elsteam HUMIDIFIERS

Droplets of performance

Isothermal and adiabatic humidification solutions for air handling systems, in-room and industrial processes

EN

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.

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 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.

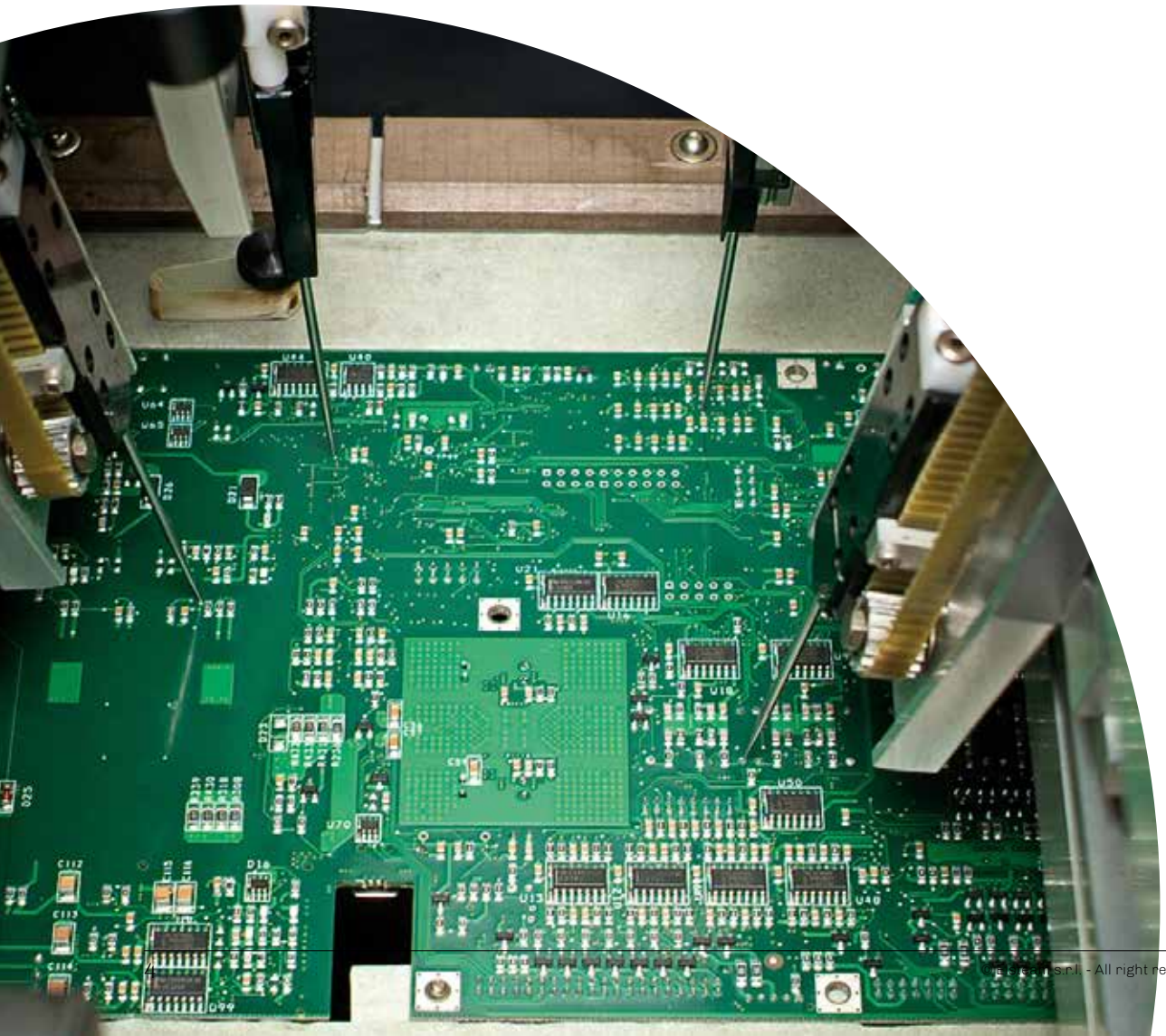
Original but simplified products, cost-effectiveness and an efficient after sales service have been the philosophy that has driven the development of Elsteam humidifiers.

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 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 in-put
- 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

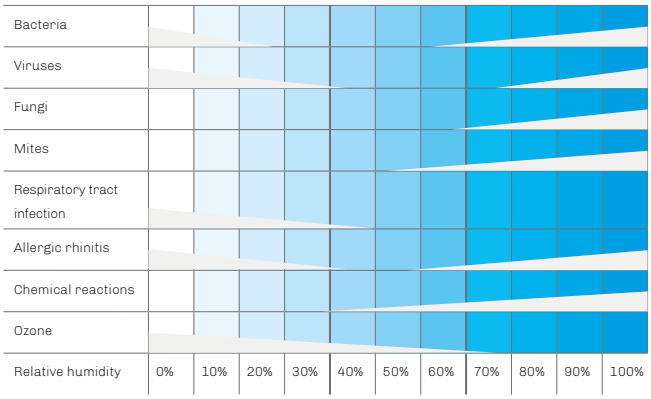
The importance of humidification

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.

