

EN

# Droplets of performance



# About us

Elsteam S.r.l., originally founded as "Elettrica", began business supplying air conditioning systems. It quickly made a name for itself on the market, thanks to its highly efficient and functional products for humidity control.

In 1982 engineer Claudio Cattaneo bought the company, changing its name to Elsteam S.r.l.. It specialised in manufacturing humidifiers which, thanks to the expertise and innovative approach of the new owner, built a reputation for themselves in the sector as distinctive, original products that offer technological features such as:

- automatic cleaning with a "free" draining system;
- control of production with variable distance between the electrodes;
- proportional modulated production with triac power control;
- cleaning of electrodes by controlled voltage rectification;
- operational safety with a system with a double siphon to prevent overpressure and voltage surges;
- containment of water leaks during steam output thanks to a selector valve.

Thanks to the validity of the company's products,

acknowledged by a series of awards from the Scientific Committee of MCE (chaired by Milan Polytechnic), Elsteam continued to grow and soon began supplying the leading Italian manufacturers of air handling units (AHU). The business continued to expand until, in 2012, the need to give fresh impetus to its products and develop a more widespread sales network led the company to look for an industry partner to share its future growth.



Original but simplified products, cost-effectiveness and an efficient after sales service have been the philosophy that has driven the development of Elsteam humidifiers.

Evco S.p.A., a leading manufacturer of electronic controllers, shares the same philosophy as Elsteam and in 2020 decided to purchase the company to give added value to its future products, thanks to its specialised knowledge of electronics and the possible synergies with its own product portfolio.

The Elsteam name has been kept, together with all the current staff including Claudio Cattaneo and, with them, the knowledge and experience they have built up over the years. The intention is to invest further in staff and resources to take this success story to the next stage.



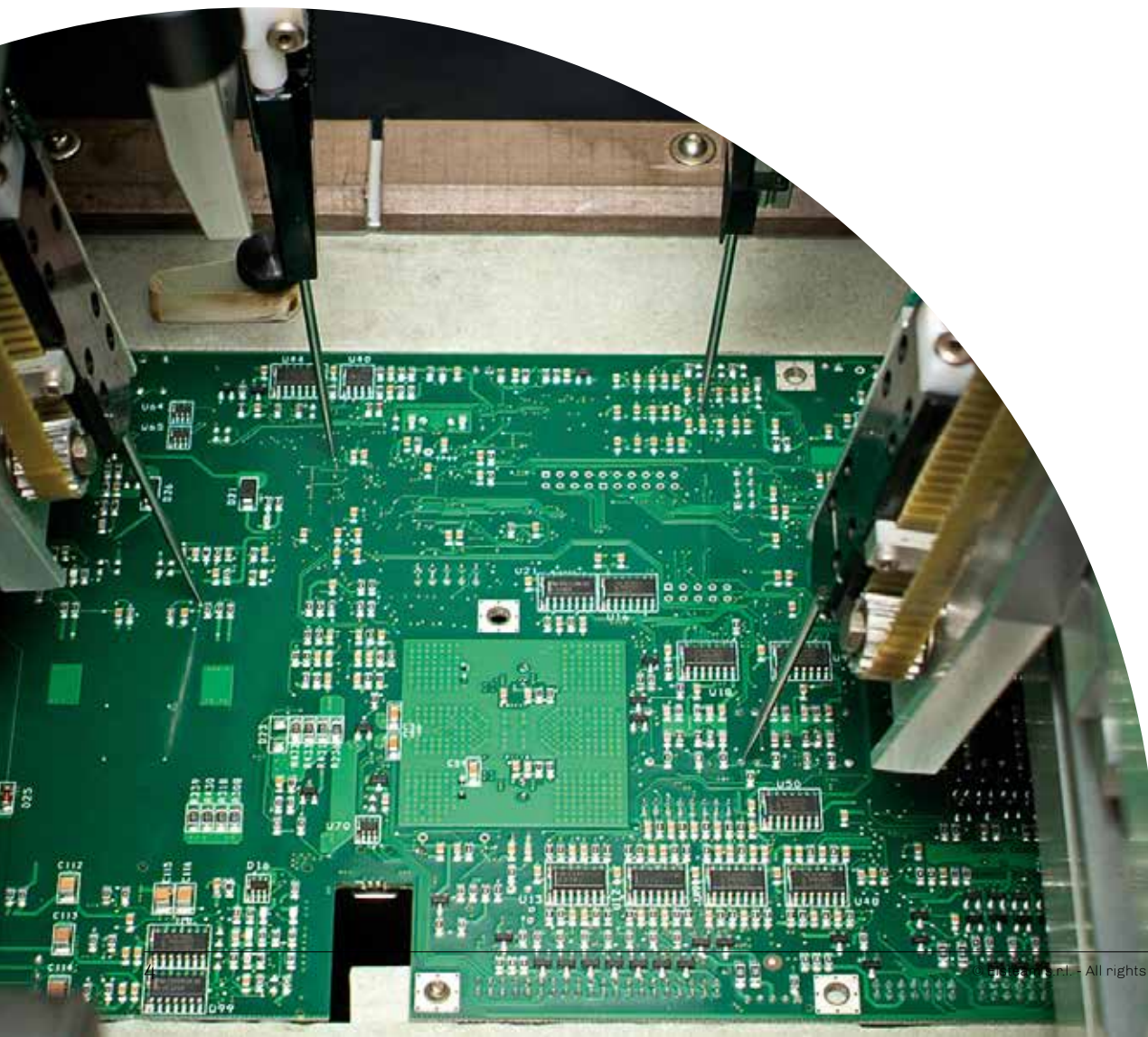
# Precision technology

Elsteam humidifiers have onboard electronic devices with a microprocessor, so users can monitor the level of humidity detected by the dedicated sensors and check it is within the setpoint. They can also control the production and distribution of steam or mist to ensure optimal humidity levels. These features help deliver more efficient humidification.

With control algorithms which guarantee precision regulation and high energy and water efficiency, EVCO controllers for humidification applications offer many benefits: they have an attractive design, are easy to use and clean, ensuring maximum hygiene. The remote and/or built-in user interfaces on the humidifiers are

supplied standard or on request and have IP65 front protection, capacitive touch keys or a full touch-screen display with intuitive procedures which ensure a pleasant user experience. EVCO controllers have different connectivity options, allowing the humidifiers to be integrated with remote management and monitoring systems and offering IoT potential.

Modulating technology provided by an inverter, developed by EVCO to manage asynchronous motors like the ones used in high-pressure humidifiers, also ensures efficient performance.



## EPcolor

3.5" TFT full touch-screen colour graphic display with high connectivity

- Communications protocol  
MODBUS RTU® master/slave
- TFT touch-screen colour graphic display
- Power supply 24 VAC/12... 30 VDC
- Data-logger
- RS-485, CAN and USB ports
- Alarm buzzer
- Clock
- IP65 front protection



## EV3

Extra-small remote user interface with two-line LED display and 4 capacitive keys

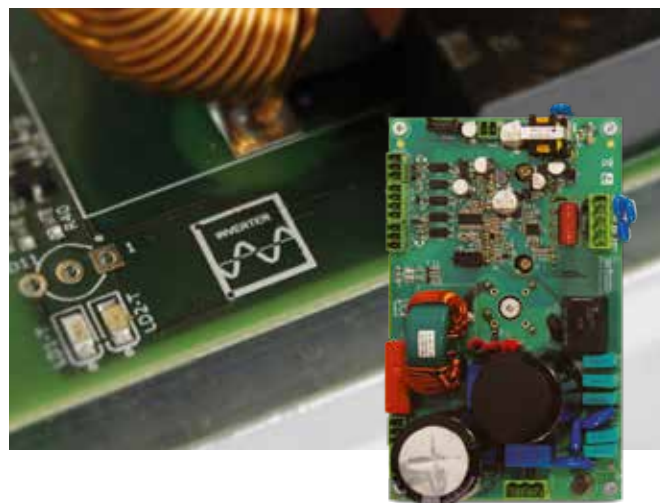
- Two-line LED display
- Power supply 12 VAC/DC
- INTRABUS or CAN ports
- Alarm buzzer
- IP65 front protection



## COMPACT

0.75 to 2.3 kW inverter for asynchronous motors

- Control through RS-485 serial port, from analogue and digital input or from FM input
- Cooling via heat sink and forced ventilation
- Protections against over/undervoltage and over-current/load/temperature
- Parameters for customisation
- Safe Start function
- Built-in EMC filters compliant with EN 61800-3-2004 in class C2





