



MAKE YOUR  
BUSINESS  
SMILE!

**merlin<sup>®</sup>**

SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

PRODUCT  
PRESENTATION

„Healthy climate – for human, material and machines“

**MERLIN TECHNOLOGY GMBH**

# THE COMPANY



Founded 1995 in Ried, Upper Austria, Merlin Technology is a constantly evolving company in the field of air humidification and moisture measurement technology. Technological market leadership and products in “Superior Quality” are clearly defined corporate principles.

Provides development, production, sales and service. So Merlin Technology is able to create complete solutions which always work.

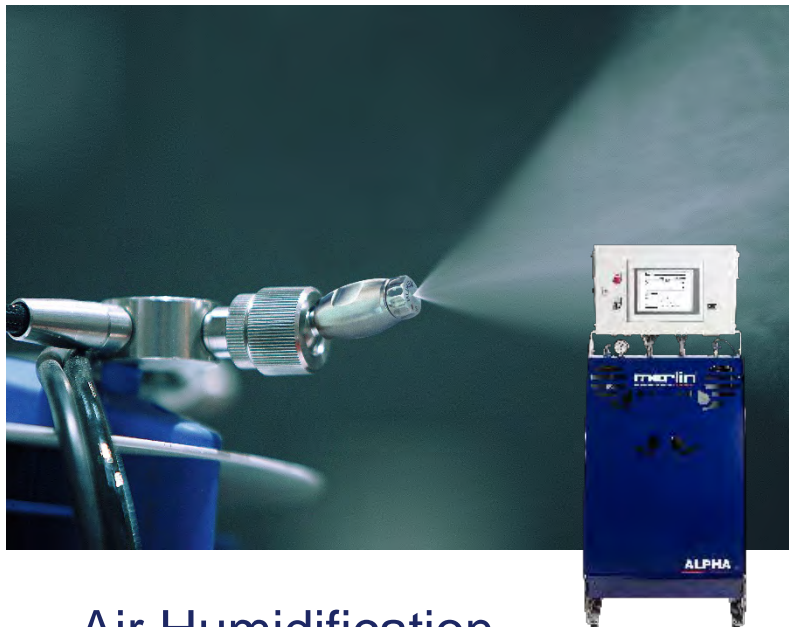
**VISION – EMOTION – COMMUNICATION – PERFECTION**

Johann Reisinger (CEO)

# MERLIN TECHNOLOGY SINCE 1995

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

1995: Start of the success story



Air Humidification



Measuring Technique

# SUPERIOR QUALITY



## ISO certified – confirmation of excellent performance

From simple devices for end users in the private sector to complex systems for large corporations – **Merlin Technology** provides its customers always the best solution with expertise and the highest quality standards.



Quality



Hygiene



Environment

Other standards:

**AUSTRIAN STANDARD H 6020-1:2007**

„Ventilation systems in hospitals – Planning, construction and inspection“

**ISO 13485:2012**

„Medical products – Quality management systems – Requirements for regulatory purposes“

# INNOVATIONS



## Patent & trademark rights

Many of our innovations and developments are approved and protected by patents.



Unique

Economical

Efficient

Successful

# TARGET GROUPS

merlin<sup>®</sup> products are used in many industrial sectors all over the world:

- ✓ Printing / Paper industry
- ✓ Wood working industry
- ✓ Automotive industry
- ✓ Building technology
- ✓ Textile & Leather industry
- ✓ Electronic industry
- ✓ Food industry
- ✓ Even agencies
- ✓ ...





# REFERENCES



## Customers building technology



Schloss Belvedere - Vienna



Vordere Zollamtstraße 13 - Vienna



Weltmuseum Wien - Vienna



Airport Domodedovo - Russia

## Further international customers





# REFERENCE VIDEO SCHÖSSWENDER



# WHY AIR HUMIDIFICATION?



- Dust reduction up to 80%
- Reduction of electrostatic
- Adiabatic cooling
- Improvement of production processes (varnish, glue,...)
- Reduction of staff illness
- Low maintenance costs
- Low operating costs

# TEST REPORT: DUST REDUCTION

75% dust reduction by using merlin<sup>®</sup> humidification technology

BEFORE:

Prior to installing the humidification system				
Type of activity and sampling	Exposure (min.)	Flow rate (l.min <sup>-1</sup> )	Sample no.	Dust (mg.m <sup>-3</sup> )
Disassembling the pallet, inserting the blanks in a line	480	2.0	4191/1	24.2
		2.0	4191/2	20.9
Time-based full-layer diameter	480			22.6
Margin of error for the results				+/- 11.9 %
Identification of the method				SOP HP-02
Principle of the analytic method				Weighing

AFTER:

After installing the humidification system				
Type of activity and sampling	Exposure (min.)	Flow rate (l.min <sup>-1</sup> )	Sample no.	Dust (mg.m <sup>-3</sup> )
Disassembling the pallet, inserting the blanks in a line	480	2.0	6236/1	5.2
		2.0	6236/2	7.0
		2.0	6236/3	5.6
Time-based full-layer diameter	480			5.9
Margin of error for the results				+/- 11.9 %
Identification of the method				SOP HP-02
Principle of the analytic method				Weighing

# TEST REPORT: DUST REDUCTION



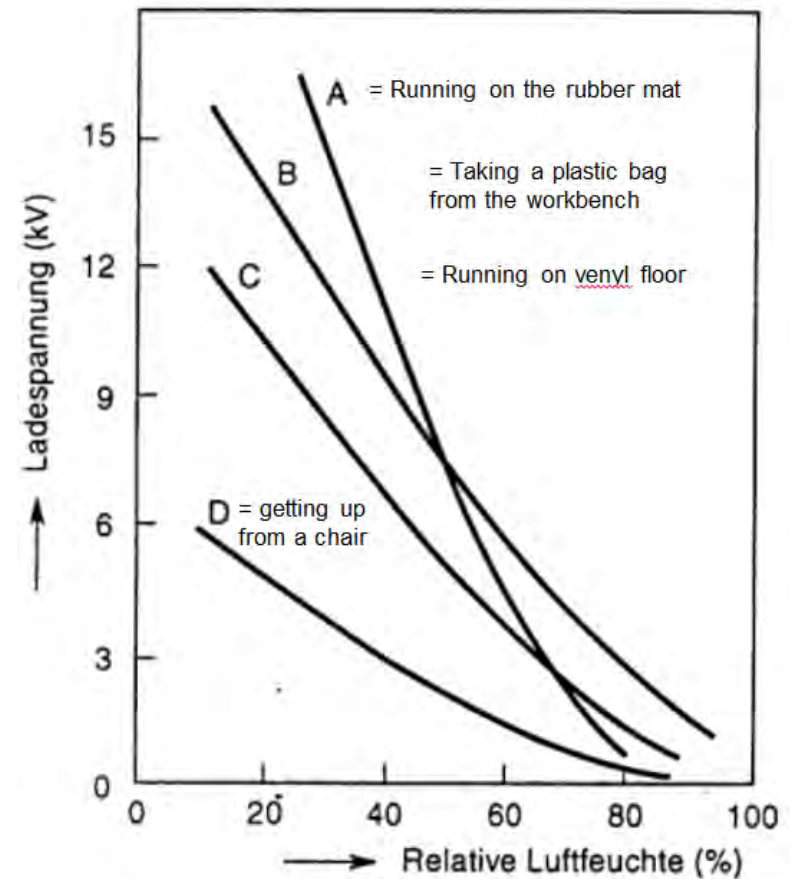
The measurement results clearly show that by installing the **merlin**<sup>®</sup> high-pressure humidification system in the production area or at the specific problematic workstation, dust development is only a quarter of the original measurement value without the humidification system.