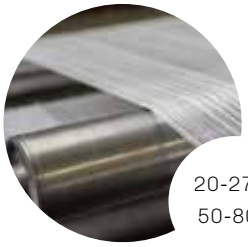
Food

0-40°C
40-85%

Chemical-pharmaceutical

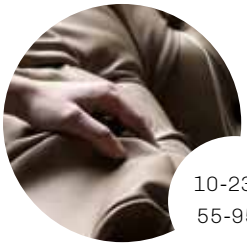
20-25°C
20-70%

Textile



20-27°C
50-80%

Leather



10-23°C
55-95%

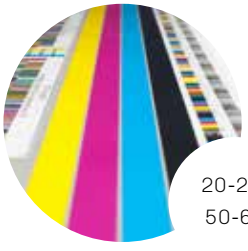
Paper

15-25°C
40-65%

Wood

18-30°C
40-60%

Printing



20-24°C
50-60%

Film making

20-25°C
40-70%

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.

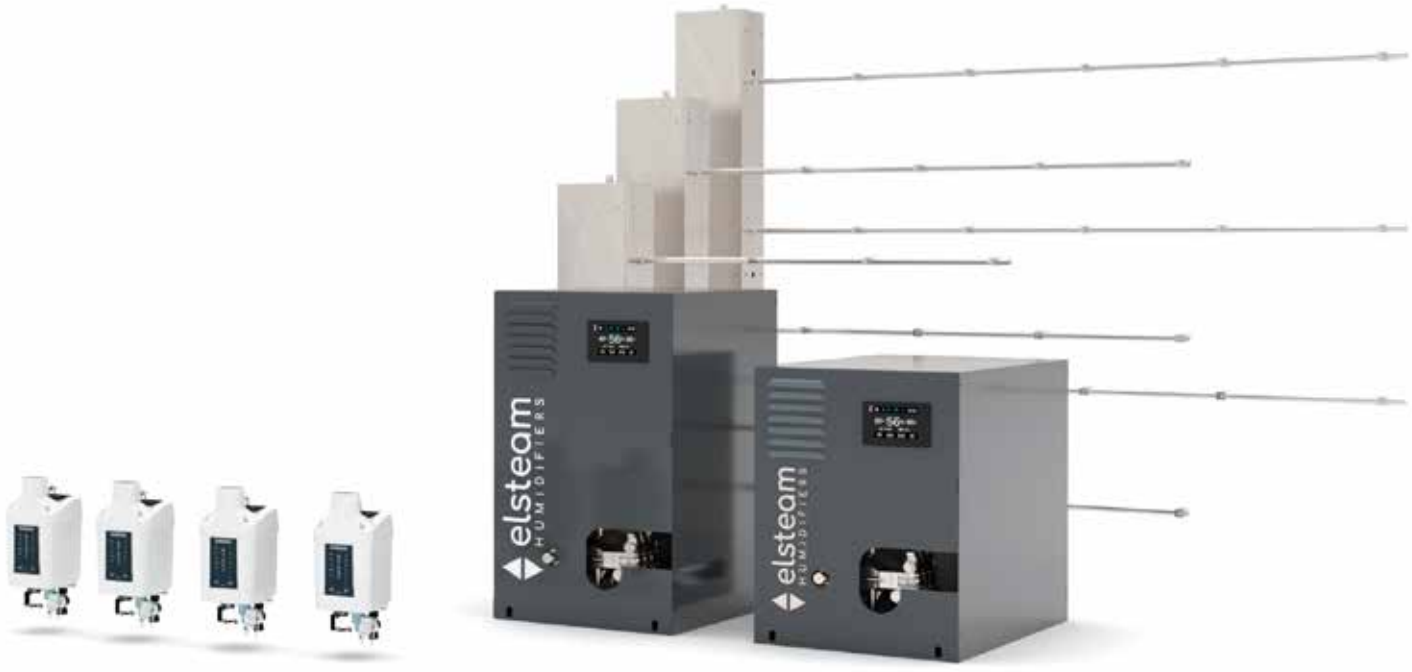
Adiabatic Humidifiers

- 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

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

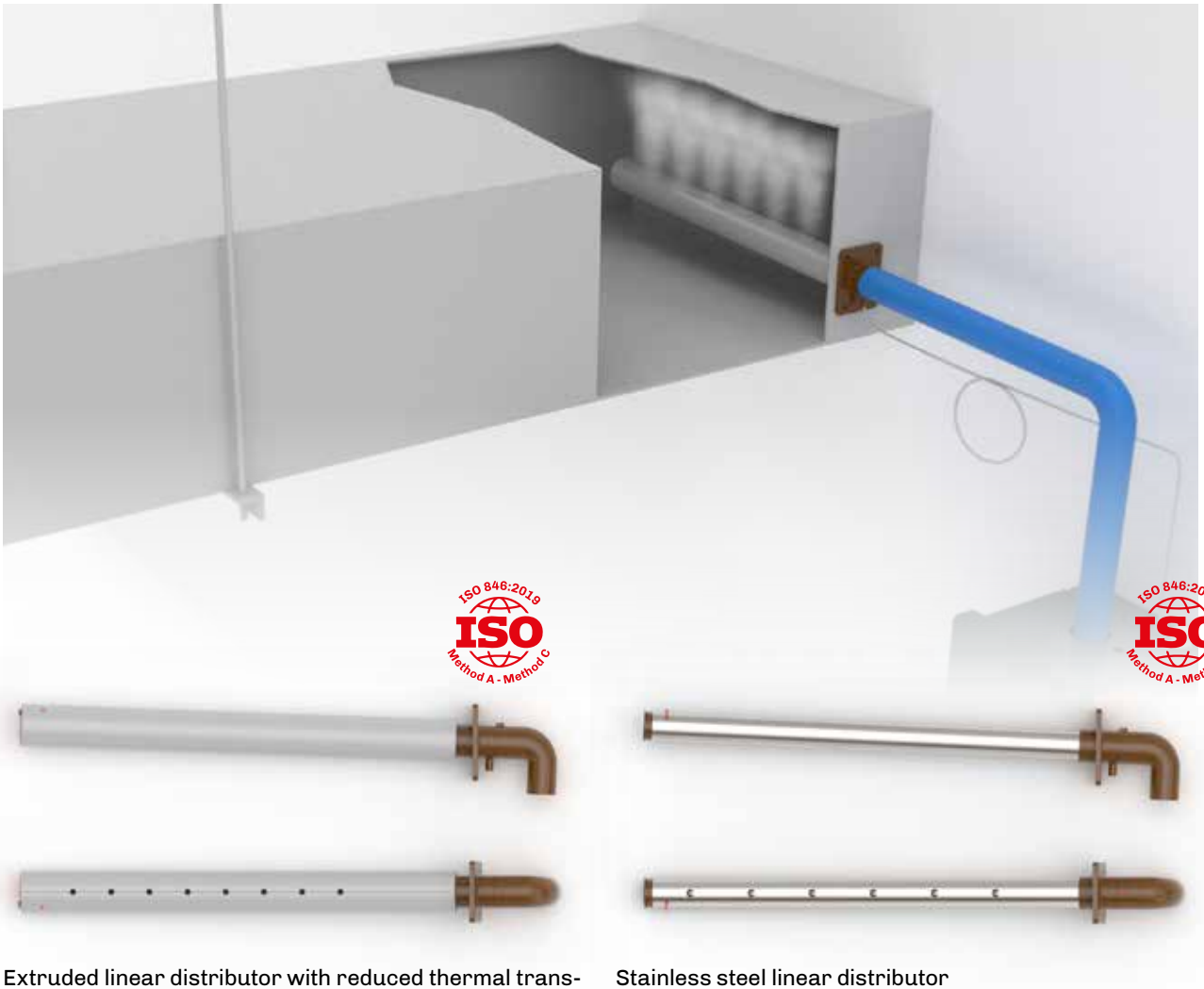
Saves water
The operation algorithm ensures only the amount of steam required is produced, optimising water consumption

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

Rapid
Steam is produced in a short amount of time

- 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 system



Extruded linear distributor with reduced thermal transmittance

The surface in non-porous, waterproof engineering plastic prevents bacterial proliferation and complies with Method A and Method C of ISO 846. It withstands sudden changes in temperature and chemicals, thus making it easy to sterilise.

