humiFog Multizone

CAREL

Technology & Evolution

humiFog multizone

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Need Some Serious Humidification or Cooling?

Learn how humiFog™ can pay for itself in “no time”

Technology & Evolution

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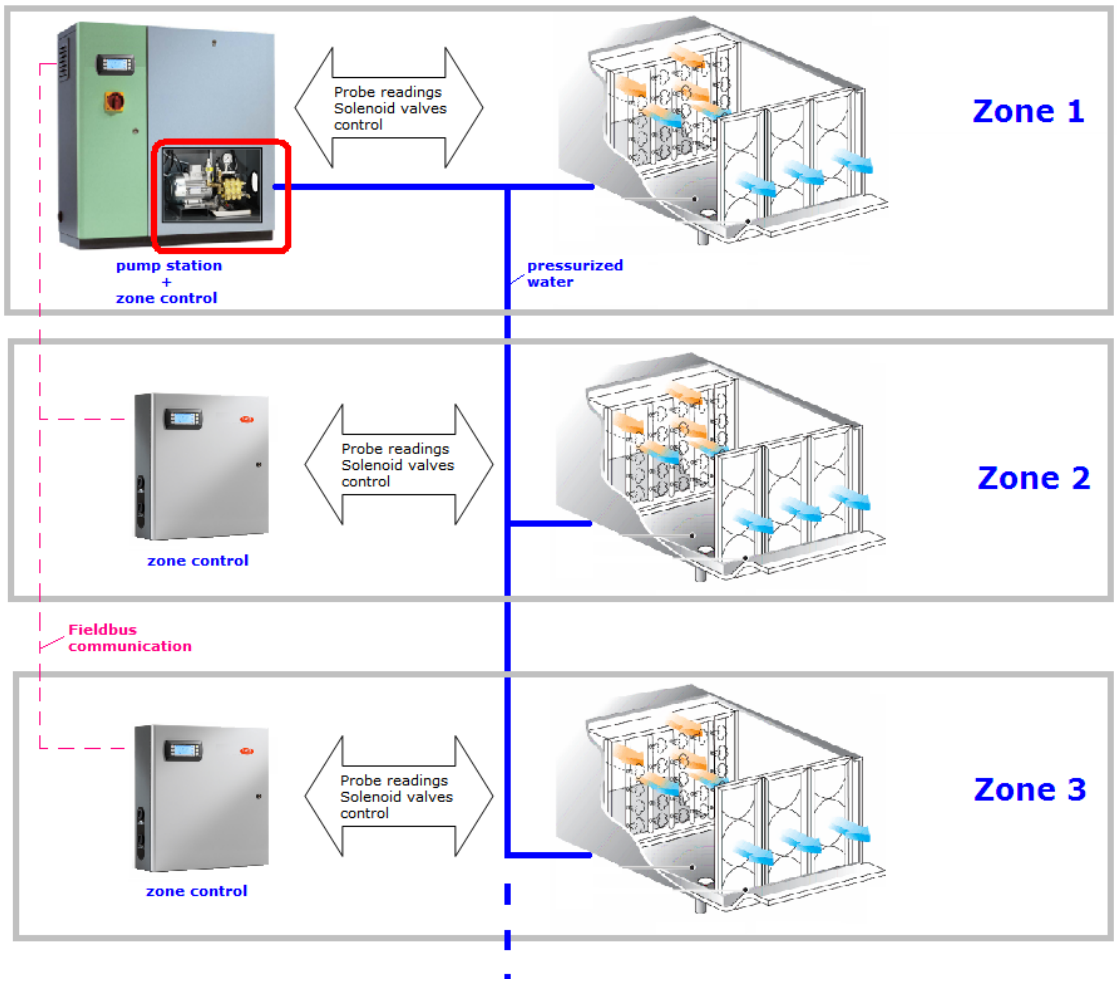
1 Pump & Up To 6 Zones=High Efficiency



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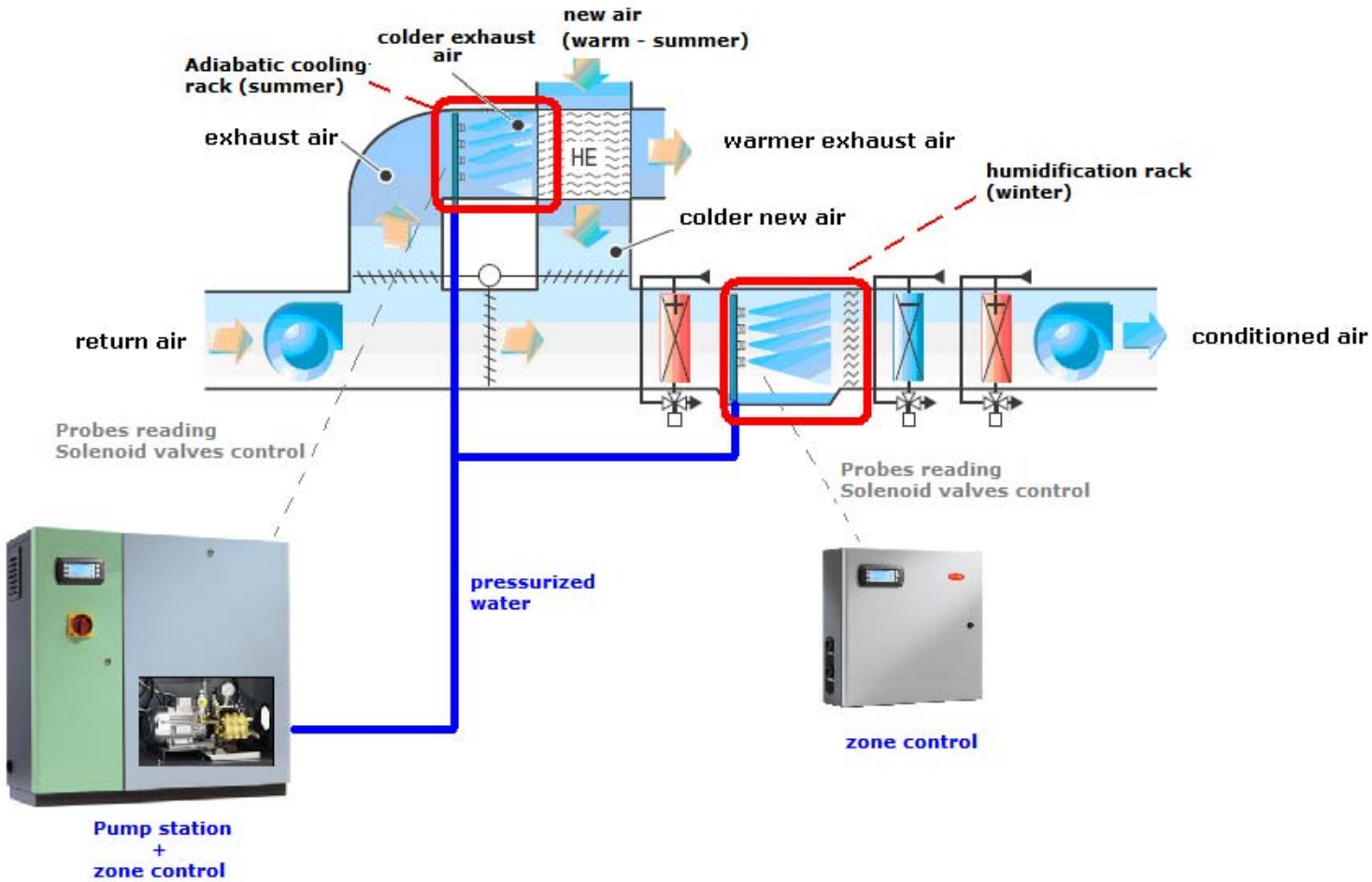
Reduce AC Energy Costs By Pre-Cooling Intake Air For Summer Use