# The importance of humidification

## Optimal humidity for comfort and health

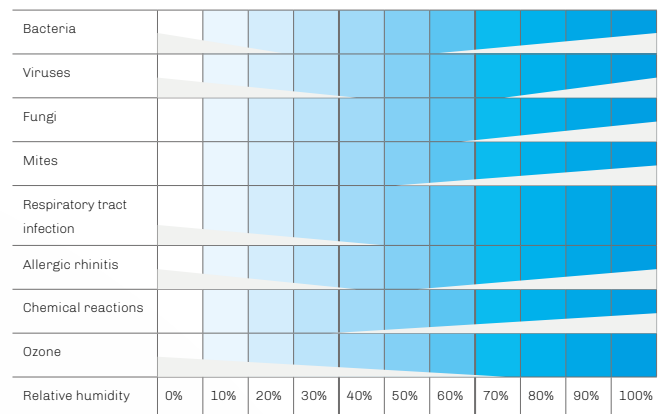
Scientific studies show that maintaining the correct level of humidity in a room contributes to our personal wellbeing, reducing tiredness and irritation of the skin and mucous membranes; it also helps prevent flu, allergies or respiratory tract infections as it limits the proliferation of bacteria, viruses and other biological contaminants.

Controlling the amount of moisture in the air is vital in hospitals, where optimal temperature and humidity conditions help improve worker efficiency and patient wellbeing, as well as ensuring electrical medical devices and machinery work properly.

## Scofield/Sterling diagram

The diagram shows the impact relative humidity in a room can have on our comfort and health.

Risks posed by unwanted microorganisms and the appearance of specific pathological symptoms are minimal when relative humidity remains within the ideal range of 40-60%.



## Optimal humidity for producing and preserving

In any industrial environment, maintaining the right temperature and humidity levels is vital in order to optimise processes and obtain quality products. As a general rule, correctly controlled humidity reduces the build-up of static electricity, lowers the temperature of machinery and creates less dust.

In the textile industry, the right degree of humidity helps fabrics maintain their elasticity and reduces the risk of tearing and breakage; in the printing sector it prevents dimensional changes in paper; in the food industry it is essential for greenhouse cultivation, production and transformation processes (proofing, aging, fermentation, curing, etc.), as well as storing, preserving and displaying food because it keeps it fresh and healthy and slows down weight loss.

Places like data centres also need to control the humidity in their environments to prevent electrostatic discharge and other unpleasant electrical issues, just as works of art, musical instruments and wooden furniture can deteriorate when the air is too dry.

## T/RH in the industrial sector

In certain production sectors, it is important to work within optimal temperature and humidity ranges. The maximum and minimum levels below are given purely as an indication, as each sector has different types of processes which require different temperature and hygrometric parameters.

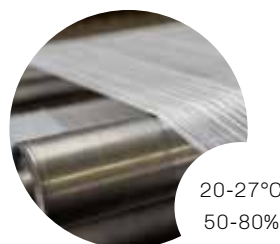
Food



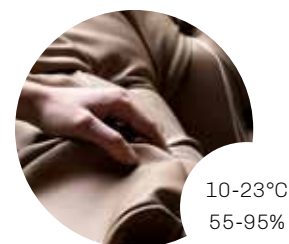
Chemical-pharmaceutical



Textile



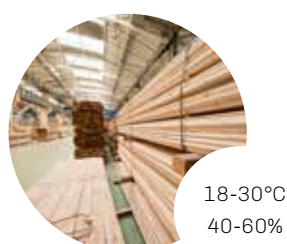
Leather



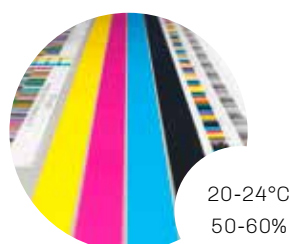
Paper



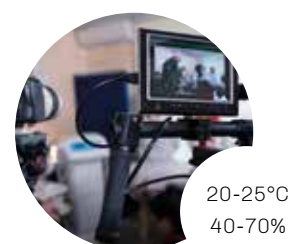
Wood



Printing



Film making



# How humidification works

## Steam humidification

With isothermal humidification, water is heated to boiling point to produce steam. The steam is generated either electrically or using steam boilers powered by combustion and then introduced directly into the room through blowers or into an air handling unit (AHU).

## Isothermal Humidifiers

- Immersed electrode humidifiers
- Heater humidifiers

### Benefits

- ✓ They ensure maximum hygiene because the high temperature of the steam eliminates contaminants
- ✓ The production of humidity is closely controlled, thanks to the efficiency of the steam humidification and greater control accuracy
- ✓ They are ideal for installing in AHUs as they only need a small mixing chamber





## Spray humidification

Adiabatic humidification is when water is atomised through friction with the air. Water is reduced to tiny particles (aerosols) which go from the solid state to the gaseous state using ambient heat. Evaporation speed is inversely proportional to the diameter of the droplet produced and directly proportional to the speed it is introduced into the air.

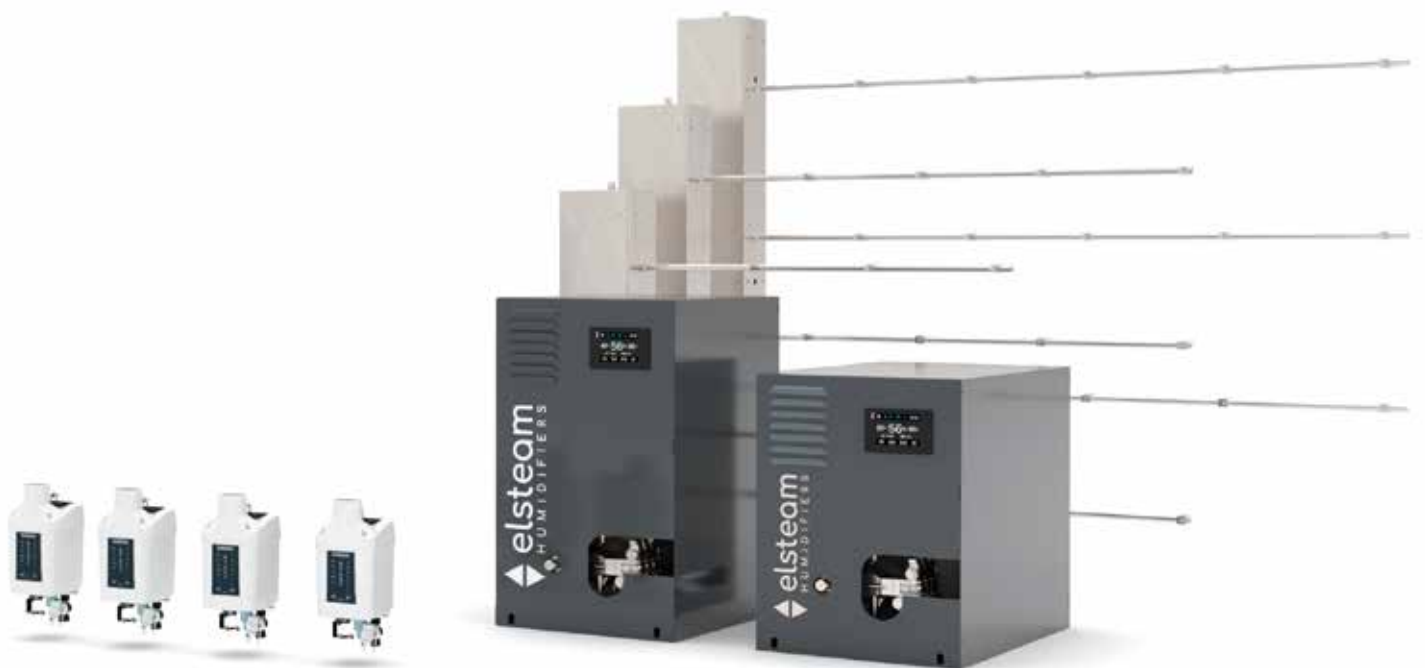
## Adiabatic Humidifiers

- Pressurised water humidifiers
- Ultrasonic humidifiers

### Benefits

- ✓ They are energy efficient because water is not heated and the process uses the heat in the air

- ✓ Regular maintenance costs are reduced when demineralised water is used, as this prevents the build-up of limescale.





