



mc multizone  
simple and robust,  
ideal for large industrial environments

# The compressed air adiabatic humidifier

Ideal for medium/large industrial environments, or in ducts in air handling units

- guaranteed hygiene: automatic procedures to prevent stagnation of water, and UV disinfection
- self-cleaning nozzles: automatic cleaning cycles to minimise maintenance
- user-friendly: display with simple and immediate user interface.

The operating principle of the mc system is to run compressed air and water through atomising nozzles so as to create a mist of very fine droplets.

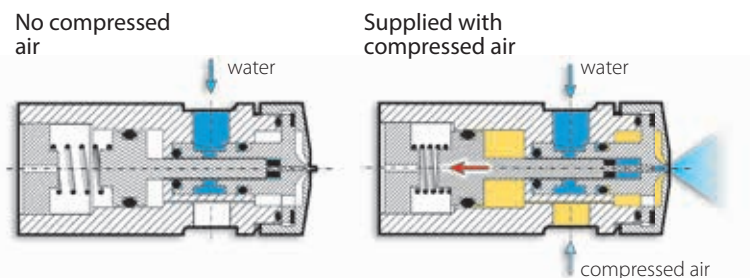
This atomised water is readily absorbed by the air, humidifying and cooling it. In fact, evaporation occurs by "absorbing" sensible heat from the air that, as a consequence, is cooled.

The microprocessor electronic controller on the mc multizone, this too designed and built by Carel, ensures completely automatic and reliable operation,

guaranteeing the required humidity level at all times.

The AISI 316 stainless steel atomising nozzles feature an exclusive self-cleaning system that reduces maintenance, even when the feedwater has a significant mineral salt content.

The mc multizone system can be supplied complete with nozzle installation kit, UV lamp disinfection system, and accessories for quick installation and commissioning.



## Guaranteed hygiene

Automatic washing and emptying of the water whenever the unit stops



## Multizone

Multiple cabinets can be connected in a master-slave network for multizone applications



## Easy to install

The system adapts automatically to the pressure drop along the compressed air lines

## System composition:

### Control cabinet

This manages the supply of water and compressed air to the nozzles. The water is atomised based on an external control signal or, in the case of independent control, so as to maintain the humidity/temperature set point.

The system has the ability to control humidity independently in multiple zones (rooms, AHUs, cold rooms, cellars and many others), using a master-slave layout: one Master and up to 5 Slaves, connected in a pLAN (serial communication).

The Master is fitted with a display providing complete information (parameters, states, messages) on both the Master itself and all of the connected Slaves.



### Special atomising nozzles

These can be installed directly in the environment being humidified/cooled, or in an AHU/duct.

Made completely from stainless steel AISI 316, atomise the water into very fine droplets with a diameter of 5-10 µm, which are rapidly absorbed by the air.



### Racks for duct installation (optional)

These are made to measure based on the AHU/duct, come complete with AISI 316 stainless steel air/water lines, nozzles and valves.

Completely tested with compressed air and water before delivery.

### UV lamp disinfestation system and protection filters (optional)

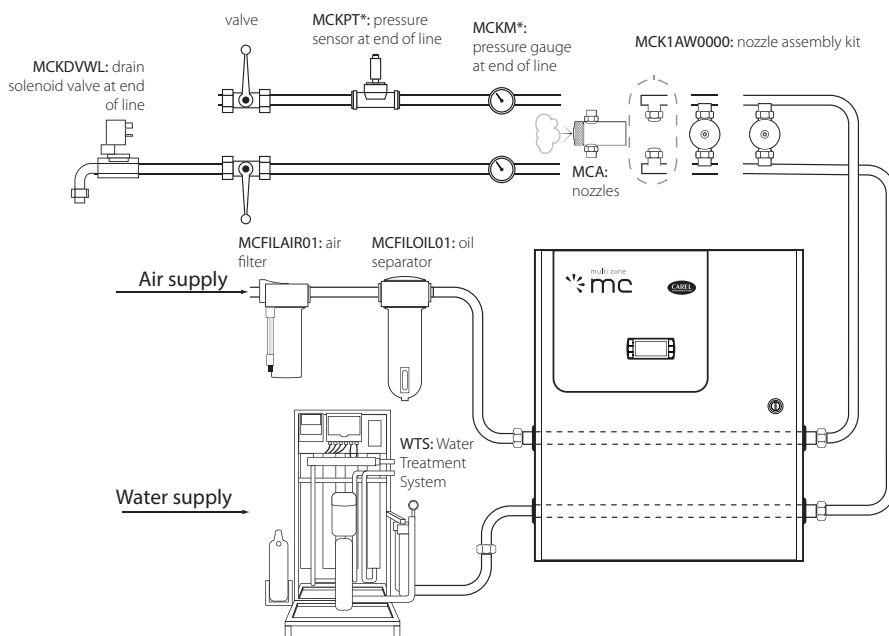
These make system feedwater more hygienic. The operating principle is very simple: the flow of water is radiated by UV rays, which kill any germs and eliminate any bacteria, mould, spores, etc. present in the water.