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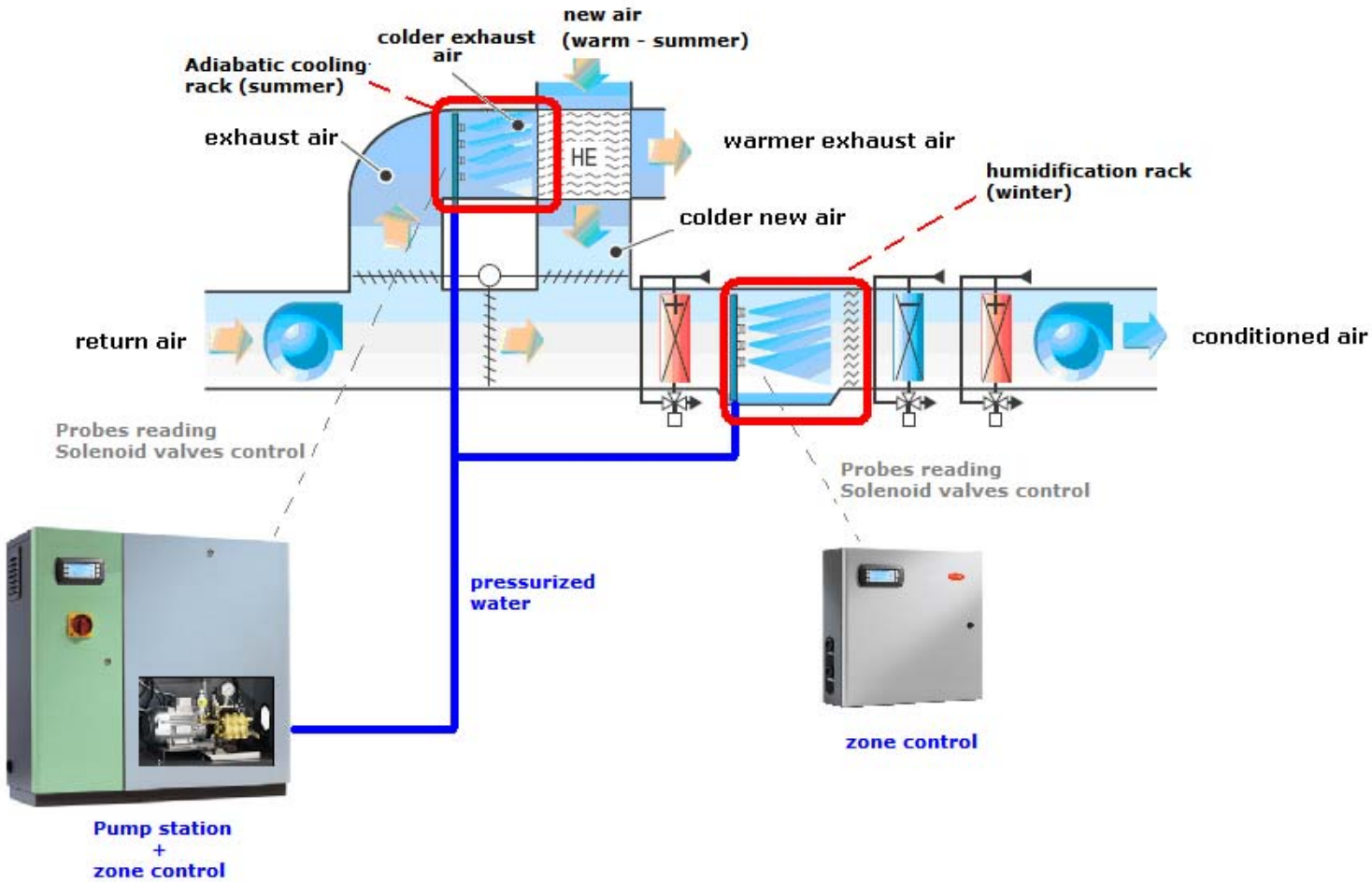
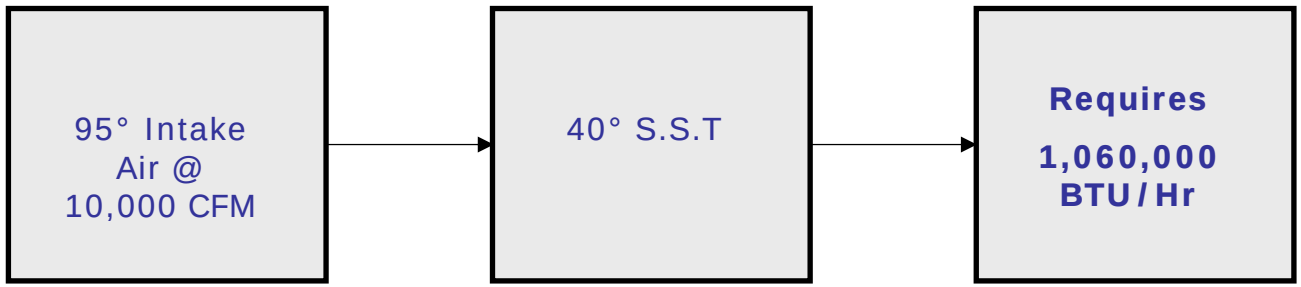
Add a 2nd Zone to Humidify the Air during Winter Mode



