

LPS

Humidifies and Cools



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Current version of this manual can be found at: www.hygromatik.co.uk



Caution: Voltage: All work must be carried out by specialists. All electrical installation work and work on the device's electrical components must be carried out by authorised electricians. Switch off devices and disconnect them from the mains supply first!

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1. Introduction

Dear Customer,

Thank you for purchasing a LPS nozzle system.

The HygroMatik LPS nozzle system corresponds to the current state of the art. It features exceptional operational reliability, ease of use and cost-effectiveness.

To ensure the proper, safe and economical operation of your HygroMatik LPS nozzle system, please read this operating manual.

Only use the HygroMatik LPS nozzle system if it is in perfect condition and only for its intended purpose, considering all safety and risk aspects as well as all instructions in this manual.

If you have further questions please contact us:

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Please have your device data ready for queries or spare part orders!

1.1 Typographic markings

- lists with items beginning with bullets: general lists
- » lists with items beginning with arrows: work or operating steps which should or must be carried out in the specified order
- ☑ installation steps which must be checked
- italics* figure and plan names

1.2 Documentation

Storage

Please keep this operating manual in a safe place where it is accessible at all times. If you sell the product, be sure to include this manual. Please contact HygroMatik if the documentation is lost.

Language versions

This operating manual is available in different languages. Please contact your HygroMatik dealer or HygroMatik for details.

1.3 Intended use

The HygroMatik LPS nozzle system is used for air humidification and cooling with desalinated water having a conductivity of 5-20 $\mu\text{S}/\text{cm}$. The feed water should have a temperature of 5-40°C.



Caution: Proper use includes fulfilment of the assembly, disassembly, reassembly, start-up, operating and maintenance conditions specified by us as well as disposal measures.

Only appointed qualified staff may work on or with the system. Persons transporting or working on or with the system must have read and understood the relevant parts of this operating manual, particularly the 'Safety instructions' section. Staff must also be informed of possible hazards by the operating company. Please keep a copy of the operating manual at the location where the device is being used.

The HygroMatik LPS nozzle system is not frost-proofed and not suitable for outdoor installation.

The room temperature should be between 5 and 40°C.

At an altitude of over 1000 meters please contact your HygroMatik dealer or HygroMatik for details.

Applications:

The HygroMatik LPS nozzle system has a wide range of applications. These systems are used wherever low-energy adiabatic humidification or cooling or systems with high-precision control are needed. They can be found in such places as offices, store-rooms, production halls, clean rooms, hospitals and concert halls.



Note: Components installed in ventilation and air-conditioning systems must be suitable for the intended use; i.e. they must be corrosion-resistant, easy to clean, accessible and hygienic. Furthermore, they must not facilitate growth of micro-organisms.

Improper use:

Hardware and software may not be modified.

Exemptions of usage:

The HygroMatik nozzle system LPS is not frost resistant and is unsuitable for outdoor installation.

The HygroMatik nozzle system LPS PLC control may not deviate from the preset programmed On-/Off Control (or only after consultation with HygroMatik).

The default constant pressure level of the HygroMatik LPS nozzle system may not be changed (or only after consultation with HygroMatik).

The HygroMatik LPS nozzle system may only be used for the purpose of cold-water cooling after consultation with HygroMatik.

The HygroMatik LPS nozzle system or may not be used in a vertical flow (or only after consultation with HygroMatik).

2. Safety instructions

2.1 General information

The safety instructions are prescribed by law. They are intended to ensure health and safety at work and accident prevention.

Warnings and safety symbols

The following safety symbols are used in this manual to indicate hazard and risk warnings. Please familiarise yourself with these symbols.



Caution: Failure to heed this warning may result in injury or danger to life and limb and/or damage to the device.



Caution: Voltage: Dangerous electrical voltage! Failure to heed this warning may result in injury or danger to life and limb.



Note: indicates materials and consumables which must be handled and/or disposed of in accordance with statutory requirements.



Note: precedes explanations for or cross-references to other places in the text.

2.2 Operational safety instructions

General information

Observe all safety instructions and warnings found on the system.

If malfunctions occur switch the system off immediately and secure it to prevent it from being switched on. Eliminate the malfunctions immediately.

After maintenance work has been carried out, expert staff must ensure that the system is safe to operate.

Only use original spare parts.

National regulations beyond the scope of this manual apply without restriction for operation of this device.

During operation of the HygroMatik LPS nozzle system it is not allowed to stay in the humidification chamber.

The desalinated water used for feeding the HygroMatik LPS nozzle system is unsuitable for drinking.

Work on the high pressure components of the nozzle system is only allowed if the unit is disconnected from the power supply.

This unit is not designed for the use by persons (also children) with limited physical, sensory and mental abilities - or without knowledge and experience. Unless they are supervised or trained by a person, who is responsible for their safety.

Supervise children in order to ensure that they will not play with the unit.

Accident prevention regulations



Caution: Heed the HSW (Health and Safety at Work) regulations for electrical installations and equipment (VBG4/BGVA3). By doing so you protect yourself and others from harm.

Operating the HygroMatik LPS nozzle system

Refrain from all work practices which compromise the safety of the system.

Check all protection and warning devices at regular intervals to ensure they are in perfect working order.

Do not remove or deactivate safety devices.

Assembling, disassembling, servicing and maintaining the device

Disconnect system parts from the mains supply before servicing or repairing them.

Mounting or insertion of **additional devices** is only permitted with the **written consent** of the manufacturer.

The HygroMatik LPS nozzle system is protected to IP20. Ensure that the devices are protected from dripping water and dust at the installation location.

If a HygroMatik LPS nozzle system is to be set up in an area without water drainage, safety measures which eliminate the possibility of water entering the system due to leaks must be taken.

Electrical equipment



Caution: Only a qualified electrician is permitted to work on the electrical system and the control cabinet.

Disconnect system parts from the mains supply before working on them. Switch off the system immediately if faults in the electrical energy supply occur. Only use original fuses with the specified amperage. Inspect the system's electrical equipment at regular intervals. Promptly eliminate deficiencies, such as loose connections or melted cables. After carrying out the corresponding electrical assembly or maintenance work, test all protective measures used (e.g. earth resistance).



2.3 Disposal upon disassembly

Note: The operating company is responsible for disposal of the system parts in accordance with statutory requirements.

3. Transport

3.1 General information



Note: Take care when transporting the HygroMatik LPS nozzle system to prevent the device and packaging from being damaged by impact or accidental loading or unloading.

3.2 Packaging



Note: The HygroMatik LPS nozzle system is delivered on a pallet.

3.3 Temporary storage

Store the material in a clean dry place. The storage temperature should be 0-40°C.



Note: Only clean components may be installed in a ventilation duct.

3.4 Inspecting for correctness and completeness

When you receive the goods, ensure that:

- the equipment is complete and all parts are in perfect condition.



Note: Any transport damages and/or missing parts must be reported immediately to the shipper or supplier.

The periods in which notification of the transport company must occur for the purposes of identifying the damage are as follows*:

Transport company	Time after receipt of goods
Post	no later than 24 hours
Rail	7 days at the latest
Rail and road transport companies	4 days at the latest
Parcel services	immediately

* Periods are subject to change without notice.

3.5 Scope of delivery

The following items are included in the delivery:

- vortex modules
- droplet separators (optional; Hygiene compliance checks applies only to systems with droplet separators)
- pump station
- operating instructions for the system
- bushing/s for duct



Note: Hoses and nozzles are delivered at the time of start-up.

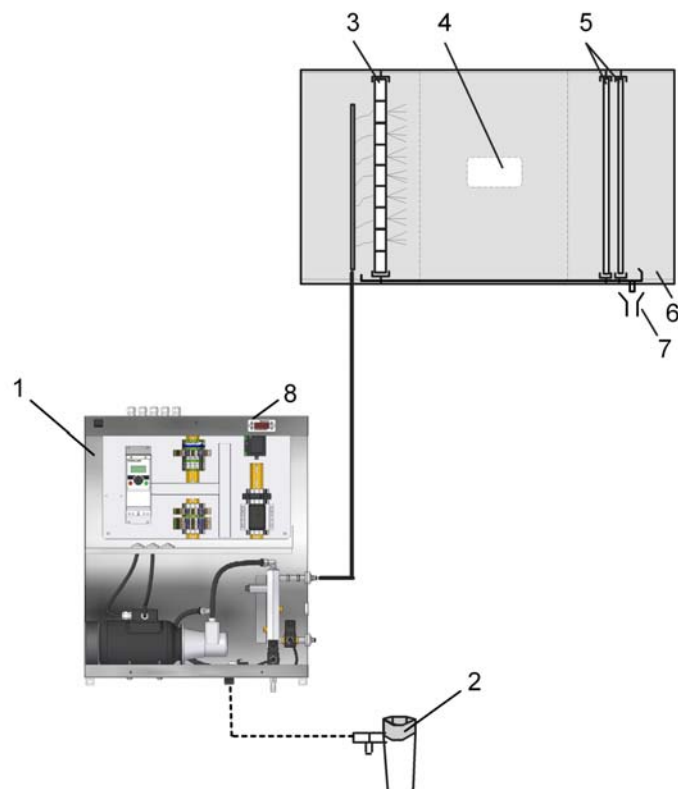
4. Function and design

4.1 Functioning

The HygroMatik LPS nozzle system is based on atomisation of water.

Desalinated water is fed into a vane pump. With an operating pressure of up to 16 bar, the water then goes to the nozzles. These nozzles generate a very fine spray mist which is taken up by the air in the device chamber. The ambient air is cooled adiabatically in the process.

4.2 Design and process



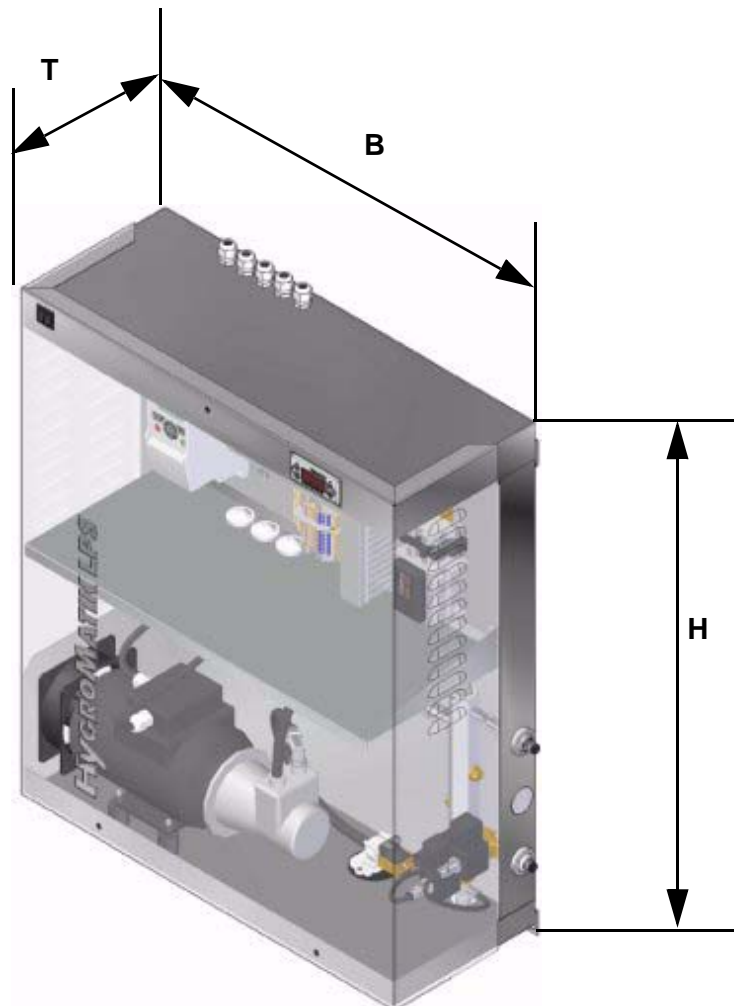
- 1: Pump group
- 2: Water feed
- 3: Vortex module wall
- 4: Viewing window (necessary according to VDI 6022)
- 5: 2-stage droplet separator
- 6: Humidification chamber or duct with service doors and water tray
- 7: Water drain, siphoned
- 8: SPS-control

4.2.1 Pump group

The vane pump generates a pressure of up to 16 bar. The maintenance-free asynchronous motor with variable frequency enables continuous operation up to 50 Hz.

Pump group	Capacity [l/h]	Max. speed [rpm]
LPS100	4 - 100	1350

4.2.2 Dimension drawing of HygroMatik LPS nozzle system



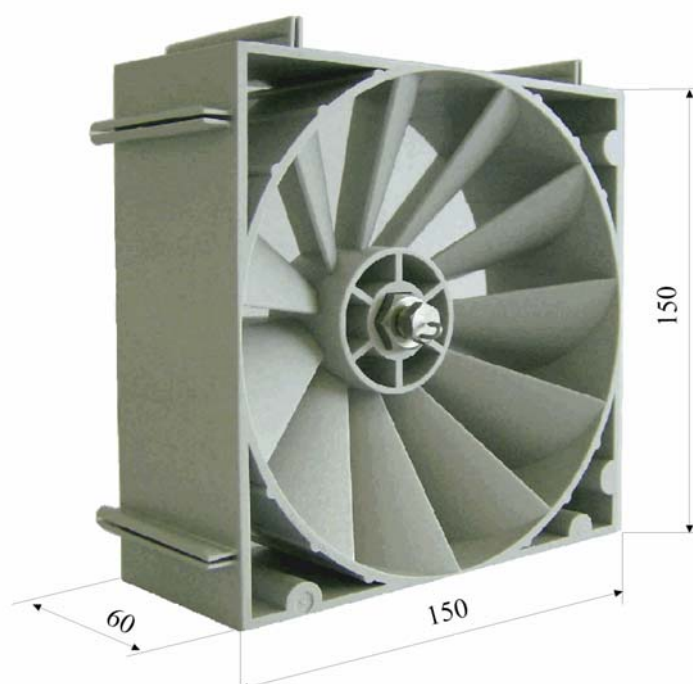
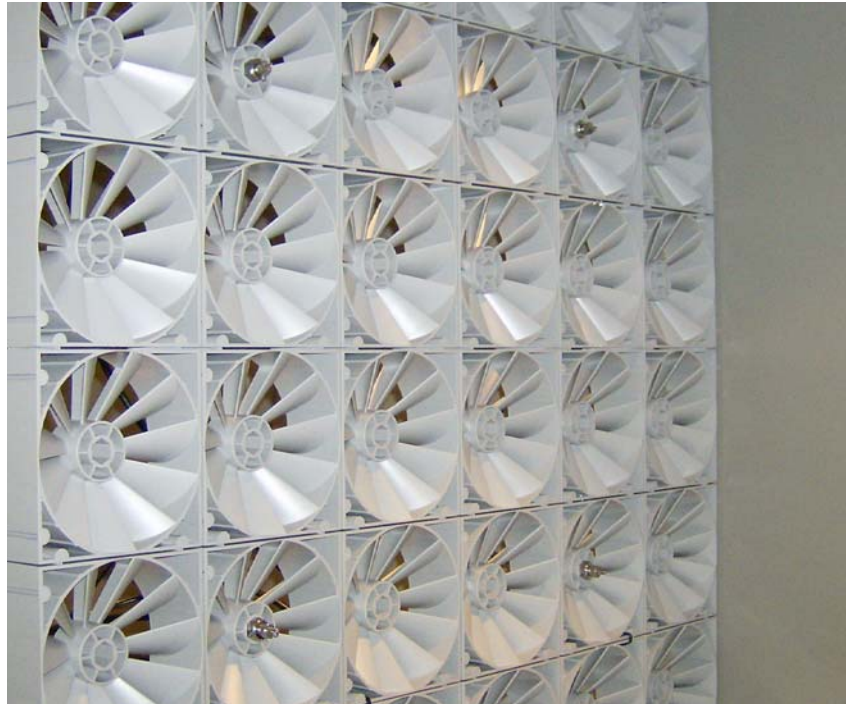
	H	T	B	Weight
LPS100	700	230	600	30 Kg

4.2.3 Vortex modules

The vortex modules provide for effective mixing of the air and the water mist.

