profits arising from defective goods or workmanship or from any other cause whatsoever.

To obtain warranty service or to ask any questions regarding the foregoing, please contact our office:

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3601 Algonquin Road Suite 925
Rolling Meadows, Illinois 60008
847- 781-0900 Tel
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Online support: <https://www.guntner-solutions.us/contact>

2. Safety information

2.1 Safety symbols

⚠ WARNING
Addresses a hazardous situation which, if encountered, will result in death or serious injury.
⚠ WARNING
Addresses a hazardous situation which, if encountered, might result in death or serious injury.
⚠ WARNING
Addresses a hazardous situation which, if encountered, could result in minor or moderate injury.
NOTICE
Indicates instructions that pertain to safe equipment operation. Failure to comply with these instructions could result in damage to the equipment.

2.2 Safety instructions

- Installation and maintenance must only be carried out by qualified personnel who are familiar with this type of equipment.
- Always wear safety glasses, gloves and head protection when working on the equipment.
- Avoid contact with sharp edges and exposed finned surfaces as these can cause painful lacerations.
- All units must be properly evacuated prior to charging the system.
- Ensure all power sources are disconnected prior to any service work being done on the units.
- Never apply heat to a sealed refrigeration system.
- Keep hands away from fans when the unit is running.
- Ensure all mounting bolts are tight and are the correct length for the specific application.
- Maintain all safety labels on the unit in good condition: If required replace with new.

2.3 Refrigerant / Fluid safety

⚠ WARNING
Although halocarbon refrigerants are classified as safe refrigerants; certain precautions must be observed when handling them. Refrigerant can be harmful if inhaled. When released to the atmosphere in the liquid state refrigerants evaporate rapidly freezing anything they contact. Refrigerants must be used and recovered responsibly.
Failure to follow this warning may result in personal injury or death.

⚠ WARNING

Anhydrous Ammonia (NH₃):

Specific precaution must be adhered to when people are working with or are exposed to Anhydrous Ammonia.

Ammonia is considered a high health hazard because it is corrosive to the skin, eyes and lungs. Exposure to 300 parts per million (ppm) is life threatening. Ammonia is also flammable at concentrations of approximately 15% to 28% by volume in air. When mixed with lubricating oils, its flammable concentration range is increased. It can explode if released in an enclosed space with a source of ignition present or if a vessel containing anhydrous ammonia is exposed to fire.

Personal protective equipment must be worn at all times when working with Ammonia. For systems that have an operating charge greater than 10,000 lbs a process safety management program is mandatory. More information on this topic is available from OSHA.

Failure to follow this warning may result in personal injury or death.

3. General information

Güntner Adiabatic Condensers and Drycoolers are designed to provide optimum efficiency and an extended life when properly installed, operated and maintained. It is therefore highly recommended that a comprehensive maintenance schedule be developed and undertaken on a regular pre-determined basis. This manual will assist in developing such a schedule.

This equipment is relatively complicated and the installation, operation, maintenance and servicing should only be carried out by suitable individuals who are qualified to carry out these functions. These individuals shall also be familiar with and comply with all applicable governmental standards and regulations pertaining to these functions.

NOTICE

The type of refrigerant must comply with what is indicated on the submittal drawings and/or the unit's nameplate. Design operating pressures, as indicated on the nameplate, must never be exceeded!

NOTICE

Adiabatic drycoolers and all piping systems must be correctly evacuated prior to charging the system with refrigerant to ensure the complete removal of moisture and non-condensables from the entire refrigerant circuit.

⚠ WARNING

Failure to comply with any of these requirements could result in serious damage to the equipment and/or the property where it is installed as well as personal injury and/or death to themselves and/or people at the specific location.

4. Receiving and inspection

All equipment is packaged for easy handling and storage. Upon delivery inspect all components for possible shipping damage and/or shortages.

NOTICE

A specific visual inspection of the cooling pads (media) should be done to confirm that these have not been damaged during shipment.

NOTICE

Record any unit damage or shortages on the Bill of Lading and report to the carrier and Güntner factory immediately. Shipping and handling damages are not warranty items.

Take photos of all damaged equipment and components. Damaged items are the responsibility of the designated carrier and should not be returned to the manufacturer unless prior approval is given to do so. Confirm that all items listed on bill of lading are received; especially all components required for the water distribution system and any loose items such as media pads, when shipped loose.

The unit(s) can be lifted using extended forks underneath the skid completely traversing the width of the unit and generally centered along its length. Do not allow the forks to make contact with the unit. Refer to the rigging instructions applicable to the specific condenser or dry cooler for greater detail.

5. Rigging

5.1 Pre-rigging inspection

Confirm that all components are secured in position and that nothing has come loose during shipment.

Confirm all fasteners, brackets and piping connections are tight.

Ensure that the cooling pad supports are firmly in place and all cooling media pads are securely in position.