Example of Energy Costs

Without Pre-Cooling Intake Air

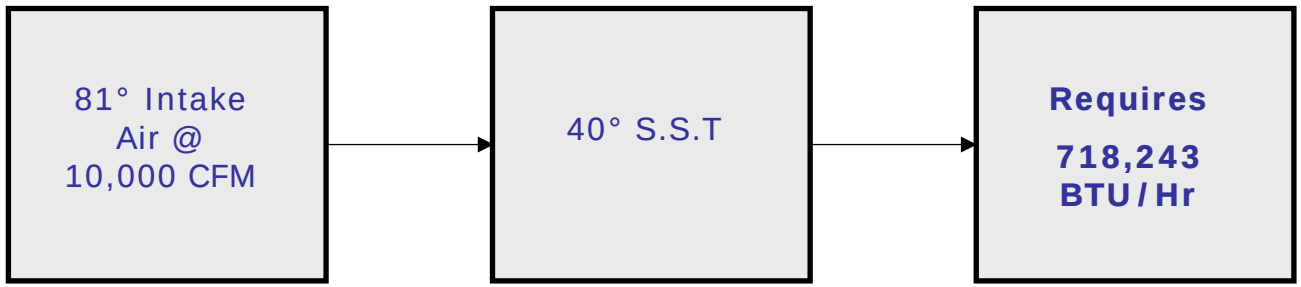


KW/h Consumption= 100.1 @ .10998 per KW/h= $11.00 Per Hour

Date based on California 2010 Electricity Rates for Over 20KW Users/Peak Usage

Example of Energy Costs

With Pre-Cooling Intake Air

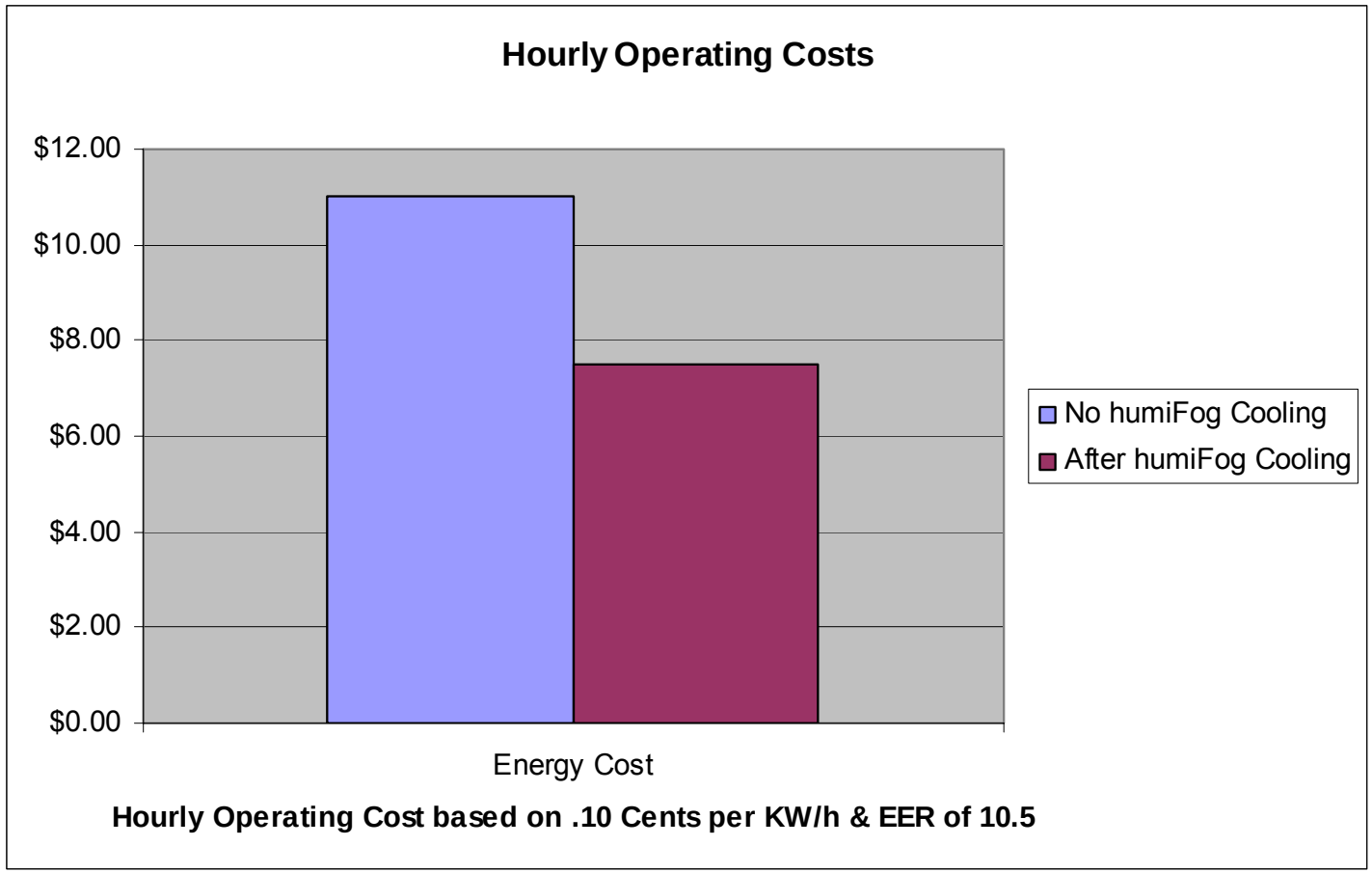


KW/h Consumption=68.4 @ .10998 per KW/h= $7.51 Per Hour

Date based on California 2010 Electricity Rates for Over 20KW Users/Peak Usage & EER A/C Unit Rating of 10.5