Due to their special design, they generate turbulence and shear zones which lead to a homogeneous distribution of moisture along the humidification section (0.9 m).

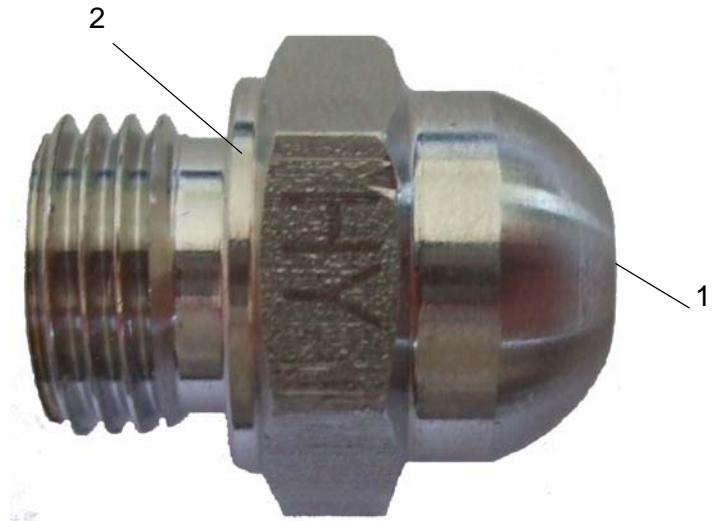
The vortex modules (dimensions: 150 x 150 mm) are delivered individually and can be assembled to form a wall. For optimal moisture absorption, the air velocity is 1.0-2.5 m/s. The vortex module wall exhibits a low pressure drop of 10Pa at an air velocity of 2.0 m/s.



4.2.4 Atomising nozzles

Desalinated water at a pressure of up to 16 bar reaches the nozzles where the water is atomised to form ultra-fine mist-like aerosols. The aerosols enter the area of the vortexed air stream downstream of the vortex modules. The air and aerosols are mixed intensively here.

The atomising nozzle generates a spray cone with a wide opening angle.



1: Nozzle opening

2: Nozzle body

Functioning:

The nozzle sets the flowing water in rotation and thereby it can leave at high speed. This enables a very fine water spray. The higher the operating pressure, the finer the droplets.

Material of the nozzle: corrosion-free stainless steel



droplet separators



4.2.5 Droplet separators (optional)

There are no more atomised water droplets in the air stream behind the HygroMatik LPS nozzle system (if the environmental parameter specifications are complied with). The two wire-mesh droplet separators arranged in series ensure this. The trap pads exhibit a low pressure drop (75 Pa at air velocity of 2.0 m/s and average air density of 1.2 kg/m³).

The air velocity should be between 0.9 m/s and 2.8 m/s. If it is outside this range it can cause moisture breakthrough downstream of the droplet separators - in such cases please first contact HygroMatik.

The droplet separators are inserted into the humidification chamber via guide rails and are hence easy to remove for servicing.

The traps are standardly delivered with corrosion-resistant metal frames.

Note: Hygiene compliance checks applies only to systems with droplet separators.

4.2.6 Humidification section

The section between the vortex module wall and the droplet separators is called the 'humidification section' in this system. It is unobstructed and hence easy to monitor and clean.

For a total standard installation length of 1.5 m for the HygroMatik LPS nozzle system the humidification section should have a length of at least 0.9 m. The exact dimensions are described in the schematic in the section entitled 'Overview of the humidification chamber'.

4.3 Partial and Full-Load

For optimal humidification control under various input conditions the HygroMatik nozzle system LPS can be equipped with a „Partial and Full-Load” control function.

At Full-load all nozzles are fed with water. At Partial-load a solenoid valve switches off the water supply for approximately half of the nozzles.

Construction:

The vane pump has two exits for water - one is the water supply for the nozzles for Partial load and the other one is the water supply for the nozzles for Full load.

If the external control signal decreases below a special switching point, the HygroMatik nozzle system LPS switches off the water supply for half of the nozzles.

5. Connections

5.1 Water

Connection:	3/4"-external thread (within the system)
Conductivity:	5-20 $\mu\text{S}/\text{cm}$
Pressure:	0.15-0.5 MPa (1.5-5 bar)
Temperature:	max. 40°C
pH value:	7 +/- 1



Note: The supply water for the HygroMatik high-pressure nozzle system must comply with VDI 6022; i.e. from a microbiological point of view it must be of drinking water quality.

5.2 Waste water

Connection:	Connecting piece DN 12 for plastic hose (resistant to low conductive water)
Fitting:	with constant fall and free outlet and siphon

5.3 Pressure water

Connection „Full-Load“:	plug-in connection for 6/4 pressure hose
Connection „Cooling“:	plug-in connection for 6/4 pressure hose
Connection „Partial-Load“:	plug-in connection for 6/4 pressure hose

5.4 Electrical

Power supply:	LNE 230 V AC, 50 Hz (a fixed socket (16 A) at the installation site is necessary)
External control signal:	0-10 V DC 4-20 mA DC
System enabling:	via ext. potential-free contact
Collective fault signal:	potential-free contact (change over contact)
Operating status signal:	potential-free contact (NO)

6. Interfaces to the HygroMatik nozzle system LPS

6.1 Air

Air purity: A Class F7 pre-filter is to be placed upstream of the HygroMatik nozzle system LPS.

Air velocity: 0.9-2.8* m/s

If the air velocity is outside this range please contact HygroMatik.

(*: under ideal conditions)

Pressure drop: Approx. 85 Pa (at an air velocity of 2.0 m/s and with use of a vortex module wall and two dry droplet separators).

Air volume flow (for 'partial-load / full-load switching' option):

If the HygroMatik nozzle system LPS is operated in systems with modifiable air volume flows (reduced air volume of less than 70% of the maximum air volume), the full-load solenoid valve is switched off and the partial-load mode is activated. This also applies for systems with multi-stage ventilators.



Note: For humidification of rooms the humidified air must exhibit a purity in terms of bacterial count in accordance with VDI 6022.

6.2 Humidification chamber

The humidification component should be designed with a floor tray that has an inclination of at least 1.5° towards the trap and to be waterproof.

The water drain must be at the end of the humidification section.

The ideal humidification section length (distance between vortex module wall and droplet separators) is 0.9 m. This corresponds to a total installation length of 1.5 m (see schematic in section entitled 'Overview of the humidification chamber'). Should this installation length not be available please contact HygroMatik.

The humidification chamber should be aerosol-tight and it should be able to withstand desalinated water.



Note: The guide rails for the vortex module wall and droplet separators are supplied by the manufacturer. The guide rails must already be installed for the system to be started. The vortex module wall and droplet separators must also already be installed.



Note: The guide rails must be designed such that

- the vortex module wall and droplet separators can be removed (for servicing)

- there cannot be any stagnant water.



Note: When starting the system check again that the humidification chamber has been thoroughly cleaned. In particular the humidification chamber and the ventilation duct upstream of it must be free from metal swarfs to prevent corrosion.

7. Mechanical assembly

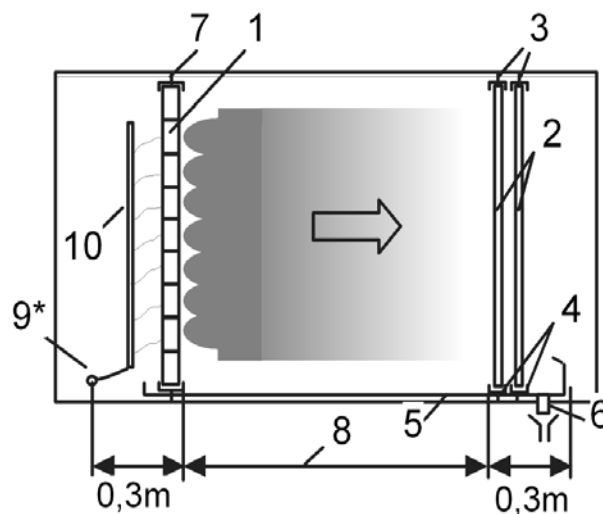


Caution: The device may only be assembled by qualified staff. HygroMatik accept no liability for damages resulting from incorrect assembly.

Observe all safety instructions and warnings found on the device. The device must be de-energised during assembly.

Mounting or insertion of additional devices is only permitted with the written consent of the manufacturer. Otherwise the guarantee and warranty will become void.

7.1 Overview of the humidification chamber



- 1: Vortex module wall with spray system
- 2: Droplet separators
- 3: Upper guide rails for droplet separators
- 4: Lower guide rails for droplet separators
- 5: Collection tray
- 6: Drain with trap
- 7: Guide rails for vortex module wall
- 8: Humidification section, ≥ 0.9 m
9. Two supplied bushings for the duct (for partial-load / full-load switching) for connecting high-pressure hoses * Only one bushing is needed for the standard model.
10. Distribution pipe



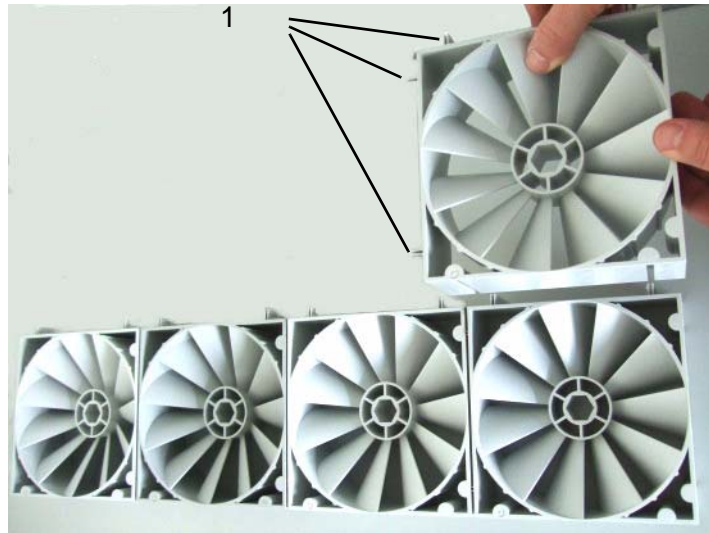
Note: In front of the vortex module wall and from the droplet separators a minimum distance of 0.3 m to other installed components must be maintained (see above schematic). Temperatures higher than 60°C may destroy the vortex modules.

7.2 Vortex wall module assembly

The vortex module wall provides firstly the air turbulence and secondly it holds the atomiser nozzles and water distributor.

The vortex module wall is supplied as specified (please note the number of vortex modules in width and height), assembled in the accompanying nozzle assembly data sheet:

- » The Vortex modules are slotted together piece by piece, starting at the bottom right



The bottom right vortex module must be so positioned that the right hand and lower side is flat surface up while the other two sides show the guide bars (1).

7.3 Assembling the vortex module wall

Two guide rails are required for assembly of the vortex module wall.

We recommend to have an air gap sideways between the vortex module wall and the housing wall as it generates a laminar air flow and prevents moisture build-up on the walls.

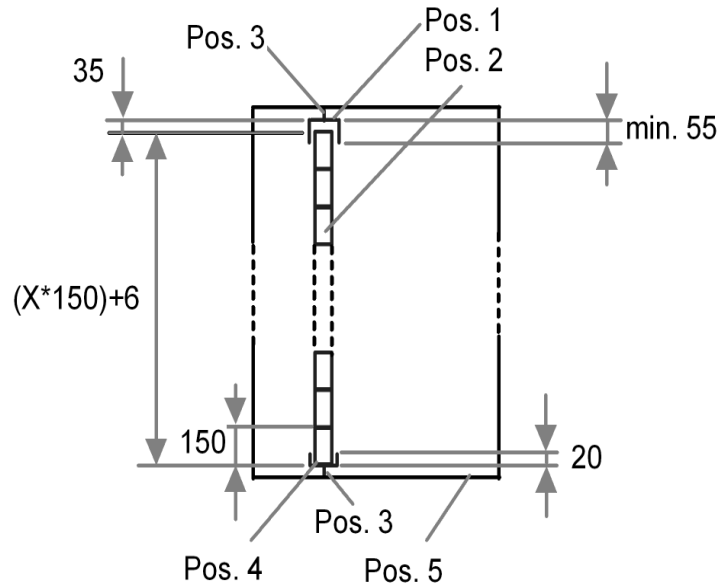
7.3.1 Guide rails for the vortex module wall:

In order to position the vortex module wall in the humidification chamber guide rails are required. The guide rails are fixed to the ceiling and the floor of the humidification chamber.

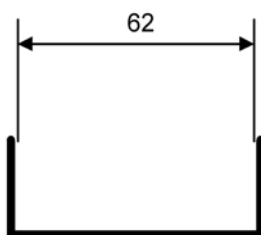
The guide rails must be installed in a way that makes it possible to either pull out of or lift up the vortex module wall and stagnant water is prevented.

Ensure that after installation the floor of the humidification chamber is leakage-free.

7.3.2 Exemplary design of guide rails for a vortex module wall



Guide rail (cross section)



Pos. 1: upper guide rail

Pos. 2: vortex module wall

Pos. 3: spacer or direct connection floor of chamber

Pos. 4: lower guide rail

Pos. 5: humidification chamber

Inner dimension of guide rail: 62 mm

Height: please see above sketch

Material: 1.4301 stainless steel sheet, thickness: 1 mm

7.3.3 Side rails for the vortex module wall:

If the wall consists of 11 or more vortex module rows side rails are required in order to avoid bending of the vortex module wall.