# REDUCTION OF ELECTROSTATIC

During the production process of electrical components, dry air causes **electrostatic charge** and this leads to errors and defective products.

Electrical equipment, conductor boards, components and data are very sensitive in regard to dry air. Even electrostatic discharge of 100 Volt may **damage** electrical components.

At 50% relative humidity electrostatic charge is reduced by 50%.



Source: FED, Dr. Ing. Bernd Schildwach (nach Dangelmayer)

# ADIABATIC COOLING

Natural evaporating cooling of ambient air – depending on ambient conditions – of about 5 – 7°C!

<b>50 °C</b>	29,9 °C	33,5 °C	38,2 °C	41,6 °C	44,8 °C	47,9 °C
<b>48 °C</b>	28,6 °C	32,1 °C	36,6 °C	39,9 °C	43,0 °C	46,0 °C
<b>46 °C</b>	27,3 °C	30,7 °C	35,0 °C	38,2 °C	41,2 °C	44,1 °C
<b>44 °C</b>	26,0 °C	29,3 °C	33,4 °C	36,5 °C	39,4 °C	42,2 °C
<b>42 °C</b>	24,7 °C	27,9 °C	31,8 °C	34,8 °C	37,6 °C	40,3 °C
<b>40 °C</b>	23,4 °C	26,5 °C	30,2 °C	33,1 °C	35,8 °C	38,4 °C
<b>38 °C</b>	22,1 °C	25,1 °C	28,6 °C	31,4 °C	34,0 °C	36,5 °C
<b>36 °C</b>	20,8 °C	23,7 °C	27,0 °C	29,7 °C	32,2 °C	34,6 °C
<b>34 °C</b>	19,5 °C	22,3 °C	25,4 °C	28,0 °C	30,4 °C	32,7 °C
<b>32 °C</b>	18,2 °C	20,9 °C	23,8 °C	26,3 °C	28,6 °C	30,8 °C
<b>30 °C</b>	16,9 °C	19,5 °C	22,2 °C	24,6 °C	26,8 °C	28,9 °C
<b>28 °C</b>	15,6 °C	18,1 °C	20,6 °C	22,9 °C	25,0 °C	27,0 °C
<b>26 °C</b>	14,3 °C	16,7 °C	19,0 °C	21,2 °C	23,2 °C	25,1 °C
<b>24 °C</b>	13,0 °C	15,3 °C	17,4 °C	19,5 °C	21,4 °C	23,1 °C
<b>22 °C</b>	11,7 °C	13,8 °C	15,8 °C	17,7 °C	19,5 °C	21,2 °C
<b>20 °C</b>	10,4 °C	12,4 °C	14,2 °C	16,0 °C	17,7 °C	19,2 °C
<b>FROM</b>	<b>10%</b>	<b>20%</b>	<b>30%</b>	<b>40%</b>	<b>50%</b>	<b>60%</b>
<b>TO</b>	<b>65%</b>	<b>65%</b>	<b>65%</b>	<b>65%</b>	<b>65%</b>	<b>65%</b>



# REDUCTION OF ILLNESS

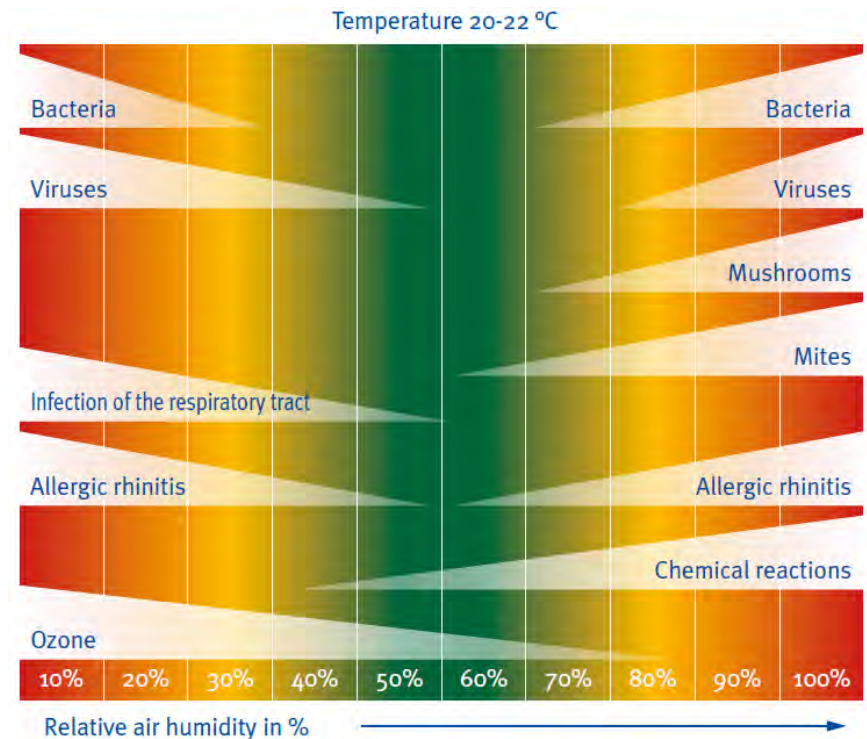


The human comfort zone is, depending on accomodations, within a **range of 40 and 60% relative air humidity** (green area). Other climate causes dry skin, red eyes, rough lips, tiredness, dust exposure, lower concentration and increased risk of illness and infections.

# REDUCTION OF ILLNESS

It is shown that a relative humidity in a range of 40% - 60% r.h. is convenient for humans.

Characteristic of growth and interaction is clear lower than out of this range.