5.2 Rigging and installation

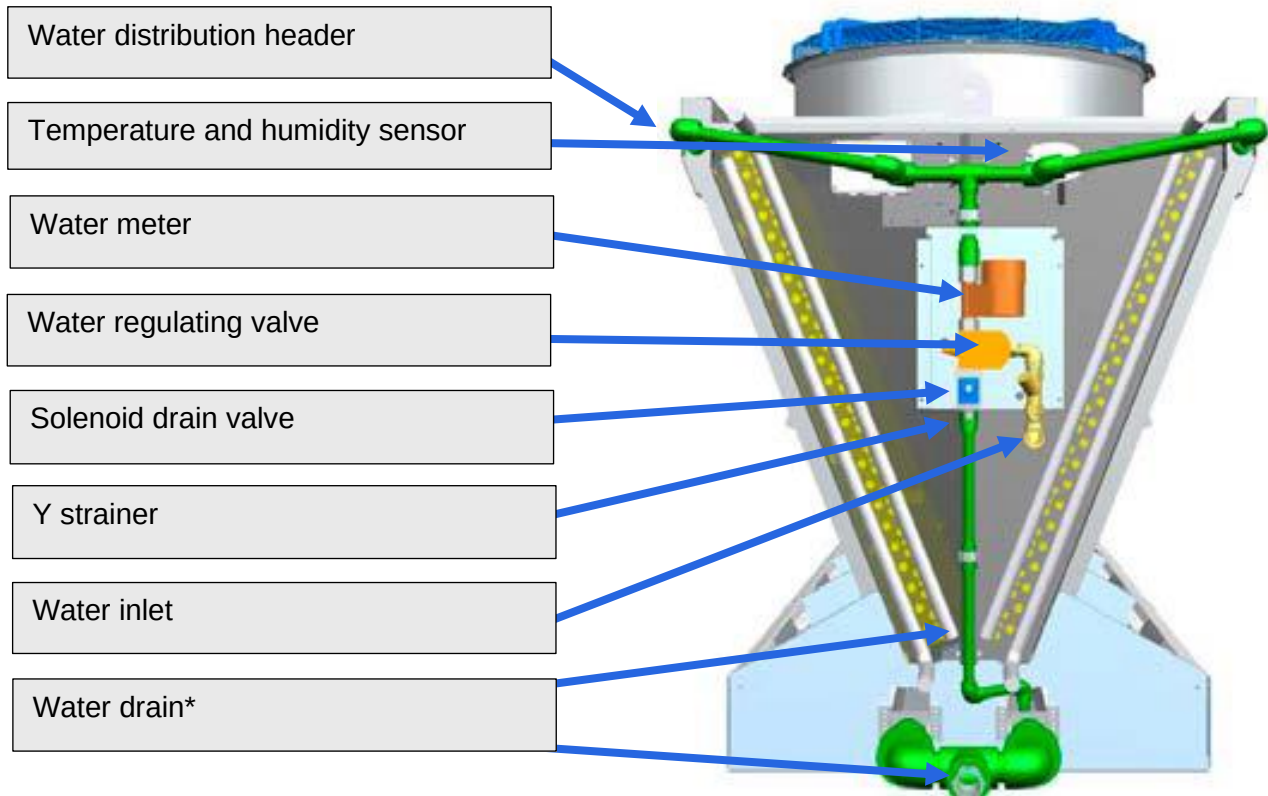
Refer to the rigging and installation instructions within the IOM for the respective unit (e.g. GFD/GVD or GFW/GVW).

⚠ WARNING

Ensure that the unit is level. This is critical for the ACS as the gutter has an inclination to allow the water to free drain. If the unit is not level this inclination could be compromised to a point where water is allowed to stand in the gutter.

hydroBLU™ Water distribution system

Figure 1. Major components of the Güntner hydroBLU™ Adiabatic Cooling System (ACS) imagen bellow:



*GFD/GVD 2x8 and 2x9 models have 2 drain connections

The Güntner hydroBLU™ ACS accessory includes the following major components:

- Water Distribution System with water regulating valve, Y strainer, solenoid drain valve, water meter, and drain piping
- Ambient humidity and temperature sensor
- Evaporative cooling pads
- Water collection gutter
- Single drain connection* (*Except GFD/GVD 2x8 and 2x9 models)
- The Güntner Hydro Management Controller (GHM) which manages the water system.
- The Güntner Motor Management Controller (GMM) which is wired and mounted in factory

The majority of these components can be identified in Figure 1 shown above.

All connecting piping to the water distribution system must be supported independently. The unit and associated piping, is not designed to bear any additional piping loads.

NOTICE

All connecting piping to the water distribution system must be supported independently. The unit and associated piping is not designed to bear any additional piping loads. Failure to comply with this will result in damage to the system and void all warranties.

6. Start-up

6.1 System inspection

Ensure that all piping and components for the water distribution system are tight and secure.

Check to ensure that all media pads are securely held in position and that there are no visible gaps between the pads.

If required, clean the media pads using low pressure water in a range from 30 to 45 psig (2-3 bar).

It is recommended to clean and flush the distribution headers prior to allowing any water to flow over the pads, opening the drain header valve/cap. After flush, close the valve/cap.

This can be accomplished by opening the valve/cap at the end of the distribution header on the opposite end to the water inlet side and allowing water to flow through the headers until no dust, dirt or debris is visible.

Figure 2. Service ball valve for cleaning and flushing distribution header



Confirm that all drain piping has been completed and water flows freely out of the gutters. Drain piping installation on site shall avoid overflow in gutters.

6.2 Preliminary operation mode

The inlet water pressure must be 20-60 psig (1.5-4 bar) for GFW/GVW and 25-60 psig (1.75-4 bar) for GFD/GVD. hydroBLU™ systems has been set according to factory setting table below:

Table 1. Parameters required for start-up water control system

1. Parameters required for Start-up	
Parameter	Factory setting
Geodetic height (in meters)	540 (Monterrey)*
Airflow (xx*1000 m3h)	According to model**
Air speed (m/s)	According to model**
Max. Water Flow (l/h)	vAccording to model**
Drive parameter (EC, FU, PC)	EC
Electric power (kW) fans	According to model**
2. Parameters required after Start-up	
Parameter	Factory setting
Wetting	
Humidification on	98%
Humidification off	85%
Outdoor temperature	22°C*
Draining	
Non-operating	24 h
Outdoor temperature T<	6°C
Water parameter	
Water threshold (Base value)	According to model**
Full load mode	100%
Increment	0%
Delay	3 min
Max H2O supply	1.3
H2O Offset	1.0
Selection IP/SI	
Selection	*SI

*Adjustable value on field by customer according with each site or Customer requirements. **Variable value according with each unit depending of unit model (G_W or G_D) and fan quantity. Find this value on datasheet or Table 2 and Table 3 of this IOM.

There are only two set points, which must to be modified in field by the customer before to startup the unit:

- Geodetic Height: This value needs to be entered to GHM in order to consider the air density depending the height where the unit will be placed. This is a metric value, and must be entered in meters above sea level.
- Outdoor temperature: The switch point setting needs to be entered in the GHM. This set point will initiate the water flow over the adiabatic pads. This value can be a preset ambient temperature, or a specific fluid temperature.