# Zephyr

## Immersed electrode humidifiers



### Versatile

Compact stand-alone unit suitable for many applications



### Saves water

The operation algorithm ensures only the amount of steam required is produced, optimising water consumption



### Rapid

Steam is produced in a short amount of time



### Energy efficiency

Boilers, linear distributors and steam blowers available with reduced thermal transmittance

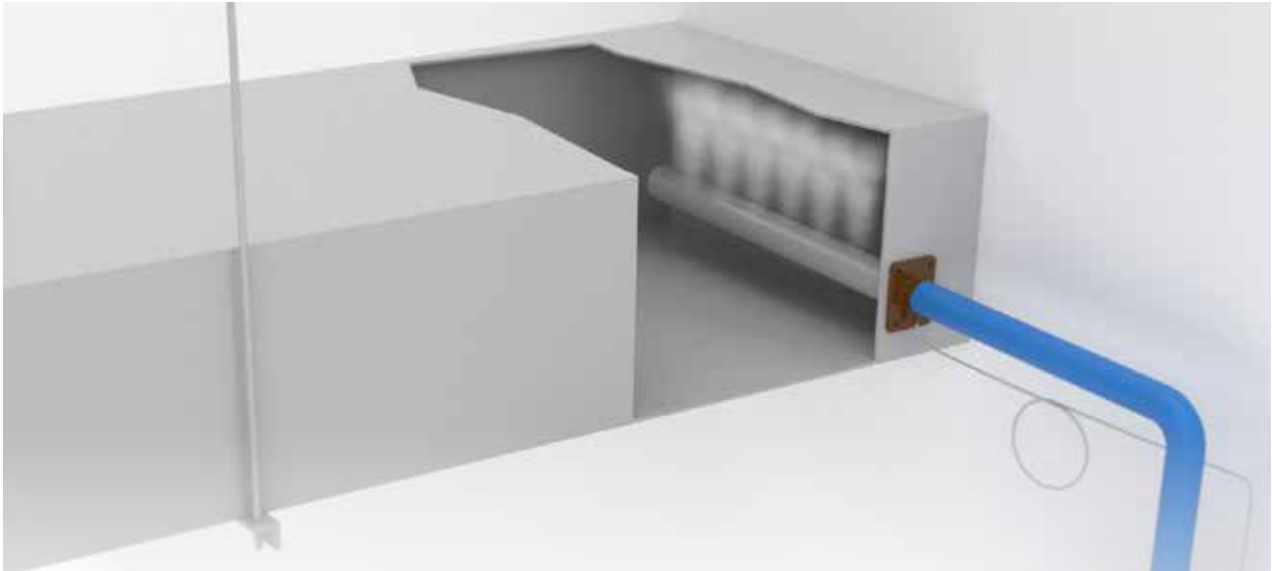


### Accurate

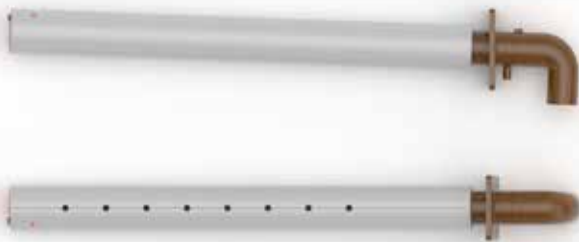
The new operation algorithm, together with a wide variety of boilers, ensures precision control, irrespective of the characteristics of the water

- The siphon circuit protects against boiler overpressure and its value can be modified on request with an optional kit
- Pump-driven draining system which breaks the limescale deposit into small pieces for easy ejection
- Automatic boiler cleaning system
- Mechanical parts designed to simplify use and maintenance
- Boiler circuit and polymeric parts of the linear steam distributors are in self-extinguishing material
- Protection against water escaping on the steam side
- No mechanical obstructions on the steam side and drain side

## Steam distribution systems



### Linear distributors for ducts



#### Extruded linear distributor with reduced thermal transmittance

The surface is non-porous, waterproof engineering plastic prevents bacterial proliferation and complies with Method A and Method C of ISO846. It withstands sudden changes in temperature and chemicals, thus making it easy to sterilise.



#### Stainless steel linear distributor

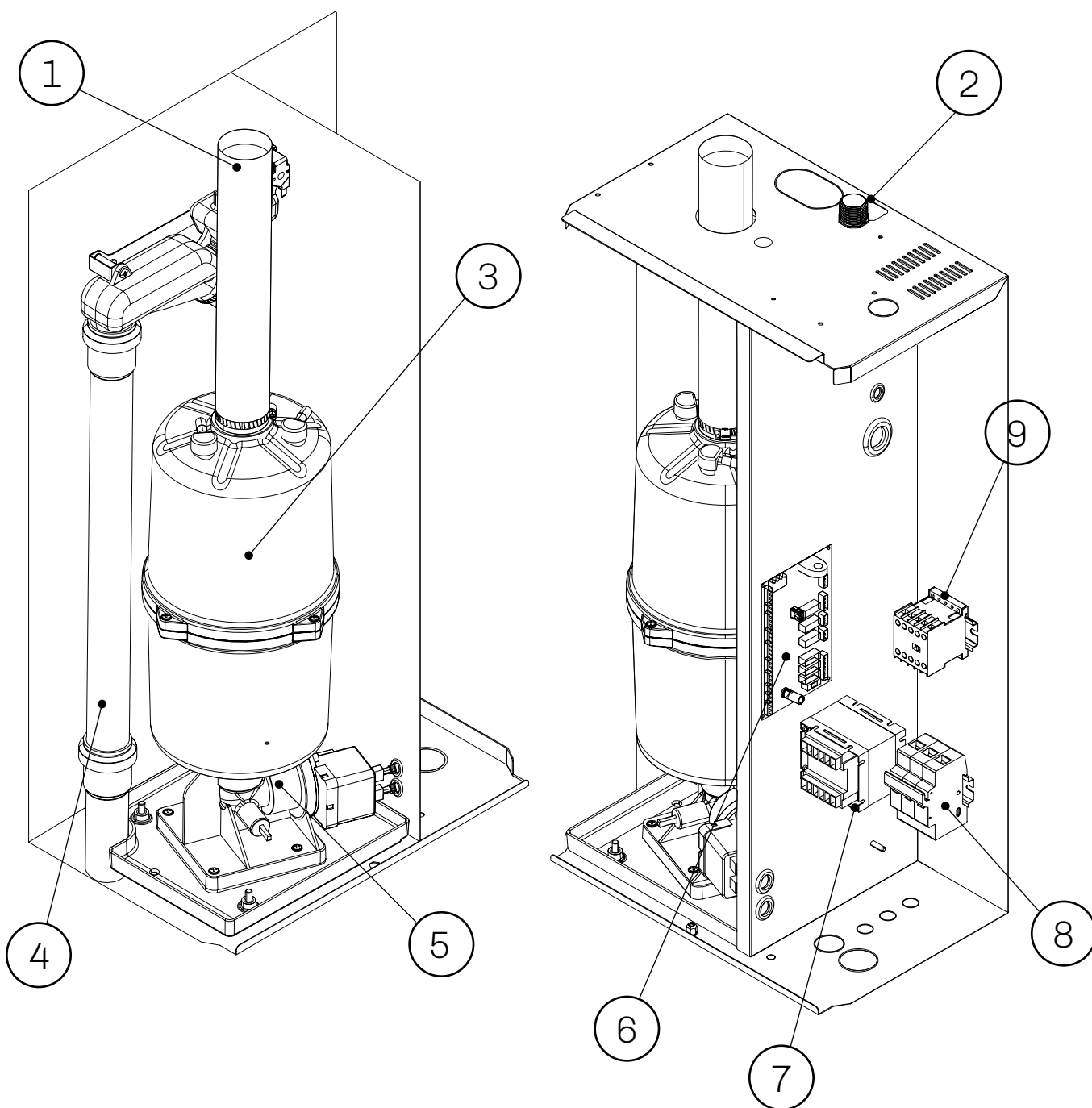
Stainless steel is a very hygienic material as it is corrosion resistant and its surface is compact and non-porous, making removing bacteria during cleaning and sterilisation easier.



### Steam blower for room

This steam blower, which delivers steam directly into the room, is made of engineering plastic which prevents bacterial contamination and withstands chemical attack. Thanks to its thermal insulation, it is also energy efficient. The blower can be fitted directly onto the humidifier or placed in the room, according to the manufacturer's instructions, using a special mobile support.