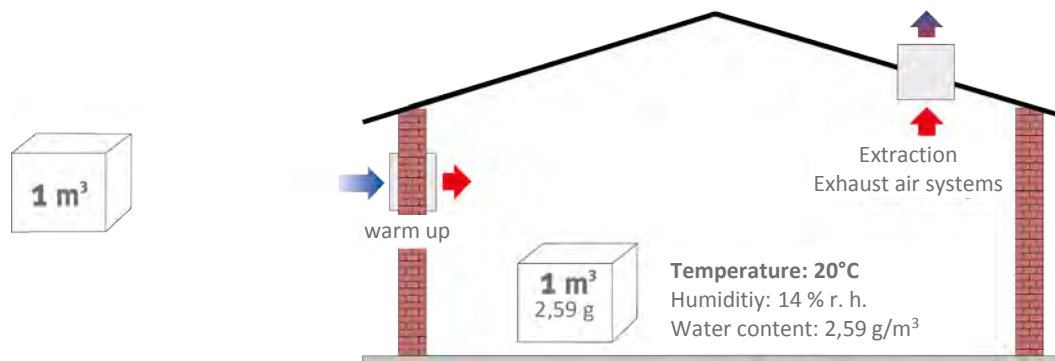
**Optimal humidity range for human health**

Source: E. Henne – Luftbefeuchtung

Figure: Sterling

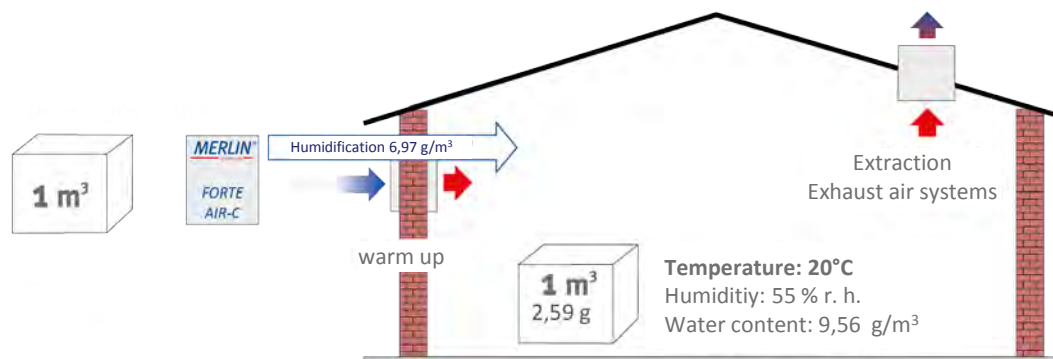
# HUMIDIFICATION THEORY

## Outside air supply in winter **without** merlin<sup>®</sup> humidification



If  $1\text{ m}^3$  outside air with an average temperature of  $-5^\circ\text{C}$  ( $23^\circ\text{F}$ ) and 80 % relative humidity is influxed into a production plant and heated up to  $20^\circ\text{C}$  ( $68^\circ\text{F}$ ), the relative humidity will drop down from 80% to approx. 14% rH. The water content remains the same.

## Outside air supply in winter **with** merlin<sup>®</sup> humidification



To preserve a relative humidity of 55% rH at  $20^\circ\text{C}$  ( $68^\circ\text{F}$ ) each cubicmeter fresh air of  $-5^\circ\text{C}$  ( $23^\circ\text{F}$ ) must be added with  $6,97\text{ g}$  water after heating up to  $20^\circ\text{C}$  ( $68^\circ\text{F}$ ).

# MICRO DROP HIGH-PRESSURE AIR HUMIDIFICATION



merlin®  
Hygiene-Concept



Quality



Hygiene



Environment

Other standards:

AUSTRIAN STANDARD H 6020-1:2007  
„Ventilation systems in hospitals – Planning, construction and inspection“

ISO 13485:2012  
„Medical products – Quality management systems – Requirements for regulatory purposes“



Fine filtration



Water  
softening



Reverse  
osmosis



Disinfection



Powerbox

# MERLIN®

## HYGIENE CONCEPT

Particle size	0,001 μm		0,01 μm		0,1 μm		1,0 μm		10 μm		100 μm (0,1 mm)	
Molecular weight (dalton)	100	200	1000	10000	20000	100000	500000					
Relative size of various materials	dissolved salts		humic substances		activated carbon						sand	
	metal ions		pyrogens				pigments					
	sugars						bacteria					
	monovalent ions				legionella							
	divalent ions		viruses		cigarette smoke		industrial dust					
	halocarbons						glass dust & abrasive dusts					
Separation processes	reverse osmosis				ultra-filtration				particle filtration			
	nanofiltration				cross-flow microfiltration				volume filtration			

# HUMIDIFYING TECHNOLOGIES



Through all different air humidification technologies from merlin® Technology, you create your own climate and thereby increase well-being, productivity and success.

## HIGH PRESSURE

Atomization



## ULTRASONIC

Capillary waves



## ROTATION LAMELLA

Natural evaporation



## COMPRESSED AIR

Atomization





# ALL SYSTEMS ARE SUITABLE FOR RETROFITTING



## LOW INVESTMENTS FOR HIGHER PROFITS

merlin® systems are worth the money from day one.

All merlin® humidification systems (Ultrasonic, Rotation Lamellas or High Pressure) have been created in a way that enables them to be included into an existing climate system – yet they can also be used as a stand-alone solution.