### Water Treatment System (optional)

System that produces demineralised water using the principle of reverse osmosis. Using demineralised feedwater reduces the required frequency of routine maintenance, and prevents mineral salts from being carried into the room.

## mc multizone overview drawing



## Water quality

The constructional and functional features of mc multizone mean it can operate on both untreated drinking water and demineralised water.

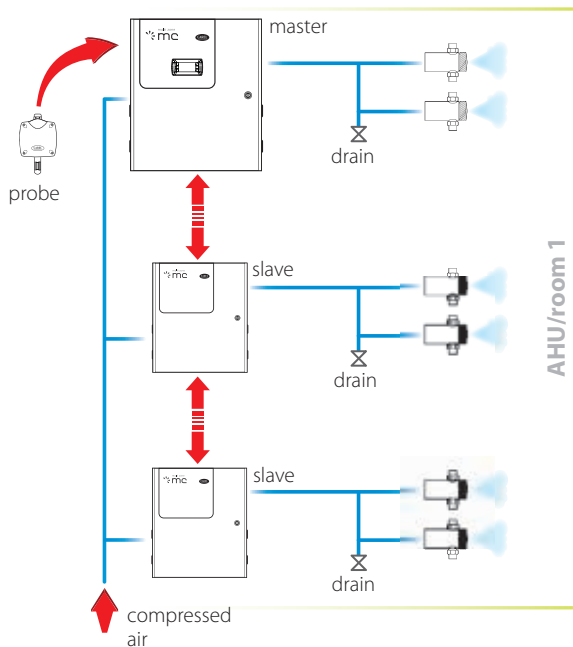
To reduce maintenance and avoid dissolved salts being entrained into the environment, demineralised water is recommended. This is also specified by the main hygiene standards for HVAC systems, such as UNI 8884, VDI6022 and VDI3803.

# Simple installation for every type of application

## Master-Slave configuration

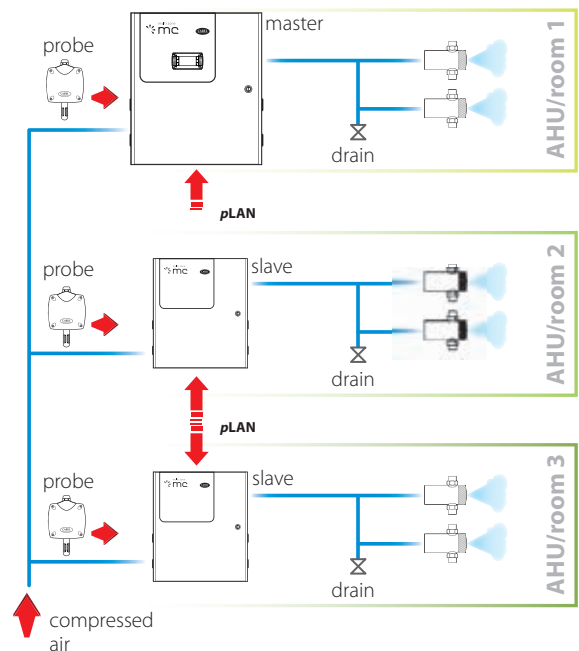
### High capacity applications

In applications in rooms or ducts where more than 230 kg/h of humidification is required, and thus more than one mc cabinet, the control signals (probes, external signals, limit probe) are connected to the Master only and all the cabinets generate a humidification and cooling capacity that is proportional to demand. In this way, a system can be developed with a capacity up to 1380 kg/h.