## Construction details



- 1. Steam outlet piping
- 2. Water inlet
- 3. Boiler with immersed electrodes
- 4. Water drainage circuit
- 5. Electric drainage pump

- 6. Control board
- 7. Insulated transformer
- 8. Fuse holder
- 9. Contactor

## Ideal for the following applications

### Hospitals and clean rooms

Steam produced by boiling water is germ-free because when water is heated to such a high temperature, a lot of the contaminants which are potentially harmful to our health are eliminated. Isothermal humidifiers are therefore suitable for use in sterile environments such as hospital wards, treatment rooms, operating theatres and laboratories which have precise temperature and humidity requirements. The control accuracy of steam humidification ensures compliance with the strict regulations which determine the values healthcare facilities must respect.



### Museums, art galleries, churches and archives

Fluctuations in temperature and relative humidity can cause variations in the size and surface conditions of many works of art and wooden or paper objects, from canvases and paintings to antique furniture, musical instruments and books, leading to their deterioration.



### Bakeries

Process humidification is a vital part of the bread making industry, particularly during proofing. Optimal temperature and humidity levels (T 23°-30°C, RH 70-80%) improve the quality of the baked goods, making the dough more elastic and giving it a perfectly golden crust in the oven. Steam humidification also ensures compliance with food safety standards.

### Data centres

The energy efficiency of data centres is greatly affected by temperature and relative humidity and parameters to ensure efficient performance were established in 2008 by ASHRAE (American Society of Heating, Refrigerating and Air Conditioning) and the European association ETSI (European Telecommunications Standards Institute) with standard ETSI EN 300 019-1-3. Correct air humidification in data centres is also important to prevent short circuits which can damage the sensitive electronic equipment: electrostatic discharge is more frequent when the air is very dry because humidity is a natural conductor, earthing any potential static charge.



### Turkish baths, fitness centres, beauty salons

Humidifiers are used widely throughout the wellness sector, thanks to the beneficial effects steam has on the respiratory system and blood circulation, toning, relaxing and generally improving a person's psychological and physical wellbeing. In Turkish baths in particular, the amount of steam and the time exposed to it promote prolonged perspiration which helps flush out toxins and impurities from the skin, leaving it deeply cleansed.





## Models available and technical features

EHKT models	003M2	005M2	003T2	005T2	003T4	005T4	010T2	010T4	015T2	015T4
EHKX models	003M2	005M2	003T2	005T2	003T4	005T4	010T2	010T4	015T2	015T4
STEAM PRODUCTION										
Production capacity [kg/h]	3	5	3	5	3	5	10	10	15	15
Maximum pressure [mm H <sub>2</sub> O/Pa/bar]	165/1650/0.0165									
Pipe connection external diameter [mm]	38									
STEAM DISTRIBUTION										
Number of linear distributors that can be connected [n]	1									
Number of steam blowers that can be connected [n]	1									
ELECTRICAL PROPERTIES										
Power consumption [kW]	2.2	3.75	2.2	3.75	2.2	3.75	7.5	7.5	11.3	11.3
Power supply [VAC, Hz]	230, 50/60				400, 50/60		230, 50/60	400, 50/60	230, 50/60	400, 50/60
Phases [n]	1	1	3	3	3	3	3	3	3	3
Current per phase [A]	9.6	16.3	5.5	9.4	3.2	5.4	18.8	10.8	28.4	16.3
WATER PROPERTIES										
Inlet water quality	Complies with microbiological standards for drinking water established by regulations in force where installed. Partially demineralised water may be used									
Inlet water conductivity [µS*cm]	70...1250									
Inlet water hardness [°f]	5...50									
Inlet water pressure [MPa/bar]	0.2...1/2...10									
Inlet water connection	M 3/4" GAS									
Water drain external dimensions [mm]	40									
GENERAL CHARACTERISTICS										
Dimensions (WxHxD [mm])	412x766x248									
Degree of protection	IP20									
REGULATION										
Type of controller	Built-in EHKX version: simplified with EV3 user interface, EHKX version: state-of-the-art version with EPcolor user interface									
Command signal [proportional (0-10 V) or ON-OFF]	ON/OFF-proportional 0-10V-probes 0-10V/4... 20 mA									
Connectivity	RS485-MODBUS-WI-FI SUPERVISION									

## Models available and technical features

EHKT models	020T2	020T4	030T4	040T4	060T4		
EHKX models	020T2	020T4	030T4	040T4	060T4	080T4	100T4
STEAM PRODUCTION							
Production capacity [kg/h]	20	20	30	40	60	80	100
Maximum pressure [mm H <sub>2</sub> O/Pa/bar]	200/2000/0.020						
Pipe connection external diameter [mm]	38						
STEAM DISTRIBUTION							
Number of linear distributors that can be connected [n]	1				2	2	
Number of steam blowers that can be connected [n]	2						
ELECTRICAL PROPERTIES							
Power consumption [kW]	15	15	22.5	30	45	60	75
Power supply [VAC, Hz]	230, 50/60	400, 50/60					
Phases [n]	3	3	3	3	3	3	3
Current per phase [A]	37.7	21.7	32.5	43.3	65	86.6	108.3
WATER PROPERTIES							
Inlet water quality	Complies with microbiological standards for drinking water established by regulations in force where installed. Partially demineralised water may be used						
Inlet water conductivity [µS*cm]	70...1250						
Inlet water hardness [°f]	5...50						
Inlet water pressure [MPa/bar]	0.2...1/2...10						
Inlet water connection	M 3/4" GAS						
Water drain external dimensions [mm]	40						
GENERAL CHARACTERISTICS							
Dimensions (WxHxD [mm])	522x893x380					928x900x375	
Degree of protection	IP20						
REGULATION							
Type of controller	Built-in EHKX version: simplified with EV3 user interface, EHKX version: state-of-the-art version with EPcolor user interface						
Command signal [proportional (0-10 V) or ON-OFF]	ON/OFF-proportional 0-10V-probes 0-10V/4... 20 mA						
Connectivity	RS485-MODBUS-WI-FI SUPERVISION						

## Main accessories

STEAM DISTRIBUTORS	
EHSR015M2	steam blowers, 3-15 kg/h
EHSD 040...200	400 to 2000 m linear steam distributor
EHSDW022	linear steam distributor with nozzles
EHSD 040X...200X	400 to 2000 m steam blower with thermal efficiency
BOILERS	
EHBK005MXXX	boiler, 3-5 kg/h 1PH (standard, low and high conductivity)
EHBK005TXXX	boiler, 3-5 kg/h 3PH (standard, low and high conductivity)
EHBK015TXXX	boiler, 10-15 kg/h 3PH (standard, low and high conductivity)
EHBK040TXXX	boiler, 20-30-40 kg/h 3PH (standard, low and high conductivity)
EHBK050TXXX	boiler, 50 kg/h 3PH (standard, low and high conductivity)
EHBKISOLXXX	insulating jacket for boilers
REGULATIONS	
EV3411M7	single output electronic controller, power supply 230 VAC, multi-sensor analogue input
PROBES	
EVHTP520	temperature/humidity probe with range 5- 95% R.H. and -10 - 70 °C
EVHP523	4...20 mA humidity transducer with range 5-95% R.H.
EVHTP523	humidity and temperature transducer, power supply 8 ... 28 VDC, 2 x 4-20 mA provided signal
EVTPNW30F200	NTC probe, thermoplastic cable, 2 wires, 3 m length, 5 x 20 mm overmoulded bulb, IP68 protection





# VEH Series

Immersed electrode humidifiers for air handling units (AHU)



## Flexibility

Various sizes available, so it adapts easily to the size of the air handling unit



## Maximum efficiency

- Hydraulic unit installed in the AHU
- No loss of load
- No condensate in the distributor
- Helps heat the room



## Germ-free steam

Isothermal humidification produces sterile steam

- Installed directly in the AHU: no need for an electronics compartment or distribution piping
- Automatic draining system with 40 mm diameter
- Protects against flooding in the AHU
- Mechanical parts designed to simplify use and maintenance
- Stainless steel electrodes
- Electrical panel separate from the hydraulic unit
- Microprocessor controller with LED user interface
- Connection for RS-485 protocol for remote control in MODBUS mode





The standout feature of the VEH series is that each model is made up of two separate units: a polypropylene hydraulic unit which is ISO 846 certified (it is installed directly in the AHU, it has no distribution piping for optimal steam release and helps heat the room) and an electrical control unit with IP55 protection which requires no electronics compartment.