# MERLIN TECHNOLOGY

## ALPHA AND CORE

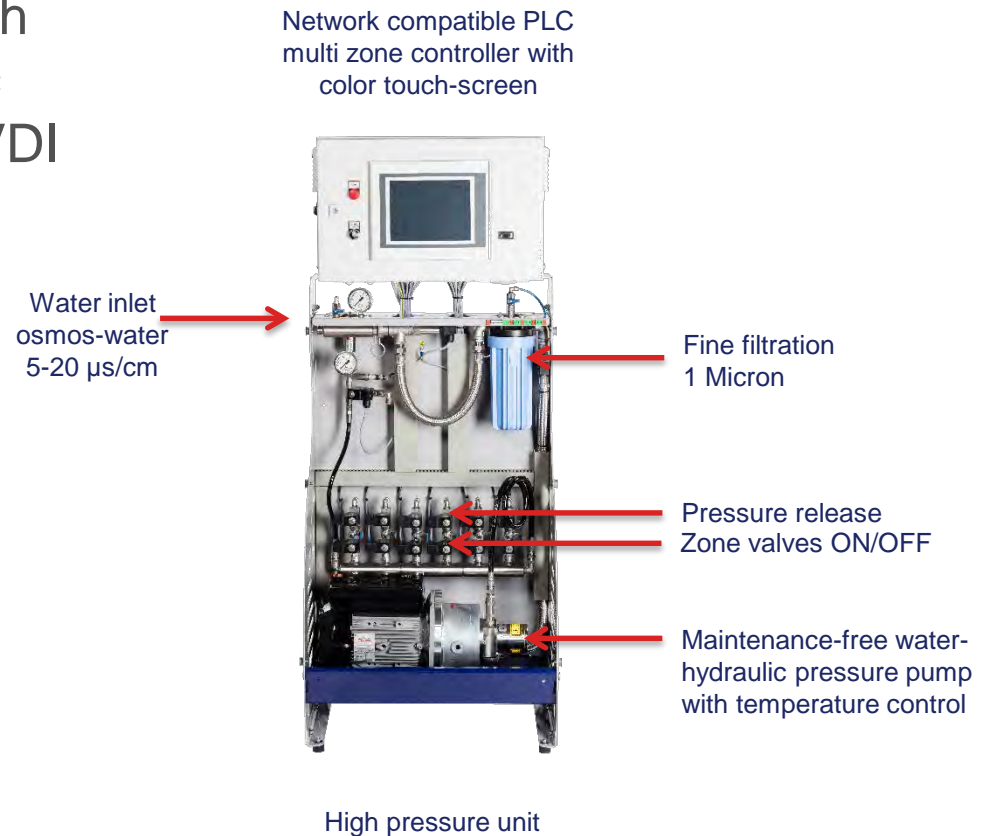
### MICRO DROP HIGH PRESSURE

### AIR HUMIDIFICATION

# ALPHA BOX

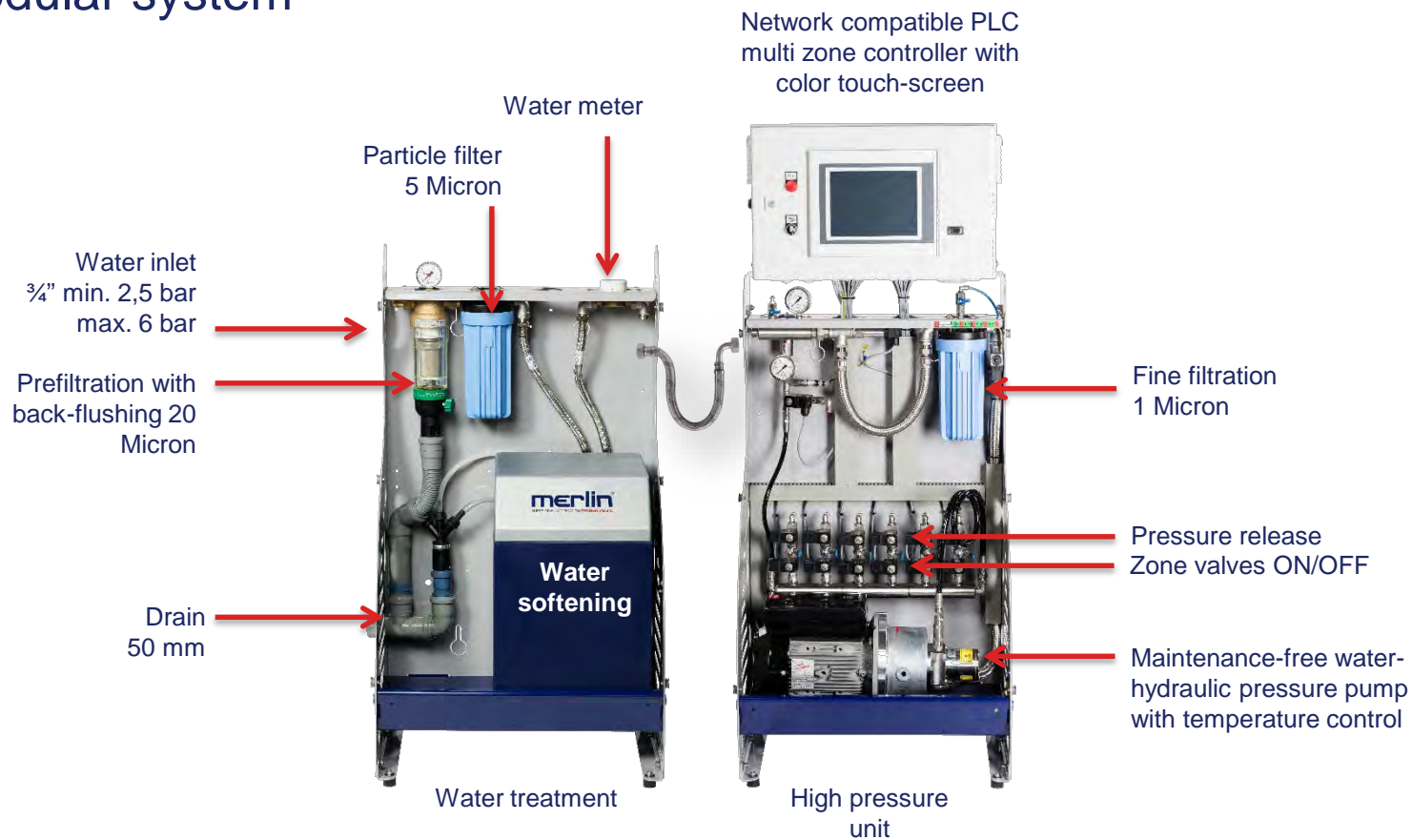
The ALPHA BOX is equipped with a special, oil free water hydraulic pump (stainless steel) (DVGW, VDI 6022 applicable).

This means a high German hygiene standard level.



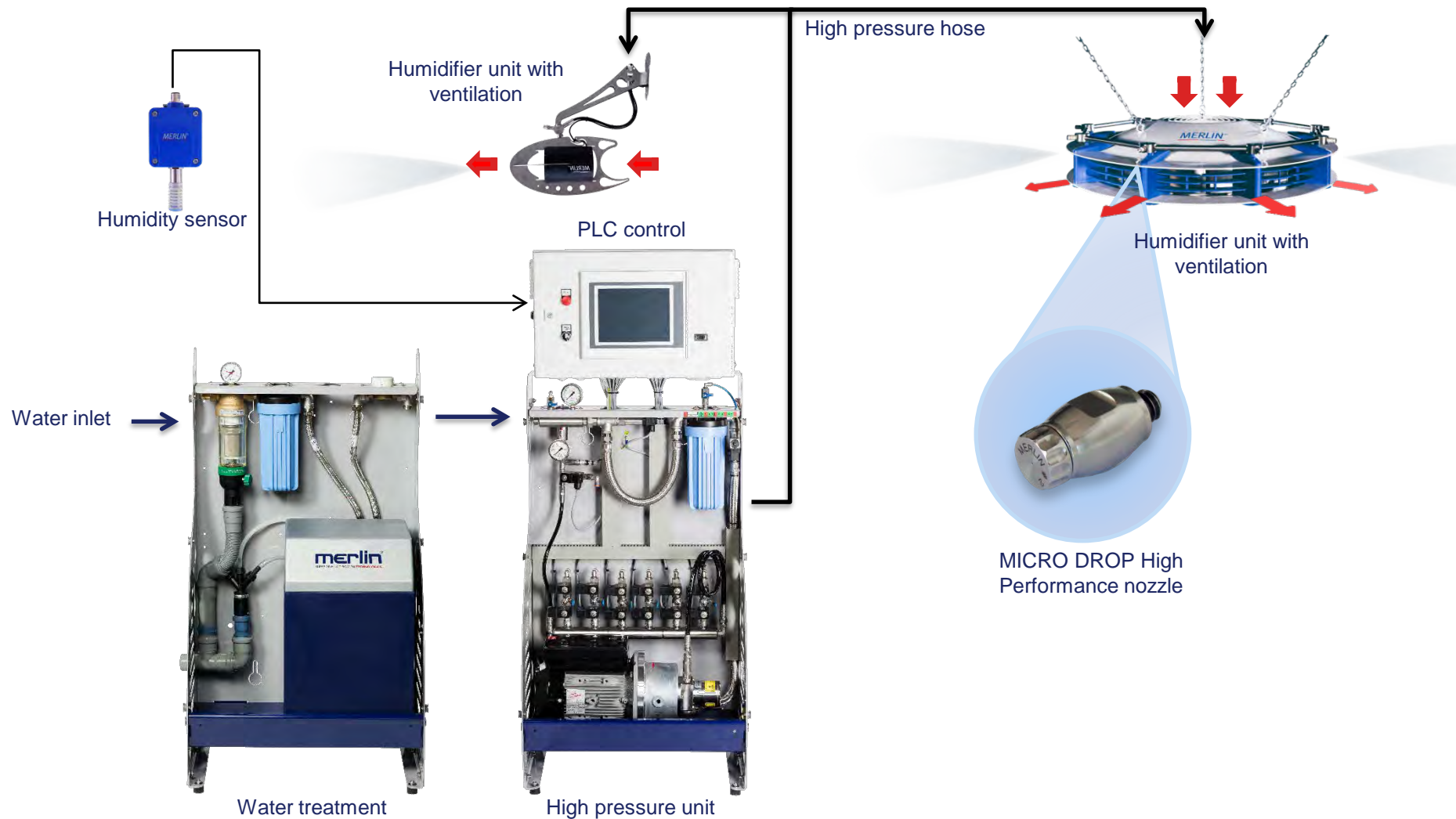
# HOW DOES IT WORK?