Example of Energy Costs

With Pre-Cooling Intake Air



Hourly Operating Cost based on .10 Cents per KW/h & EER of 10.5

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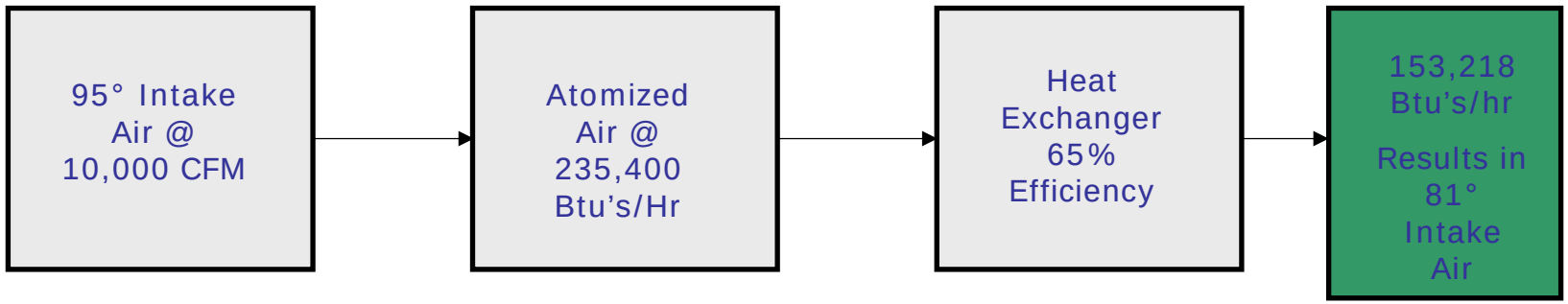
Example of Energy Costs

Using humiFog multizone 220 Lbs/hr



KW/h Consumption=.955 Kw @ .10998 per KW/h= $0.11 Per Hour

Date based on California 2010 Electricity Rates for Over 20KW Users/Peak Usage & EER A/C Unit Rating of 10.5

6 Pumping Stations

- 220 Lbs/h = 235,400 btu @ 955w/hr @ $0.10 kw/h = 9.6 Cents Kw/h
- 440 Lbs/h = 470,800 btu @ 955w/hr @ $0.10 kw/h = 9.6 Cents Kw/h
- 704 Lbs/h = 753,280 btu @ 1150w/hr @ $0.10 kw/h = 11.5 Cents Kw/h
- 1012 Lbs/h = 1,082,840 btu @ 1150 w/hr @ $0.10 kw/h = 11.5 Cents Kw/h
- 1320 Lbs/h = 1,412,400 btu @ 1950 w/hr @ $0.10 kw/h = 19.50 Cents Kw/h

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The humiFog pumping station quickly, quietly and efficiently delivers a powerful 1000 PSI of Water Pressure!

Laser Precision Nozzles quickly atomize the water into billions of droplets which evaporate instantly before reaching the cooling coil!

Pumping Station

Variable Frequency Drive

pGD1 display

Pressure switches

Conductivity Meter

Filter etc.

pCO controller

High pressure pump

Electric Motor

Technology & Evolution

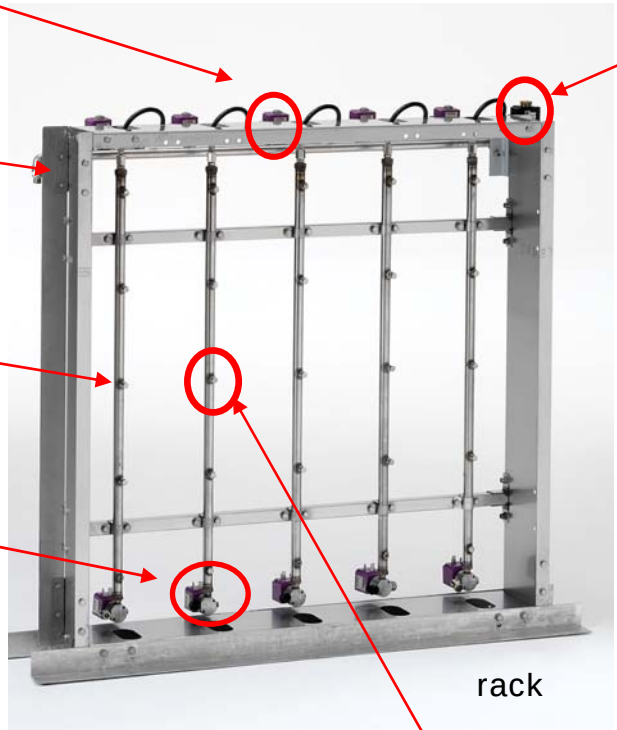
Atomizing Rack

STAGING valves (every manifold)

Pressurized Water

Stainless Steel Manifold

Drain Valves



Ventilation Valve

Rack empties when not working

Automatic washing cycles

Never Mold or Bacteria

Nozzle: 6.2 Lbs/hr @ 1000 PSI

8.8 Lbs/hr @ 1000 PSI

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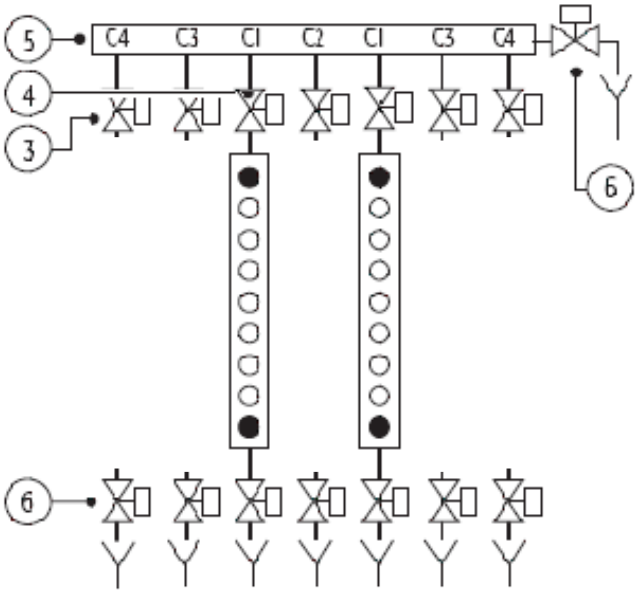
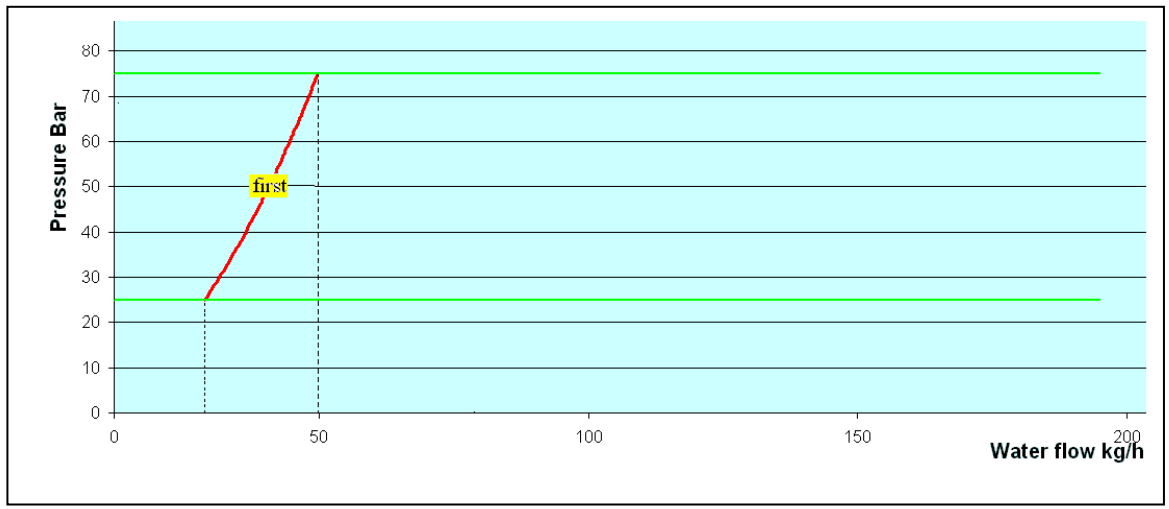
Single zone: Continuous Capacity Modulation