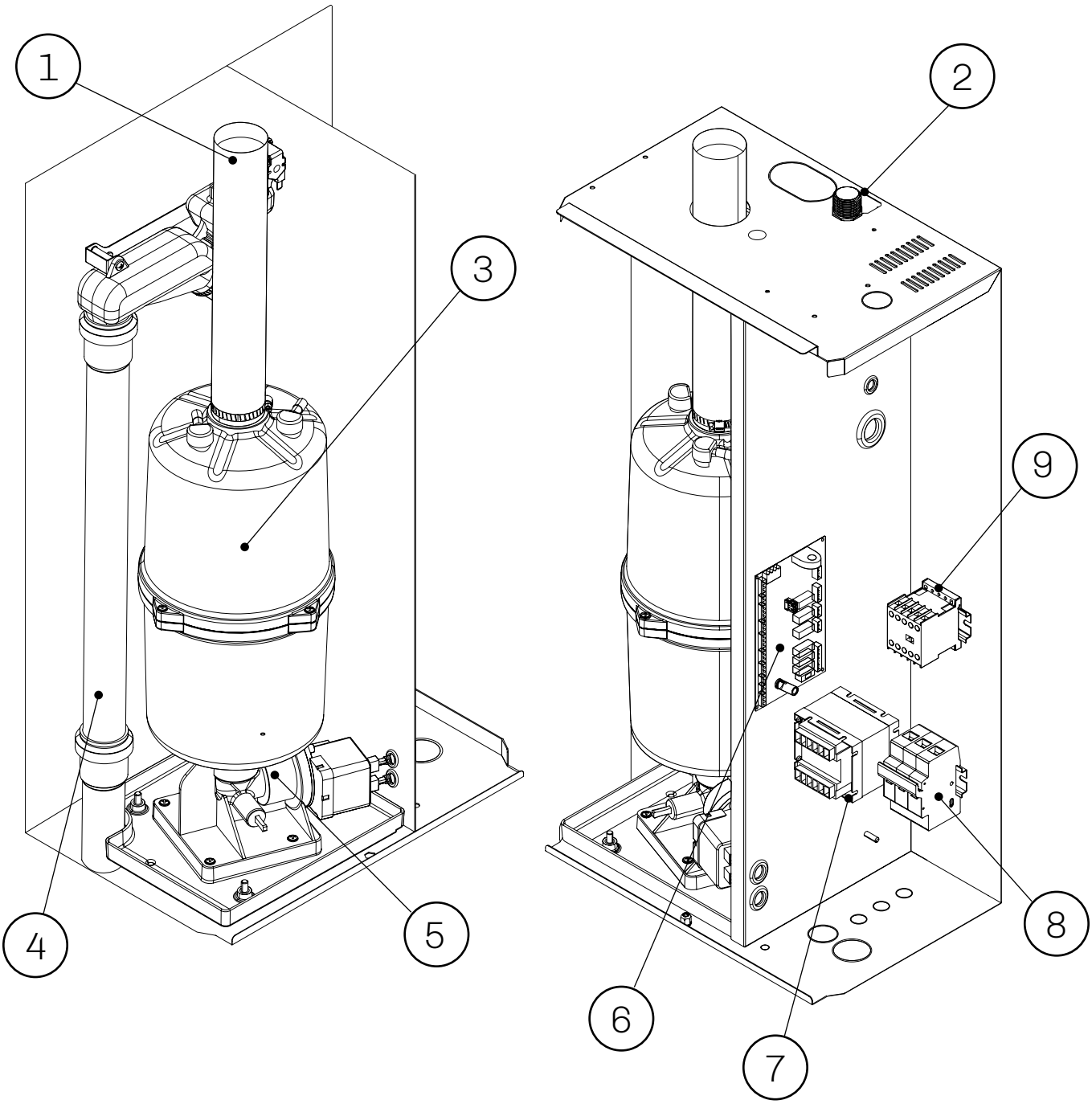
Stainless steel linear distributor

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	015T4
EHKX models	003M2	005M2	003T2	005T2	003T4	005T4	010T2	010T4	015T4
STEAM PRODUCTION									
Production capacity [kg/h]	3	5	3	5	3	5	10	10	15
Maximum pressure [mm H_2O/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
Power supply [Vac, Hz]	230, 50/60				400, 50/60		230, 50/60	400, 50/60	400, 50/60
Phases [n]	1	1	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	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 [mm]	412x766x248								
Operating conditions [°C, RH]	1...40, max. 80% non-condensing								
Storage conditions [°C, RH]	-10...70, max. 95% non-condensing								
Degree of protection	IP20								
REGULATION									
Type of controller	Built-in control unit with simplified user interface EV3 in EHKT models, built-in control unit with advanced user interface in EHKX models								
Command signal	ON-OFF, proportional 0...10 V, transducer 0...10V/4...20 mA								
CONNECTIVITY									
RS-485 MODBUS	Built-in								

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_2O/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 [mm]	522x893x380					928x900x375	
Operating conditions [°C, RH]	1...40, max. 80% non-condensing						
Storage conditions [°C, RH]	-10...70, max. 95% non-condensing						
Degree of protection	IP20						
REGULATION							
Type of controller	Built-in control unit with simplified user interface EV3 in EHKT models, built-in control unit with advanced user interface in EHKX models						
Command signal	ON-OFF, proportional 0...10 V, transducer 0...10V/4...20 mA						
CONNECTIVITY							
RS-485 MODBUS	Built-in						

The list of accessories is available on our website www.elsteam.it

VEH

Immersed electrode
humidifiers for air handling units (AHU)

