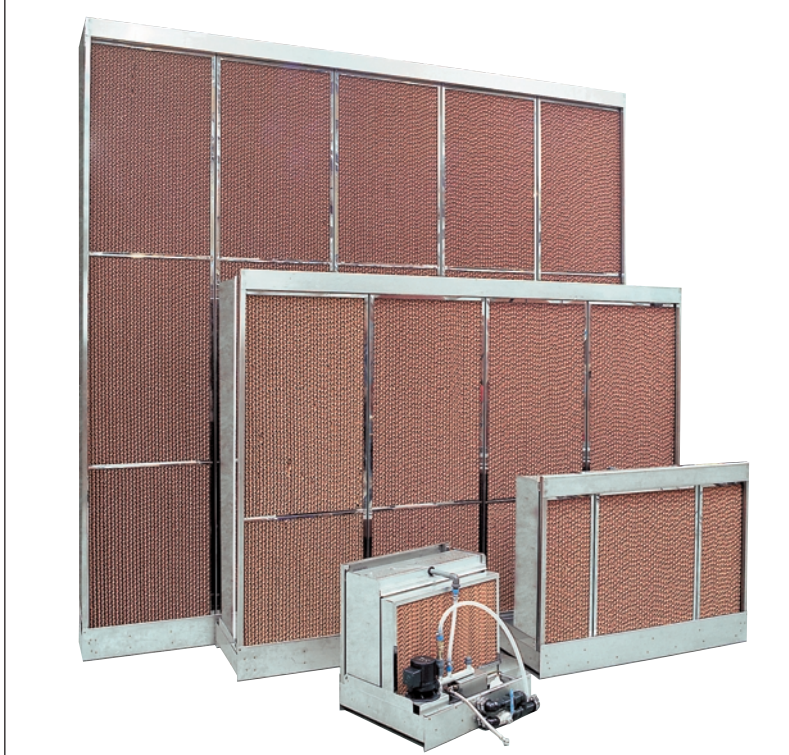


EQUIPMENT

FA6™

FA6™

Evaporative Humidifier/Cooler



- Ultra low energy humidifier/cooler (50–250 W)
- Ideal for evaporative cooling
- Available in wide range of sizes from 0.5 to 34 m³/s (single unit)
- High efficiency: 65%, 85% and 95%
- Low pressure drop
- Superb controllability – typically down to $\pm 1\%$
- No risk of over-saturation
- GLASdek®, evaporative media made from inorganic, non-combustible material
- No water treatment required
- Low running costs
- Compact design allows for space and cost saving
- Trouble-free maintenance
- Safe and hygienic
- Windows based selection program
- ISO 9001 and ISO 14001 certified manufacturing

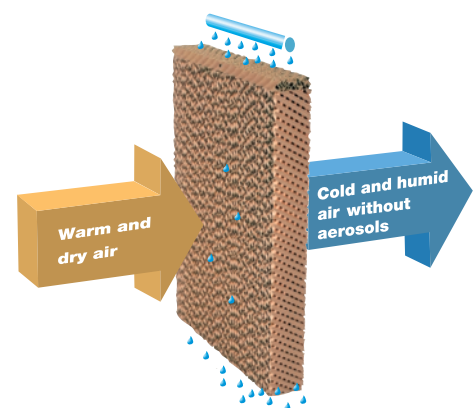
FA6™ Evaporative Humidifier/Cooler has been specially designed for integration into air-handling systems within both residential and industrial buildings. The design is compact and sizes conform to all typical air-handling units (AHU). The standard product line encompasses a wide range of sizes, options for multistage control, integrated droplet separators and three nominal humidification efficiencies, 65%, 85% and 95%.

Technology basics

The heart of FA6 is a cassette made from inorganic non-combustible evaporative media – GLASdek®. Water is supplied to the top of the GLASdek evaporative media via a distribution header. The water flows down the corrugated surface of the media. As the warm and dry air passes through the media it evaporates a proportion of the water and thus produces cold, humidified air. The rest of the water assists in washing the media, and is drained back to the tank.

The energy that is needed for the evaporation is taken from the air itself. The air that leaves the humidifier is therefore humidified and cooled simultaneously without any external energy supply for the evaporation. This is in essence the adiabatic cooling process. It is very efficient and the consumption of energy is very low.

It also allows the use of water straight from the tap with no need for water treatment (i.e. demineralisation plants). Minerals and pollutants stay behind in the GLASdek evaporative media to be washed away with the discharge water keeping the total humidification process pure.



The principle of evaporative humidification and cooling (the adiabatic cooling process).