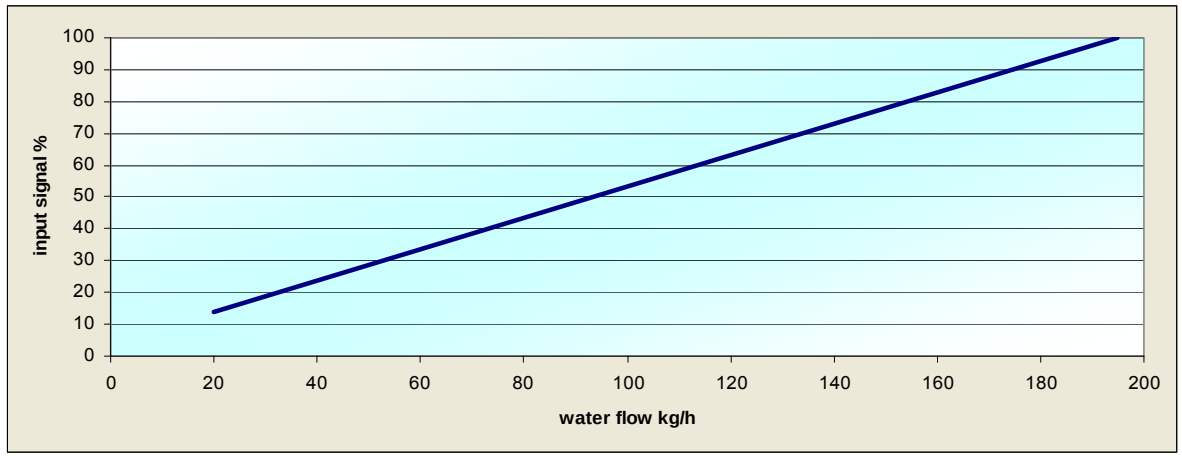
STAGED (valves) + SPEED control (VFD) = Wide Operating Range @ +-2% Accuracy



Key:

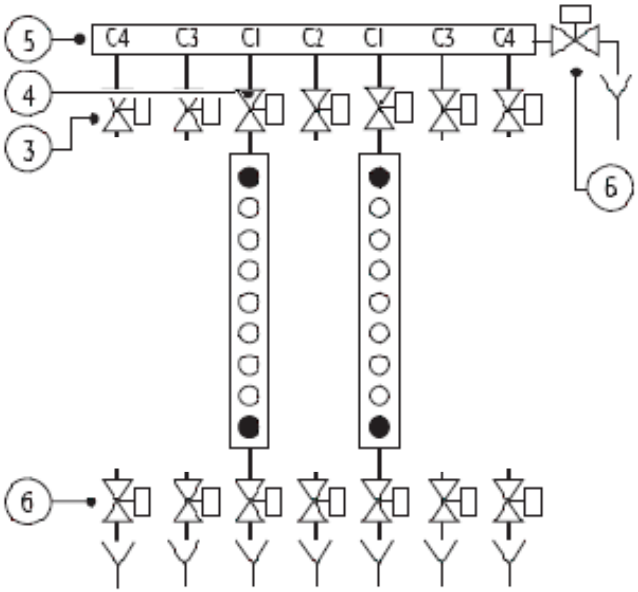
1.	nozzles
2.	plugs
3.	NC solenoid valve
4.	direct connection
5.	from the pump
6.	NO solenoid valve





Single zone: Continuous Capacity Modulation

STAGING (valves) + SPEED control (VFD) Mean wide operating range 14-100% @ +-2% Accuracy