Having more than 16 vortex modules in horizontal position the the vortex module wall has to be vertically separated into two halves, that are separately fixed by side rails

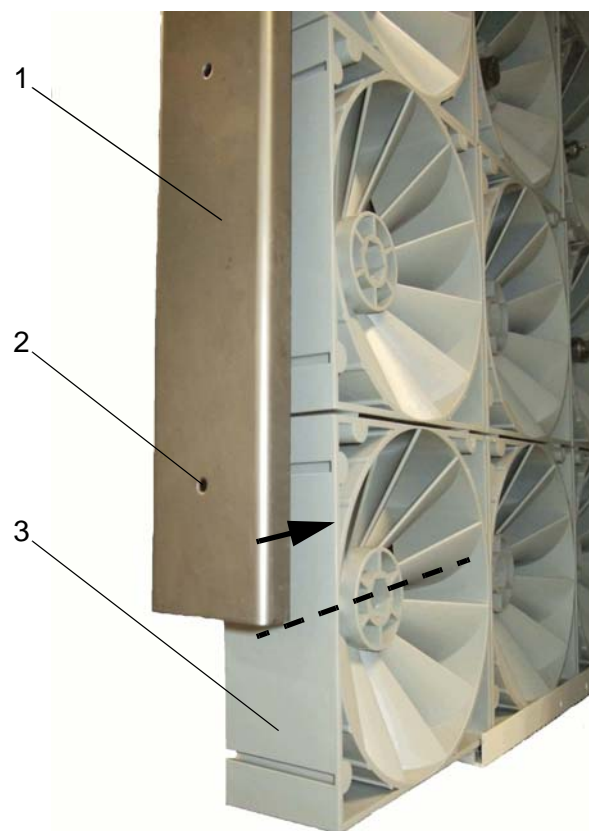
7.3.4 Assembling of the side rails for the vortex module wall

Vortex module walls consisting of 11 or more vortex module rows are automatically equipped with side rails and self-tapping screws.

The side rails have to be adapted to the right length by the installer. The required length is the distance between the middle of the lowest and the middle of the top vortex module.

The side rail is an u-section and made of stainless steel. It is 1.5mm thick. For the assembling the open side of the u-section has to be attached to the lateral edge of the vortex module wall (pos. 3). The lower end of the side rail is positioned in the middle of the lowest vortex module. The lowest drilling (pos. 2) of the side rail is used to screw in a self-tapping screw (M3.9X20). A second self-tapping screw is used for the upper end of the side rail.

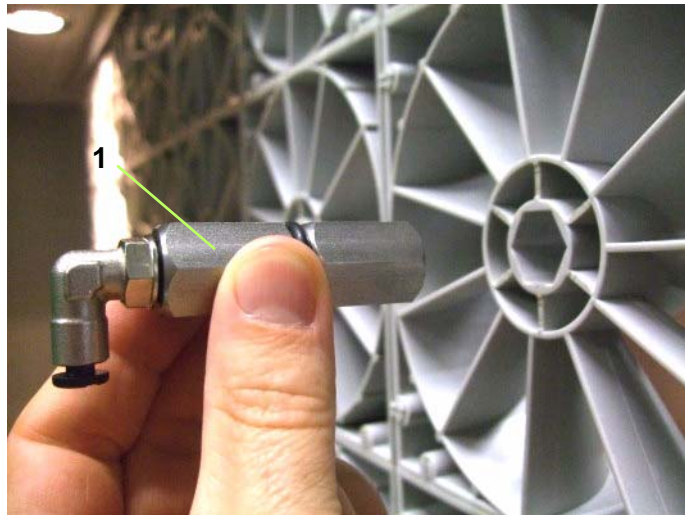
The side rail for the other side of the vortex module wall has to be assembled in the same way.



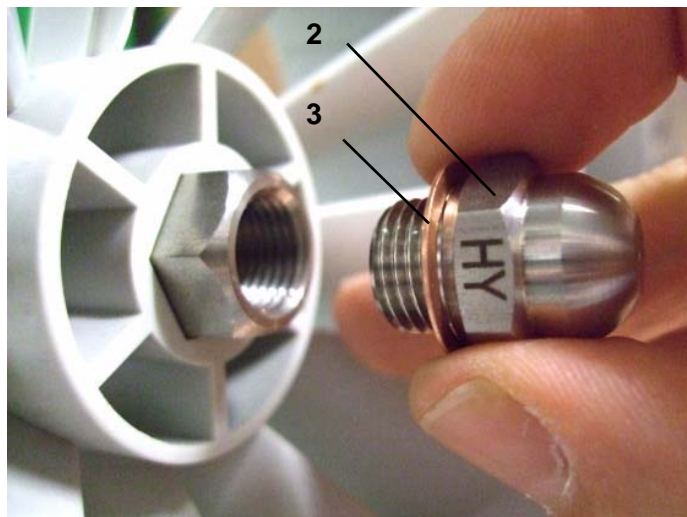
7.4 Installation of the nozzles, distributor pipe and tubing

7.4.1 Nozzle Installation:

- » In accordance with the supplied nozzle assembly data sheet locate the vortex module to be equipped with a nozzle.
- » Then plug the nozzle body (1), as shown in the picture, on the upstream side of the vortex module, so that it protrudes about 1 cm on the other side



- » Screw the nozzle (2) and copper washer (3) firmly into the nozzle body.



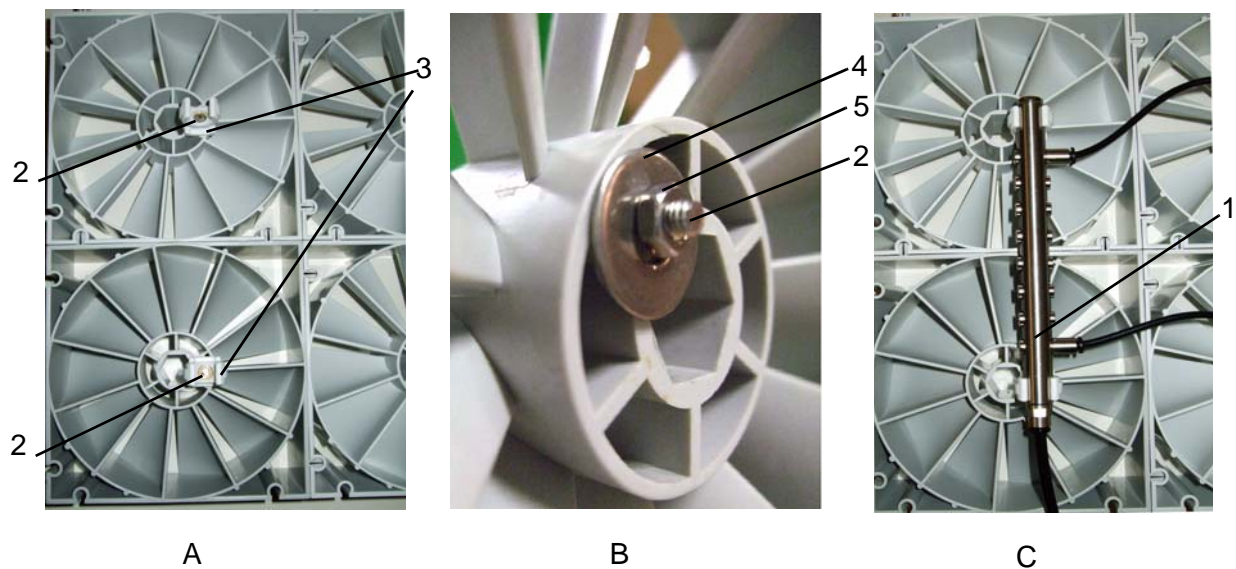
7.4.2 Assembling the distributor pipe

The high-pressure water coming from pump station first enters a manifold and is routed from there to the nozzle.

The manifold is mounted according to the nozzle assembly sheet (project specific) produced by HygroMatik on the vortex wall.

Each nozzle in the vortex wall is connected to the manifold with a hose. Each nozzle must be higher than the corresponding port on the manifold - the water hose must have a constant slope

Installation:

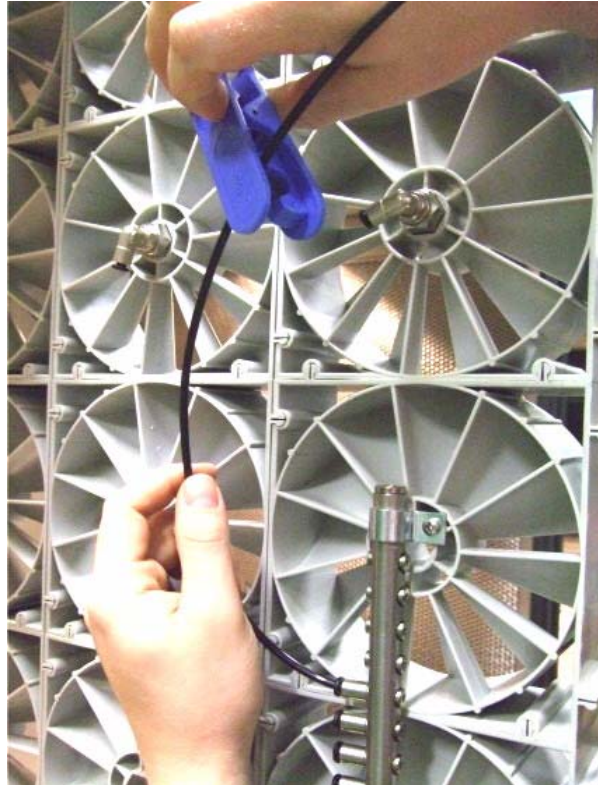


- » A manifold is mounted on the inlet side to at least two vortex modules.
- » Determine distributor pipe position (1) on vortex wall in accordance with nozzle data sheet.
- » Place retaining clips (3) on the appropriate position on Vortex Modules.
- » Put screw (2) through by retaining clip Vortex Module.
- » Tighten nut (4) with washer (5) on the rear of the Vortex Module where the screw stands proud.
- » Repeat this process for all the holding clamps.
- » Press manifold (1) into the holding clamps (see figure C) and check for tightness.

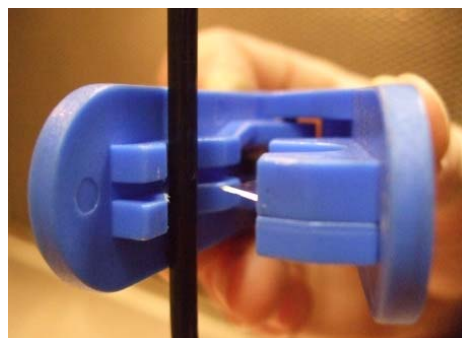
7.4.3 Piping

Manifold - Nozzles

- » The supplied 4 / 2 Hose pipe is firmly fitted into one of the snap-connections on the manifold pipe.
- » Check connection by gently pulling on the hose.
- » Estimate the hose length (noting nozzle assembly plan) to the nozzle by observation. Minimum bending radius no less than 25mm.



- » Cut the hose at right angles with a hose cutter.



- » Insert hose into the nozzle snap-connector.
- » Check connection by gently pulling the hose.

The completed finished hose connection should look like this:



Manifold - Pump Station

In the standard version a 6/4 hose leads from the pump station to a manifold. However, if the LPS nozzle system is equipped with a partial/full load switch, then there is a 6/4 hose line leading to two manifolds.

Since the 6/4 hose line goes through the air conditioning duct a duct wall grommet is provided (or two in the case of a partial/full load switch).

Assembly of the hose guide

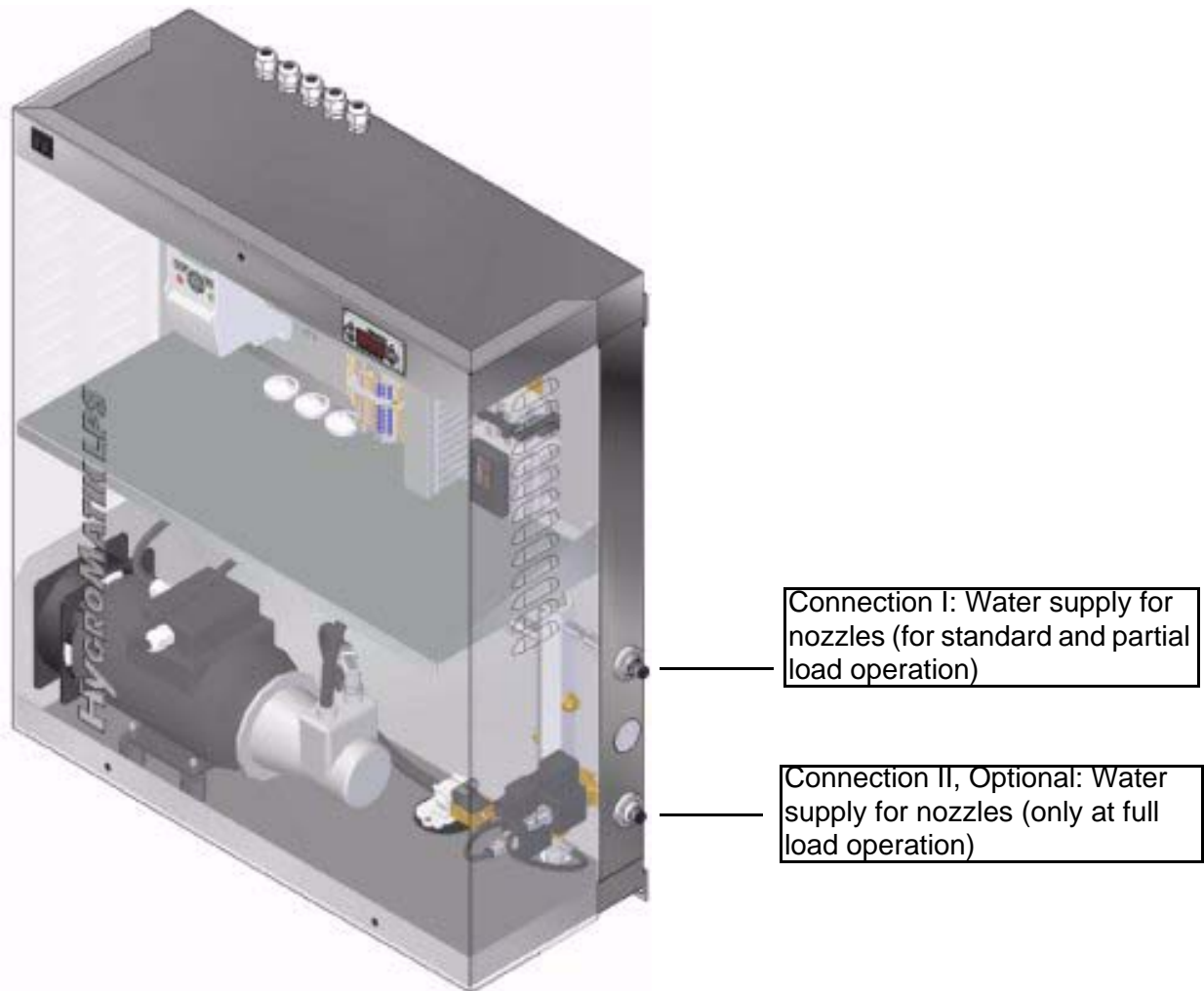
- » Drill a hole with a diameter of 15mm. through the wall of the air conditioning duct,
- » Assemble snap connector (4), nut (3) and washer (2) to hose opening (1) and insert through the duct wall from the outside (see picture below).