Flexibility

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

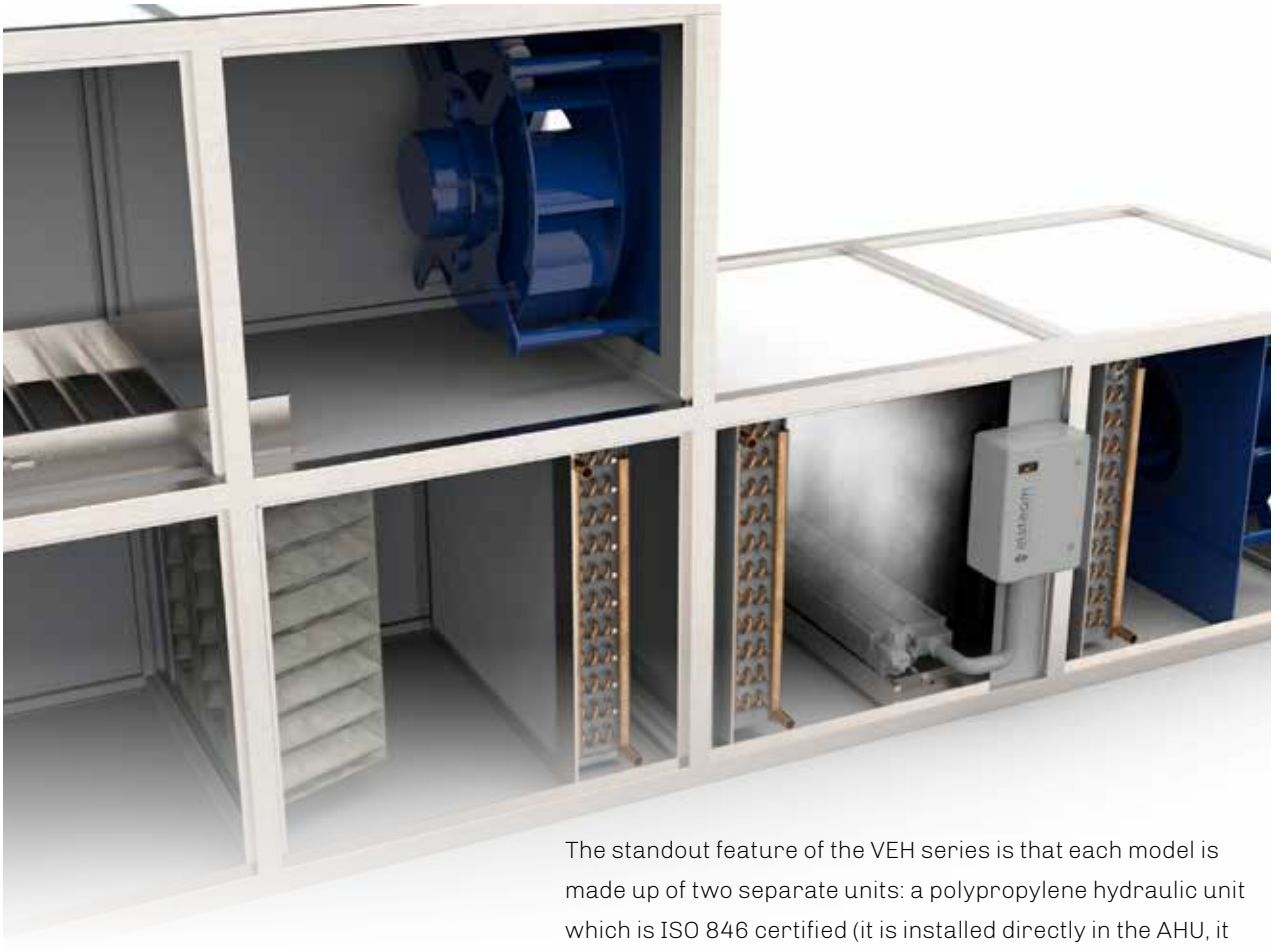
Germ-free steam

Isothermal humidification produces sterile steam

Maximum efficiency

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

- 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



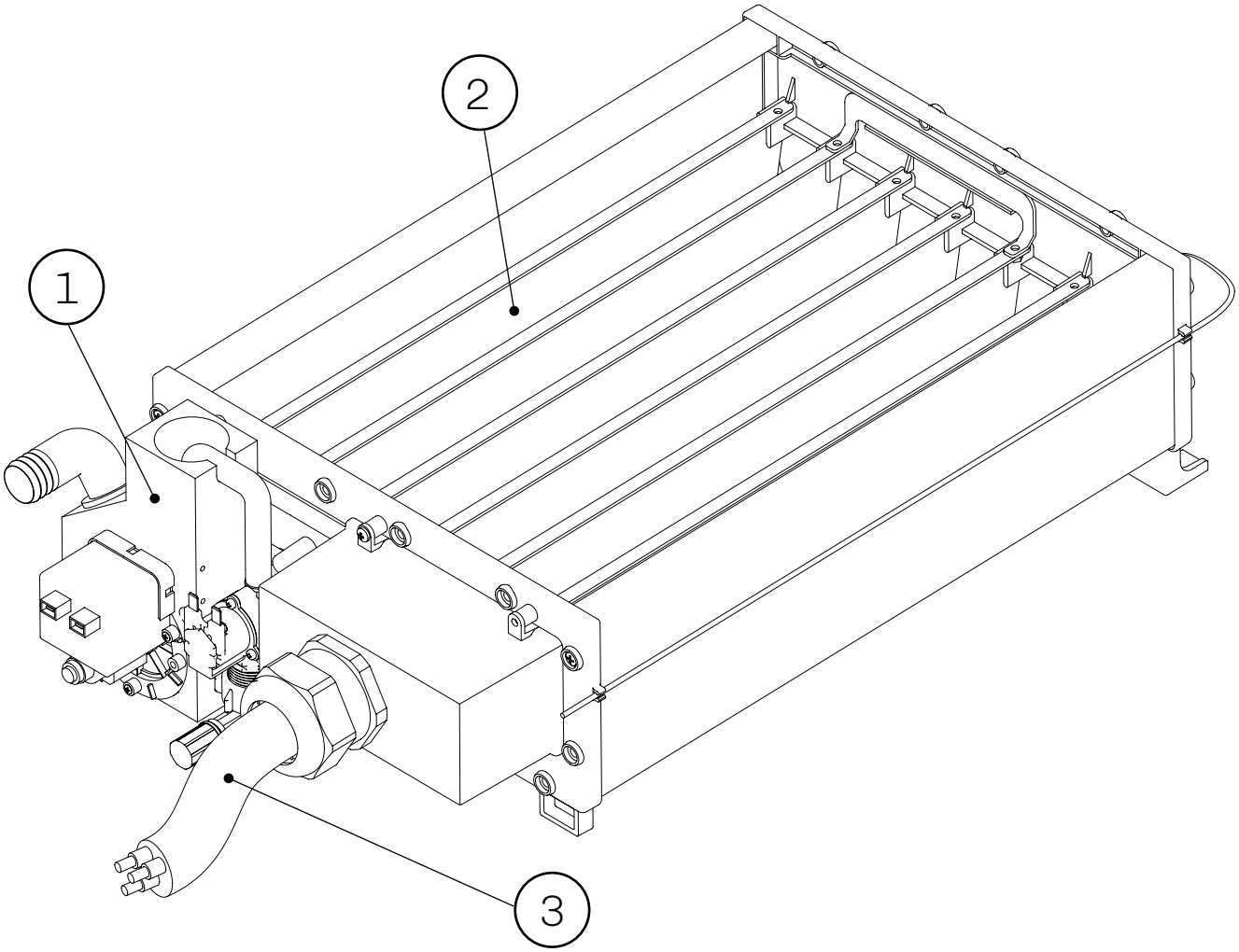
The standout feature of the VEH series is that each model is made up of two separate units: a polypropylene hydraulic unit which is ISO 846 certified (it is installed directly in the AHU, it has no distribution piping for optimal steam release and helps heat the room) and an electrical control unit with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

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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.