Design

FA6 consists of one or more cassettes supported by a rigid frame and a water tank made from stainless steel (EN 1.4301). The cassettes are made from GLASdek evaporative media protected by stainless steel casings. On top of each individual cassette is a distribution header that supplies the cassette with water and fixes it to the frame. The water supply to the headers can come from a circulation pump or directly from the mains.

Water systems

Circulating water systems are most commonly used due to the low water consumption. Direct water systems are commonly used when the water quality is too poor for circulating systems or when the humidifiers' annual operation time is short.

1. Circulating water system

The reservoir is filled with cold water from the mains, and a float valve maintains the water level. When there is a humidity demand, the pump starts and circulates water over the cassettes via the distribution headers. Mains water will contain a certain amount of minerals and salts, the concentration of which varies from place to place. During the evaporation, pure water vapour is released to the air. The minerals and salts remain in the water and are returned to the reservoir. A proportion of the water in the reservoir is continually drained and replaced with fresh water to control the mineral concentration.

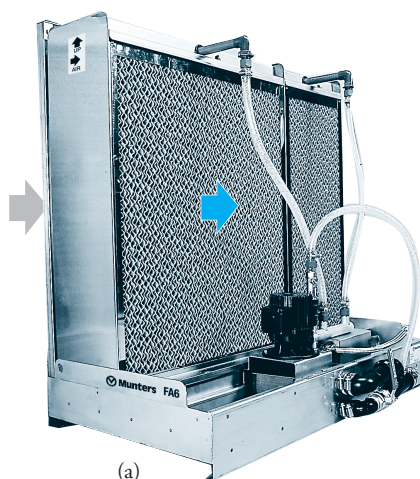
GLASdek® evaporative media

The inorganic material GLASdek used for the humidifier cassette has been fire tested and classified as non-combustible material according to ISO 1182.

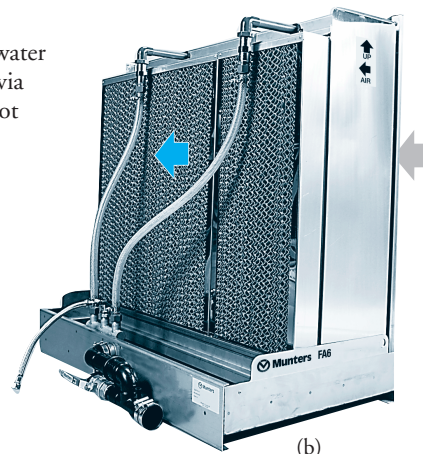
The inorganic material GLASdek used for the droplet separator cassette has been fire tested and classified as non-flammable material class 1, according to BS 476: part 7, M1 according to the French CSTB, and class T1 according to JISA 1322, Japan. This corresponds to NordTestFire 004, class 1, and the German DIN 4102, part 1, class B1.

2. Direct water system

When there is a humidity demand, the mains water is supplied directly to the distribution headers via constant-flow valves. The excess water that is not used for evaporation cleans the cassettes before being discharged.



(a)



(b)

a) FA6 – circulating water system, without droplet separator.

b) FA6 – direct water system, with droplet separator.

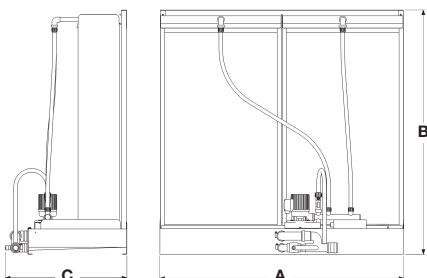
Wide range of sizes

FA6 comes in a wide range of standard sizes that conform to all typical air handling unit dimensions. The individual units cover air volumes from 0.5-34 m³/s. For very large air volumes a combination of units is selected in order to achieve the desired size. Sizes can be modified upon request. Selecting the optimal size is easy with the FA6 Dimensioning Program and on-line technical support.

Standard sizes

A, width [cm]	B, height [cm]								
	60	90	120	150	180	210	240	270	300
60	0.9	1.6	2.4						
90	1.2	2.3	3.4		Air volume [m³/s at 4.5 m/s]				
120	1.7	3.2	4.7						
150		3.9	5.8	7.6	9.5	11.3	13.2		
180		4.8	7.1	9.3	11.6	13.8	16.0		
210			8.1	10.7	13.3	15.9	18.5		
240			9.4	12.4	15.4	18.4	21.4	24.4	
270			10.5	13.8	17.2	20.5	23.9	27.2	
300			11.8	15.5	19.3	23.0	26.7	30.5	34.2