For more information on the set-up and functioning of the GHM, please refer to the GHM IOM. Alternatively, see the Quick GHM startup video on Güntner websites: <http://www.guntnerus.com> and <http://www.guentner.com.mx>
Prior to system start-up, verify the operation of the water distribution system with the following steps:

1. Enter an outdoor temperature set point that is lower than the actual ambient temperature on the GHM controller
2. Enter a water threshold (minimum water flow required to turn on the hydroBLU™ system) 10% lower than the unit requires
3. Modify set point on GMM to a value 20 °F lower than the actual process temperature
4. Once finished points 1 to 3 mentioned before, verify that the water regulating valve has being activated and allow water flow through media pads (The discoloration of the media, once wetted, will be clearly visible). This confirms a properly functioning of hydroBLU™ system

Figure 3. The regulating valve will automatically meter the exact water flow rate to be evaporated as required by the GHM controller.

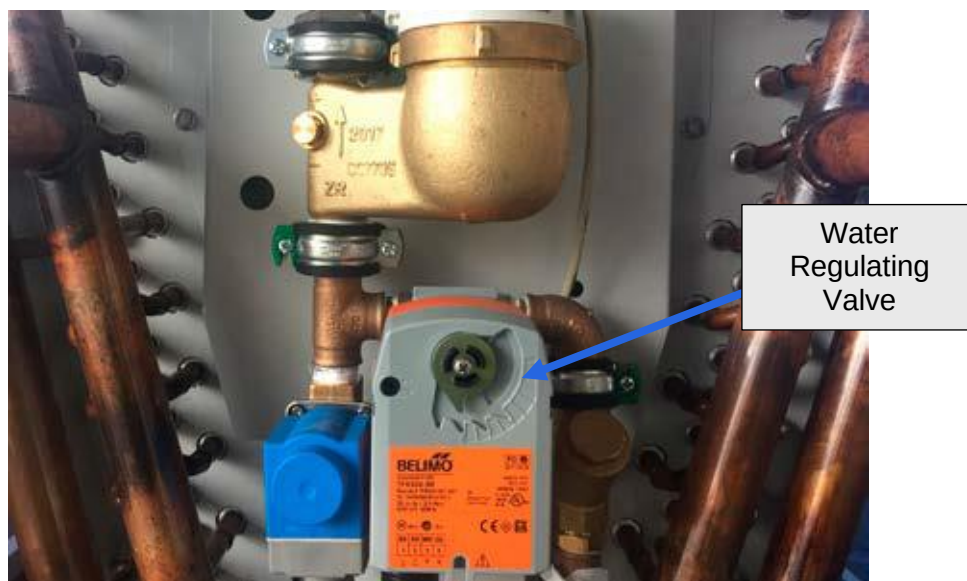


Figure 4. Water distributes from above the media pads, which transition from dry to saturated.



5. Ensure that there is no water carry over outside of the pad area.

NOTICE

If water carry over outside the unit occurs, please contact your Güntner representative to evaluate the case. Please note that 5% of water carry over is permissible.

6. Confirm that all water caught in the gutters is able to free-drain unobstructed.

6.3 Operation mode

1. Enter the desired ambient temperature set point in the GHM. This will be the switch point at which time, water supply to the adiabatic pads may be initiated.
2. The minimum water threshold is preset in the GHM and is dependent on the unit size.
3. Enter the desired temperature set point in the GMM.

Only when all three of the above parameters are met, will the water supply to the adiabatic pads be initiated.

NOTICE

When the ambient temperature drops below 43°F (6°C) the water distribution system will drain automatically.
The end-user's water supply and piping to the metering valve are not protected from freezing. **This protection must be supplied by the customer with heat trace and insulation or other satisfactory method.**

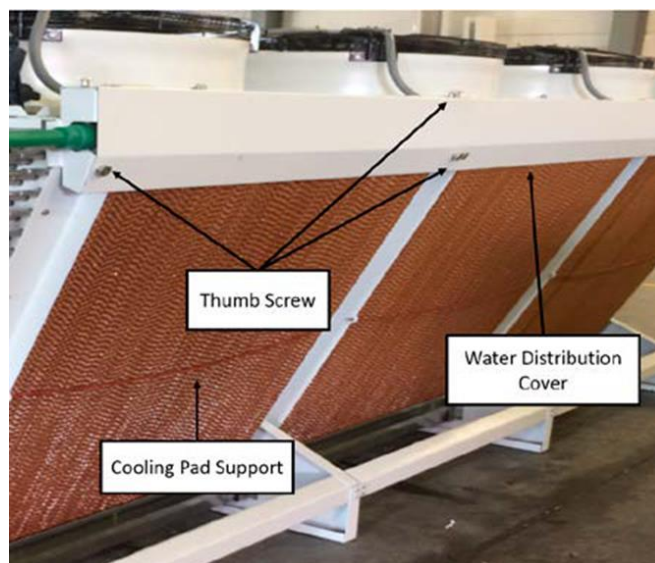
7. Extended shut down

If the system will be shut down for a period of three weeks or more, please ensure the following:

Lock out, and tag, all electrical power supplies.

The hydroBLU™ water system uses a normally open solenoid valve to ensure water is drained from the system in the event of a power outage. Assure that drain solenoid valve is open.