- » From the inside of the duct, assemble washer (5), mother (6) and necessary snap-connectors (7) and screw tight.



Hoses:



For standard version:

The pump station has a hose leading to a manifold at the vortex wall. From the manifold, it goes to all the nozzles of the LPS nozzle system.

Additionally:

- » All hose assemblies are to be laid with a constant incline.
- » Put a 6/4 hose line in the pump station outlet (I).
- » Check by gently pulling the tube.
- » Estimate the hose length to the ducting snap-connector (external duct wall). Maximum bend radius 40mm.
- » Cut the hose at right angles with a hose cutter.
- » Put the 6/4 hose line into the ducting angled snap-connector (external duct wall).
- » Check by gently pulling the tube.
- » Put a further 6/4 hose line into the straight snap-connector (internal duct wall).

- » Check by gently pulling the tube.
- » Estimate the hose length from the snap-connector to the duct opening (external duct wall) to the manifold. Maximum bending radius 40mm.
- » Cut the hose at right angles with a hose cutter.
- » Put the 6/4 hose line into the angled snap-connector on the duct opening (external duct wall).
- » Check by gently pulling the tube.

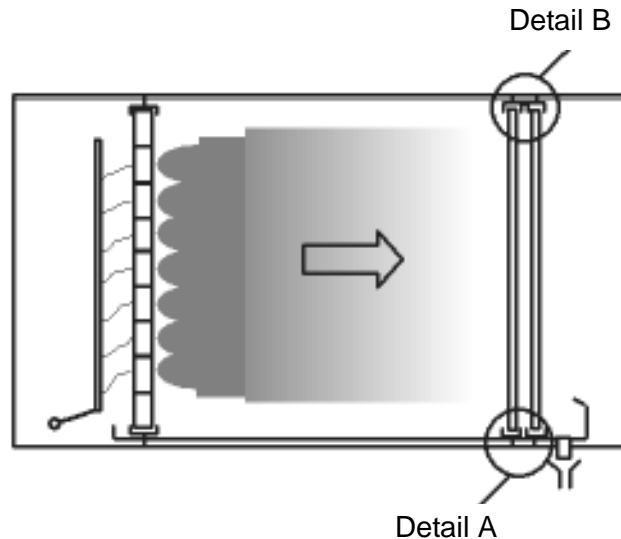
Partial / full load switching:

The tubing for partial/full load switching is initially in the same as described above for the standard version.

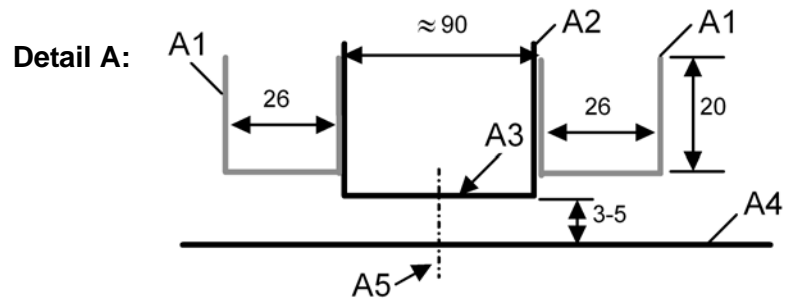
In addition, though, there is a further pump station hose for optional output II (for full load operation) to a second manifold on the vortex wall

7.5 Assembling the droplet separators

The guide rails must be installed in a way that makes it possible to either pull out or lift up the vortex module wall.



7.5.1 Exemplary design of guide rails for the droplet separators



Dimensions given in mm

A1: Trap guide rail: U-section with perforated 1.4301 stainless steel sheet

A2: Trap guide rail holder: U-section made from 1.4301 stainless steel

A3: Several **holes** (at least 4 per metre) 8-10 mm in diameter distributed over the length of the trap holder

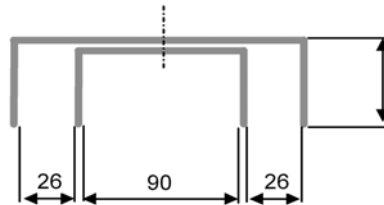
A4: Collection tray for humidification chamber

A5: Fixation of guide rail with the floor of the humidification chamber (ensure that condensate can freely run to the drain)

Dimensions of guide rails for droplet separators

Material used for **upper guide rail**: 1.4301 stainless steel sheet, thickness: 1 mm

Detail B:



Height is variabel:

pushed in droplet separators: **55**

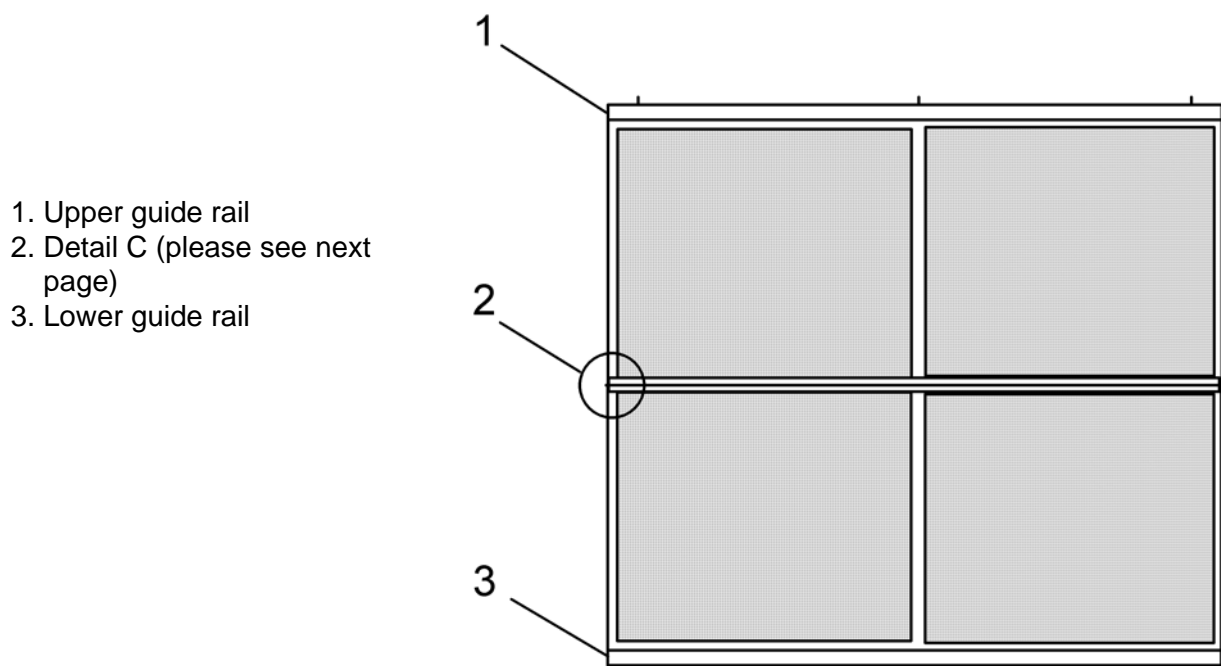
lifted in droplet separator: **30**

The upper guide rail is directly attached to the ceiling of the humidification chamber (using screws, rivets or similar)

Assembling two droplet separators in a stack

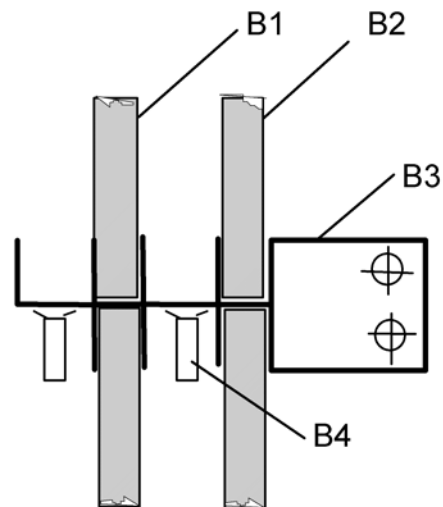
For installation heights of above 1.5 m, two droplet separators must be mounted in a stack.

The waste water from the upper droplet separator is drained via an additional collector. For this the waste water from the upper trap is drained via a flexible hose either directly or into the collection tray. This additional collector is to be provided for both the preliminary and the final droplet separator.



- 1. Upper guide rail
- 2. Detail C (please see next page)
- 3. Lower guide rail

Detail C (side view):



B1: Preliminary droplet separator

B2: Final droplet separator

B3: Angle bracket

B4: Hose connection for drainage of waste water from upper droplet separator

Perforated sheet metal (material: 1.4301) should be used for the lower guide rails for the droplet separators. Alternatively, sheet metal with several holes (at least 4 per metre) 8-10 mm in diameter can be used. The assembly must be made with 1.5% incline.

7.6 Pump station wall mounting

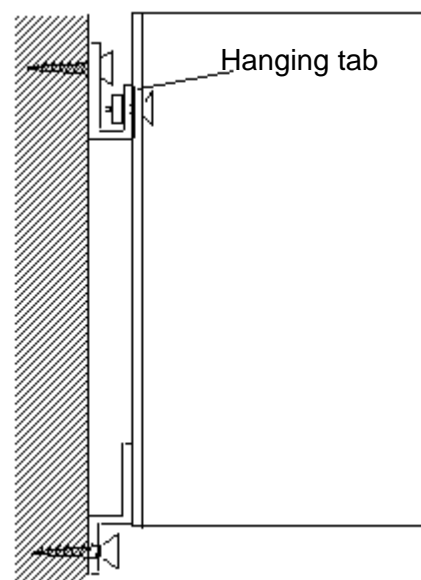


The installation of this unit must be carried out only by qualified personnel. We can assume no liability for damages caused by incorrect installation.

Please observe all the safety instructions and warnings on the equipment.

On the rear wall of the unit housing there are 4 mounting brackets (see also: Dimensions, pump station). There is a mounting kit supplied in which four screws, and rawlplugs are included for hanging the unit housing.

Firstly, holes are to be drilled according to the pump station dimensions (see pump station dimensions). Press rawlplugs into the drilled holes if dealing with stone or concrete walls. Then screw the top two fittings to the wall (allowing a 12mm distance from the screw head to the wall) and hang up the pump station. Then attach and tighten the bottom two screws.



Note: If installing the system is done by a single person there is a danger that the unit can be dropped. Therefore we recommend that two qualified persons do the installation.

7.7 Checking the installation

Assembling the vortex module wall

- Have all electrical cable and plug connections been properly tightened? Is the vortex module wall in accordance with the nozzle arrangement data sheet? (please note the number of modules in width and height)?

Vortex module wall assembly

- Have all electrical cable and plug connections been properly tightened? Are the guide rails built so that the vortex wall module can be lifted or slid from the guide rails?
- Is it ensured after assembly that the floor pan is showing no leaks?
- Have all electrical cable and plug connections been properly tightened? With a wall height of 11 modules is the Vortex-Vortex-module supported by two side rails. With 16 Vortex modules is it vertically split and supported individually by side rails?

Droplet separator assembly

- Are the guide rails built so that separator can be lifted or slid from the guide rails?
- Is it ensured after assembly that the floor pan is showing no leaks? Are all electrical plug connections secure?

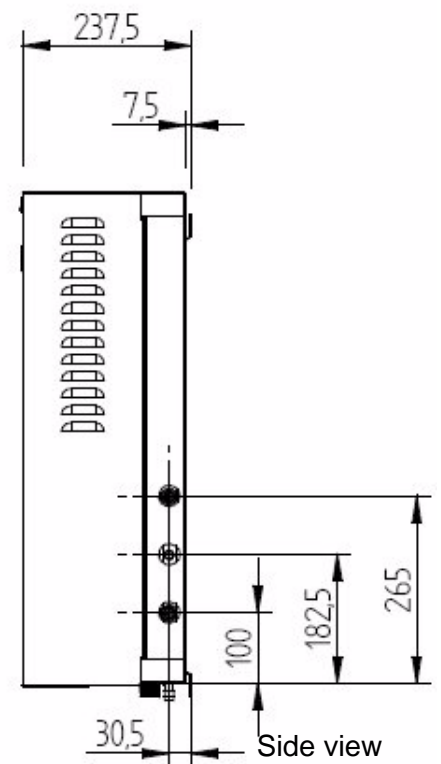
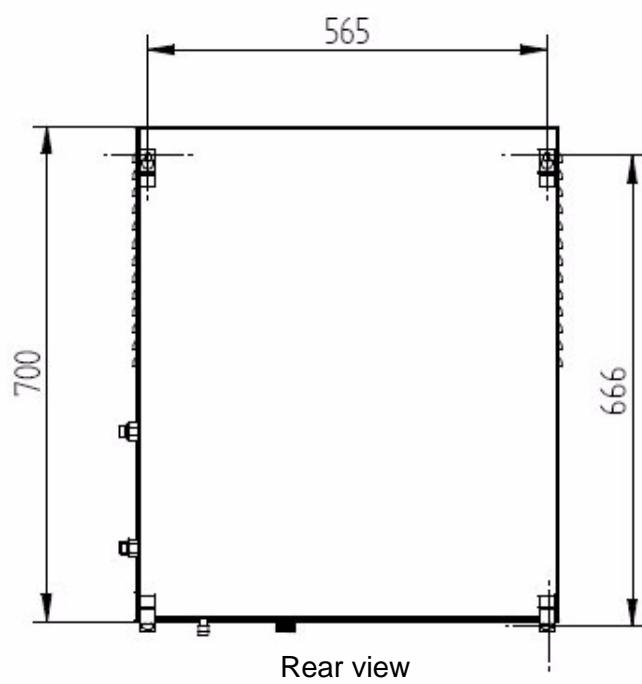
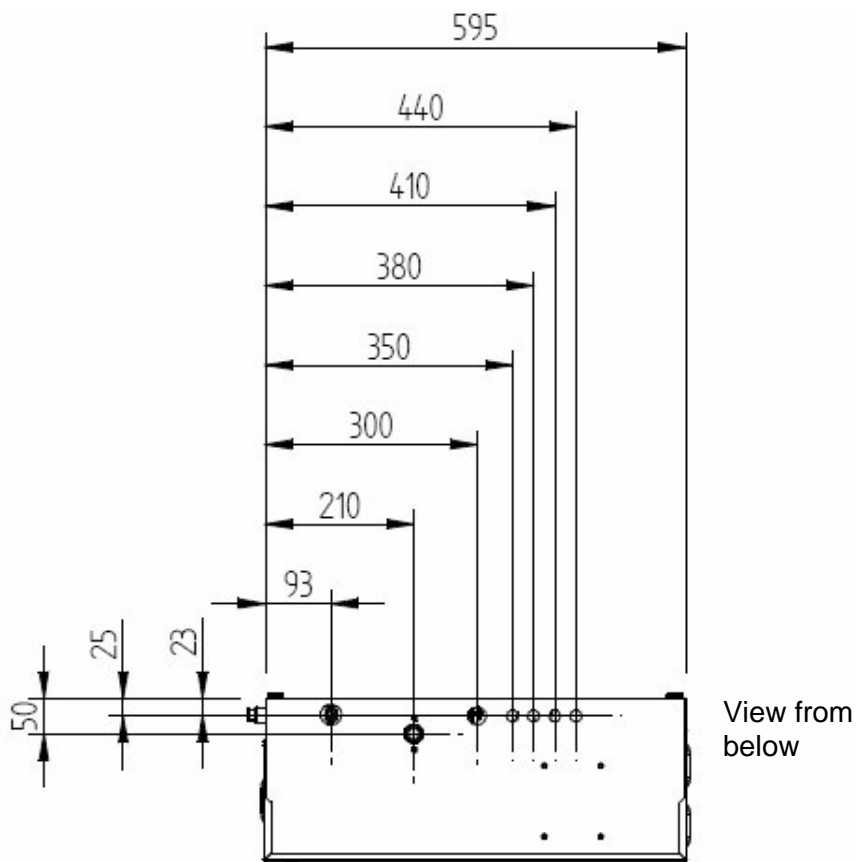
Mounting of the distributor pipe / tubing

- Has the seating of the individual hoses on their connectors been checked by pulling gently on them? Are all electrical plug connections secure?
- Is the arrangement of the nozzles and tubing in accordance with to the supplied nozzle arrangement data sheet?