### MULTIZONE applications

In applications with multiple zones, rooms or ducts, each with its own humidity/temperature set point. Each cabinet, Master and Slave, receives the signals (probes or external signals) from the corresponding zone, and generates the capacity required to reach its own set point. Note that, in the case of installations in large spaces, these can be divided into zones, each with their own humidity/temperature probe, using a multizone Master-Slave system.



Additional accessories are available to simplify installation and commissioning of mc multizone. The main accessories are:



#### pressure sensor at end of the line - auto-balancing:

if this is installed at the end of the longest compressed air line that supplies the nozzles, the controller can regulate the air pressure at the optimum value (2.1 bars) for the nozzle that is furthest away, thus compensating for pressure drop. This enormously simplifies the setup of the installation, which will work perfectly right from the very first time.



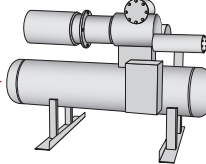
#### drain valve at end of the line - anti-stagnation:

this is installed at the end of the water line that supplies the nozzles. In this way, mc multizone can empty the line when the unit is off and perform the automatic periodical washing cycles. These procedures ensure a high level of hygiene by avoiding stagnated water in the line.

## Installation in AHUs/ducts

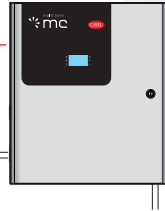
### Air compressor

mc multizone requires compressed air produced by an external compressor, not supplied by CAREL. The volume of air at standard atmospheric pressure required to atomise one litre of water is 1.27 Nm<sup>3</sup>/h, compressed to a pressure between 4 and 10 bars.



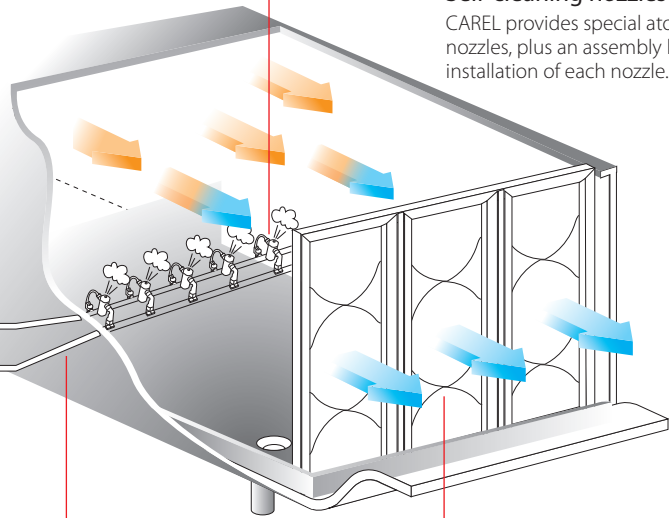
### Cabinet

The cabinet is available in various models, according to the maximum capacity, type of control (ON/OFF or modulating), type of feedwater, Master/Slave and power supply.



### Self-cleaning nozzles

CAREL provides special atomising nozzles, plus an assembly kit for the installation of each nozzle.



### Droplet separator

With fibreglass or AISI304 filtering mesh (duct installations only)

### Racks

Upon request, CAREL can also provide stainless steel racks for ducted installations, where the atomising nozzles are installed. The racks and the lines for installations in rooms are not supplied by CAREL.

## Applications

With more than 5,000 installations all over the world, mc multizone is one of best-selling and most widely tested adiabatic humidification systems on the market for medium/high capacity installations where humidification and evaporative cooling is required directly in the room.