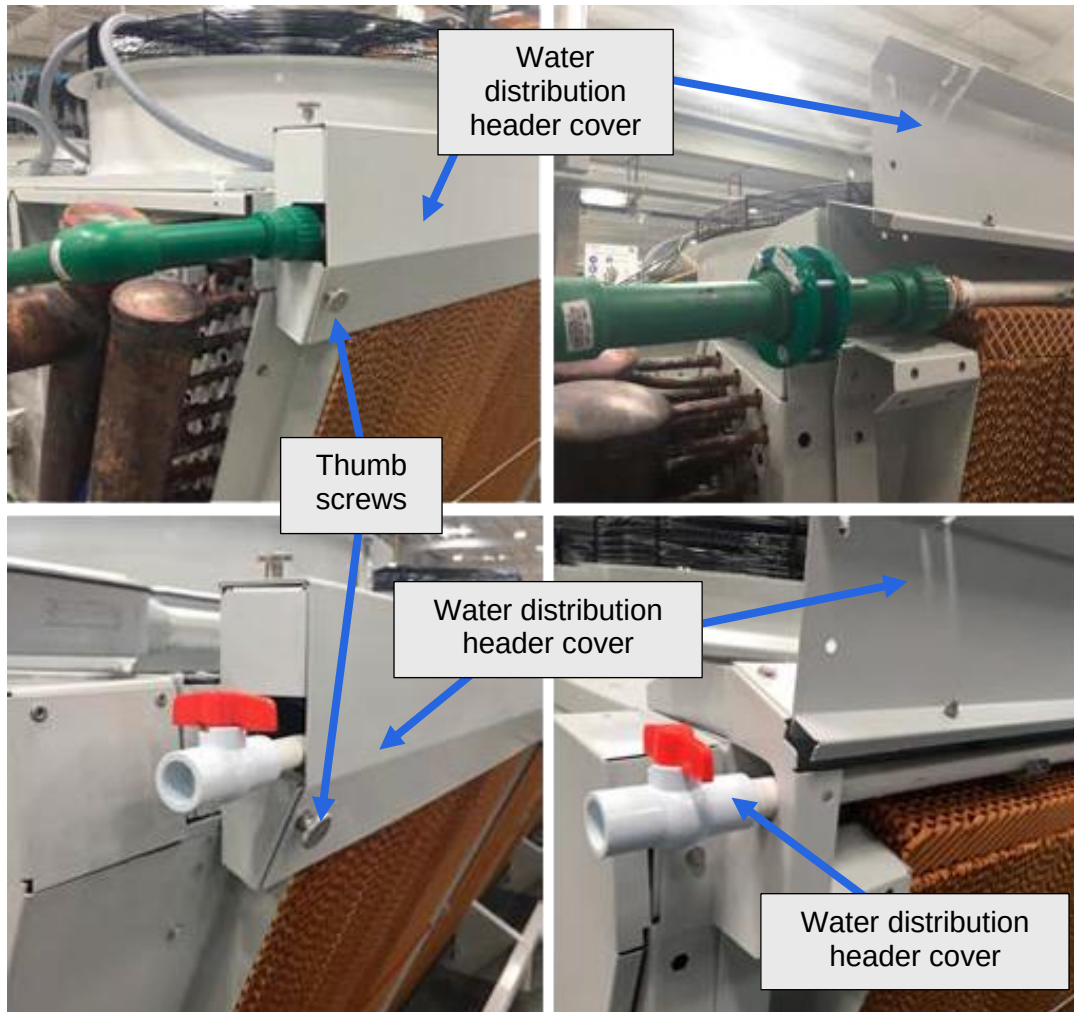
The media pads must be removed from the unit and placed in a well-ventilated storage area and not exposed to sunlight.



To remove the cooling pads:

Remove the thumb screws and lift to open the header cover.

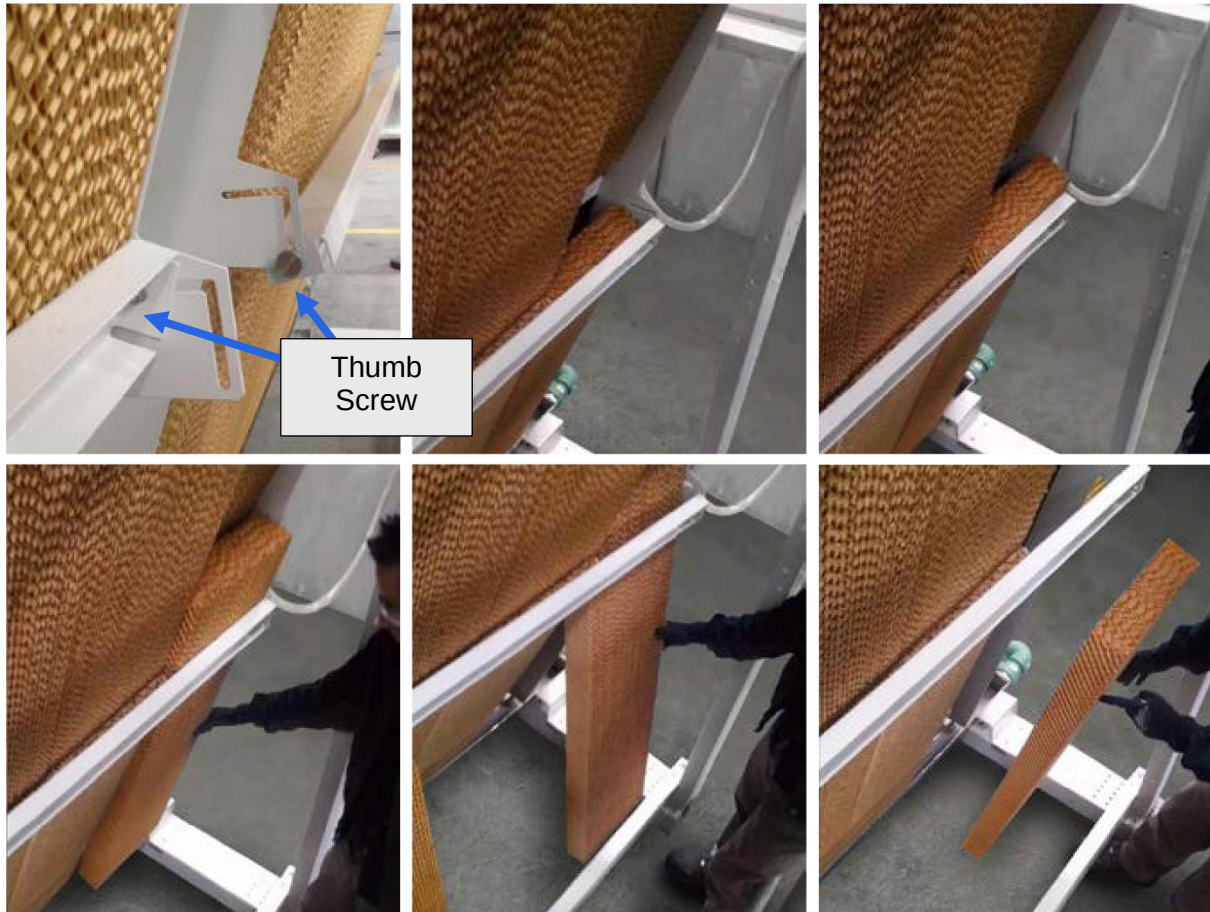
Water distribution header cover



With the header cover open, remove the top cooling pads by simply lifting them up and out.