Pump station installation

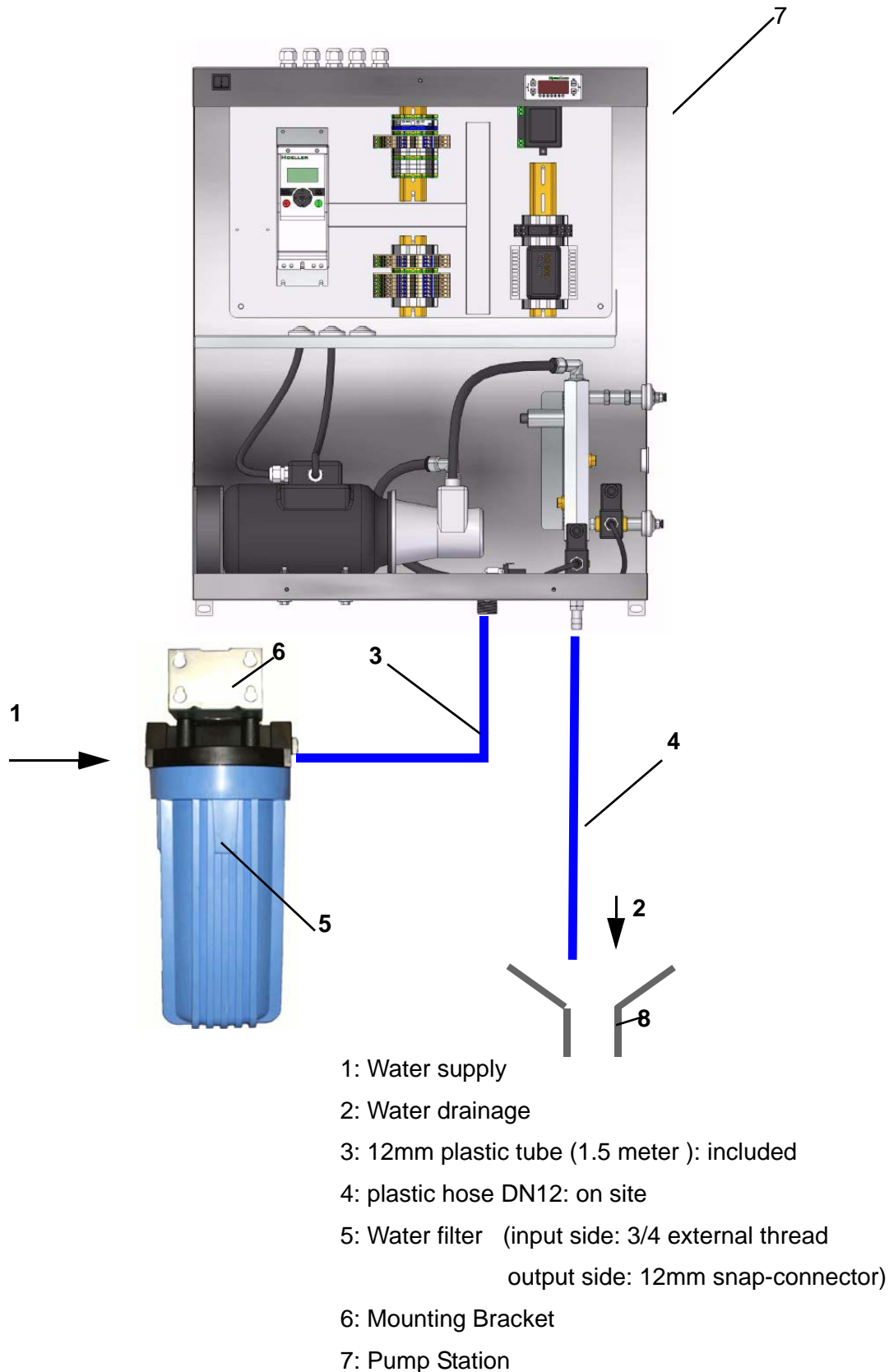
- Is the pump station fixed horizontally on a suitable wall? Does the mains voltage match the voltage on the name plate/delivery note?

8. Dimensions - Pump Station



9. Water connection

9.1 Overview Water connection



8: External drain, siphoned (free entry must be assured)



Note: There must be a stopcock and a sampling valve in the immediate vicinity of the HygroMatik LPS nozzle system provided.

9.2 Water supply



Attention: Please observe during installation:

- All work must only be performed by qualified personnel.
- System must be switched off and voltage free.
- Please observe local waterworks and utilities regulations

When using de-mineralized water we recommend the use of stainless steel or plastic pipes.

Water supply:

- » Locate water Filter (position 5 in the graph above) near the pump station (7).
- » Transfer mounting bracket hole pattern (6) to a suitable location on wall.
- » Then drill using rawplugs and mounting brackets including water filters.
- » An 8mm plastic tube is supplied (length 1.5 m, shorten if necessary). Connect this to the snap-connector on the output side of the water filter. Gently pull on the hose to check for tight fit.
- » Attach other end of the 8mm plastic tube into the snap-connector to the pump station water supply. Gently pull on the hose to check for tight fit.
- » Connect the external feed water line to the input side of the water filter (3/4 "external thread).

9.3 Drainage

At the bottom of the housing, a DN12 spout is sticking out. This is a drain and is used to:

- empty and relieve the pressure lines to the vortex wall after removal of the module enable signal
- drain the flush water after flushing

Water drainage

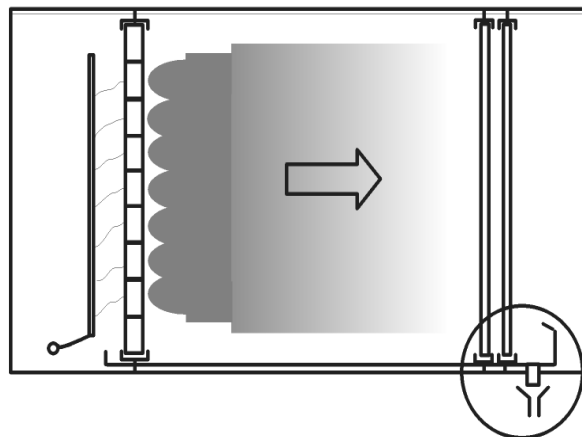
- » A DN12 water hose (position 4 on the graph above) is attached to the DN12 spout on the bottom and made fast with a clamp.
- » The tube is then siphoned off and installed on the slope to the drain (8).

9.3.1 Water drain for the humidification chamber



Note: The water drain in the collection tray must be at the lowest point in the humidification chamber.

It is recommendable to have the water drain positioned behind the droplet separators with respect to the direction of air flow. Only in this way can the waste water drain completely.



9.4 Water Quality

Conductivity:	5-20 μ S/cm
Pressure:	0,15-0,5 MPa (1,5-5 bar)
Flow rate	greater than max output of the nozzle sytem
Temperature:	5-40°C
PH value:	7 +/-1

9.5 Inspection the water supply

Water supply

- Is the supplied water filter installed to the water inlet for the pump station?
- Is the feed water quality within the specified range?
- Is the hose that lies between the water filter and pump station waterproofed?

Drainage

- Is the drain hose siphoned and installed with a constant incline to the drain?
- Can the flushing water drain off freely?

Humidification chamber

- Is the humidification chamber provided with a drain at the lowest point?

10. Hygiene

10.1 Ensuring hygiene (VDI 6022)

The regulations require that only inert materials must be used and biocides should only be used as a last option.

Prior to humidification the supply air is to be purified using a Class F7 filter.

A metal filter made of mesh wire is used as a droplet separator.

The droplet separators can, as far as is necessary, be easily cleaned and reused. Addition of a biocide is not required.

All components must be easily accessible to perform a cleaning in accordance with VDI6022.

In order to carry out a visual inspection according to VDI 6022 sufficiently large windows / removable panels have to be provided in the area of the droplet separators and the vortex modules.

10.2 Automatic flushing

If the HygroMatik nozzle system LPS is in „stand by mode” and there is no demand for work for 24 hours the system will periodically run (every 24h) flush cycles.

Hereby the growth of bacteria in standing water is obviated.

During flushing the inlet water solenoid valve and the flushing valve are simultaneously open. Thus the water in the pump station is being exchanged and directly led into the drain without reaching the humidification chamber.

11. Electrical connection



Caution: Voltage! All electrical installation work must be carried out by qualified specialist staff (electricians or skilled workers with equivalent training) only. It is the customer's responsibility to monitor qualifications.



Caution: Voltage! All installation work must be completed before the HygroMatik nozzle system LPS is connected to the mains supply.

Please observe all local regulations for electrical installation work.



Caution: The electronic components of the HygroMatik nozzle system LPS control system are sensitive to electrostatic discharge. To protect these components from damage by electrostatic discharge, special measures must be taken during all installation work.



Caution: During installation please perform the following steps:

- Disconnect the system from the mains supply and secure it to prevent it from being switched on again.
- Ensure that the system is de-energised.
- Installation and removal of the control system may only be performed if the device is switched off.
- Lay electrical cables properly.
- Make the electrical connections according to the circuit diagrams.
- Ensure that all terminals are tight.
- Connect the system via socket to the supply network. The back-up fuses specified in the technical data must be used.
- The mains plug of the nozzle system HygroMatik LPS is the network point of separation according to VDE and is therefore absolutely necessary.

11.1 Connection data

Power supply:	LNE 230 V AC, 50 Hz
External control signal:	0-10 V DC 4-20 mA DC
System enabling:	via ext. potential-free contact
Group fault signal:	potential-free contact (change over contact)
Operating status signal:	potential-free contact (NO)



Note: If a residual current device should be installed upstream of the system a universal-current-sensitive circuit-breaker should be selected.



Note: When sizing the connection lines, observe that the supply impedance must be low! If a short circuit occurs the circuit-breaker must switch off automatically within 0.4 s. The magnetic short circuit trigger for the circuit-breaker (type B) acts immediately when the flowing short circuit current is more than five times the rated current.

Pump group	Rated power [kW]	Rated current [A]	Fuse [A]
LPS100	0.37	2.7	1 x 16

11.2 System enabling / Safety chain



Note: Interlock contacts, such as max. hygostat, air flow relay, duct pressure switch, ventilator interlock etc., are placed in series between series terminals X2.1 and X2.2 (= safety chain).



Caution: If the ventilation system fails or the supply air face velocity is too low (less than 0.9 m/s) the built-in control must switch off the humidifier via the safety chain. Otherwise undesired condensate build-up behind the droplet separator may occur.

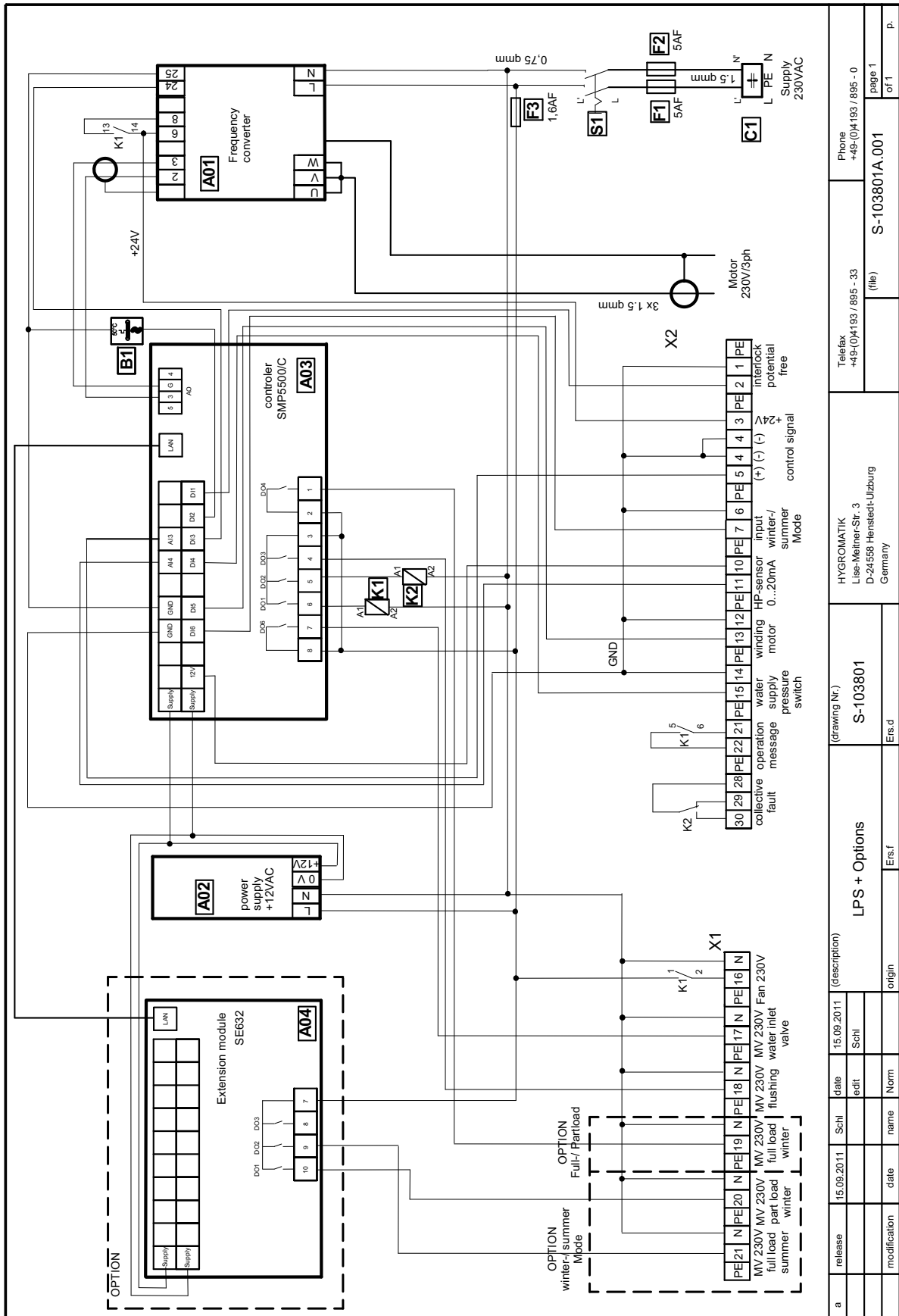


Caution: Integration of a max. hygostat into the safety chain is state-of-the-art. The max. hygostat serves as a safety element in case of malfunction of the humidity sensor and protects against over-humidification.