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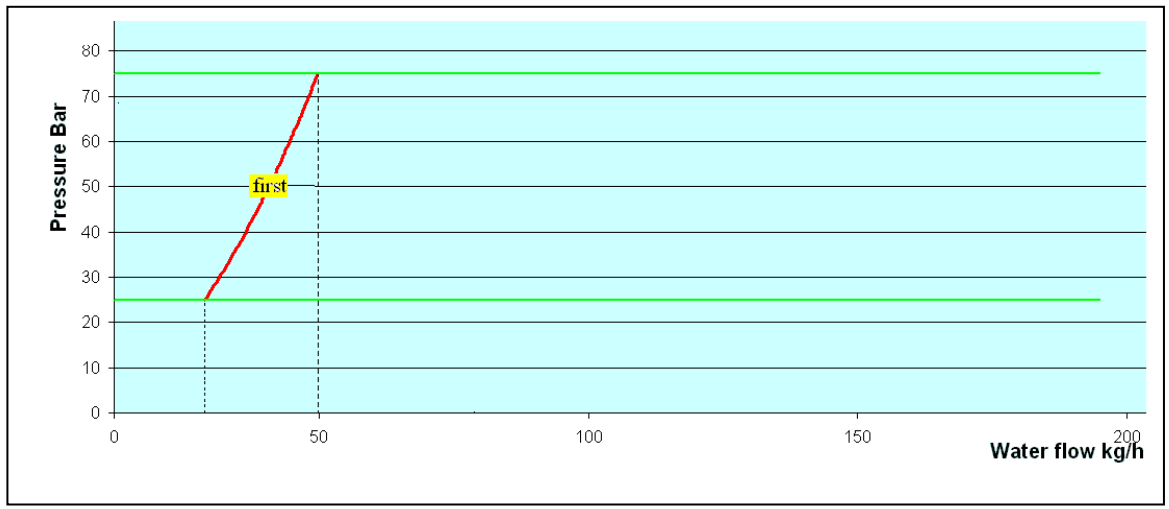
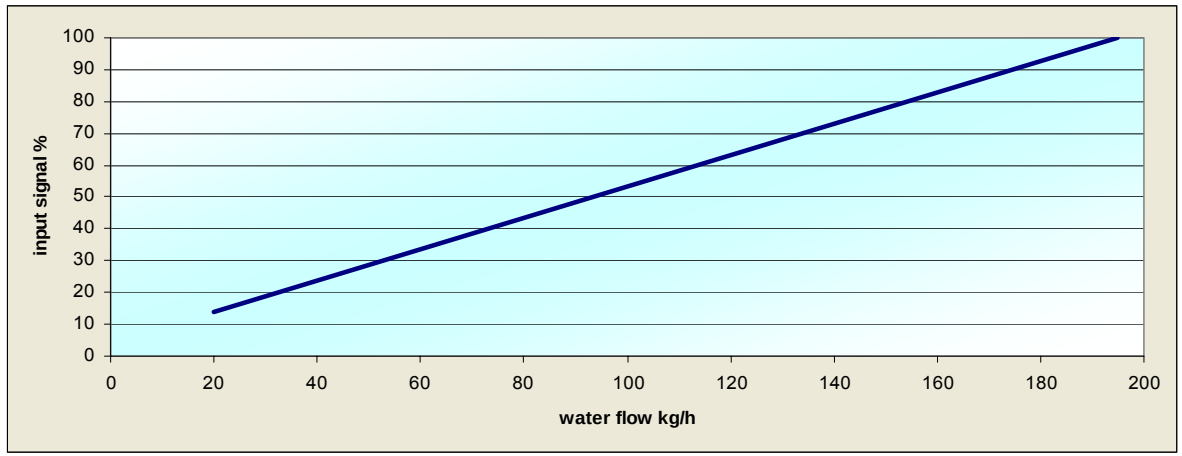
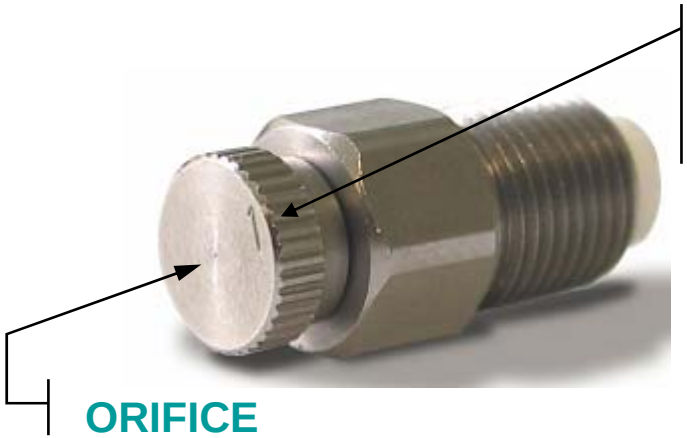