- Loosen the thumb screws on the cooling pad support and slide the cooling pad support out and down to create space for the removal of the bottom cooling pads.
- Lift the bottom cooling pads up out of the gutter and then out to remove.



8. hydroBLU™ System operation

The hydroBLU™ System is an adiabatic cooling process with an innovative and high technology control system which manages the water and energy consumption based in 4 main parameters.

1. Fluid Temperature
2. Ambient condition (Outdoor temperature and Humidity)
3. Fan speed
4. Water flow

The principle behind the adiabatic cooling process is that as water evaporates the surrounding air becomes cooler and more humid. This is a natural occurrence. Therefore, a portion of the water which is distributed over the media pads will evaporate. The heat that is needed for the evaporation process is removed from the air. The air that leaves the pad is therefore cooled and humidified simultaneously resulting in the temperature of the air entering the finned heat exchange surface being closer to the wet bulb temperature. This process permits a lower entering dry bulb temperature onto the finned heat exchange surface; effectively creating a greater approach and thereby utilizing less finned surface for the heat rejection requirement(s).

Each unit fitted with the adiabatic cooling media pads has a high cooling efficiency with maximum water flow for optimum operation. This water flow and fan speed will be controlled by GHM-GMM controls according 4 main parameters settings, provide accuracy fluid temperature with smart control for water and energy saving.

The hydroBLU™ system can operate at partial or full water flow, or dry, dependent on ambient conditions and the fluid temperature / pressure. Under normal operation, with either full or partial water flow, a portion of the water will be evaporated. Water which is not evaporated will flow across the pads, providing a “cleaning” function and into the gutter. The drain outlet (gutter outlet) should be routed to a waste water drain.

NOTICE

Partial wetting of the adiabatic pads is a normal operation for the hydroBLU™ system. The pads will only be completely wetted when water flow is at 100%.

⚠ WARNING

Inlet supply water pressure must be between 20 psig (1.5 bar) and 60 psig (4 bar) for GVW/GFW family, and between 25 psig (1.75 bar) and 60 psig (4 bar) for GVD/GFD family.

Table 2. hydroBLU™ Water flow for GFW / GVW

Fan Quantity G_W	Maximum water flow for hydroBLU™		Minimum water flow (Water Threshold)	
	l/hr	US GPM	l/hr	US GPM
1	250	1.1	34	0.15
2	500	2.2	68	0.30
3	750	3.3	102	0.45
4	1000	4.4	136	0.60
5	1250	5.5	170	0.75
6	1500	6.6	204	0.90
7	1750	7.7	238	1.05
8	2000	8.8	273	1.20
IMPORTANT NOTE: For GFW/GVW supplier water pressure must be 1.5 bar (20 psig) to 4 bar (60 psig)				

Table 3. hydroBLU™ Water flow for GFD / GVD

Fan Quantity G_D	Maximum water flow for hydroBLU™		Minimum water flow (Water Threshold)	
	l/hr	US GPM	l/hr	US GPM
2x2	975	4.3	91	0.4
2x3	1460	6.4	136	0.6
2x4	1950	8.6	182	0.8
2x5	2435	10.7	227	1
2x6	2920	12.9	273	1.2
2x7	3410	15.0	318	1.4
2x8	3900	17.2	363	1.6
2x9	4380	19.3	409	1.8
IMPORTANT NOTE: For GFD/GVD supplier water pressure must be 1.75 bar (25 psig) to 4 bar (60 psig)				

Determine the number of fans from the model nomenclature, as underlined in the following examples:

GFW ###.#2-*(*) - #/### has 2 fans [such as GFW 090.1/2 - L(L) - F4/01

GFD ###.#.#/2x2 - *** has 2 x 2 fans, or 4 fans total

AGVD ###.#.#/2X6 - *** has 2 x 6 fans or 12 fans total

9. Water quality guidelines

Typical municipal and well water supplies are suitable for use on the ACS. The application of other water sources, cleaning agents, or treatments must be compatible with the materials of construction. The ACS components include polypropylene piping, brass valves and fittings, PVC distribution headers, cellular media, and type 304L stainless steel frames and gutters.

Table 4. hydroBLU™ Water quality parameters.

Designation	Lower	Upper	Unit
Conductivity	-	< 450	microSiemens/cm
Calcium Hardness (as CaCO ₃)	-	< 170	ppm [mg/l]
Chlorides (as Cl)	-	< 50	ppm [mg/l]
Total Alkalinity (as CaCO ₃)	-	< 170	ppm [mg/l]
pH	6.5	8.5	-
Sulfate (SO ₄ ²⁻)	-	< 250	ppm [mg/l]
Silica (as SiO ₂)	-	< 25	ppm [mg/l]
Iron (as Fe)	-	< 0.2	ppm [mg/l]
Oil and grease	-	< 2	ppm [mg/l]
Total dissolved solid	-	< 550	ppm [mg/l]
Suspended solids	-	< 5	ppm [mg/l]
Colony-forming units	-	< 50	ppm [CFU/ml]

⚠ WARNING

Failure to adhere to these water inlet quality parameters will reduce the lifespan of the adiabatic pads. Further, scaling, sometimes severe, can also occur.

10. Clean unit

10.1 General

The following applies for cleaning: The operator must ensure that the cleaning agent is environmental friendly. Harmful to the environment substances, e.g. acid-forming, are forbidden.

Clean casing by rinsing with warm water (approx. +25°C) and/or with environmentally friendly cleaning agents.

Rinse thoroughly with water after using cleaning agents.