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	EHKD 010T4XS	EHKD 020T4S	EHKD 020T4XS	EHKD 030T4M	EHKD 030T4S
STEAM PRODUCTION					
Production capacity [kg/h]	10	20		30	
ELECTRICAL PROPERTIES					
Power consumption [kW]	7.5	15		22.5	
Power supply [Vac, Hz]	400, 50/60				
Phases [n]	3				
Current per phase [A]	11	22		32	
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	/
Depth 7 electrodes [mm]	/	/	635	/	785
Hydraulic unit weight [kg]	15	18	18	20	20
Operating conditions [°C, RH]	1...40, max. 80% non-condensing				
Storage conditions [°C, RH]	-10...70, max. 95% non-condensing				
Electrical panel protection	IP55				
Hydraulic unit protection	IPX0				
REGULATION					
Type of controller	Built-in				
Command signal	ON-OFF, proportional 0...10 V, transducer 0...10V/4...20 mA				
CONNECTIVITY					
RS-485 MODBUS	Built-in				

Models available and technical features

Models	EHKD 040T4L	EHKD 040T4S	EHKD 060T4XL	EHKD 060T4M	EHKD 080T4L	EHKD 100T4XL
STEAM PRODUCTION						
Production capacity [kg/h]	40		60		80	100
ELECTRICAL PROPERTIES						
Power consumption [kW]	30		45		60	75
Power supply [Vac, Hz]	400, 50/60					
Phases [n]	3					
Current per phase [A]	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]	1185	/	1385	/	/	/
Depth 7 electrodes [mm]	/	785	/	985	1185	1385
Hydraulic unit weight [kg]	24	24	26	26	31	33
Operating conditions [°C, RH]	1... 40, max. 80% non-condensing					
Storage conditions [°C, RH]	-10... 70, max. 95% non-condensing					
Electrical panel protection	IP55					
Hydraulic unit protection	IPX0					
REGULATION						
Type of controller	Built-in					
Command signal	ON-OFF, proportional 0...10 V, transducer 0...10V/4...20 mA					
CONNECTIVITY						
RS-485 MODBUS	Built-in					

The list of accessories is available on our website www.elsteam.it

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 TFT graphic touch-screen 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