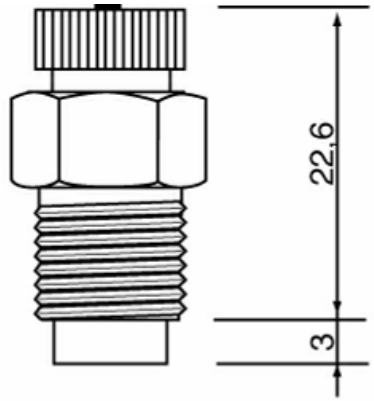


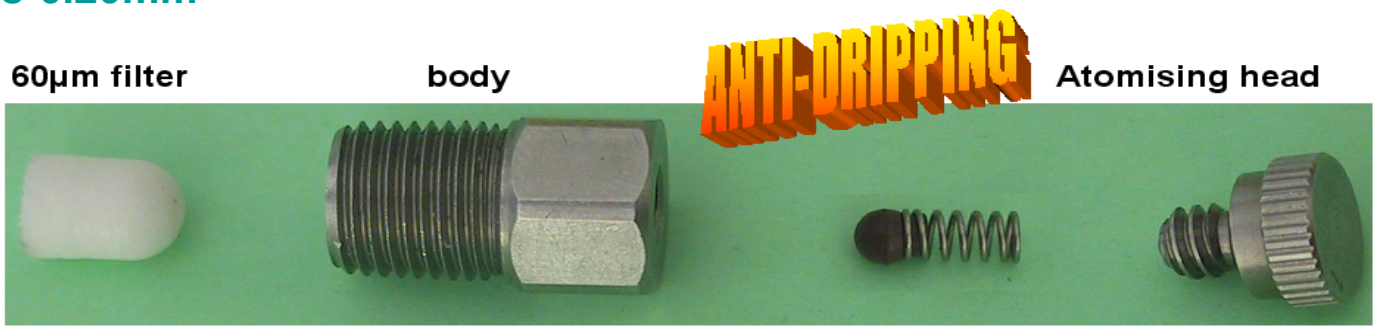
System components: Nozzles



0 = 3.3 lbs/h @ 1000 PSIG
1 = 6.2 lbs/h @ 1000 PSIG
2 = 8.8 lbs/h @ 1000 PSIG

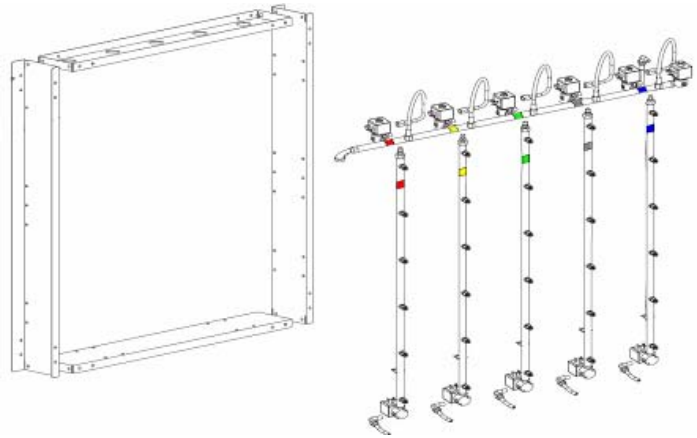
ORIFICE
0.10-0.15-0.20mm





For Air Handling Units

Manifold Racks Are Pre-Assembled To Fit the Frame



Available in 4 Standard Sizes

36 x 36

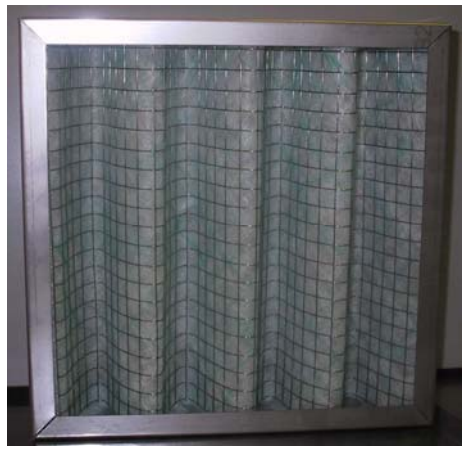
48 x 48

60 x 60

72 x 72

System Components: Mist Eliminators

Stainless Steel



Fiberglass

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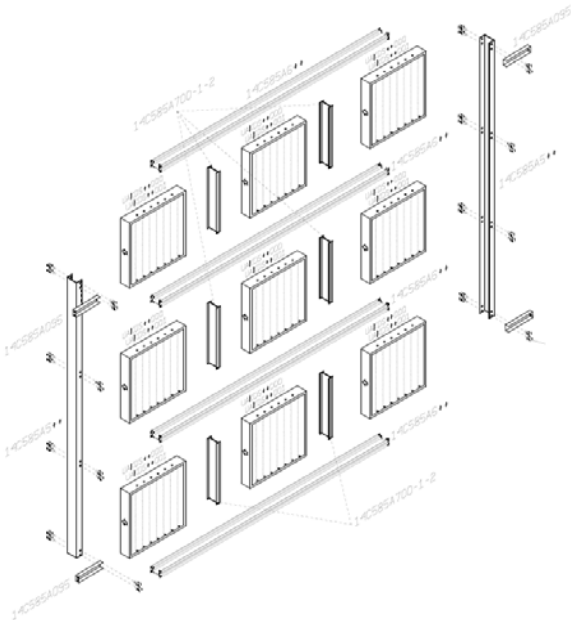
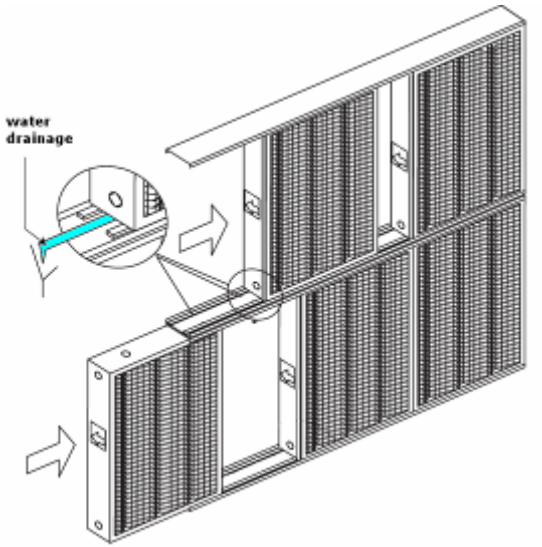
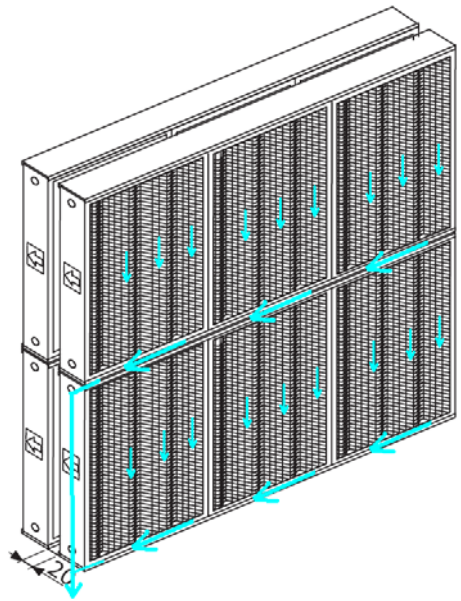
System Components: supporting / draining frame

Complete drop separator: standard modules

draining frame made of stainless steel







External Reverse Osmosis System

- Environmentally Friendly
- No Dust or Air Born Particles
- Less Maintenance
- Supplied By Installer

humiFog multizone

The Myths Of Bacteria Concerns

- humiFog Does Not Recycle Water
- Automatic Drain Flushes Prevent Stagnant Water
- 95% of Water Is Evaporated , 5% Is Drained
- Stainless Steel Mist Eliminator and Drip Frame

No Chemicals Used!

stainless steel rack
with drain valves

Drop separator in
stainless steel

INSTITUT FÜR LUFTHYGIENE
Air and water: planning, analyses, remediation concepts

ILH BERLIN

Certificate

Hygiene conformity test

Tested type series	Humifog
Device type	high pressure atomizing humidifier
Manufacturer	Carel SpA Headquarters, Via dell'Industria,11, I-35020 Brugine
Date and place of test	30th and 31th July 2008, Carel SpA Headquarters, I-35030 Brugine
Test criterion	Hygiene requirements for the following standards:

Standard climatisation		Hospitals	
VDI 6022, page 1 (04/06)	✓	DIN 1946, part 4 (01/94)	✓
VDI 3803 (10/02)	✓	ÖNORM H 6020 (02/07)	✓*
ÖNORM H 6021 (09/03)	✓	SWKI 99-3 (03/04)	✓
SWKI VA104-01 (04/06)	✓		
DIN EN 13779 (09/07)	✓		

* In accordance with H 6020 (02/07), chapter 6.13.2 is demanded in Austria the use of steam humidifiers or equivalent humidification systems.

Test result	Hygiene conformity is	☐ not confirmed ☐ confirmed subject to conditions ☑ confirmed without conditions
Validity period	3 years: 08.2008 – 08.2011	
Registration number	HKP/I/050a/8/0808/0811/MZ	

Institut für geprüft RLT-Hygiene 2008-2011 Lufthygiene

Hygienerelevante Merkmale
VDI 6022 (D)
VDI 3803 (D)
ÖNORM H 6021 (A)
SWKI VA104-01 (CH)
DIN EN 13779 (EU)

geprüft durch ILH BERLIN

Expert appraiser: Dr.-Ing. M. Möritz — Berlin, 27th March 2009

Within the scope of the hygiene conformity test, the hygiene-relevant requirements of the regulations listed under the "test criteria" and marked with a "✓" were tested. Requirements referred to in other regulations were not tested. The hygiene conformity test does not include toxicological tests or assessments of the materials used in the tested equipment series.

humiFog
Multizone

MM27

Special Features:

Capacity Controlled Off Cycle Water Conservation:

- Automatic Disengage Nozzles With Minimal Water Loss
- Does Not Affect Hygiene

System Rotation:

- humiFog periodically “rotates” the branches that atomize the water, allowing an even and uniform distribution.