Allow casing to dry completely.

Check heat carrier-carrying and electrical connections (see Test readiness for operation section, page 35).

10.2 Clean heat exchanger

Drain the unit. Shut off the unit. Power off the fans. Perform defrosting.

Clean the heat exchanger with one of the following procedures:

- Cleaning with compressed air (see Cleaning with compressed air section 10.2.1).
- Hydraulic cleaning (see Hydraulic cleaning section 10.2.2)
- Cleaning with brushes or brushes and compressed air (see Cleaning with brushes and compressed air section 10.2.3).

NOTICE

Danger of damage to property!

The fins can be damaged with too high a pressure, too small a distance or a cleaning jet that hits the fins at an angle. Mechanical cleaning with hard objects (e.g. steel brushes, screw drivers, or similar) damages the heat exchanger.

- Use a pressure of max. 50 bar with hydraulic cleaning and max. 80 bar with cleaning with compressed air!
- Maintain a minimum distance from the fins of 200 mm!
- Always aim the jet vertically (max. ± 5 degree deviation) at the fins!
- Do not use any hard objects when cleaning!

- Switch fans on.
- Open drain side.
- Open inlet side.

10.2.1 Cleaning with compressed air

Blast heat exchanger (max. 80 bar pressure) with compressed air to remove dirt and contaminants.

NOTE! Hold the jet of the cleaner vertical to the fins (max. deviation of ± 5 degrees) to prevent fins from bending.

10.2.2 Hydraulic cleaning

⚠ WARNING



Warns against dangerous electrical voltage!

Direct and indirect contact with voltage-carrying parts of motors and electrical lines can cause serious injuries or death. Water and cleaning agents conduct electricity.

- Power off the fans for cleaning with water or steam jet and ensure them against switching on again.

NOTICE

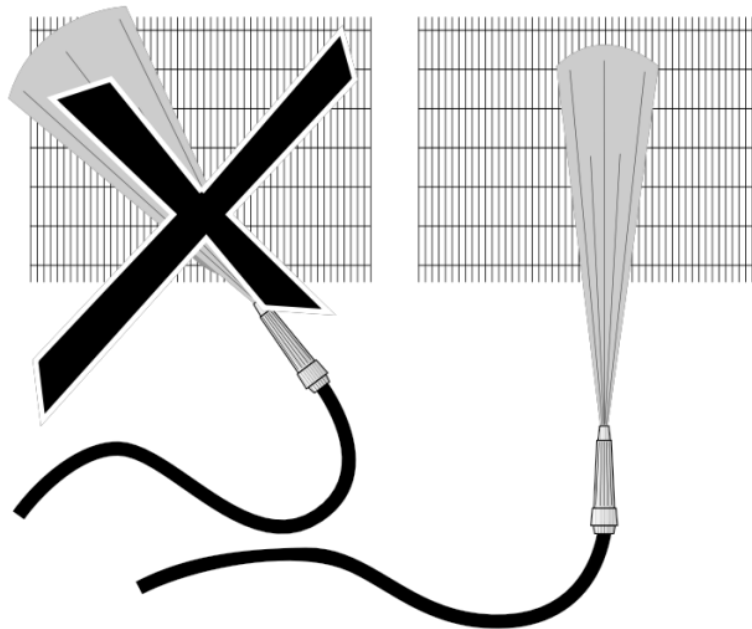
Danger of damage to property!

Water or steam jets can damage fans, electrical lines or other components.

- Ensure that electrical connections and motors, as well as components and stored goods at the set-up point are not touched by water or steam jets. Cover these if required.

Heavier moisture or greasy dirt must be removed with a high-pressure water jet (max. 50 bar pressure), steam pressure jet (max. 50 bar pressure), min. 200 mm distance with flat jet nozzle, or using neutral cleaning agent where applicable, against the coil. Ensure here:

- With oily and greasy dirt it helps to add a cleaning agent to the water.
- When applying chemical agents ensure that they are not aggressive towards the unit's materials. Rinse the unit off after the treatment. The use of chemical substances is always under the full responsibility of the enduser and/or customer.
- Cleaning should be done from one side of coil preferably from outside to the inside, that is enough if done frequently. When the coil is too dirty and/or it has been reduced significantly its capacity, it must be cleaned from both sides.
- Hold the jet of the cleaner vertical to the fins (heat exchanger – max. deviation of ± 5 degrees) to prevent fins from bending



- Continue cleaning until all dirt has been removed.

10.2.3 Cleaning with brushes and compressed air

Remove dry dust or dirt with a brush, a hand brush or with compressed air (max. 80 bar pressure, min. distance of 200 mm to the fins; against the airflow direction) or with a powerful industrial vacuum cleaner.

- Use soft brushes! (no steel brushes or similar)
- Where possible, cleaning should be from the top down, so that the dirt can be removed without the possibility of returning to cleaned parts. Continue cleaning until all dirt has been removed.
- Always brush the fins lengthways – never across!

11. Cooling pad media guidelines

The functionality of the hydroBLU™ system is such that the evaporation of the water occurs at the pad media surface as it flows over and through the pads. Standard water treatment practices are therefore somewhat different to standard heat exchanger practices. The hydroBLU™ methodology is to provide just the required water quantity to the pads to maintain the process temperature, or pressure, set point.

Many water related problems can be avoided if good system design and basic housekeeping practices are followed.

- The hydroBLU™ system is designed to operate with partial or completely wetted pad media. In some conditions excess water will flow into the gutter(s).
- Clean and flush distribution PVC headers on a regular basis to prevent buildup of deposits or microbiological growth.
- Replace damaged or spent pad media.
- At times or specific locations when the pad media experiences extreme evaporation, a flush cycle is recommended every 24 hours with the fan off.
- Locate the equipment and use appropriate water sources to minimize or avoid ingestion of contaminants that can clog or damage the media pads. Some examples include airborne dust/debris and exhaust air from other processes or equipment.

12. Cooling pad media maintenance

- Avoid harmful contaminants including dust, dirt, fumes and harsh cleaners.
- Drain and disinfect the entire water distribution system quarterly with compatible concentrations of disinfectants with ball valve in PVC header open.