## Modular system



# HOW DOES IT WORK?

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**



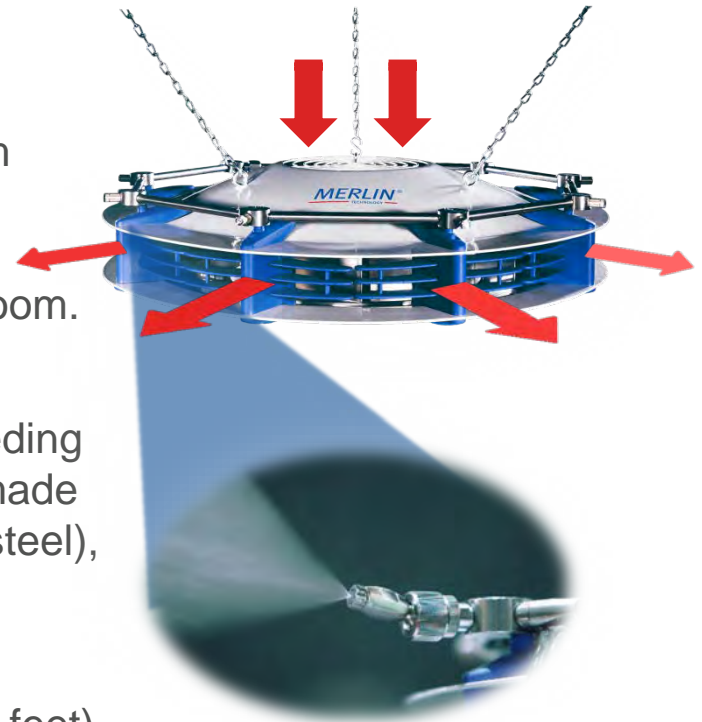
# MICRO DROP HUMIDIFIER

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION TECHNOLOGIES

The merlin<sup>®</sup> humidifier modules aspirate warm air from above and create a better distribution (patented). This makes a fast evaporation possible and at the same time a constant humidity can be achieved inside the room.

The unique construction makes an automatic self bleeding possible. All parts, getting in contact with water, are made of permanent corrosion resistant materials (stainless steel), according to German VDI 6022.

Volume of water in a merlin<sup>®</sup> high pressure hose (900 feet) is about 0,13 gallons.





# OVERVIEW MICRO DROP HUMIDIFIER

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

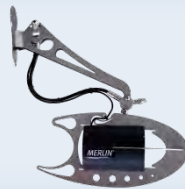
DS-1250



MD-2 oV

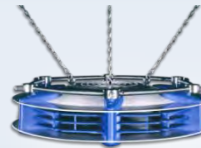
with ventilation

MD-1



with ventilation

MD-6

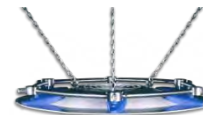


with ventilation

MD-9



MD-1 oV



MD-6 CR



MD-9 CR

# OVERVIEW MICRO DROP HUMIDIFIER

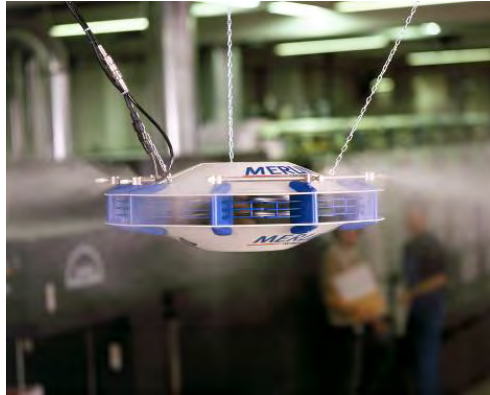


## Modular and functional construction

- ✓ Low need of maintenance and service
- ✓ Self air bleeding humidifier units (patented)
- ✓ Water hydraulic pump: oil free and lubricated with water
- ✓ Capillary water filter for solid particles ( > 1 Micron) in the system
- ✓ Connection with external PC possible
- ✓ Wasserenthärtung auf 0° dH
- ✓ Water softening down to 0° dH (German hardness)
- ✓ High availability (24 h/day; 365 days/Y)
- ✓ Stainless steel components
- ✓ Optional and modular expendable