Typical applications are those that require adiabatic humidification and evaporative cooling directly in the room, with maximum absorption:



Textiles industry



Paper processing/stores and printing facilities



Wood/timber processing/stores



Tobacco processing/stores



Fruit and vegetable cold stores



Wine and barrel cellars

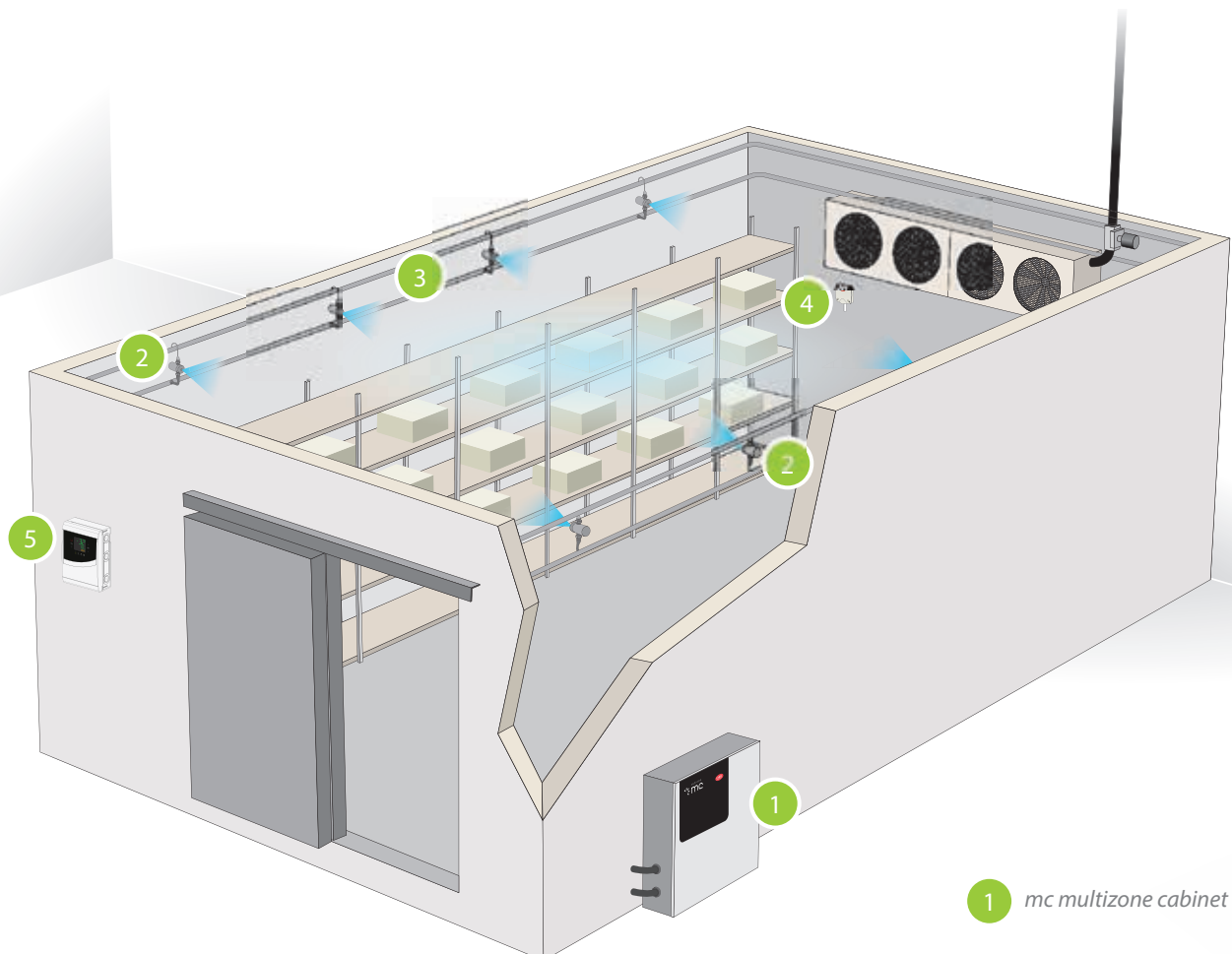
# Application examples

## Fruit and vegetable cold stores

The purpose of a cold room is to keep produce fresh, without alterations, from the point of harvest to the point of sale. Consequently, the correct air quality needs to be ensured, in order to maintain the freshness of food, preserve its organoleptic properties (flavour, texture, fragrance and appearance), prevent surface deterioration and guarantee it is healthy from a bacteriological point of view. Humidity, as well as temperature, is a fundamental parameter that needs to be