MM27 Rotation: all the branches have the same rated capacity

Michele Martello, 9/22/2009

I/O

The built-in electronic controller has the following inputs:

- Control inputs
  - ON/OFF control input (usually a humidistat)
  - Regulation input:
    - Main probe for humidity or temperature,
    - Proportional signal from external controller
    - Serial (MODBUS)
  - Limit input
    - humidity or temperature probe
- Pumping unit Enable (system on/off)
- Zone Enable (remote on/off)
- Zone spraying / standby (on/of output)
- R.O. enable (output) and alarm (input)
- Flow switch input
- Alarm relay
- Anti-icing output
- BMS port (MODBUS as a standard, others with optional cards)

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MULTIZONE =

1 pump station for several zones, up to 6
STEP modulation = precision **± 5%**

SINGLEZONE =

1 pump station for every zone
continuous modulation = precision **± 2%**

Hygienic certification, VID6022, as certified by the Institut für lufthygiene of Berlin , without injecting chemical biocide in the water!

humiFog Multizone for AHU

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Features	Benefits
High pressure water adiabatic humidifier	○ Extremely low energy consumption, 4 W/(kg/h) ○ Up to 95% of the atomised water is absorbed by the air: extremely low water consumption ○ Very short absorption distance, starting from 700 mm ○ Low noise nozzles
Precision applications: continuous capacity modulation by combining VFD(*) and steps	○ Wide range of modulation ○ Continuous modulation ○ Optimanl atomisation in the whole range
Multizone application: constant pressure operation	○ Relevant energy saving thanks to the Variable frequency driver
Atomisation system with automatic emptying, periodical washing cycles, approved plastic materials, stainless steel droplet separator	○ Certified compliant with VDI6022 and DIN1946 hygiene standards ○ **Does NOT require chemical additives**
Powerful built-in controller	○ Complete management of the unit with limit humidity/temperature control ○ Multizone applications ○ Cost rationalisation ○ MODBUS as a standard (others are optionals)
Duct atomisation system and blowers supplied already assembled and tested	○ Simple installation ○ Immediate operation when commissioning
Large graphic display, with navigation divided into menus	○ Easy to use and setup
Use with demineralised water	○ Low maintenance for nozzles, filters and AHU
Capacity up to 600 kg/h	○ Ideal solution for AHUs with high air flow-rates

humiFog Multizone for AHU

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applications

- Office buildings
- Printing industry or warehouse
- Clean rooms (electronics)
- Theatres and museums
- Textile industry or warehouse
- Other industrial applications

HumiFog Multizone for AHU

ITALY

IVECO - Bolzano
Palazzo Regione Lombardia
Banca d'Italia Roma
Museo Palazzo Regione Verona
Solaris Padova
Museo accademia di Venezia
Vodafone Milano palazzo Liberty – Vodafone
Vodafone Milano CED
Vodafone Ivrea
Vodafone Torino
Vodafone Pisa
Unicredit – Bank offices
Comune di Bolohna
Fiera di Bologna – Bologna Exhibition centre
Teatro Reggio Emilia – Reggio Emilia Theatre
Ospedale di Sacile – Sacile's hospital
Museo arte moderna Bolzano – Museum of modern art – Bozen
Camera dei deputati – Room of Deputy
Micron – Microelectronics Avezzano
Holteg - Bolzano
Ospedale di Aosta – Aosta's hospital
AGFA – AGFA
Museo Civico di Rieti – Museum of Rieti
Aeroporto Linate - Linate Airport
Aeroporto Malpensa - Malpensa airport
Aeroporto Orio al Serio – Orio al serio airport
Sacca sessola – Congress center in Venice
Centro servizi provincia di Venezia –Venice Service Center
Sammontana – Sammontana ice creams
Comune di Bologna – Bologna's city hall
Eurostampa – printing company
PIRELLI – Rome
ST microelectronics - Italy
Ospedale di Barletta – Barletta's hospital
Il Sole 24 Ore Milano – Il Sole 24 ore (newspaper)
Il Sole 24 Ore Verona
Lastra – Lastra (photographic film)
Aeroporto Caselle – Caselle airport (Torino)
Università di Udine (University)

Europe, USA and ROW

CAREL

Thermogaz (B)
EDS (UK)
Qingzhou Tobaco (China)
National Portraits Gallery (AUS)
Pzl Swidnik (Poland)
AIRBUS (Nantes and Toulouse - France)
Aircell (F)
Vectronic (CH)
Nemak (A)
Dassault (France)
HSBC bank (Deutschland)
Nissan motor (USA)
Toyota (USA)
Mozart birth house museum (Austria)
FIFA home (Switzerland)
Kodak (Norway)
Denso (CZ)
BDN (Poland)
Metro station (Spain)
Novartis Basel (Switzerland)
St Bernward Krankenhaus (Deutschland)
Mercedes Benz (USA)
Lufthansa (Deutschland)
AERO (CZ)
ST microelectronics – (France)
Hochtief (Deutschland)
Seagate (USA)
AXA insurance - (Deutschland)
Manresa – (UK)
Continental (CZ)
Flemish Parliament (Belgium)
Bulgarian National Mint (Bulgaria)
MAN Trucks (Deutschland)
Tsimis (printing factory) (Greece)
Albany (hi-tech textile factory) (France)
Radio Canada (Canada)
BKM - (Deutschland)
Procter and Gamble (Ukraine and Hungaria)
Office building (Spain)
Jaguar (UK)
Cottage (Russia)


CAREL

Foto macchina collaudo UA

Foto macchina collaudo Rack

Certificato ”CERTIFIED Silicone free” (procedura a parole perché confidenziale)

Certificato CE

Certificato UL

Nuova Brochure

Tabelle altezze di installazione testate

Esempio numerico di raffreddamento adiabatico indiretto con valori di T e H (e anche esempio di umidificazione non gli farebbe male)