To clean the adiabatic pads follow the procedure below:

1. Turn off the equipment and let the pads dry completely.
2. Drain excess water in the system.
3. Making sure that the pads are dry, brush with a rigid plastic brush where there is accumulation of scale and dirt, taking care not to damage the pads. Add new water to the system.
4. Enter Manual Mode in GMM Controller and run fans in inverse mode to clear out dust and debris for 5 minutes.
5. In Manual Mode, set control valve voltage to 10V to fully open and allow water to rinse pads for 10 minutes

13. Maintenance

Recommended Inspection and Maintenance Frequencies	Start-Up	Weekly	Monthly	Quarterly	Annually	Shut-down
Inspect and Clean as Required						
Visually inspect pads for bowing, sagging or dry streaks	X	X			X	X
Inspect gutters and remove any debris	X	X			X	X
Check water distribution system for leaks and clogged distribution holes	X	X			X	
Flush water distribution system			X		X	X

Recommended Inspection and Maintenance Frequencies	Start-Up	Weekly	Monthly	Quarterly	Annually	Shut-down
Drain and disinfect the entire water distribution system				X		
Check water flow rate and adjust if necessary	X		X		X	
Check water distribution is even across entire length of unit	X		X		X	
Remove all dirt and debris from the media pads			X			X
Clean the Y Strainer's mesh	X			X		

14. Adiabatic cooling system controls

14.1 Guntner hydro management (GHM)

The wetting system is used to increase the capacity of heat exchangers at peak load times with high external temperatures and for more efficient heat dissipation with moderate ambient temperatures making efficient use of the water consumption. The adiabatic evaporation of the water on the media pads cools the air drawn in by the heat exchanger, which increases the heat exchanger's capacity. The wetting controller GHM governs the regulation of the wetting process. The required water volume is calculated on the basis of the load state, the ambient temperature and the relative humidity. The GHM sets the appropriate water volume using the water regulating valve. The system's frost protection is secured with automatic draining. The water supply to the unit must be protected separately against frost.

There are three possible operating conditions when the Güntner ACS accessory is included on a GF/VW unit when utilizing the Güntner Motor Management Controller.

- Dry Mode
- GHM Water Saving Mode
- GHM Energy Efficiency Mode
- GHM Manual Mode

14.2 Dry mode

This is the standard operating mode for the unit when ambient temperature and process are within the design operating conditions. In this operating mode the GMM (Güntner Motor Management) controls motors and regulate the speed to achieve the desired process set-point, no water is used in this operating condition.

14.3 GHM Water saving mode

Only as much water as the media pads can evaporate is applied. hydroBLU™ technologies works with this mode as standard.