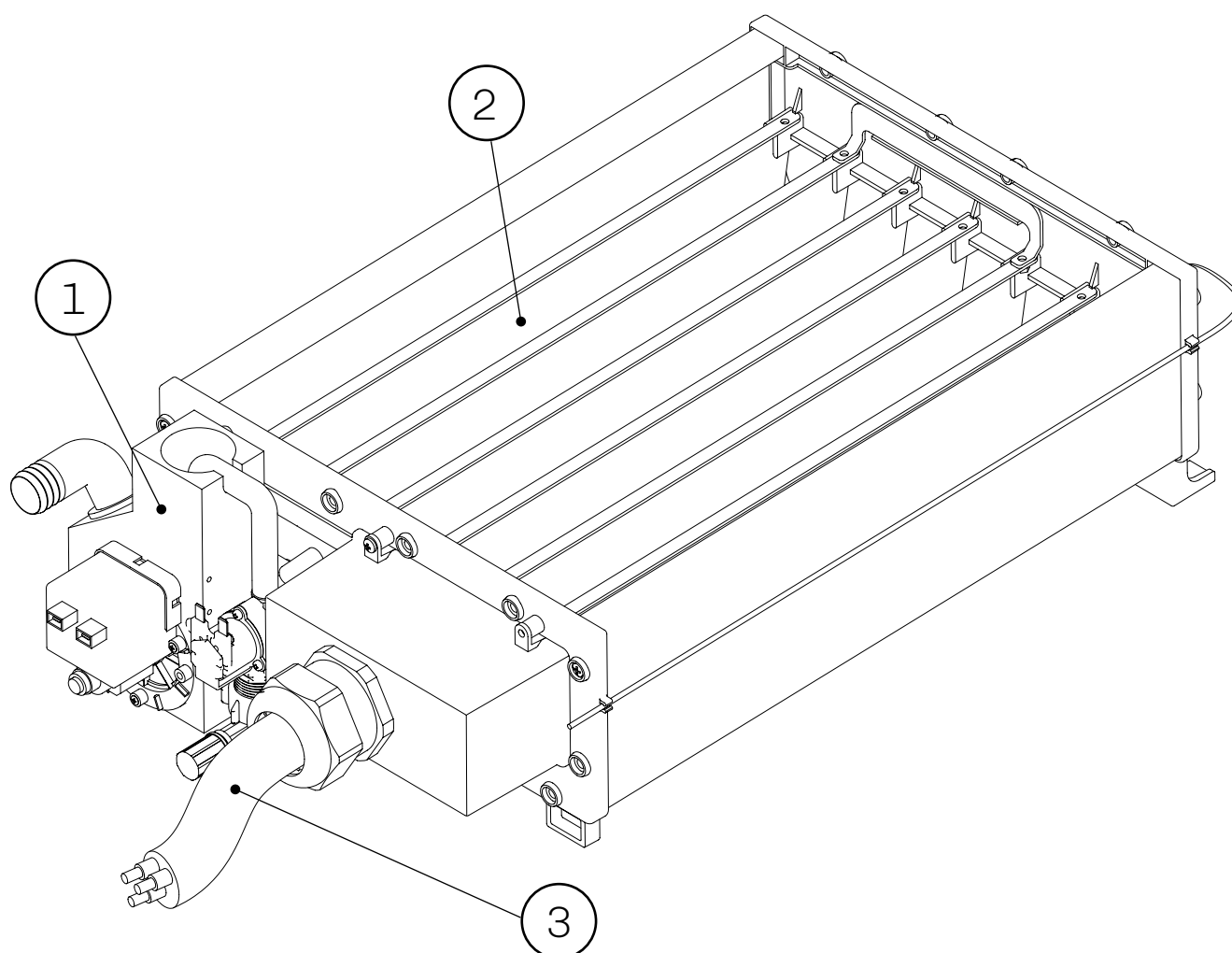
## Choose the most suitable version for your AHU



Models are available with 4 or 7 electrodes of different depths and steam production capacity that goes from 10 to 100 kg/h, making the VEH series easy to adapt to the size of the AHU.

A range of accessories is available to customise the size and accessibility of the hydraulic unit.

## Hydraulic unit



- 1. Manifold group Water charge/discharge
- 2. Electrodes

- 3. Power cable from the electrical panel to the hydraulic unit

## Ideal for the following applications

### Hospitals and clean rooms

Steam produced by boiling water is germ-free because when water is heated to such a high temperature, a lot of the contaminants which are potentially harmful to our health are eliminated. Isothermal humidifiers are therefore suitable for use in sterile environments such as hospital wards, treatment rooms, operating theatres and laboratories which have precise temperature and humidity requirements. The control accuracy of steam humidification ensures compliance with the strict regulations which determine the values healthcare facilities must respect.



### Data centres

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### Residential and commercial environments

Comfort in our homes depends largely on creating the ideal climate, which science has established as being 20-24° C for temperature and 40-60 % for relative humidity. In winter in particular, when buildings are heated, the level of relative humidity can fall drastically. Skin and mucous membranes can become dry, allergies and respiratory tract infections are more likely to develop and unwanted microorganisms like bacteria and viruses can proliferate. Dry air can also affect our perception of the temperature (lower than it really is in winter), make us feel tired and cause a drop in concentration. Maintaining the right level of humidity is therefore crucial to ensure personal health and wellbeing, in the workplace too.



## Models available and technical features

Models		VEH 10XS	VEH 20S	VEH 20XS	VEH 30M	VEH 30S	VEH 40L	VEH 40S	VEH 60XL	VEH 60M	VEH 80L	VEH 100XL
STEAM PRODUCTION												
Production capacity	[kg/h]	10	20	30		40		60		80	100	
ELECTRICAL PROPERTIES												
Power consumption	[kW]	7.5	15	22.5		30		45		60	75	
Power supply	[VAC, Hz]	400, 50/60										
Phases	[n]	3										
Current per phase	[A]	11	22	32		43		65		87	108	
WATER PROPERTIES												
Inlet water quality		Complies with microbiological standards for drinking water established by regulations in force where installed. Partially demineralised water may be used										
Inlet water conductivity	µS*cm	75...1250										
Inlet water hardness	°f	5...50										
Inlet water pressure	[MPa/ bar]	0.02...1/0.2...10										
Inlet water connection		M 3/4" GAS										
Water drain external diameter	[mm]	40										
GENERAL CHARACTERISTICS												
Control unit dimensions	[mm]	350x500x210										
Hydraulic unit dimensions	[mm]	330x167										
Depth 4 electrodes	[mm]	635	785	/	985	/	1185	/	1385	/	/	/
Depth 7 electrodes	[mm]	/	/	635	/	785	/	785	/	985	1185	1385
Weight (hydraulic unit)	[kg]	15	18	18	20	20	24	24	26	26	31	33
Degree of protection of hydraulic unit		IP00										
Degree of protection of electrical panel		IP55										
REGULATION												
Type of controller		Built-in or remote										
Command signal		Built-in:	4...20 mA									
		Remote:	Proportional (0...10 V), ON-OFF or (0...10 V / 4...20 mA)									

## Accessories

FLEXIBLE HOSES TO LOAD WATER	
0031000048	flexible hose ¾" GAS female which feeds water from the mains to the water load solenoid valve
CONDENSATE COLLECTION TRAYS	
0016020018	stainless steel condensate collection tray 490x690x70 mm
0016020019	stainless steel condensate collection tray 490x950x70 mm
0016020020	stainless steel condensate collection tray 490x1350x70 mm
REGULATIONS	
EV3411M7	single output electronic controller, power supply 230 VAC, multi-sensor analogue input
PROBES	
EVHP523	humidity transducer, power supply 8 ... 28 VDC, 1 x 4-20 mA provided signal
EVHTP523	humidity and temperature transducer, power supply 8 ... 28 VDC, 2 x 4-20 mA provided signal
EVTPNW30F200	NTC probe, thermoplastic cable, 2 wires, 3 m length, 5 x 20 mm overmoulded bulb, IP68 protection





