



humiFog direct

The humidification solution
that improves your business

Connected Efficiency

humiFog direct

High-pressure sprayer for direct humidification in medium-sized environments. The evaporative effect, a direct consequence of adiabatic humidification, counterbalances the indoor thermal loads, thus reducing the work of the air-conditioning system

Correct installation of the distribution system is essential to ensure uniform humidification and avoid condensation on nearby objects.



In many industrial and conservation processes, guaranteeing the right level of relative humidity increases product quality, helps reduce waste and saves time and energy.

humiFog direct is CAREL's adiabatic humidification solution for direct room applications. Introducing pure water in very small droplets, which evaporate spontaneously in the air, ensures the right relative humidity level with very low energy consumption.

In addition, due to the evaporative cooling effect, the heat generated inside the rooms is absorbed, lowering the temperature without wasting additional energy on cooling.

humiFog direct is hygienically safe, as thanks to automatic washing of the water lines, only fresh and clean water is atomised and sprayed.

Designed for industrial environments, this product combines maximum reliability with low running costs. An effective and easy-to-install system that can be adapted to suit any context, even the more complex.

Control cabinet

The powerful and high performance pumping unit can pressurise the water to a constant 70 bars, ensuring the highest performance with very low energy consumption. The system can manage up to two different zones with independent set points. The solution is modular, and thus easily expandable to cover different humidification loads.

Specifications	UA040*	UA080*	UA050*	UA090*
Rated capacity (kg/h)	40	80	50	90
Power supply	230 V 1 phase, 50 Hz		120 V 1 phase, 60 Hz	
Control zones	Up to 2			
Pressure (bars)	70			
Power consumption	4 W per l/h			



Increased productivity

The right relative humidity level means the properties of materials remain stable, reducing waste and quality problems in industrial processes.



Easy installation

Designed with innovative features that minimise installation and commissioning times, including the line fill and drain valves already built into the cabinet.



Energy saving

Minimum energy consumption: just 4 watts of power consumed per l/h of sprayed water.

Touch screen display

pGDx is the new touch screen display that sets a new standard in user experience. The information is immediately clear, with explanatory icons that make the display efficient and pleasant to use. Designed to simplify management of the humidifier even

for less-experienced users, while at the same time giving the humiFog direct range a touch of elegance and unprecedented technology. The screens have been designed to ensure easy access to frequent information and actions, such as switching the humidifier on and off, setting the set



point, displaying system information and the dashboard that describes humidifier operation in real time.

Blower units

Our new blower units distribute minute droplets of water into the room, right where it is needed. The powerful air flow created by the fans means the droplets evaporate instantly in the air, in all temperature and humidity conditions. Blower unit features:

- **Flexible:** they can deliver the atomised in water either in one direction only, or in two opposing directions. From 2 to 8 nozzles, available in different sizes (1.45, 2.8 and 4 l/h).
- **Simple to install:** they are supplied already assembled and tested. No wiring required for control of the solenoid valves. The fastening systems ensure quick and easy installation;
- **Easy positioning:** they can be installed either on the ceiling or on the wall, so as to control humidity right where it is needed.

Specifications

	Single-side		Double-side	
	DLA*DF*	DLA*UF*	DLA*DB*	DLA*UB*
Nozzles	2 / 4		4 / 8	
Capacity (l/h)	3 - 8 / 6-16		6-16 / 12-32	
Power supply	230 V 50 Hz	120 V 60 Hz	230 V 50 Hz	120 V 60 Hz



High pressure flexible hose

humiFog direct is even easier to install when using the piping kit. The plastic pipes can withstand high pressure and feature quick couplings

for much faster installation. They can be used to create solutions that adapt perfectly to the requirements of each individual installation.