Wine cellars and bottle coolers

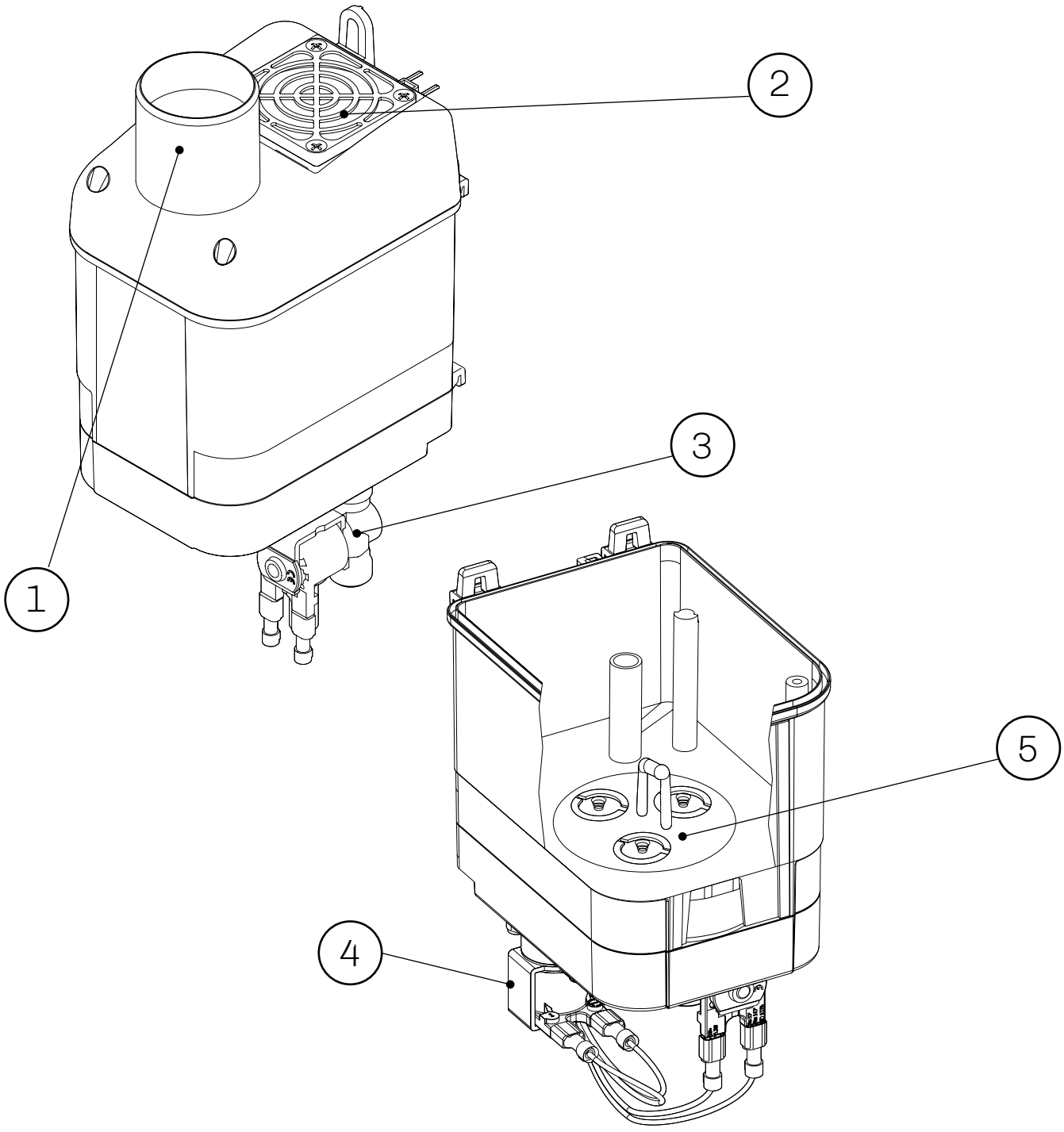
Air renewal units

Cigar humidors and display cases

Refrigerated units and cold rooms

Fan coils

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

Models	EHUC001M2
STEAM PRODUCTION	
Production capacity [kg/h]	1,0
ELECTRICAL PROPERTIES	
Power consumption [W]	110
Power supply [Vac, Hz]	100...230, 50/60 (power switching)
WATER PROPERTIES	
Inlet water quality	Demineralised/drinking water
Inlet water conductivity [µS*cm]	0...1250
Inlet water hardness [°f]	0...50 °f
Inlet water pressure [MPa/bar]	0.02...1/0.2...10
Inlet water connection	John Guest 8mm
GENERAL CHARACTERISTICS	
Dimensions [mm]	107.4x262.7x148
Weight [kg]	1.7
Operating conditions [°C, RH]	1...40, max. 80% non-condensing
Storage conditions [°C, RH]	-10...70, max. 95% non-condensing
Degree of protection	IP20
REGULATION	
Type of controller	Built-in
Command signal	ON-OFF, proportional 0...10 V, transducer 0...10V/4...20 mA
CONNECTIVITY	
RS-485 MODBUS	Built-in

The list of accessories is available on our website www.elsteam.it

HPN

High pressure humidifiers

Energy saving
Energy-efficient adiabatic humidifier

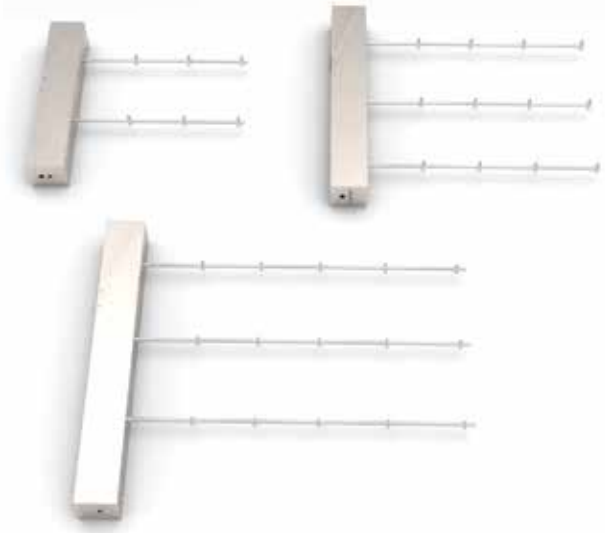
Distribution
Rack with configurable number of nozzles