# Mistral

## Compact, low capacity ultrasonic humidifier



### Minimum footprint

Compact unit for small spaces which produces up to 1 kg/h



### Energy saving

Energy-efficient adiabatic humidifier



### Silent operation

Thanks to advanced ultrasound technology and fan modulation



### Optimisation

Constant, efficient production and master/slave function for multiple units



### Connectivity and IoT

RS-485 port which allows configuration from a PC, remote supervision and Wi-Fi connectivity for IoT uses



### Remote viewing and complete diagnostics

Thanks to optional remote user interfaces with LED display or LCD graphic display with master-slave functions

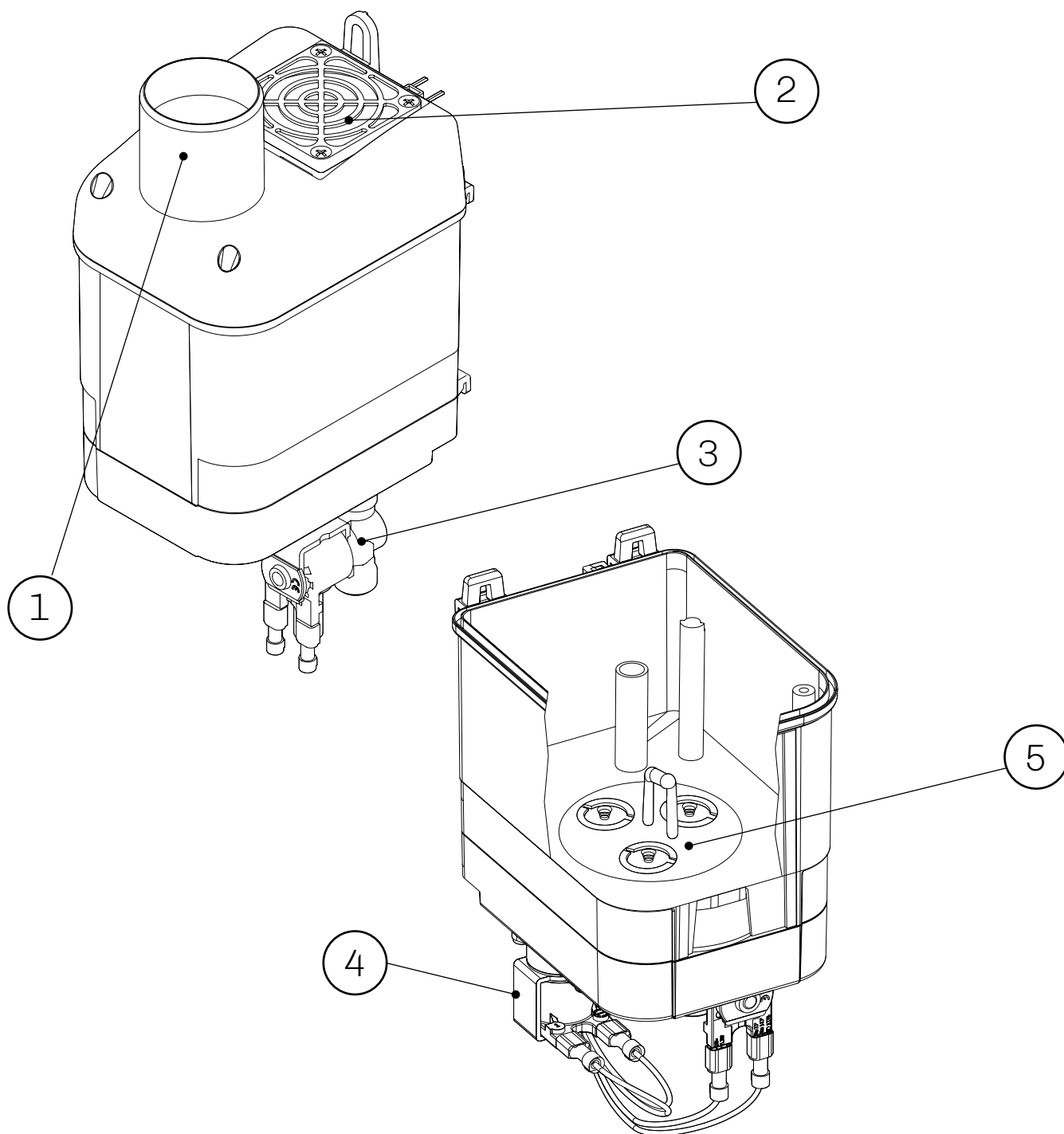
- Automatic draining system, stops bacteria proliferating
- Protection against no inlet water
- Significantly less maintenance required when EHR0012 is installed - reverse osmosis water demineralisation system

- Built-in controller with LED user interface and capacitive touch keys
- Can be connected to humidity probes for proportional control
- Tank in self-extinguishing engineering plastic in compliance with Method A and Method C of ISO 846

## Compact technology for indoor use or T/RH preservation



## Construction details



1. Steam outlet

2. Suction fan

3. Solenoid valve to load water

4. Solenoid valve to discharge water

5. Mist maker

## Ideal in the following applications

### Fan coils



When a room is heated with a convection heating system, where heat is transferred by the movement of liquids (natural or forced), the air can often become very dry and filled with suspended dust particles. To ensure maximum comfort, it is advisable to install a humidity control system alongside the heating. Compact ultrasonic humidifiers are often connected to fan coils as they are easy to maintain and hygienic and provide considerable energy savings: piezoelectric transducers vibrate, producing an ultra-fine mist which is quickly absorbed in the air, humidifying it without having to heat the water.

### Non-refrigerated display counters and cases for fresh produce

Mistral humidifiers are ideal for humidity control when fresh produce is displayed in non-refrigerated counters and cases, like in outdoor markets: adiabatic humidification keeps produce cooler because the water droplets evaporate, drawing heat from the surrounding air. When food like fruit and vegetables is humidified, it is more saleable because it is healthier, fresher and more visually appealing.



### Food processing

Curing charcuterie and maturing cheese involves different cycles, like dripping, drying and aging, and being able to accurately control and manage humidity is key to obtaining a high-quality end product. When curing meats, humidity is crucial to make up for loss of moisture, while when aging cheeses it prevents the surface cracking (especially in hard cheeses).



### Wine cellars and bottle coolers

Aging wine is a delicate operation which calls for carefully controlled temperature and humidity levels, especially when aging in wooden barrels. When the air is too dry, the staves on the barrel can become dry and the wine can evaporate excessively, causing loss of product and forcing producers to top up the barrels. During aging or conservation in the bottle, if there is not enough humidity, the cork can shrink and the wine oxidises.



## Models available and technical features

Code	EHUC001M2	EHUC001M2W0
<b>FEATURES</b>		
Production capacity	1.0 kg/h	1.0 kg/h
Power consumption	110 W	110 W
Power supply	100-230VAC 50/60Hz Power Switching	100-230VAC 50/60Hz Power Switching
Inlet water quality	Demineralised/drinking water	Demineralised/drinking water
Inlet water conductivity	0 - 1250 $\mu$ S*cm	0 - 1250 $\mu$ S*cm
Inlet water hardness	0 - 50 °f	0 - 50 °f
Inlet water pressure	0.02...1 MPa / 0.2...10 bar	0.02...1 MPa / 0.2...10 bar
Inlet water connection	John Guest 8 mm	John Guest 8 mm
Water drain external dimensions	11 mm	11 mm
Outlet mist external dimension	50 mm	50 mm
Dimensions	107.4 x 262.75 x 148 mm	107.4 x 262.75 x 148 mm
Weight	1.7 kg	1.7 kg
Degree of protection	IP20	IP20
<b>REGULATION</b>		
Type of controller	built-in	built-in
Command signal	ON/OFF, 0...10 V or 4...20 mA	ON/OFF, 0...10 V or 4...20 mA
<b>COMMUNICATIONS PORTS</b>		
RS-485 MODBUS RTU serial port	1	1
<b>CONNECTIVITY</b>		
Wi-Fi	optional with EVIF25SWX external module	built-in