Caution: The contacts which are placed on terminals X2.1 and X2.2 must be potential-free and suitable for switching 24 V DC / 100 mA. After the HygroMatik nozzle system LPS has been started, a standard voltage of 24 V DC is applied to terminal X2.1.

11.3 Circuit diagram



a	release	15.09.2011	Schl	date	15.09.2011	(description)	LPS + Options	(drawing Nr.)	S-103801	HYGROMATIK Lise-Meiner-Str. 3 D-24568 Henstedt-Ulzburg Germany	Telefax +49-(0)4193 / 895 - 33 (file)	S-103801A_001	Phone +49-(0)4193 / 895 - 0
	modification		date	name	Norm		Ers.f	origin				page.1	p.

11.4 Inspecting the electrical installation

The electrical installation must be checked by an electrician in accordance with customer requirements and the regulations set out by the public electricity supply company:

- Does the mains voltage match the voltage specified on the nameplate / delivery note?
- Have all electrical connections been carried out according to the connection diagrams?
- Have all electrical screw and plug cable connectors been attached properly?
- Are the switch-off conditions for protection in case of faults complied with?
- Has the system been earthed?

The system can then be switched on.

12. Commissioning



Note: The LPS nozzle system may only be operated by qualified personnel.

Turning the LPS nozzle system off



Note: Before the LPS nozzle system is put into operation, it must be clear how to switch the system off.

- » Switch off Nozzle system using control switch (Pos.0).
- » Shut off water supply shut-off valve.

Check all cable connections

- » Check all cable connections for tightness.

Activating the LPS nozzle system

- » Operate main switch.
- » Open up water shut-off valve
- » Switch on unit using control switch (Pos.I).
- » Set commissioning control to permanent demand steam production.

The following functions begin:

A self-test.

When humidity is demanded, the pump vane is operated and directs the water at a pressure of up to 16 bar to the nozzle.

The water is atomized at the nozzle. All nozzles should not drip and show an even spray pattern.

Further tests:

- All electrically-powered functions must function.
- » Observe LPS nozzle system and let it run for 15-30 minutes. The air conditioning duct fan should be in operation so that the moisture produced can be blown away. Should any leakages be evident then turn the LPS nozzle system off.
- » Eliminate the leaks:



Attention, voltage! Please observe all safety instructions while working on live components.

13. Control System

13.1 Control and speed regulation

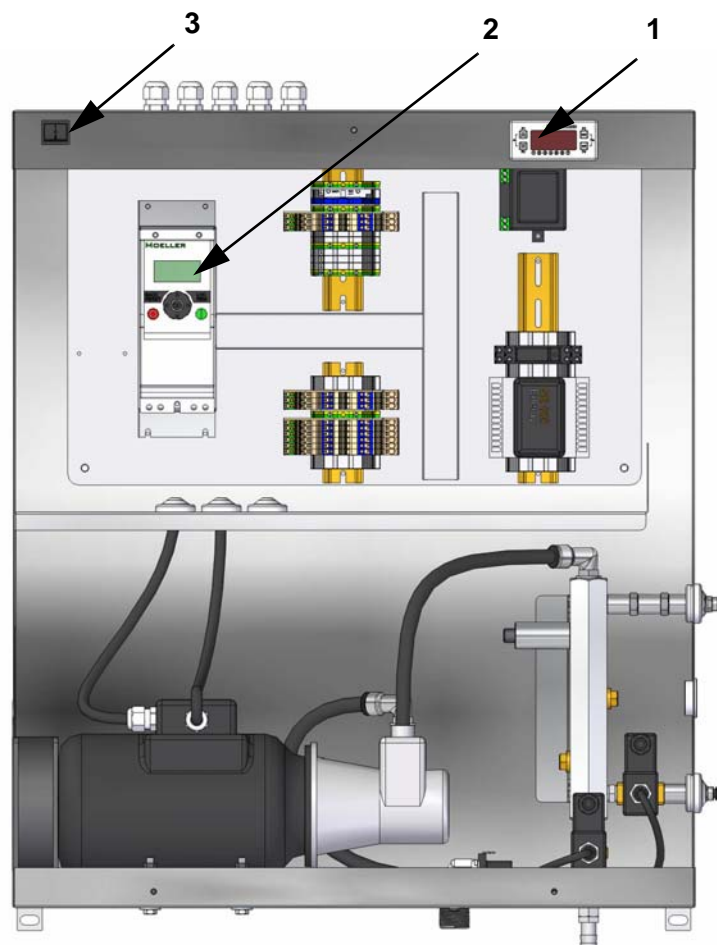
The electrical components and terminals are located in the system cabinet under the removable cover. A programmable logic controller PLC (Item 1 in the illustration below) is responsible for the control function.

Important operating data are depicted in the control system display. A frequency inverter (Item 2) supplies different frequencies and voltages for the asynchronous motor of the pumping station located in the lower part of the system cabinet.

Depending on the speed of the pump, it is possible to vary the water pressure and thereby the quantity of water atomized. The water pressure may range between 5 and 16 bars.

The main switch (Item 3), which is located at the top right-hand side, is for switching off the HygroMatik low-pressure nozzle system LPS.

HygroMatik low-pressure nozzle system LPS



13.1.1 Full load and part load

The HygroMatik low-pressure nozzle system LPS is controlled by a 0-10V control signal.

In the 5-10V range, all the nozzles are charged with pressurized water. If the control signal falls below a value of 5 volts, the system switches to part load operation. In this case, approx. 50% of the nozzles are no longer supplied with water. The rotary vane pump then works with a higher pressure, whereby an improved spray pattern is produced.

13.1.2 Summer / winter mode

The HygroMatik low pressure nozzle system can be operated in summer or winter mode.

In winter mode, the HygroMatik low pressure nozzle system is used to regulate air humidity, whereas summer mode is used for exhaust air cooling.

Changeover between summer and winter modes is made by potential-free contact between connecting terminals 6 and 7:

Contact open = Winter mode

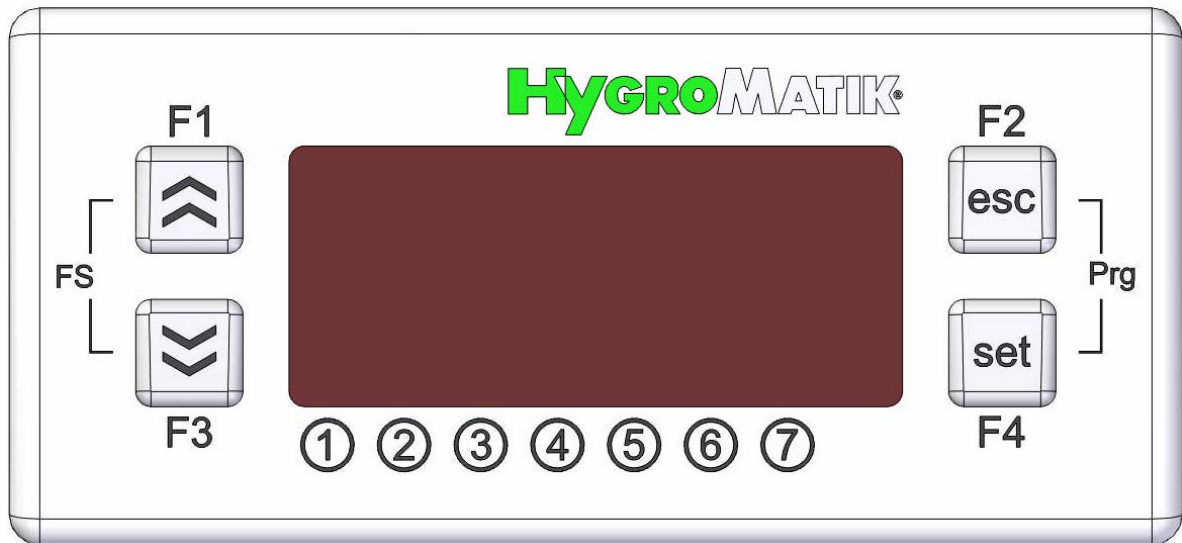
Contact closed = Summer mode

In summer mode, regulation of the HygroMatik low pressure nozzle system LPS is made solely by means of the safety chain (Terminals 1 and 2) in single-stage switching mode; as long as the safety chain is closed, the system operates at 100% humidification performance.





13.2 Description of the programmable controller (PLC)

13.2.1 General description

The HygroMatik low pressure nozzle system LPS controller regulates the complete atomizing operation. The user interface for operating and regulating the function of the appliance is on the face of the PLC controller.



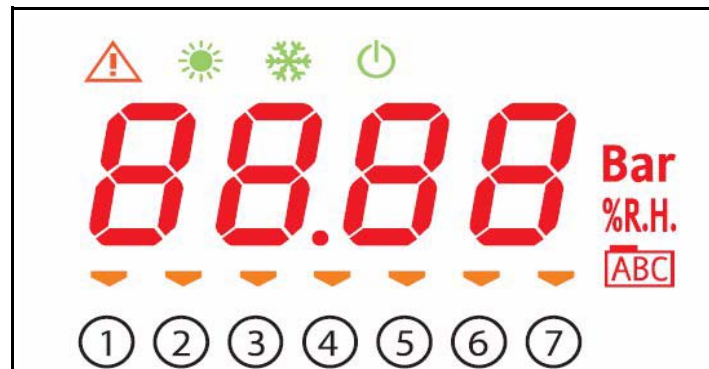
Functions of keys:





-  (F1): - increase value
- to the next identifier
-  (F3): - decrease value
- to previous identifier
-  (F2): - exit without saving the setting
- return to previous level
-  (F4): - confirm value / exit and setting save
- to the next level (select menu, submenu, parameter, value)
- select reading level

Functional description of the display and LED:

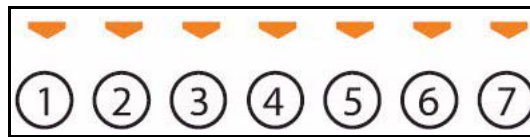
The display consists of 14 icons in 3 categories:

1. Operating modes
2. Values and dimensional units
3. Switching states



Icon	Description	Colour
	Error (Error codes F1...F8 are displayed; detailed description see below)	red
	Summer mode (cooling)	green
	Winter mode (humidify)	green
	No demand (the safety chain is closed, the demand is however below the activation threshold)	green
Bar	Pressure [bars]	red
%R.H.	Relative humidity [%]	red
ABC	Control signal error (control signal wrong or missing - humidification is interrupted)	red

Description of switching states:



Condition	Description	LED colour
1	Mode (nozzle system operating)	orange
2	Maintenance/fault	orange
3	Magnetic valve drain enabled	orange
4	Magnetic valve full load enabled	orange
5	Magnetic valve water inlet enabled	orange
6	Magnetic valve winter mode part load enabled	orange
7	Magnetic valve summer mode full load enabled	orange

13.2.2 Menu

System start

After switching on the Hygromatik low pressure nozzle system LPS at the main switch, an initial flushing operation is carried out (default setting 10 sec.).

The system is then in the **main menu**, i.e. the actual pressure is displayed.

From here one can navigate to the **reading level** and read off current reading parameters (L1 ... L14) or to the **programming level**, where parameters can be set or changed.

A detailed description of the programming steps can be found in the following subsection "Menu structure and parameter setting".

13.2.2.1 Reading level:

The following reading parameters can be selected in the reading level:

L01	Actual value of pressure [bars]
L03	Actual value of the control signal
L04	Setpoint control signal
L05	Set value of performance limiter [%]
L06	Set value for the target humidity (only valid with PI control [%])
L07	Actual value of current humidity (only valid with PI control [%])
L11	Total running time of pump [h]
L13	Total running hours [h]
L14	Remaining running time before next service reminder [h]

13.2.2.2 Programming level:

The following parameters can be changed in the programming level:

Parameter	Designation	Option
U6	Controls	0 = external controller 1 = single-stage/ On-Off
L06	Setpoint rel. humidity	10-100%
L05	Output limitation	25-100%
r_S	Reset „Service” message	ON/OFF
C12	Integral part, with PI humidity controller	5-50%
C11	Proportional part, with PI humidity controller	5-20%
E03	External control signal	3 = 0-10V DC 4 = 4-20mA DC



13.2.2.3 Operation

If the HygroMatik low pressure nozzle system LPS is enabled, (i.e. the safety chain is closed) and a control signal greater than the activation threshold is put in, the system atomizes water.

The LED 1 for status "Operating" is illuminated.

At the same time the current working pressure in bars is shown on the display.


In addition, the topmost line of the display shows whether the HygroMatik low pressure nozzle system LPS is operating in

summer  or winter  mode.


13.2.2.4 Function of the safety chain

It is possible to read off from the main display window whether the system is enabled for operation. It is essential that a potential-free normally closed contact for enabling (= closing the safety chain between terminals X2.1 and X2.2) is provided on site. Here, several safety contacts (NO / NC) can be connected in series.


No demand:

Should the PLC controller show  the safety chain is closed, however the requirement is below the activation threshold. There is no demand for humidification.

Ready for use:

If  is **not** displayed and if the display indicates *0.0 bars* the safety chain is open (terminals X2.1 and X2.2 are not bridged). The HygroMatik low pressure nozzle system LPS is ready for use.