Minimal maintenance
Works with demineralised water

Germ-free
VDI 6022-1 certification guarantees no risk of bacterial proliferation

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

- 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

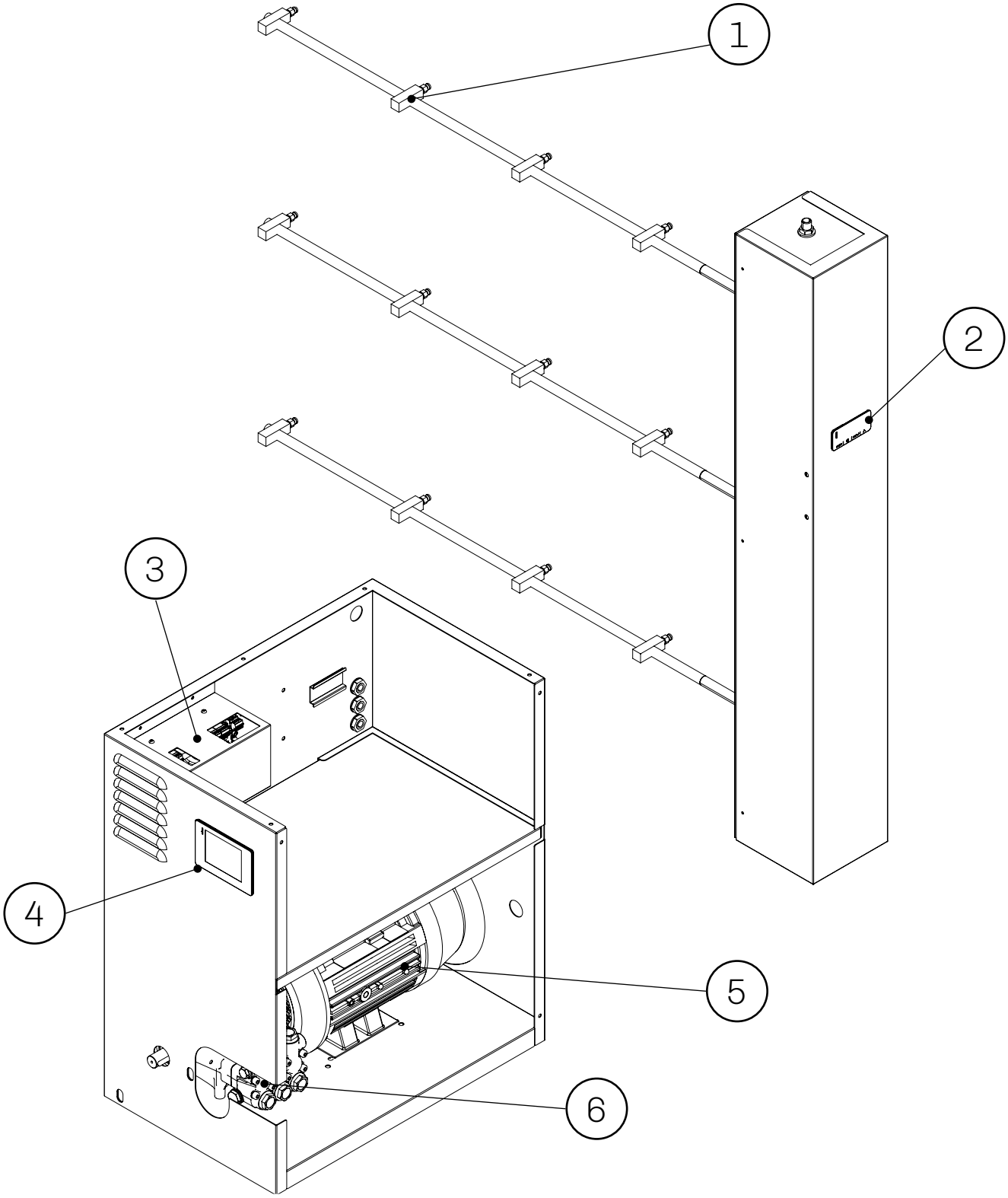


The humidifiers in the HPN series deliver steam into the room using a customisable distribution system, or directly into an AHU, using distribution racks with a configurable number of branches and nozzles. Several AHUs can be served by a single humidifier by connecting the hydraulic unit to multiple 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 µm, irrespective of the size of the rack.

Steam distribution racks

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

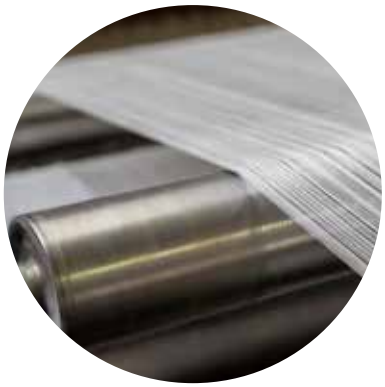


1. Nozzle
2. EV3 remote controller on rack
3. COMPACT inverter
4. EPJ controller
5. Motor
6. High-pressure pump

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	EHPN 060 M2DW	EHPN 120 M2DW	EHPN 180 M2DW	EHPN 240 M2DW	EHPN 300 M2DW	EHPN 420 M2DW	EHPN 540 M2DW	EHPN 660 T4DW	EHPN 840 T4DW
SPRAY PRODUCTION									
Production capacity [kg/h]	60	120	180	240	300	420	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
SPRAY DISTRIBUTION									
Maximum number of nozzles (4l/h) [n]	15	30	44	60	74	104	134	164	210
Maximum number of nozzles (8l/h) [n]	7	15	22	30	37	52	67	82	105
ELECTRICAL PROPERTIES									
Power consumption [kW]	1.5	1.5	1.5	1.5	1.5	1.5	2.2	4	4
Power supply [Vac, Hz]	230, 0/60	230, 0/60	230, 0/60	230, 0/60	230, 0/60	230, 0/60	230, 0/60	400, 0/60	400, 0/60
Phases [n]	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									
Main unit dimensions [mm]	515x600x335						660x600x335		
Main unit weight [kg]	50								
Operating conditions [°C, RH]	1...40, max. 80% non-condensing								
Storage conditions [°C, RH]	-10...70, max. 95% non-condensing								
Main unit protection	IP20								
Distribution rack protection	IP40								
REGULATION									
Type of controller	Built-in with advanced EPcolor user interface on the main unit and simplified EV3 user interface on the distribution rack								
Command signal	ON-OFF, proportional 0...10 V, transducer 0...10V/4...20 mA								
Connectivity									
RS-485 MODBUS	Built-in								

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