## Accessories

REMOTE USER INTERFACES	
EV3K61XLESRB	remote user interface 74x32 mm, 4 touch keys, two-line LED display, power supply 24 VDC
PROBES	
EVHTP520	temperature/humidity probe with range 5- 95% R.H. and -10 - 70 °C
EVHP523	4...20 mA humidity transducer with range 5-95% R.H.
EVHTP523	humidity and temperature transducer, power supply 8 ... 28 VDC, 2 x 4-20 mA provided signal
REVERSE OSMOSIS KIT	
EHR0012	reverse osmosis water demineralisation system which produces 12 litres an hour
LINEAR STEAM DISTRIBUTORS	
UHFK02	linear steam distributor kit with different direction piping bends
EHUK009	connection for external forced ventilation (venting kit)
0031000043	transparent engineering plastic hose, diameter 8 mm, length 30 cm
SUPPORTS	
EHUK007	metal support
EHUK008	metal container



# HPN Series

## High pressure humidifiers



### Energy saving

Energy-efficient adiabatic humidifier



### Minimal maintenance

Works with demineralised water



### Variable speed management

Equipped with an EVCO inverter installed in the electrical compartment and physically separated from the hydraulic unit



### Distribution

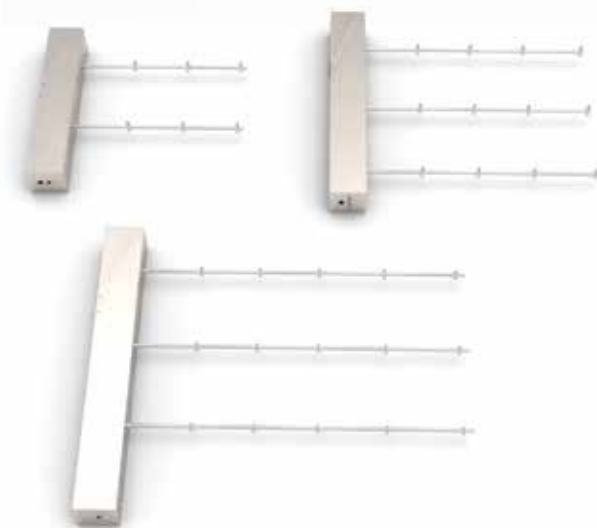
Rack with configurable number of nozzles



### Germ-free

VDI 6022-1 certification guarantees no risk of bacterial proliferation

- Humidity distributed into an AHU or the room
- Number of nozzles customisable (4 l/h or 8 l/h)
- Constant 80 bar pressure irrespective of number of nozzles
- Tiny particles produced (15 µm)
- Stainless steel pumping system
- EVCO controller with an EPcolor interface on the hydraulic unit and an EVCO controller with an EV3 interface on the distribution rack
- Pump control with instant viewing of operational parameters

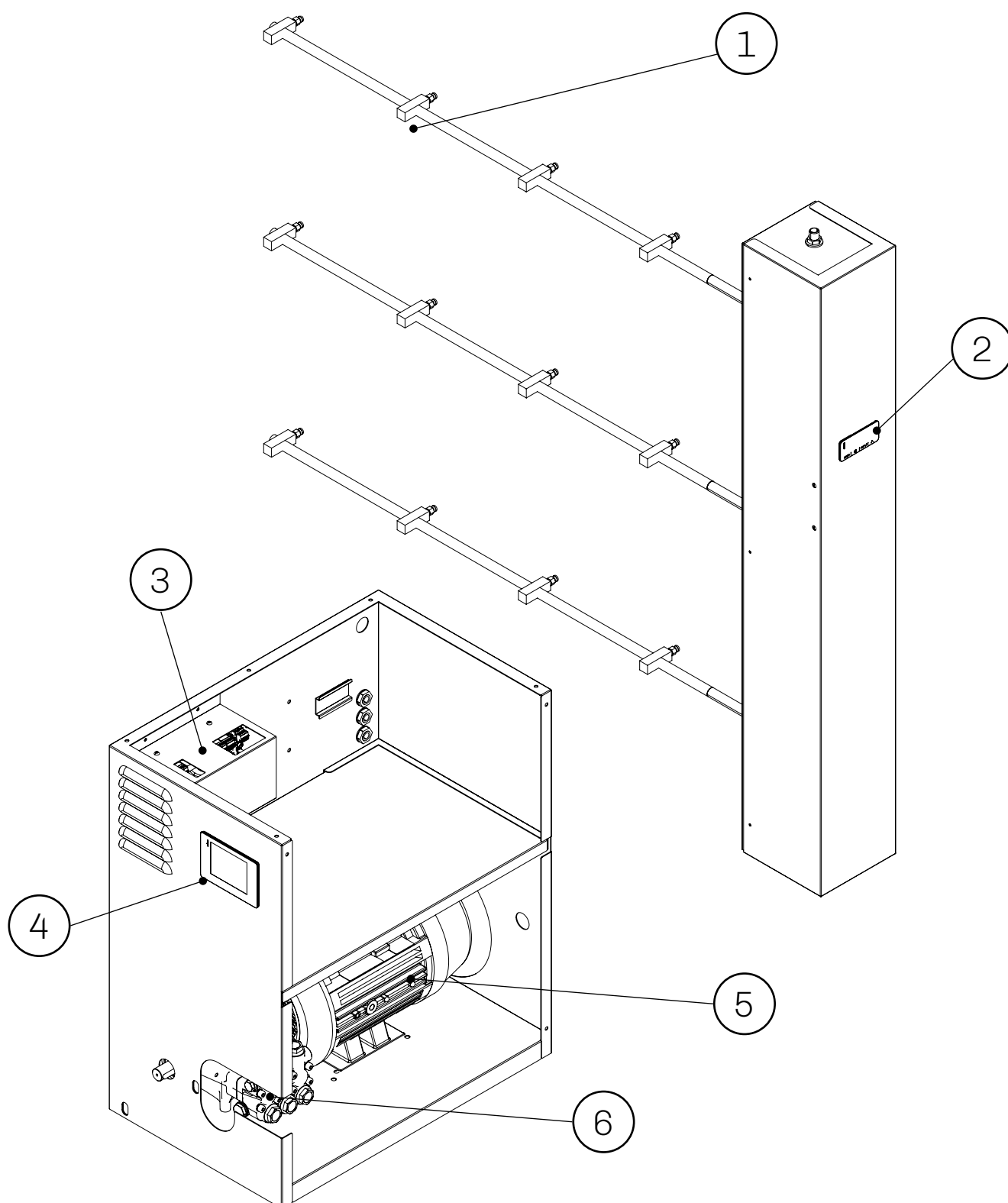


The humidifiers in the HPN series deliver steam into the room using a customisable distribution system, or directly into an AHU, using distribution racks with a configurable number of branches and nozzles. Several AHUs can be served by a single humidifier by connecting the hydraulic unit to multiple distribution racks. Each rack has its own controller connected to the AHU humidity sensor. Depending on the production requirement of each rack, the precision control of the hydraulic unit keeps the pressure of the fluid constant (8 MPa), producing mist with a particle size of around 15  $\mu\text{m}$ , irrespective of the size of the rack.

## Steam distribution racks

Distribution racks are available in three different heights; Distribution racks are available in three different heights; the length of the branches is variable and nozzle size may be 4 l/h or 8 l/h. The number of nozzles can be customised to the client's needs. The EVCO controller installed on the rack gives proportional control of the opening of the nozzles. Built entirely in stainless steel, the distribution system automatically controls the solenoid valve to discharge water, meeting the hygiene requirements of VDI 6022-1.

## Construction details



1. Nozzle

2. EV3 remote controller on rack

3. COMPACT inverter

4. EPJ controller

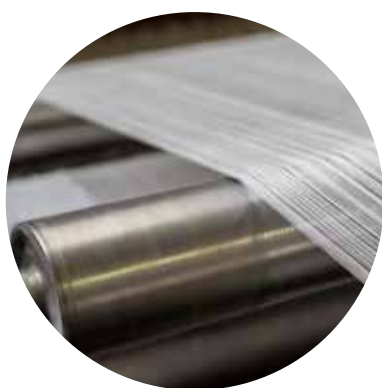
5. Motor

6. High-pressure pump

## Ideal in the following applications

### Residential and commercial environments

Comfort in our homes depends largely on creating the ideal climate, which science has established as being 20-24° C for temperature and 40-60 % for relative humidity. In winter in particular, when buildings are heated, the level of relative humidity can fall drastically. Skin and mucous membranes can become dry, allergies and respiratory tract infections are more likely to develop and unwanted microorganisms like bacteria and viruses can proliferate. Dry air can also affect our perception of the temperature (lower than it really is in winter), make us feel tired and cause a drop in concentration. Maintaining the right level of humidity is therefore crucial to ensure personal health and wellbeing, in the workplace too.