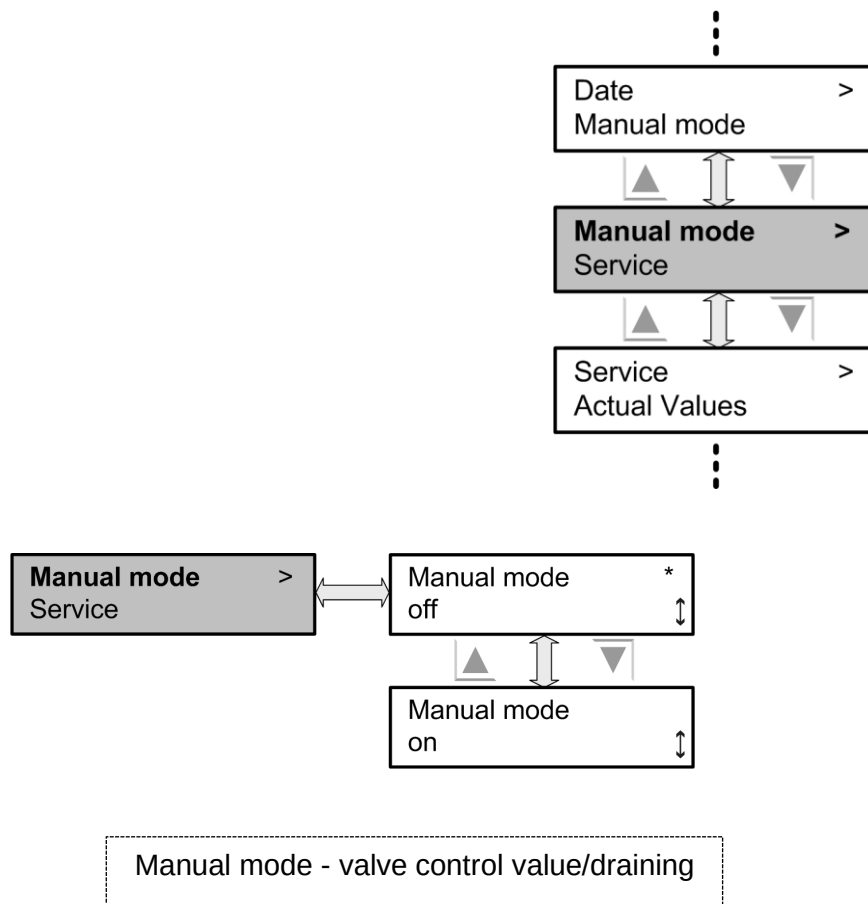
14.4 GHM Energy efficiency mode

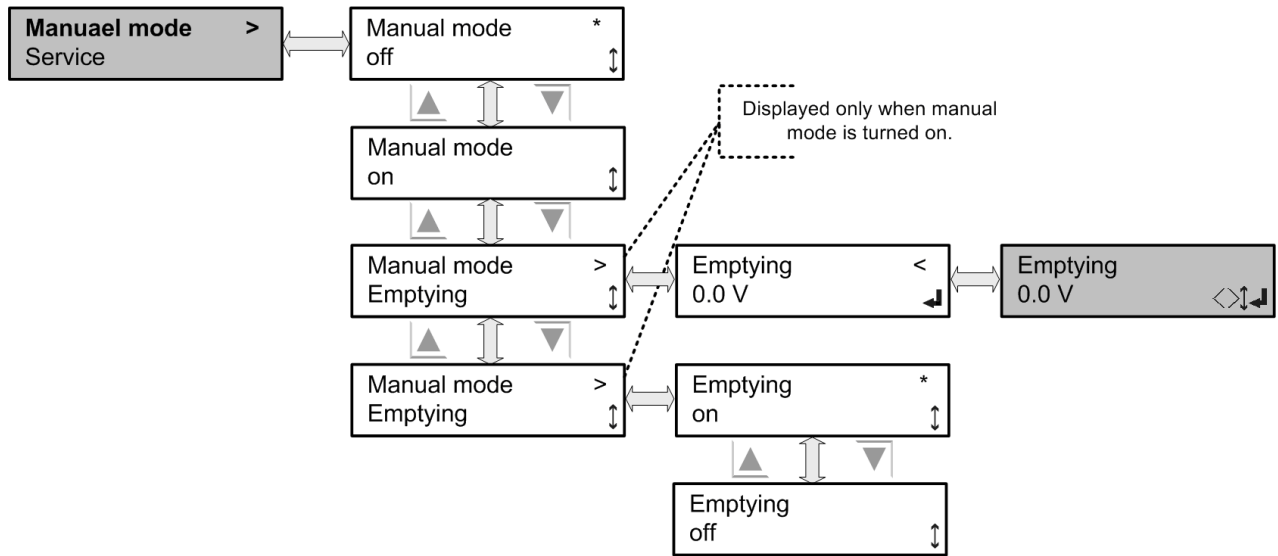
More water is used in this mode, as the focus is on conserving as much fan power as possible.

14.5 GHM Manual mode

- Manual mode is used to operate the system's water inlet valve and drainage valve by hand.
- Manual mode does not depend on DI1 enabling.
- Manual mode has the highest priority and switches all other control types off.
- The prerequisite for switching on the manual mode is the set external temperature.
- This must be above the frost temperature, as otherwise the manual mode cannot be switched on. Wetting is not permitted in the manual mode without recording the external temperature.
- The fact that manual mode is active is recorded permanently. In other words, it will still be active after you have switched the system off and back on.

14.6 Manual mode ON / OFF



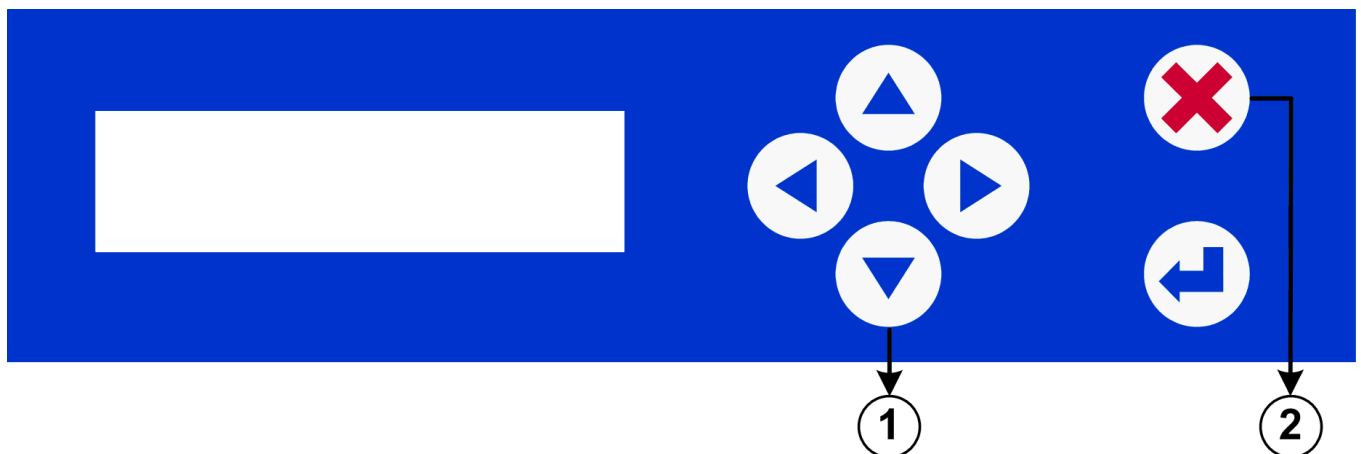


14.7 Adjusting settings on the GHM

- Cancel and return to INFO menu
- Enter key for function selection; change to EDIT mode and value acceptance
- Right arrow for moving to the next menu level
- Left arrow for moving to the previous menu level
- Up / down arrows for scrolling through the menu level



2



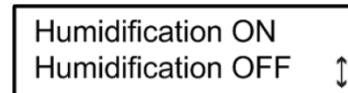
1. Use this key to move from the "INFO" menu to the Operating menu
2. Use this key to return to the "INFO" menu at any time

14.8 Edit mode

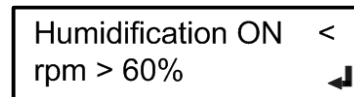
This mode is required to change values (control values, for example).



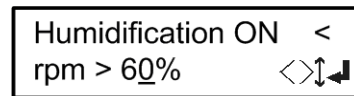
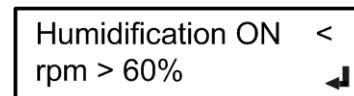
Select menu option you want (top line)



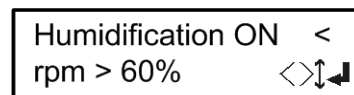
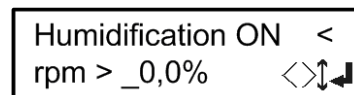
Change to menu option



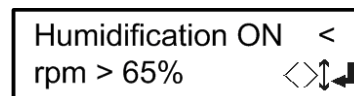
Change to writing mode
(cursor flashes)



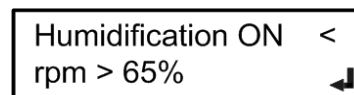
Decimal point selection
(cursor flashes)



Change value



New value acceptance



For more information on the set-up and functioning of the GHM, please refer to the IOM for the GHM or in GHM startup video on Güntner web site.