13.2.2.5 Accumulated malfunction

If a fault is detected in the HygroMatik low pressure nozzle system LPS by the controls, the dedicated changeover relay is de-energized (terminals X2.28-30 NC, terminals X2.29-30 NO). Simultaneously a specific error report (F1 ... F8) is shown in the display and the  icon is illuminated red. The HygroMatik low pressure nozzle system LPS is deactivated.

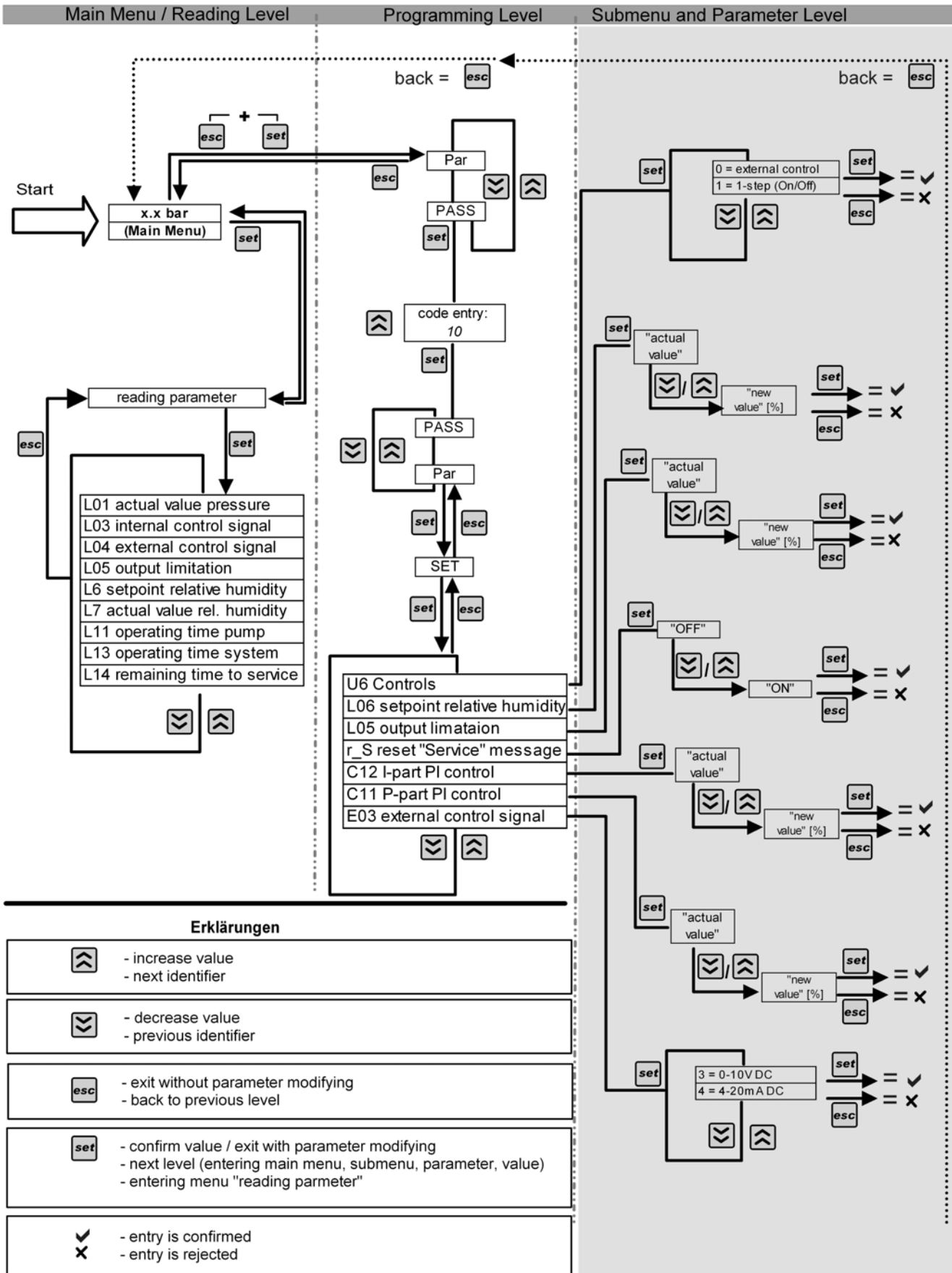
If no fault exists, the changeover relay is energized.

You will find a detailed description of the errors and their possible elimination in the following table.

13.2.3 Overview of error reports

Fault No.	Malfunction report	Description	Possible cause	Remedial action
F1	Water inlet Pressure < 1bar	Water supply inadequate. Inlet pressure must be between 1 to 5 bars.	Water supply not connected.	Connect water supply with adequate pressure.
F2	Temperature in control cabinet	The temperature sensor in the control cabinet is recording a temperature in excess of 50°C +/- 10%	The ventilator in the control cabinet failed Air inlets blocked	Check ventilator and replace if necessary Clean out air inlets
F3	FU defective	Frequency inverter reports a malfunction. This is shown in the frequency inverter display.	Overload of motor Motor cable short circuited Fault in electronics frequency inverter Earthing fault of output terminals	For remedial action please observe the instructions in the documentation for the frequency inverter.
F4	Motor winding	Temperature control of the motor winding activated due to excess temperature.	Failure of external ventilator Air inlets of the external ventilator blocked.	Check external ventilator and replace if necessary. Remove blockage
F5	Low pressure	No pressure can be built up after activating the rotary vane pump for 30 seconds	Pressure pipe leaking Water deficiency Signal cable pressure sensor not connected	Check pressurized water pipe and replace if necessary Check cable connection and correct
F6	Excess pressure	The supply of pressurized water exceeds a pressure of 16 bars for 30 seconds	Nozzles blocked Pressure-relief valve not set correctly	Clean nozzles or replace Please contact HygroMatik
F7	Sensor fault pressure	The value of the pressure sensor is outside the normal range	Pressure sensor defective Burst pipe	Replace pressure sensor Renew pipe
F8	Sensor fault humidity	The value of the humidity sensor fitted (optional) is outside the normal range	Humidity sensor defective Burst pipe	Replace humidity sensor Renew pipe

13.2.3.1 Menu structure and parameter setting:



14. Maintenance

The HygroMatik nozzle system LPS is maintenance-friendly. However, operational faults which can be traced back to inadequate or improper maintenance may occur.

Regular maintenance of the HygroMatik nozzle system LPS is indispensable for ensuring long service life.



Caution: For maintenance work please bear in mind that:

- the system must be serviced by qualified appointed staff only;
- safety instructions must be followed;
- the system must be taken out of operation and secured to prevent it from being switched (take the plug out of the socket) on before maintenance work is performed;
- after maintenance work has been completed the device must be inspected by qualified staff to determine whether it is safe to operate.

14.1 Maintenance activities

For the system to operate without any problems the following checks and maintenance tasks must be carried out regularly:

1 x per month:

- » Check housing for contamination and clean if necessary.
- » Carry out a visual inspection of droplet separators and clean if necessary.
- » Check the water filter cartridge upstream of the pump for contamination and replace if necessary; flush the mains water system if necessary.
- » Check the resulting spray cone of the nozzles and clean or change nozzles if necessary.

1 x per year (or after 2500 h)

- » Nozzles should be checked as part of annual maintenance and cleaned if necessary (see "Cleaning nozzle"). If required, the nozzles to be replaced.
- » Water filter cartridge change
- » Visual inspection of the vortex module wall, if necessary clean.
- » Check shutdown function, such as a "Max-Hygrostat".

14.1.1 Inspection / replacement of the net-based water filter

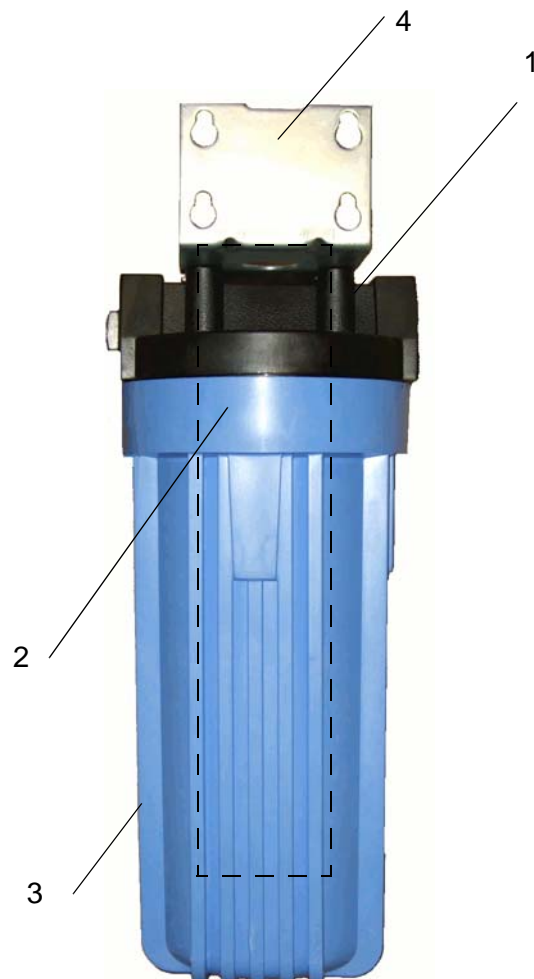
Water filter check

Water filter must be checked for contamination 1 x monthly and if necessary replaced. If the white water filter cartridge changes its colour this means it is polluted.

Pollution causes a higher flow resistance. This reduces the water pressure at the pump. Too little pressure can cause the nozzle system to switch off (dry-run protection).

Replacing the water filter:

1. Filter housing holder
2. Filter cartridge (inside-lying)
3. Filter housing
4. Mounting plate



1. Set the main switch on the control panel of the HygroMatik nozzle system LPS to '0'.
2. Close the (external) stopcock.
3. Relieve the line pressure.
4. Open the filter housing by hand. The threads may be damaged if pliers are used.
5. Clean the filter housing.
6. Replace the filter cartridge (if necessary).
7. Screw the filter housing into the seat by hand.



Note: Do not pinch the sealing ring.

8. Open the external stopcock.
9. Set the main switch to 'I'.

14.1.2 Cleaning the atomizer nozzle

1. Switch the HygroMatik LPS Nozzle System power supply to 0
2. Unscrew the nozzle from nozzle holder. Take care not to touch the impact pin.
3. Unscrew the nozzle by screwing the inside part out.
4. Clean the nozzle components in an ultrasonic bath for about 10 minutes, if necessary use a lime remover in low concentration (less than 10%).
5. Put nozzle components back together.
6. Screw nozzle in the nozzle holder.
7. Switch power switch back to I
8. Finally check spray pattern



Caution: Make sure that the pressure reduces by, for instance, activating the wash cycle.



Caution: Wear eye protection when cleaning the nozzle.



Caution: Use only an appropriate tool to remove the nozzles.

14.1.3 Cleaning the droplet separators

The droplet separators should be checked every 4 weeks for possible contamination and cleaned if necessary. The droplet separators should be thoroughly cleaned at least once a year.



Cleaning the droplet separators:

1. Pull or lift the droplet separators out of the guide rails.
2. Clean the droplet separators with a cleaning agent and then rinse and dry them.
3. Carry out a visual inspection of the droplet separators, repeat the cleaning step if necessary and replace the droplet separators if damaged.
4. Place the droplet separators back on the guide rails. While doing so ensure that the trap frame drain holes are facing downwards to guarantee free drainage.

14.1.4 Cleaning the vortex module wall

The vortex module wall should be checked for contamination and damage as part of annual maintenance. Any contaminants must be removed with a cleaning agent.



14.1.5 Cleaning the humidification chamber

Clean the humidifier housing and the base tray as required with a cleaning agent, then rinse and dry them.

For cleaning and disinfection we recommend INCIDUR produced by Ecolab.

When using other cleaning and disinfection agents please check material compatibility with all plastic materials used in the humidification chamber.



Caution: Do not aim the water jet at the droplet separators. Any upstream or downstream heating or cooling units must not become wet during cleaning.

15. EC declaration of conformity

EG-Konformitätserklärung EC Declaration of Conformity

Hersteller: **HygroMatik GmbH**
 Manufacturer: *HygroMatik GmbH*
 Anschrift: **Lise-Meitner-Straße 3, D-24558 Henstedt-Ulzburg**
 Address: *Lise-Meitner-Straße 3, D-24558 Henstedt-Ulzburg / Germany*

Produktbezeichnung / *Product description:*
LP System (LPS): LPS-100

In den Ausführungen / *Type:* Volllast, Voll- und Teillast / full load, full and partial load

Die bezeichneten Produkte stimmen in der von uns in Verkehr gebrachten Ausführung mit den Vorschriften folgender Europäischer Richtlinien überein:
The products described above in the form as delivered are in conformity with the provisions of the following European Directives:

- DIN EN 61000-6-3** *Elektromagnetische Verträglichkeit (EMV) - Teil 6-3: Fachgrundnormen - Störaussendung für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe (IEC 61000-6-3:2006); Deutsche Fassung EN 61000-6-3:2007*
Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments (IEC 61000-6-3:2006); German version EN 61000-6-3:2007
- DIN EN 61000-6-2** *Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche (IEC 61000-6-2:2005); Deutsche Fassung EN 61000-6-2:2005*
Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments (IEC 61000-6-2:2005); German version EN 61000-6-2:2005
- DIN EN 60204-1** *Sicherheit von Maschinen - Elektrische Ausrüstung von Maschinen - Teil 1: Allgemeine Anforderungen (IEC 60204-1:2005, modifiziert); Deutsche Fassung EN 60204-1:2006*
Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005), German version EN 60204-1:2006

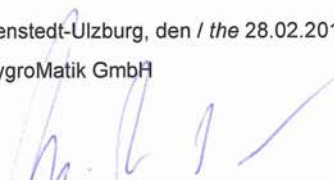
Die Konformität mit den Richtlinien wird nachgewiesen durch die Einhaltung folgender Normen:
Conformity to the Directives is assured through the application of the following standards:

Referenznummer: <i>Reference number:</i>	Ausgabedatum: <i>Edition:</i>	Referenznummer: <i>Reference number:</i>	Ausgabedatum: <i>Edition:</i>
DIN EN 55016-2-1	VDE 0877-16-2-1:2009-12	DIN EN 55016-2-3	VDE 0877-16-2-3:2007-08
DIN EN 55016-1-2	VDE 0877-16-1-2:2007-08		
DIN EN 61000-3-2	VDE 0838-2:2006-10	DIN EN 61000-3-3	VDE 0838-3:2009-6
DIN EN 61000-4-2	VDE 0847-4-2:2009-12	DIN EN 61000-4-5	VDE 0847-4-5:2007-06
DIN EN 61000-4-3	VDE 0847-4-3:2008-06	DIN EN 61000-4-6	VDE 0847-4-6:2009-12
DIN EN 61000-4-4	VDE 0847-4-4:2010-11	DIN EN 61000-4-8	VDE 0847-4-8:2009-10
DIN EN 60204-1	VDE0113 Teil 1:2007-06	DIN EN 61000-4-11	VDE 0847-4-11:2005-02

Die Anforderungen des Geräte- und Produktsicherheitsgesetzes (GPSG) §4 Abs. 1 bis 3 werden eingehalten. Eine vom Lieferzustand abweichende Veränderung des Gerätes führt zum Verlust der Konformität. *The requirements of the German Appliance and Product Safety Law (GPSG) paragraph 4 clause 1 to 3 are met. Product modifications after delivery may result in a loss of conformity.*

Henstedt-Ulzburg, den / the 28.02.2011

HygroMatik GmbH


 Maiké Nielsen
 General Manager


 Dirc Menssing
 Technical & Manufacturing Manager / Quality Manager

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Zusicherung von Eigenschaften. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.
This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation accompanying the product shall be considered in detail.