### Textile industry

Keeping air humidity within the parameters required for each particular product improves the quality of the fabric, process efficiency and productivity, as the yarns are more elastic, less prone to tearing (even when using high-speed looms) and produce less lint. The fabrics lose considerably less weight and static electricity, which attracts dust, is eliminated so machine performance is enhanced.

### Paper and printing industry

Paper is extremely sensitive to moisture in the air and, when it is being processed, humidity levels must be controlled very carefully. Once the paper has dried, it is wound into spools which can become distorted or tear if the air is too dry and this has repercussions on the subsequent stages in the process. In the printing industry, if humidity levels are too low, errors can occur during printing due to paper distortion, sheets of paper can stick together due to a build-up of dust and static electricity on the machinery can cause serious issues.



## Ideal in the following applications

### Food industry

Industrial production of flour, pasta and baked goods can be affected when there is not enough moisture in the atmosphere. If the temperature tends to rise during production, the ingredients, whose water content is dependent on the humidity in the surrounding atmosphere, can quickly lose water, with repercussions on their weight and quality. Cold steam generated by an adiabatic humidification system specially designed to ensure hygienic conditions during production, is the ideal, cost-effective solution for lowering the temperature while humidifying large food production departments.



### Biomedical industry

Components in engineering plastics for medical use, whether they are single use or otherwise, are manufactured in a protected atmosphere, where temperature and humidity levels are kept constant to prevent any variations in quality and size that may occur during the transformation process of hygroscopic polymers. This environment also ensures machinery a long life and efficiency, reducing friction and electrostatic charge. Thanks to VDI 6022-1 certification, the energy-efficient adiabatic humidification of HPN products also reduces the risk of bacterial proliferation in aseptic environments where biomedical products are produced and stored.

### Greenhouses, botanical gardens and farms

The microclimate in greenhouses must be kept at constant, optimal levels to increase productivity and minimise water consumption. Humidification plays a key role in maintaining ideal conditions, especially for plants (tropical plants, mushrooms, etc.) which absorb moisture from the air around them. Misting systems are ideal for ensuring the right microclimate both in winter, when relative humidity falls due to heating in the greenhouse, and in summer because the cold mist cools and humidifies at the same time, according to the adiabatic principle. Misting systems are also an efficient, cost-effective solution for cooling barns: heat stress reduces productivity on farms, having a negative effect on the animals' appetite, mortality rate, fertility and growth.



## Models available and technical features

Models		HPN2L DEMI	HPN3L DEMI	HPN4L DEMI	HPN5L DEMI	HPN6L DEMI	HPN7L DEMI	HPN8L DEMI	HPN9L DEMI	HPN11L DEMI	HPN14L DEMI
SPRAY PRODUCTION											
Production capacity	[kg/h]	120	180	240	300	360	420	480	540	660	840
Maximum pressure	[MPa/ bar]	8/80	8/80	8/80	8/80	8/80	8/80	8/80	8/80	8/80	8/80
SPRAY DISTRIBUTION											
Distribution rack (HPNxRACKxxx)		Customisable									
Maximum number of nozzles (4 l/h) controlled by the humidifier	[n]	30	44	60	74	90	104	120	134	164	210
Maximum number of nozzles (8 l/h) controlled by the humidifier	[n]	15	22	30	37	45	52	60	67	82	105
ELECTRICAL PROPERTIES											
Power consumption	[kW]	1.5	1.5	1.5	1.5	1.5	1.5	2.2	2.2	4	4
Power supply	[VAC, Hz]	230, 50/60	230, 50/60	230, 50/60	230, 50/60	230, 50/60	230, 50/60	230, 50/60	230, 50/60	400, 50/60	400, 50/60
Phases	[n]	1	1	1	1	1	1	1	1	3	3
WATER PROPERTIES											
Inlet water quality		Complies with microbiological standards for drinking water established by German standard (TrinkwV) and demineralised (completely or partially) water from drinking water. A VDI 6022 non return valve must be installed if non-demineralised water is used									
Inlet water conductivity	µS*cm	0...100									
Inlet water hardness	°f	0...5									
Inlet water pressure	[MPa/ bar]	0.02...14/0.2...10									
Inlet water connection		M 3/4" GAS									
Water drain external dimensions		M 1/4" GAS									
GENERAL CHARACTERISTICS											
Dimensions	WxHxD [mm]	515x600x335						660x600x335			
Weight	[kg]	50									
Main unit protection		IP20									
Distribution rack protection		IP40									
REGULATION											
Type of controller		built into hydraulic unit, remote on distribution rack									
Command signal		4... 20 mA (built-in controller), 0-10 V or ON-OFF (remote controller)									



## Accessories

DISTRIBUTION RACK	
HPNxxRACKxxx	customisable distribution rack
MIST ELIMINATOR	
HPNDROPXX	mist eliminator, various sizes
HOSES TO LOAD WATER	
0017020016	flexible hose 3/8 " GAS female that connects the distribution rack (by the meter)
HPNK03/04/05/06/07	unit/rack water inlet hose in engineering plastic, length 2 m-15 m
HPNK13/14/15/16/17	stainless steel unit/rack water inlet hose, length 2 m-15 m
REGULATIONS	
EV3411M7	single output electronic controller, power supply 230 VAC, multi-sensor analogue input
PROBES	
EVHP523	humidity transducer, power supply 8 ... 28 VDC, 1 x 4-20 mA provided signal
EVHTP523	humidity and temperature transducer, power supply 8 ... 28 VDC, 2 x 4-20 mA provided signal
EVTWN30F200	NTC probe, thermoplastic cable, 2 wires, 3 m length, 5 x 20 mm overmoulded bulb, IP68 protection
REVERSE OSMOSIS SYSTEMS	
EHR0200	200 l/h reverse osmosis system
EHR0300	300 l/h reverse osmosis system
EHR0400	400 l/h reverse osmosis system





# UHYD Series

## Mobile ultrasonic humidifiers



### Easy to move around

Fitted with castors and a brake



### Energy saving

Energy-efficient adiabatic humidifier



### Flexibility

Direct distribution into room can be custom configured



### Fed by water bottles

Machinery can be supplied on request with water bottles onboard

- Protection against no inlet water
- Proprietary built-in humidity probe
- Built-in controller with LCD user interface
- Overflow system prevents flooding

## Ideal in the following applications

- Preservation and display of fresh produce
- Wine cellars
- Temperature/humidity/food processing units and rooms
- Direct humidification in residential, commercial and industrial environments

## Models available and technical features

Models		UH03YD	UH09YD	UH15YD	UH21YD
MIST PRODUCTION					
Production capacity	[kg/h]	3	9	15	21
Maximum pressure	[mm H <sub>2</sub> O/bar]	9/0.0009	16/0.0016	16/0.0016	23/0.0023
Pipe connection external diameter	[mm]	110x1	110x2	110x3	160x2
MIST DISTRIBUTION					
Number of distributors that can be connected	[n]	1	2	3	2
Air capacity	m³/h	180	360	540	720
ELECTRICAL PROPERTIES					
Power consumption	[kW]	0.3	0.9	1.5	2.2
Power supply	[VAC, Hz]	230, 50			
Phases	[n]	1			
WATER PROPERTIES					
Inlet water quality		Complies with microbiological standards for drinking water established by regulations in force where installed; partially demineralised water is recommended to reduce routine maintenance; completely demineralised water must not be used			
Inlet water conductivity	µS*cm	70...1250 (not completely demineralised)			
Inlet water hardness	°f	5...50			
Inlet water pressure	[MPa/bar]	0.1...0.4/1...4			
Inlet water connection		M 1/2" GAS			
Water drain external dimensions		F 1/2" GAS			
GENERAL CHARACTERISTICS					
Dimensions	(WxHxD [mm])	600x330x500	640x420x500	640x550x500	700x600x500
Weight	[kg]	28	36	35	48
Degree of protection	---	IP20	IP20	IP20	IP20
REGULATION					
Type of controller	---	built-in			
Command signal	---	ON-OFF with proprietary probe			

## Accessories

VERTICAL DISTRIBUTORS	
UHYK01	vertical distributor diameter 110 mm
UHYK02	vertical distributor diameter 160 mm
REVERSE OSMOSIS SYSTEMS	
EHR0012	12 l/h reverse osmosis system
EHR0020	20 l/h reverse osmosis system

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