High
Efficiency
Solutions.

CAREL

humiFog direct

the humidification solution
that improves your business

humiFog direct

high pressure atomiser for room applications

Adiabatic humidification is the ideal solution for controlling air humidity and "absorbing" the heat generated by machinery and equipment inside the controlled environment.

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 can be easily expanded to cover any humidification load, without limits.

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

Less electrostatic charges

A relative humidity above 35 % reduces the risk of electrostatic charges forming, which can damage electronic equipment and components

Airborne dust

The right relative humidity level helps reduce the amount of dust suspended in the air, avoiding problems for production processes and operators.

The complete solution

flexible and versatile, adaptable to any context

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:

- Infinite combinations: 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	
Nozzles	2	4
Capacity (l/h)	3 - 8	6-16
Power supply	230 V 50 Hz	120 V 60 Hz

Specifications	Double-side	
Nozzles	4	8
Capacity (l/h)	6-16	12-32
Power supply	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.

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. 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.

Demineralised water is recommended to ensure maximum hygiene, as specified by the main standards for HVAC systems, such as UNI8884, VDI6022, VDI3803.
Demineralised water also minimises maintenance and prevents salt deposits in the room.

Easy installation

Designed with innovative features that minimise installation and commissioning times.

Energy saving

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

Maximum hygiene

Only fresh and clean water atomised and sprayed, thanks to the automatic washing cycle every time the unit starts.

Connectivity

System accessible at all times

Perfect integration with Building Management Systems via the BACnet and Modbus protocols available on the Ethernet and serial ports

CAREL c.pHC controller

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

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.

Easy management

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.

Supervision

Modbus, BACnet and Carel communication protocols are available as standard on the unit's BMS serial port, while Modbus and BACnet are also available on the Ethernet port.

tERA ready

Enabling the tERA service on the Ethernet port allows the unit to be monitored and controlled over a remote connection.

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.