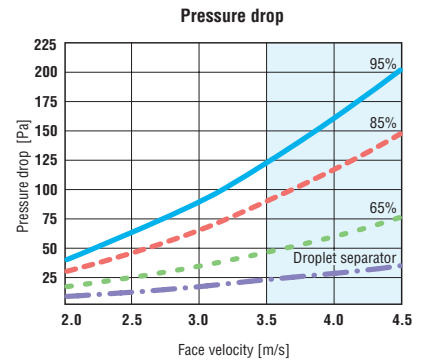
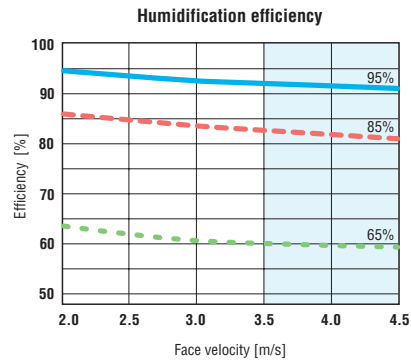
C=592mm for 65-85% efficiency, C=692mm for 95% efficiency



High performance

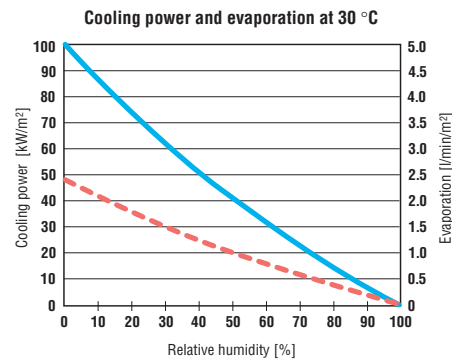
FA6 can be ordered with three different humidification efficiencies 65, 85 and 95%. The choice of humidification efficiency depends on the control method and the cooling and/or humidity demand of the application.

Droplet separator is recommended for face velocities over 3.5 m/s. The maximum face velocity is 4.5 m/s.



Cooling power

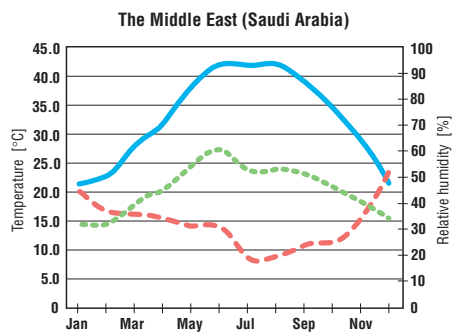
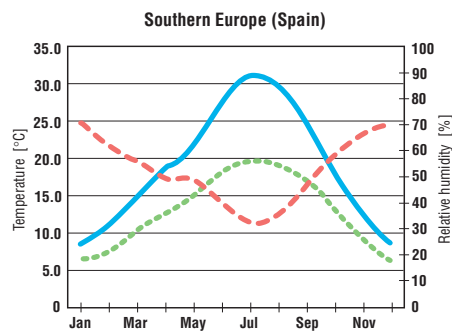
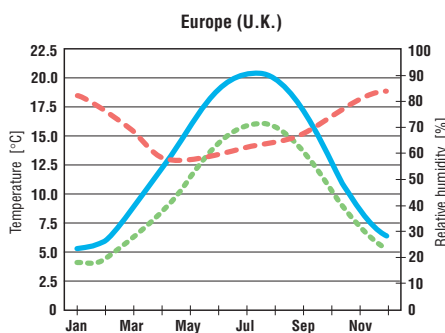
The adiabatic cooling process is often used to eliminate or reduce the load on cooling equipment during the summer. The FA6 can be used as a direct cooler – cooling and humidifying the supply air, or as an indirect cooler in conjunction with a heat recovery rotor – cooling the supply air without adding any humidity.



Cooling power specified per m² surface area at 4.5 m/s and 95% humidification efficiency.

— Cooling power
- - - Evaporation

— Ambient temperature
- - - Ambient humidity
... Temperature after humidifier

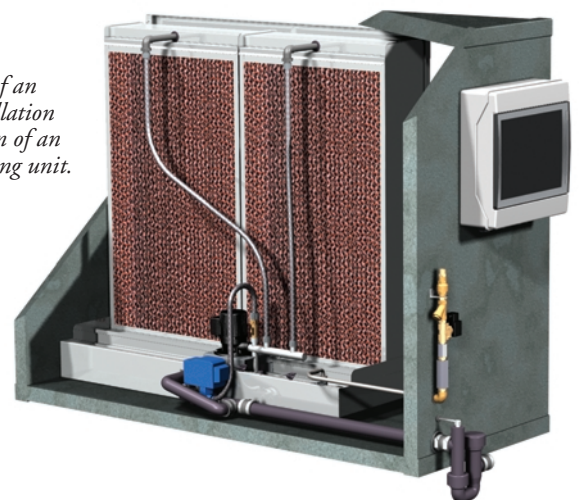


Evaporative cooling from ambient conditions. Based on average daytime climate condition data.