Atomised water droplet absorption height (m) in relation to the set point, for 1.45 l/h and 2.8 l/h nozzles respectively. For information on the 4l/h nozzles, contact CAREL's specialists

r.H.	1.45 l/h nozzles										
80	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5
70	5	5	5	5	5	5	5	5	5	5	5,5
60	5	5	5	5	5	5	5	5	5	5	5
50	4,5	4,5	4,5	4,5	4,5	4,5	5	5	5	5	5
40	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
30	4	4	4	4	4	4	4	4	4	4	4
	15	16	17	18	19	20	21	22	23	24	25
	Temperature										

r.H.	2.8 l/h nozzles										
80	7	7	7	7	7	7	7	7	7	7	7
70	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
60	6	6	6	6,5	6,5	6,5	6,5	6,5	6,5	6,5	6,5
50	5,5	5,5	5,5	5,5	5,5	5,5	6	6	6	6	6
40	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5
30	5	5	5	5	5	5	5	5	5	5	5
	15	16	17	18	19	20	21	22	23	24	25
	Temperature										

Performance and connectivity, without compromise

Simple and reliable system ensured by precise management of atomisation and the software strategies used to maximise performance. Perfect integration with third-party Building Management Systems or CAREL supervisory systems.

CAREL c.pHC

controller the c.pHC electronic controller for humiFog direct has been designed to ensure easy setup, simple management and maximum reliability.

Wireless sensors

Wireless sensors humiFog direct supports CAREL wireless sensors. Up to four probes can be connected for each zone, for more precise humidity or temperature control in large or complex spaces.

The modulating limit probe ensures a preset relative humidity value is not exceeded in a certain area, so as to prevent local condensation and damage to machinery.

Easy commissioning

Start-up wizard

Guided configuration of the main parameters to get the unit up and running quickly and easily.

USB port

The built-in USB port, available on all versions of humiFog direct, allows immediate access to several functions, such as alarm logging, copy-and-paste configuration parameters for easy installation of multiple units, and software updates directly in the field.

Maximum reliability

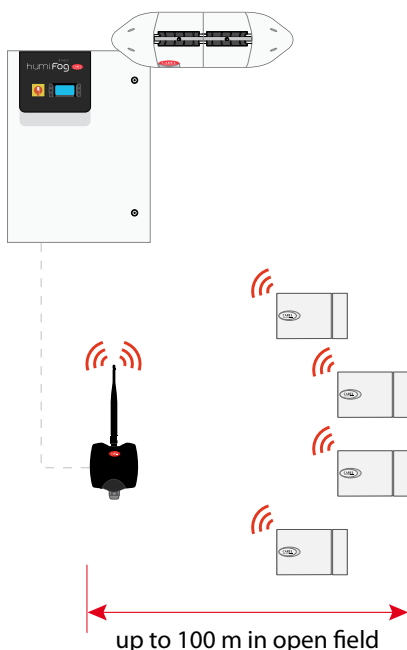
Back-up & rotation

The back-up & rotation function via the Ethernet network ensures system service continuity even when one unit is off due to maintenance, while also allowing rotation of several pumping units in order to minimise maintenance.

Operating principles

When there is humidification or cooling demand, the system starts the pump, which pressurises the water to 70 bars. After an initial stage in which the lines are washed and filled, the blower units start atomising the water into droplets with a diameter of just a few microns. The anti-dripping system prevents the risk of dripping when the system shuts down.

Capacity is controlled using PWM (pulse width modulation), to ensure precise and reliable humidity control.