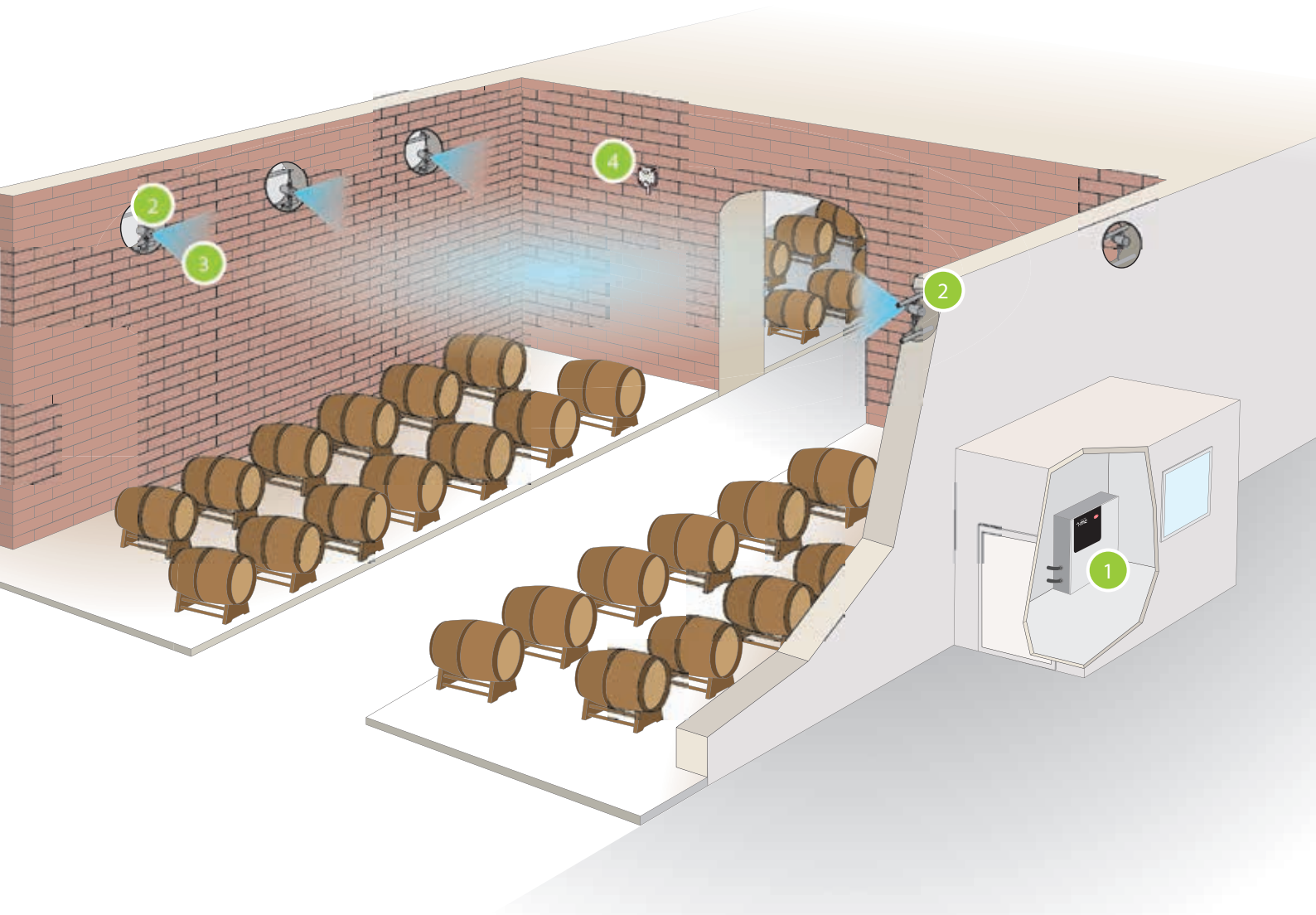
managed and kept at the right level in relation to the specific foodstuff stored. Fruit and vegetables have a high moisture content and must be stored at low temperature and high relative humidity, to avoid dehydration (meaning weight loss and consequently lower sales income), surface deterioration (wrinkling) and control metabolic ripening processes, which still continue after harvesting or picking.