# APPLICATION

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**





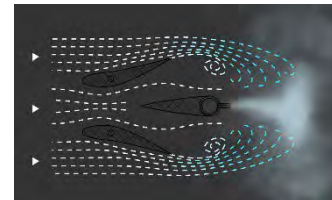
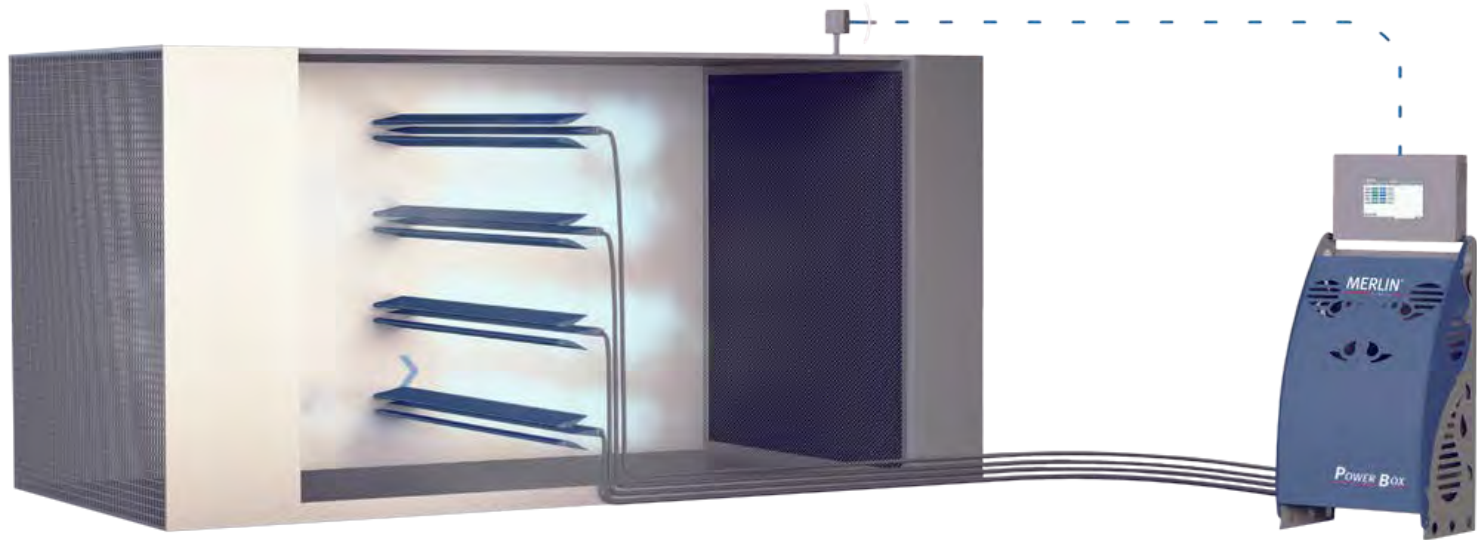
# MERLIN TECHNOLOGY

## ORBIT WING® MICRO DROP

### DUCT HUMIDIFICATION (PATENTED)

# ORBIT WING® MICRO DROP DUCT HUMIDIFICATION

**merlin**®  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

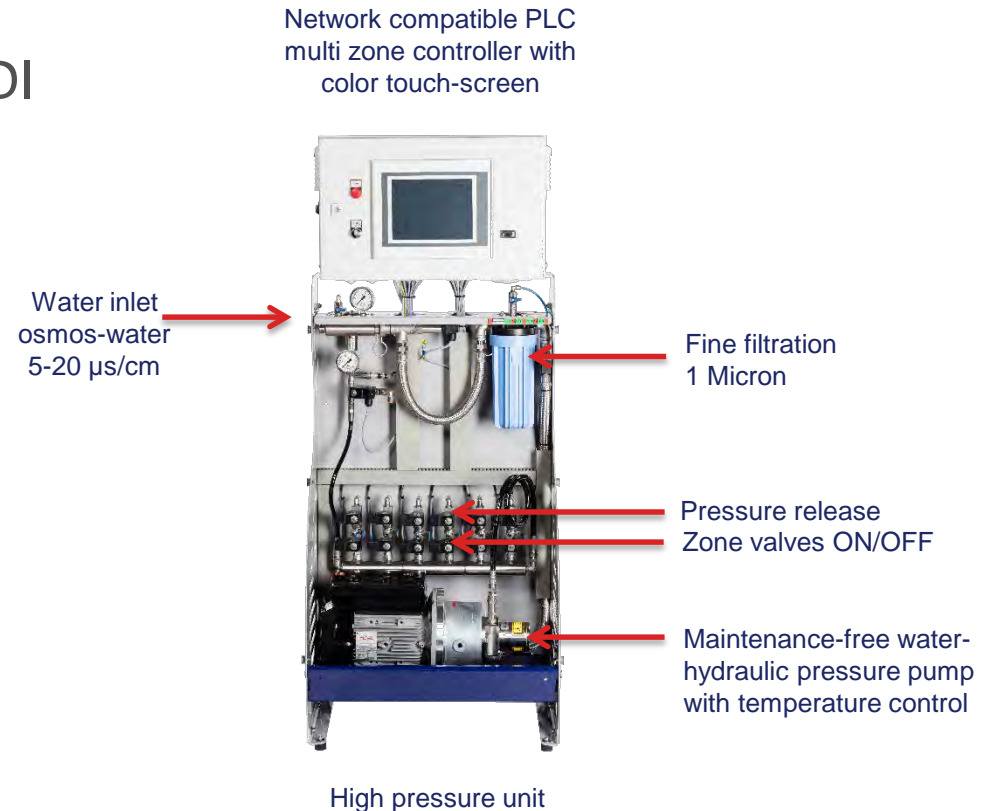




# ORBIT BOX

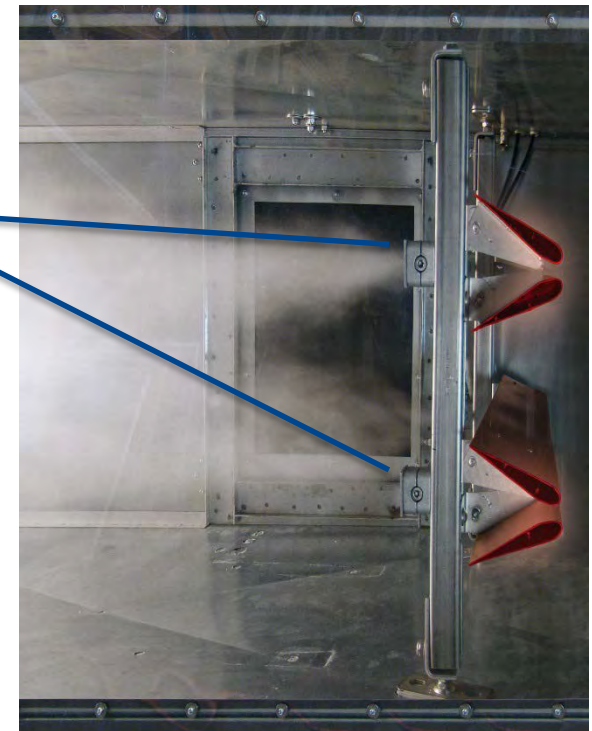
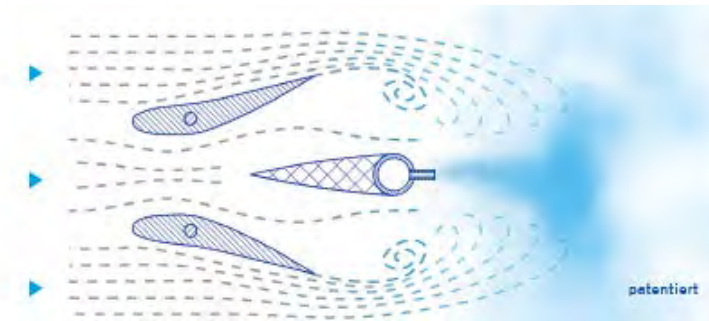
The ORBIT BOX is equipped with a special, oil free water hydraulic pump (stainless steel) (DVGW, VDI 6022 applicable).

This means a high German hygiene standard level.