Water treatment

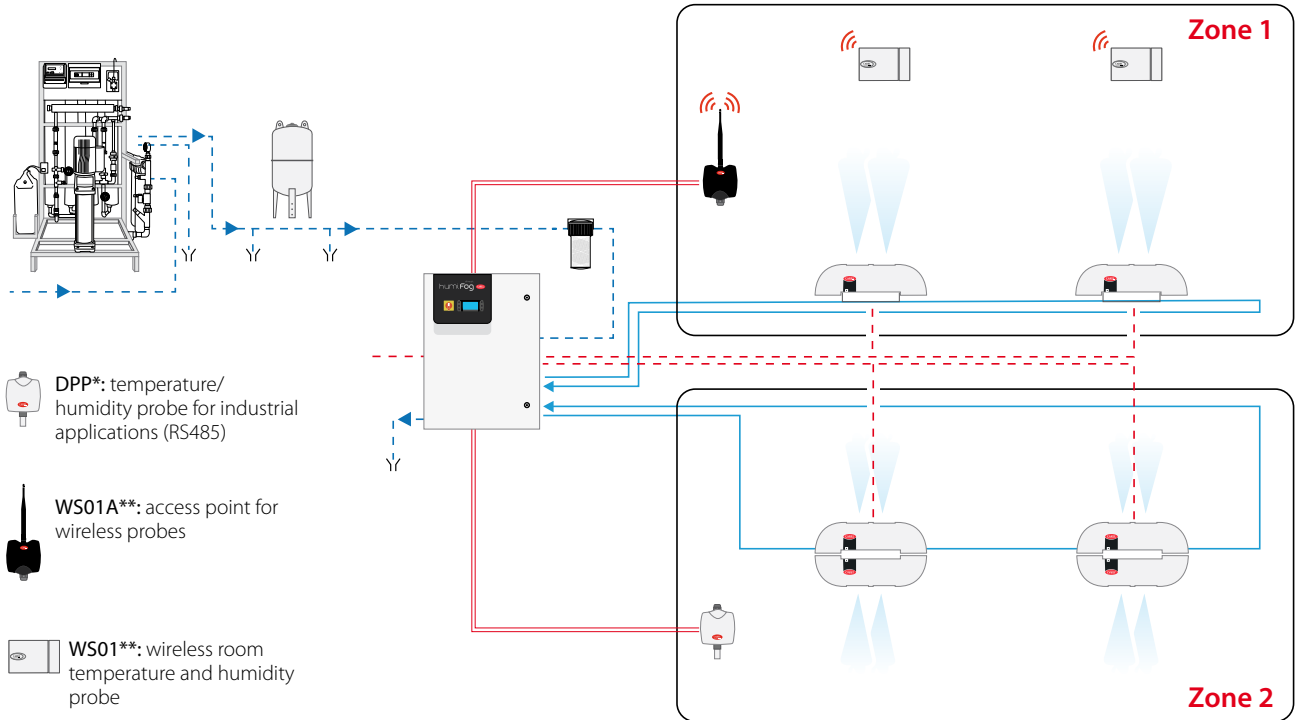
CAREL has developed reverse osmosis water treatment systems designed especially for use with its humidifiers.

Demineralised water is fundamental in room applications as filtering minerals and bacteria through the membrane guarantees maximum hygiene, as specified by the main standards for HVAC systems, such as UNI8884, VDI6022, VDI3803. Moreover, using demineralised water minimises maintenance requirements on the unit due to deposits, and prevents salts from building up on surfaces inside the room following evaporation of the droplets.

Certification



ALL UL CERTIFIED



Supervision

The default communication protocols on the units are Modbus and BACnet, on the RS485 serial port and on the Ethernet port.

Remote supervision

tERA ready

Enabling the service via the tERA box (RVRBX*) allows remote monitoring and interaction with the unit.

Web server

The unit's display can be accessed directly from any PC or tablet connected to the same local network as the humidifier.

The settings can thus be configured exactly as if operating directly on the unit itself, including all main control settings and configurations, as well as viewing unit status.

Local supervision

Boss range and Usage Balancer plugin

humifog direct is compatible with the Boss range, which also includes the Usage Balancer plugin. Specifically developed for humidification solutions, this plugin simplifies site management, maximising synergy between one or more humidifiers with rotation logic. Usage Balancer can also read one or more probes, which can be grouped together according to requirements, for example to control the two humiFog direct zones using two distinct groups of probes.



Applications

In many industrial environments involving hygroscopic materials, the production capacity and final product quality are strongly affected by relative humidity and the possible formation of electrostatic discharges.

Printing and paper industries

Paper is made from plant fibres (cellulose) and is intrinsically hygroscopic, meaning it is highly susceptible to variations in humidity. During the cold season, as the heat generated by machinery and space heating systems dries the air, the moisture content in paper falls dramatically, causing changes in the

dimensions and technical characteristics of the paper. In ideal conditions for paper storage and printing, relative humidity must be kept between 50% and 60%. Correct and stable humidity ensures better print quality and increases productivity and efficiency, minimising costs relating to machinery downtime and wasted material.