For these reasons, in large cold rooms where compressed air is available, mc multizone is the ideal solution for adiabatic humidification directly in the store room: excellent absorption efficiency, possibility of multizone applications, and guaranteed hygiene.



- 1 *mc multizone cabinet*
- 2 *nozzles*
- 3 *air and water lines*
- 4 *humidity probe*
- 5 *UltraCella (cold room controller)*

CAREL offers an integrated temperature and humidity control solution for food cold stores: Ultracella + mc multizone. The combination of these two products means that temperature and humidity are under control at all times, for perfect food storage.



## Wine and barrel cellars

Wine is a product that is strongly affected by climatic conditions. Temperature, humidity and light are the main factors that can modify its characteristics. In wine cellars, it is fundamental to ensure the right humidity level for suitable maturation, ageing and storage of wine. Low humidity in the barrel room may cause the wooden barrels to dry out and product to evaporate between the slats. In bottle cellars, on the other hand, low humidity causes the corks to dehydrate, reducing their volume and elasticity and

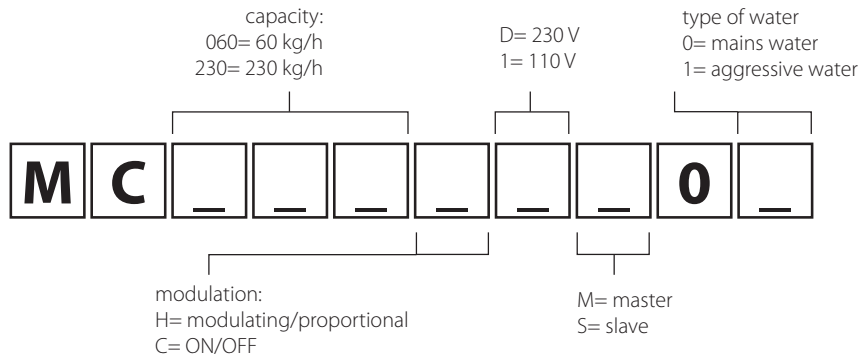
allowing wine to evaporate, as well as air to enter the bottle and modify the original characteristics of the product. Vice-versa, excessive humidity may lead to the formation of mould and ruin the labels, a less important yet equally unpleasant phenomenon. All these aspects mean a decline in product quality, but above all a reduction in earnings (due to losses in quantity) and an increase in production costs (continuous refills, etc...). In large wine cellars that have a

compressed air system available, mc multizone is the ideal solution for adiabatic humidification directly in the room: excellent absorption efficiency, thanks to the minuscule size of the droplets and close mixing with the compressed air, even in spaces with low ceilings and kept at low temperatures.

## Technical specifications

Features	MC060*	MC230*
Maximum humidification capacity	60 kg/h	230 kg/h
Power supply	230 Vac single-phase, 50/60 Hz / 110 Vac single-phase 60 Hz	
Operating conditions	1T40 °C, 0 to 80% RH	
Ingress protection	IP40	
<b>Water supply/drain</b>		
Connection	1/2" G	1/2" G
Temperature limits	1T50 °C	
Water pressure limits	3 to 7 bars	
Total hardness	0 to 400 ppm CaCO <sub>3</sub>	
Conductivity limits	0 to 1250 µS/cm	
<b>Air line</b>		
Intake/outlet connection	1/2" G	1/2" G
Temperature limits	1T50 °C	
Air pressure limits	5 to 7 bars	
Required air pressure	4 to 10 bars	
<b>Nozzles</b>		
Material	stainless steel (AISI 316)	
Nozzle capacity at 2.1 bars	2.7 - 4.0 - 5.4 - 6.8 - 10 kg/h	
<b>Network</b>		
Network connection	Modbus®, LON, TCP/IP, SNMP (with optional card)	
<b>Dimensions</b>		
Cabinet dimensions ( L x W x H)	500 mm x 150 mm x 580 mm	

## Part numbers



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