## Patented air flow



## Controlling

- Optimised PID regulation for virtually no excessive humidification (condensation)
- Variable output through frequency-controlled high pressure pump
- Patented combination of increments & pressure control

ORBIT WING®



Product video ORBIT WING®

Start

# ORBIT WING® IN ACTION

**merlin**®  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**



Inside the duct



In Action



Outer view

## The benefits summarised

- ✓ minimal energy consumption  
-2.5 watt/kg
- ✓ no chemicals used to maintain water quality
- ✓ minimal loss of pressure thanks to optimal droplet separator  
(100 Pa at 2 m/s)
- ✓ patented combination of step and pressure control
- ✓ modular design means straightforward installation
- ✓ can be integrated into any duct system  
(can be replaced and retrofitted)
- ✓ high level of reliability and safety
- ✓ all water-bearing components are made of anti-corrosive V2A stainless steel or food-tested plastics
- ✓ fine water filtration and dry-running / heat protection
- ✓ energy-saving alternative to steam humidification (uses 90% less energy)
- ✓ almost zero maintenance required
- ✓ shorter evaporation distance  
(-50%)



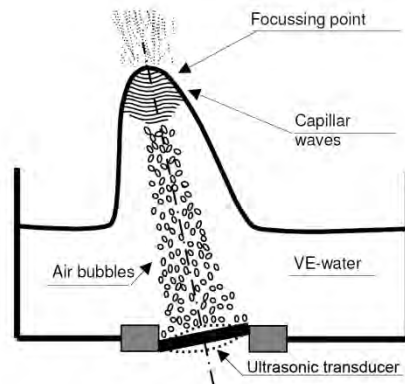
# MERLIN TECHNOLOGY

## PURUS, FORTE, FINESSE UND SENSO

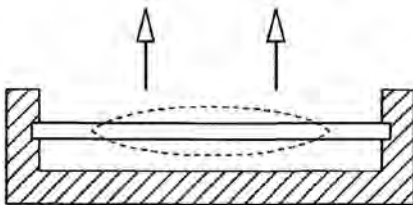
### ULTRASONIC AIR HUMIDIFICATION

# THE ULTRASONIC PRINCIPLE

„Ultrasonic air humidification“ creates ideal room and business climate conditions in an incredibly simple way:



*Oscillation line – Piezo ceramic*



In a water container lamellas oscillate in a defined frequency range. Through this aerosols of merely 1 $\mu$  are generated. These are released into the room air in a controlled way. Through them hygroscopic deficits are balanced.

That way they create the **individually perfect climate** for tasks, offers and performances.

**Contra-Keim<sup>®</sup>** and **AquaDrain<sup>®</sup>** guarantee highest hygienic standards

# ULTRASONIC AIR HUMIDIFICATION

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

**PURUS** Direct humidification



**FORTE** Duct humidification





# ULTRASONIC AIR HUMIDIFICATION

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

**FINESSE** Food humidification



**SENSO** Universal humidification



# ADVANTAGES ULTRASONIC TECHNOLOGY



## 1. Maximum energy saving

CO<sub>2</sub> reduction by up to 93 % less electrical energy in comparison with steam/infrared humidifiers.

## 2. Minimum connected load

Only approximately 7 % of the connected load is required for the same humidifier output in comparison with electrode-type steam humidifiers. This means significantly lower connection costs.

## 3. Energy saving cooling effect

Room cooling takes place as a result of the **adiabatic humidification principle**. This means that where heat load is present, that running time of the cooling equipment can be significantly reduced.

# ADVANTAGES ULTRASONIC TECHNOLOGY



## 4. Minimal water consumption

Conventional humidifiers have a water loss of up to 70%, steam humidifiers a loss of up to 30%. With the ultrasonic humidifier, apart from cyclic drainage, there is no water loss.

## 5. Maximum humidification immediately

Humidification takes place without any form of delay when switched on (except during drainage and line flushing).

## 6. Maximale Wasserverdunstung

The particle diameter of the aerosols is on average only 0,001mm (1 micron). Thus, the very fine aerosol fog disseminates quickly and is absorbed by the air extremely rapidly.

# DUCT HUMIDIFIER FORTE

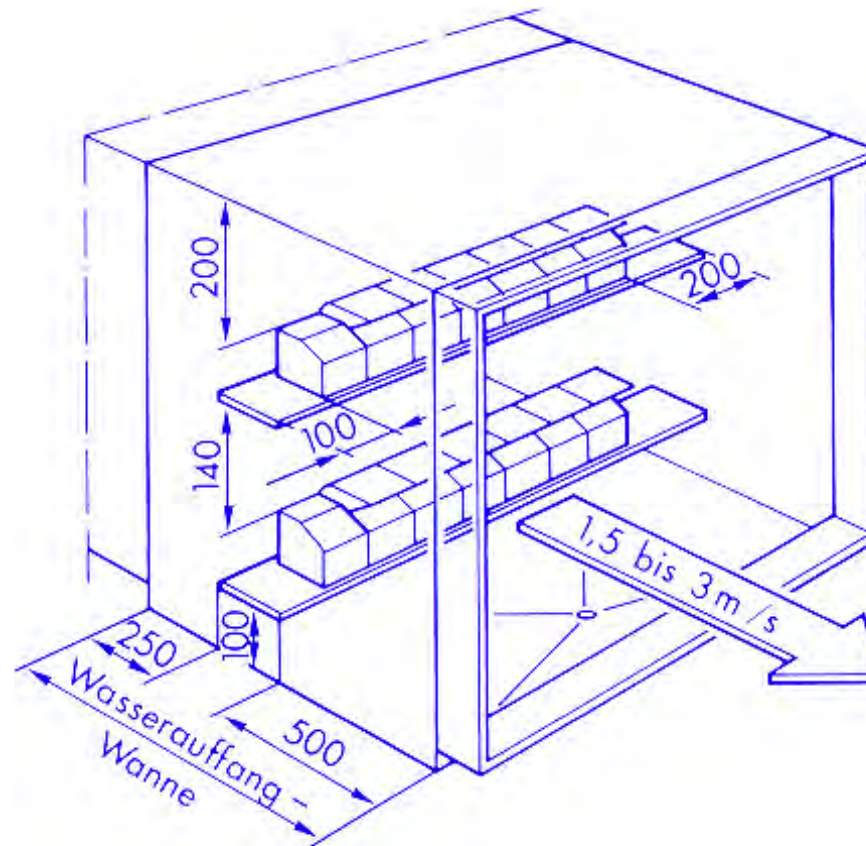


## Technical data

Type	Humidification capacity kg/h	Capacity VA	Voltage V/Hz	Weight kg	Length mm	Hight mm	Depth mm
FORTE 6	3,6	185	48V/50Hz	6,0	285	202	261
FORTE 12	7,2	375	48V/50Hz	7,7	435	202	261
FORTE 18	11,8	555	48V/50Hz	9,5	585	202	261
FORTE 24	14,4	735	48V/50Hz	11,7	735	202	261
FORTE 30	18,0	915	48V/50Hz	13,7	885	202	261
FORTE 36	21,6	1095	48V/50Hz	15,2	1035	202	261
FORTE 42	25,2	1.275	48V/50Hz	17,2	1185	202	261

# MOUNTING SITUATION FORTE

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**



# APPLICATION FORTE



Humidification and adiabatic cooling by  
**merlin®** ultrasonic systems.