Timber processing

The moisture content of wood tends to vary considerably depending on the surrounding environmental conditions. To ensure the best working conditions throughout the entire process, the moisture content of wood must be between 9 and 11%, corresponding to an ambient relative humidity of around 60%. Failure to meet these requirements,

in particular when humidity levels are low, may modify the appearance of the wood or timber, causing warping and cracks in the boards and even detachment of the laminates that line furniture not made from solid wood, as the wood absorbs the solvent from the glue before polymerisation is complete.



Wineries and 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. 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 top-ups, etc.).



Technical specifications

Cabinet

Specifications	UA040*	UA080*	UA050*	UA090*
General				
Rated capacity l/h	40	80	50	90
Power supply	230 V, 1 phase, 50 Hz		120 Vac, 1 phase, 60 Hz	
Pumping unit power consumption (kW)	0.28	0.28	0.38	0.38
Operating conditions	2T40 °C, 5 to 95% non-condensing			
Storage conditions	-10T50 °C <90 % RH non-condensing			
Ingress protection	IP20			
Water inlet				
Connection	G3/4" F			
Water pressure limits (bars/MPa)	3 to 8 (0.3 to 0.8)			
Conductivity limits (µS/cm)	<80 µS/cm			
Water outlet				
Connection	G1/4" F			
Water outlet pressure (bars)	70			
Water drain				
Connection	G1/2" F			
Network				
Network connection	Modbus®, BACnet® via Ethernet and RS485			
Control				
Control type	external signal, temperature or humidity control; plus temperature or humidity limit probe			
Type of input signals	0 to 1 V, 0 to 10 V, 2 to 10 V, 0 to 20 mA, 4 to 20 mA, NTC			
Functional characteristics				
Number of probes supported (temperature and/or humidity)	1 (single zone) + limit 2 (two zones) + limit			

Fan blower unit models

Single-side fan blower units

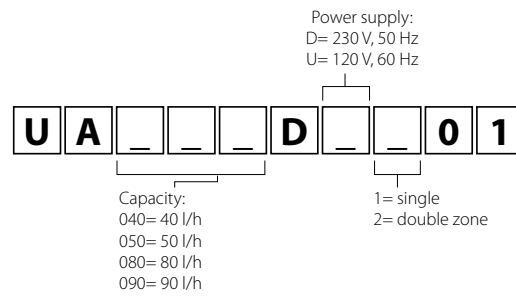
Specifications	DLA**DF*	DLA**UF*
Water inlet	M16 x 1.5 male	
Water outlets	M16 x 1.5 male	
Fan power supply	230 Vac, 50 Hz	120 Vac 60 Hz
Capacity (kg/h)	3; 5,6 ; 6; 8; 11,2; 16	
Air flow-rate	300 m³/h for 2 nozzle model, 600 m³/h for 4 nozzle model	360 m³/h for 2 nozzle model, 720 m³/h for 4 nozzle model

Testate ventilanti doppie

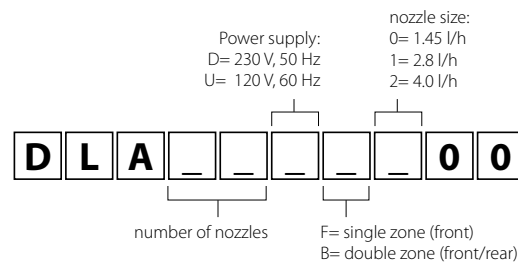
Specifications	DL**DB*	DL**UB**
Water inlet	M16 x 1,5 female	
Water outlets	M16 x 1,5 female	
Fan power supply	230 Vac, 50 Hz	120 Vac 60 Hz
Capacity (kg/h)	6; 11,2; 12; 16; 22,4; 32	
Air flow-rate	600 m³/h for 4 nozzle model, 1200 m³/h for 8 nozzle model	720 m³/h for 4 nozzle model, 1440 m³/h for 8 nozzle model

Part numbers

Control cabinet P/N



Fan Blower units



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