16. Spare parts

Article no.	pump station
E-7800100	Motor LPS-100, 230V, 0,37kW
E-7800200	Pump LPS-100, incl. Coupling
E-3720010	fan, axial, 230VAC
E-7702200	protection grill, cabinet fan HDS, incl. filter inlay 120 x 120 mm
B-7800400	Solenoid valve water inlet, incl. pressure switch 1bar
E-7800300	3/2 Solenoid valve, incl. coil 230V/50-60Hz
E-7800310	Plug for solenoid valve
E-7704800	High pressure sensor
E-7800436	pipe fitting G3/8, 12mm hose
E-7800438	pipe fitting G3/8, 90°, tumbable, 12mm hose
E-7800416	pipe fitting G1/8, 6mm hose
E-7800444	female pipe fitting G1/8, 6mm hose
E-7621028	Filter element 10" filter quality 10 µm for water-prefilter HP-pumpstation
E-7705200	Water filter housing, 10" bothside connection 3/4" iD blue sump, pressure release button
B-2504021	Auxiliary relay 230V AC 2 switching contact
E-2505206	Safety fuse 1,6A 5x20mm
E-2504039	Safety fuse 1,6A 5x20mm
E-7704870	Thermal circuit breaker ; NC with automatic reset, switching point at 50°C ± 5K
E-7800544	Transformer 230V/12V 11VA
E-7800500	Frequenzy converter 0,37kW
E-7800540	Display CPU unit
E-2501005	main contactor 16A(AC1)coil 230V AC

Article no.	Vortex-wall
E-7701000	Vortex module
E-7800400	LPS water distribution tube
E-7601630	T-piece female 1/8"
E-7601586	Double nipple G1/8" - G1/8"
E-7800410	Sealing plug M5
E-7800412	Sealing plug male 1/8"
E-7800414	Pipe fitting M5, 4mm hose
E-7800416	Pipe fitting G1/8, 6mm Hose
E-7800472	Fixing clip
E-7800452	Mountin bracket for nozzle
E-7621020	O-ring for nozzle mounting bracket
E-7800450	Nozzle
E-7800470	Sealing 1/4" for nozzle
E-7800424	Pipe fitting male 1/8", 90°, turnable, 4mm hose
E-7800428	Hose PA, 6mm
E-7800426	Hose PA, 4mm
E-7800430	LPS duct inlet fitting
E-7800432	Hexagon nut M14
E-2204122	Washer 15x25x2.5
E-7800418	Pipe fitting male 1/8", 90°, turnable, 6mm hose
E-7800416	pipe fitting G1/8, 6mm hose

17. Fax Form - Order for spare parts



Airtrend Ltd.-Gobrid. Ltd.
Kumanovska 14, 11000 Beograd
Tel. +381 11 383 68 86, 308 57 40
Faks +381 11 344 41 13
E-mail: gobrid@eunet.rs

Fax Form

Please copy, fill in and fax to

Fax.No. **+381 11 344 41 13**

Order of spare parts

unit type * _____ serial no.* _____

commission: _____ order no.: _____

quantity	article	article no.

date of delivery _____ forwarder _____ shipment by _____

delivery address (if different from invoice address)

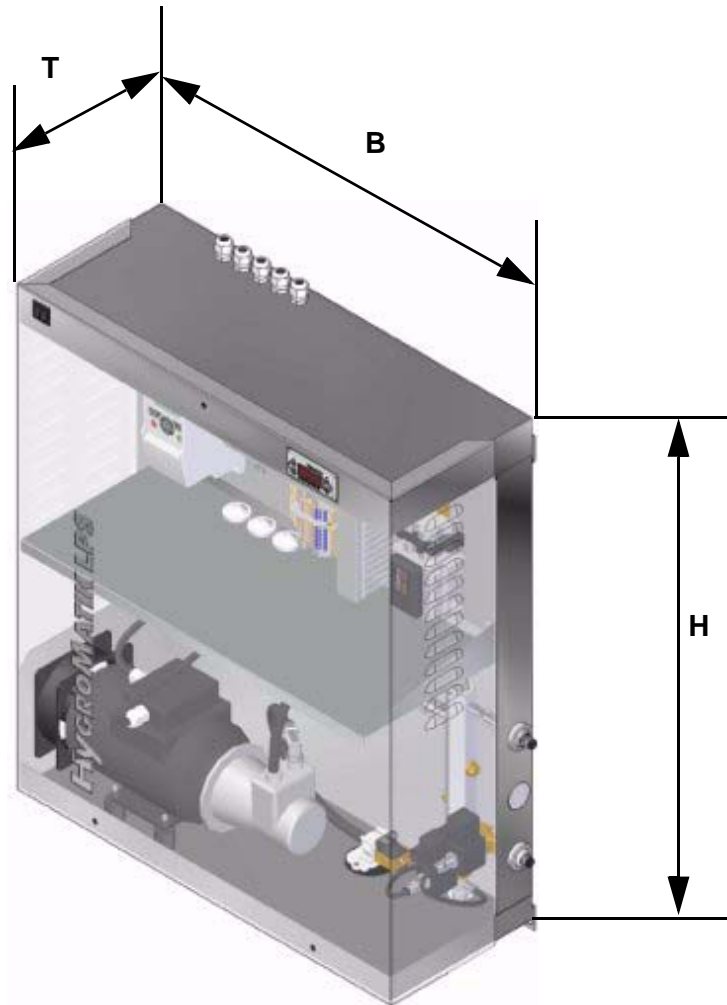
company stamp (delivery adress)

date/signature

* Order can only be processed if unit type and unit serial no. are filled in.

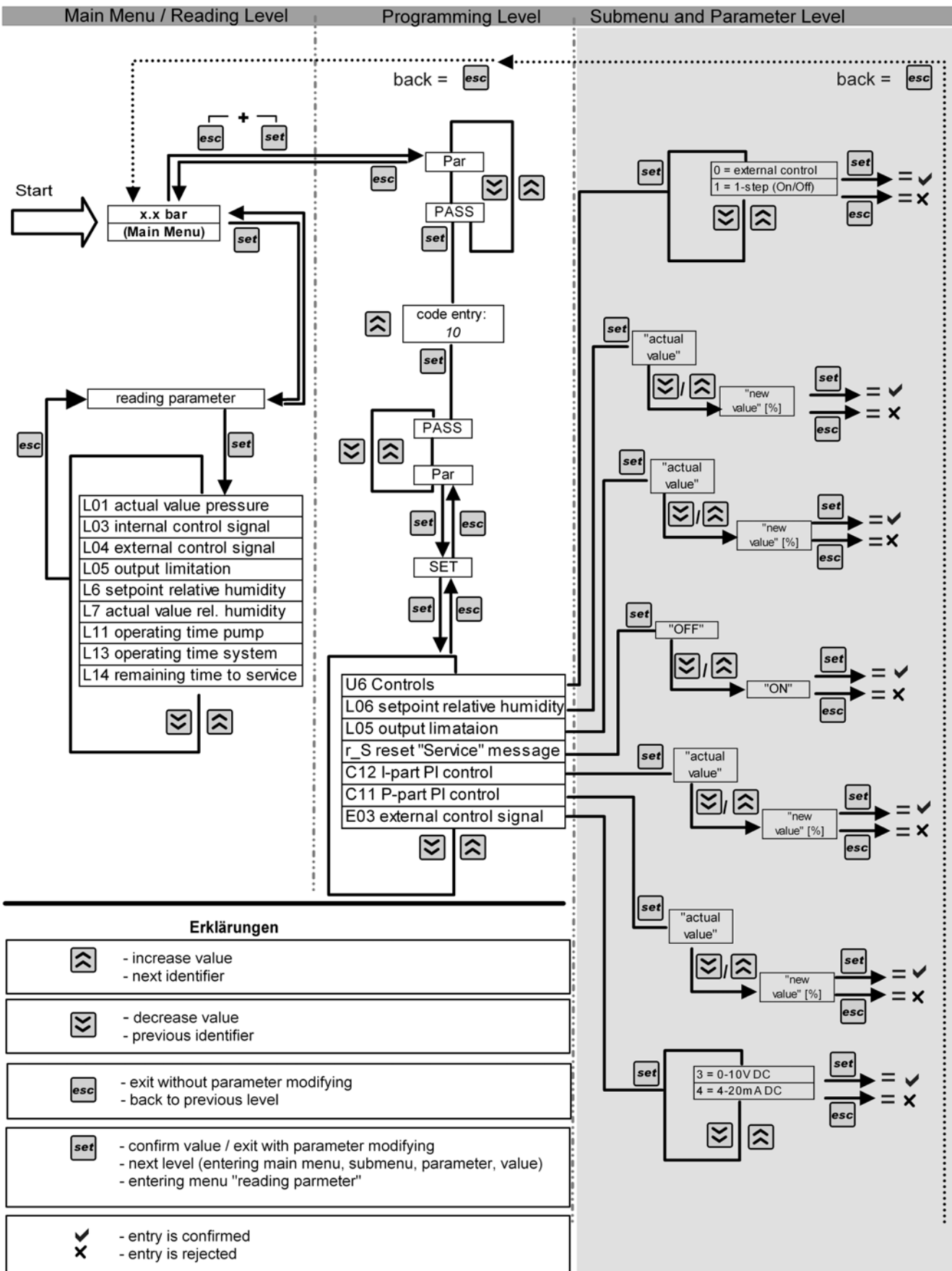
18. Technical Specifications

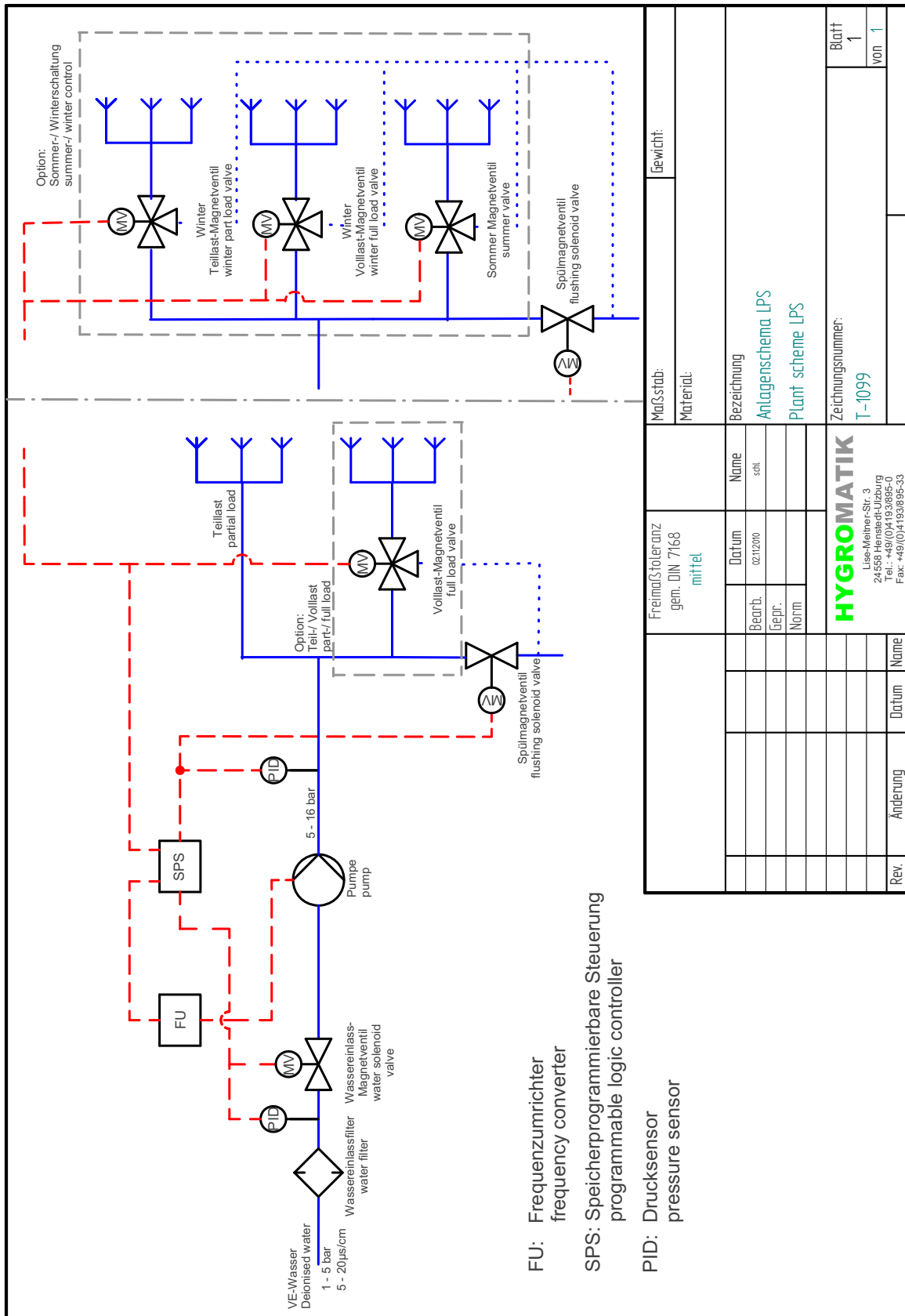
Nozzle system LPS	Output [l/h]	Nominal Power [kVA]	Nominal current at 50 Hz, 16 bar [A]	Max .Rotation [rpm]	Fuse Protection [A]
LPS 100	4 - 100	0,37	2,7	1350	1 x 16



	H	T	B	Weight
LPS100	700	230	600	30 Kg

19. Plant scheme





FU: Frequenzumrichter
frequency converter

SPS: Speicherprogrammierbare Steuerung
programmable logic controller

PID: Drucksensor
pressure sensor



HYGROMATIK®

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