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

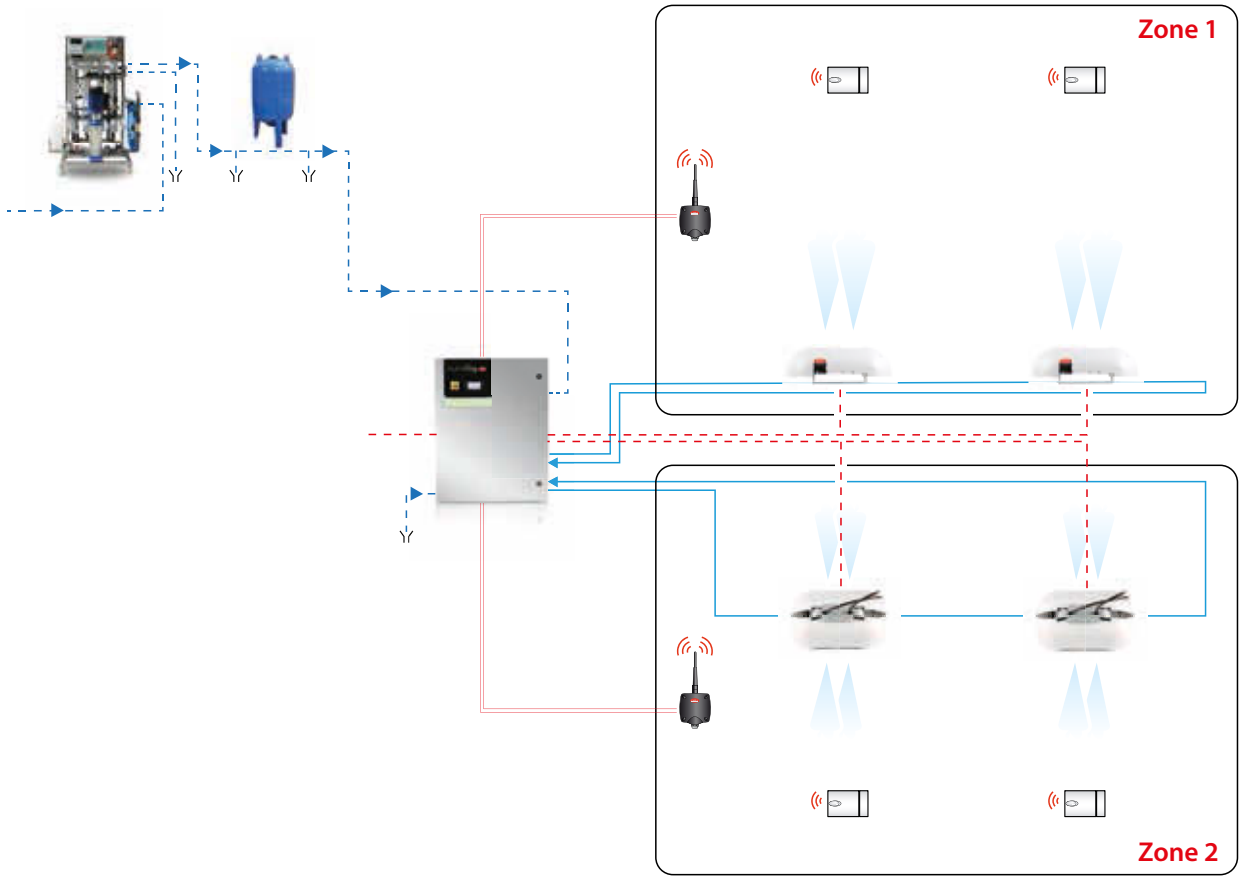
Performance

a simple and reliable system

The system is controlled based on the signal from a probe or external controller. 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.



Summary table of humiFog direct functions

Functions
Automatic washing cycles
Master/slave function
Redundancy and rotation
Wireless sensors
Web server
BACnet™, Modbus® and CAREL protocols
USB port
tERA ready
Start-up wizard
Scheduler
Modulating limit probe
PWM modulation

Certification

CE

ALL UL CERTIFIED

UL LISTED

Applications

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.).

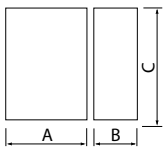
Controlling humidity in printing processes avoids breakages, misalignments due to variations in dimensions, and optimises ink absorption.

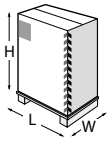
Technical specifications

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…8 (0.3…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			

Dimensions in mm (in) and weights in kg (lb)





Model	AxBxC	weight	LxWxH	weight
UA	630x800x300 (40.6x146x33.9)	85…105 (187.4…231.5)	1100x455x1020 (43.3x17.9x40.2)	100…125 (220.5…275.6)

Fan blower unit models

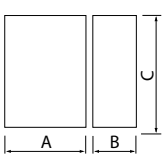
Single-side fan blower units

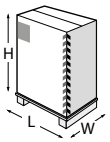
Specifications	DLA**DF*	DLA**UF*
Water inlet	M16 x 1.5 male	
Water outlets	M16 x 1.5 male	
Fan power supply	230 Vac, 50 Hz	120 Vac 60 Hz
Capacity (kg/h)	3; 5.6 ; 6; 8; 11.2; 16	
Air flow-rate	300 m^3/h for 2 nozzle model, 600 m^3/h for 4 nozzle model	

Double-side fan blower units

Specifications	DL**DB*	DL**UB**
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)	6; 11.2; 12; 16; 22.4; 32	
Air flow-rate	700 m^3/h for 4 nozzle model, 1500 m^3/h for 8 nozzle model	

Dimensions in mm (in) and weights in kg (lb)

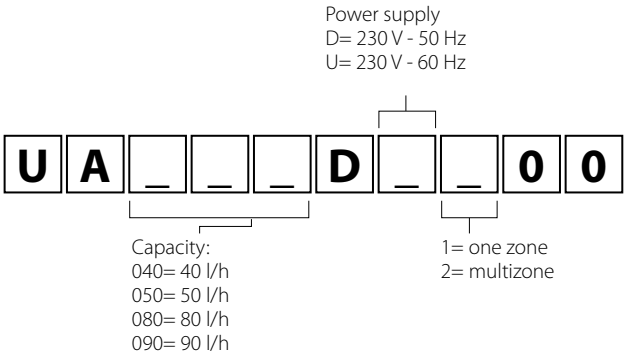




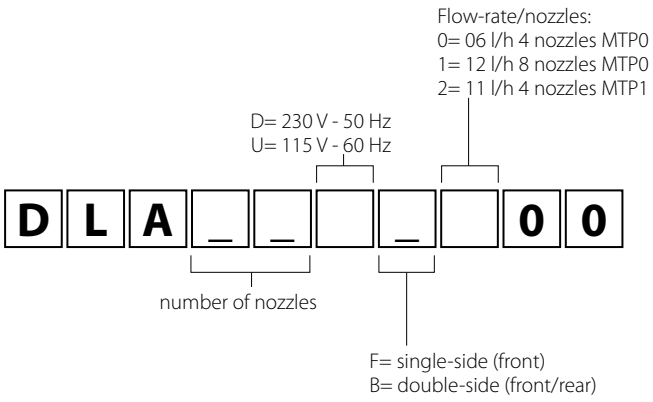
Model	AxBxC	weight	LxWxH	weight
UA (master)	1030x370x860 (40.6x146x33.9)	85…105 (187.4…231.5)	1100x455x1020 (43.3x17.9x40.2)	100…125 (220.5…275.6)
UA (slave)	500x150x580 (19.7x5.9x22.8)	19.5 (43)	605x255x770 (23.9x10x30.3)	21 (46.3)

Part numbers

Control cabinet P/N



Fan Blower units



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