Through the combination of  
humidification and adiabatic  
cooling, a **hygienic, highly modern**  
and **safe** humidification system is  
present.

With **minimal electrical energy**  
per kg humidity (~ 0,05-0,06 KW/h).

# APPLICATION FORTE



Aerosol mist image of **FORTE** in partial load situation. The humidifier are cotrollable between 0% and 100%.



# APPLICATION FORTE



Printery NL-Amsterdam  
AHU with FORTE ultrasonic  
humidifiers





# MERLIN TECHNOLOGY

## AIR-C500 AND AIR-C250

### ROTATION LAMELLAS

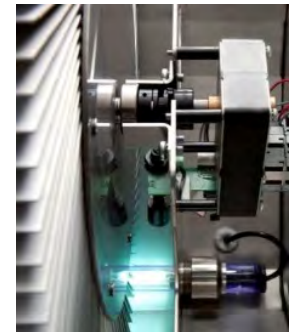
# ROTATION LAMELLAS TECHNOLOGY

Aerosol-free air humidification through natural evaporation by means of rotation lamellas creates ideal room and business climate conditions on the basis of simple physical principles.

- The rotation lamella evaporator lies in a humidification trough supplied with drinking water.
- An integrated heating register heats the air for generation of evaporating energy.
- Integrated UVC-disinfectors guarantee that only germ-free water is evaporated.
- Rotating lamellas ‚scoop‘ the humidity into the ambient air with an accuracy in the single percent range.
- That way they generate the individually perfect climate for tasks, offers and performances.
- Rotation lamella air humidifiers by **merlin**<sup>®</sup> are proofed with regard to their hygienic safety.



Lamellenrotor



Steuerung und  
Desinfektion

# ROTATION LAMELLAS TECHNOLOGY



Rotation lamella humidifiers by merlin® can easily be integrated into existing air-handling solutions. By adjustable air outlet temperatures they additionally support heating and cooling of the room.



# CONFIGURATION POSSIBILITIES



For integration into existing air-handling solution



**AIR-C 250**  
until max. 250 m<sup>3</sup>/h airflow



**AIR-C 500**  
until max. 500 m<sup>3</sup>/h airflow



As stand-alone solution



Including ventilation unit



merlin<sup>®</sup> sale technicians calculate the best solution for your needs based on comprehensive analyses and measuring dates.

# MERLIN TECHNOLOGY

## IQ

### COMPACT AIR HUMIDIFICATION



# IQ – COMPACT AND VERSATILE



- IQ-System can be adapted to almost all spatial conditions
- With Quick-Change System it is possible to complement the humidifier with additional nozzles
- Perfect solution for small production and storage areas
- Simple and easy self-installation
- MICRO DROP atomization
- Control of humidity between 30 and 100 % with integrated sensor
- No need for a special water treatment
- The best cost/performance ratio



# IQ – COMPACT AND VERSATILE

**merlin**<sup>®</sup>  
SUPERIOR HUMIDIFICATION **TECHNOLOGIES**

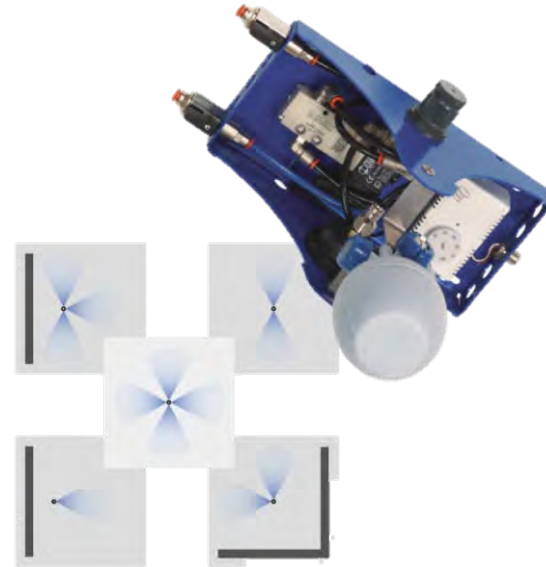
Patented  
Quick-Change  
nozzle (Type  
SU 4,5)



Cleaning set

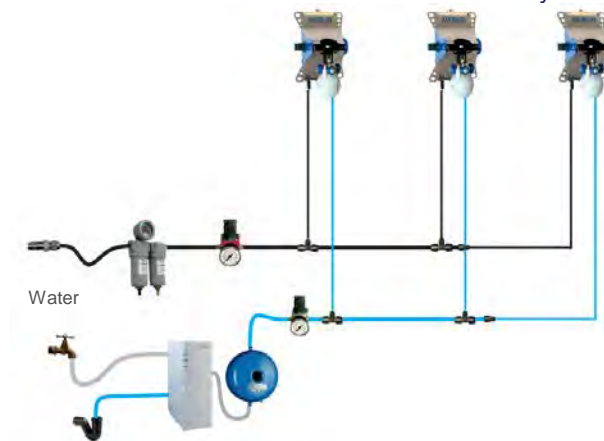


Optional:  
Pivoting nozzle  
adapter

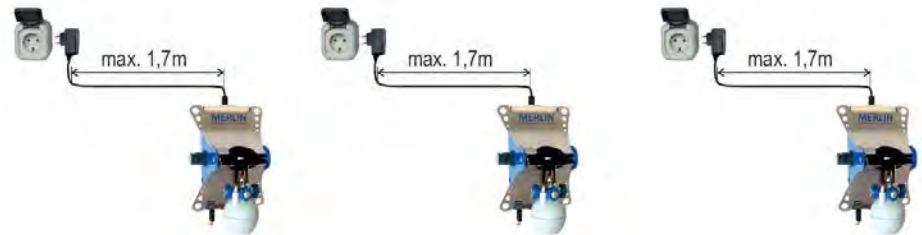


# INSTALLATION OVERVIEW

## Water-Air Installation of more than one IQ-systems incl. Osmosis system



## Elektrical-Installation with hygrostat control



## Electrical-Installation with capacitive control



# VISION



Vision and Goal: the brand

**merlin®**

gains national and international presence,  
which exists for generations and reaches economical and ecological  
positive things.

# STRATEGY



- We are a family company.
- We work environmentally conscious and with a vision.
- We inspire through new developments and special services.
- We are committed to the region and its people.
- We are a reliable market partner for customers and suppliers.
- We are a team that cooperates in trust and respect.
- Personal development is supported by the management.
- Quality and growth are clear and important corporate goals.

# SUPERIOR SERVICE & QUALITÄT



We keep our promises and offer individual concepts with highest-quality products within the expected time schedule.



## MERLIN<sup>®</sup> Technology GmbH

Hannesgrub Süd 10 | 4911 Tumeltsham | AUSTRIA

T +43 (0)7752 / 71966

F +43 (0)7752 / 71988

office@merlin-technology.com

www.merlin-technology.com