Simple to install

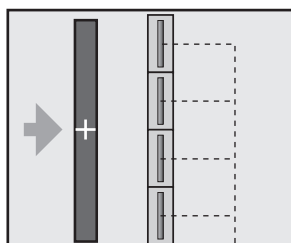
The FA6 is easy to install and easy to configure into both existing and new HVAC systems. Electricity (230/400 V, 50Hz), water supply (1-10 bar) and drainage (Ø 40 mm) are all that is needed. Due to its high performance and compact design it is the ideal replacement for older, less efficient humidifiers/coolers.

Example of an FA6 installation in a section of an air-handling unit.

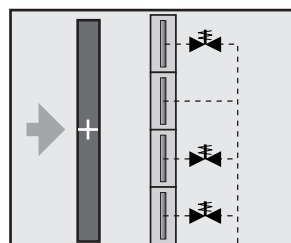


Control options

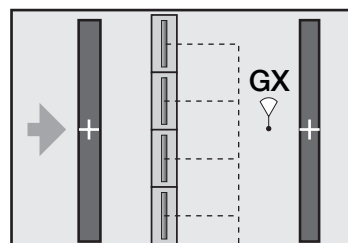
The FA6 can be easily controlled to address even the most demanding conditions. The choice of control method depends mainly on the application and the desired accuracy of the system. The controls vary from the simple on-off control with a typical accuracy of $\pm 10\%$ RH to the infinitely variable face and by-pass control with a typical accuracy of $\pm 1\%$ RH.



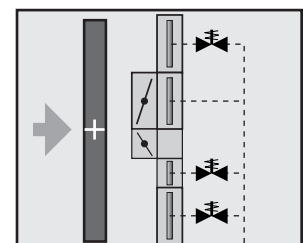
On-off (1-stage)



Stage (2-5 stages)



Dew-point*)



Face & bypass*)

*) Available for customized designs only. Not included in the order code.

Optional equipment

To adapt the FA6 to the specific demands of different applications Munters offers a full range of accessories.

1. **Droplet separators** are used to eliminate the risk of carry-over due to high air velocities or turbulent airflow. They are very easy to install and do not change the FA6 humidifier's space requirement. Separators are recommended for all installations with a face velocity over 3.5 m/s.
2. **Stage control** consists of solenoid valves that control the water supply to individual cassettes. The valves enable the humidifier/cooler to be operated in 2-5 stages to suit a variable humidity demand (availability subject to size).
3. **The FA6cc, Clean Concept** is a bolt on enhancement for the FA6 Humidifier/Cooler that enables circulating water models to operate at optimum hygiene levels. It also incorporates BMS connections and alarms to increase the operational safety. The FA6cc is designed to exceed current legislation in relation to the control of bacteria in water systems in many countries – e.g. ACOP L8 in the U.K.
 - 3.1. **FA6ds, Dosing System** enables time controlled, and/or externally controlled, dosing of biocides into

the humidifier tray. The dosing system is ideal for use in installations with suspected poor water quality or high levels of airborne organic matter.

- 3.2. **FA6cs, Conductivity System** enables conductivity controlled bleed-off. The system reduces water consumption and is especially effective with stage-controlled humidifiers/coolers.
- 3.3. **FA6uv, Ultra Violet Sterilisation System** with intensity sensing (available in U.K. only).
4. **Custom designed units** can be supplied upon request.

Tested and certified

FA6 Humidifier/Cooler is manufactured in accordance with the following harmonized EU standards and technical specifications:

- EN 60204-1 – Safety of machinery, electrical equipment of machines;
- EN 50081-1 – Electromagnetic compatibility, generic emission control;
- EN 50082-1 – Electromagnetic compatibility, generic immunity standard, industrial environment.

It agrees, with the limitations that have been stipulated for machines, with the most important health and safety requirements of Machinery Directive 89/392/EEC and its supplement Directive

91/368/EEC, 93/44/EEC, 93/68/EEC and 89/336/CEE – council directive electromagnetic compatibility. It is certified according to VDI 6022 (German, HVAC Hygiene Standard).

More over the FA6 Evaporative Humidifier/Cooler has been rigorously tested by the Central Department for Hospital Hygiene at the Medical Faculty of RWTH in Aachen, Germany. According to the results there were no aerosols containing legionella identified, nor were Legionella pneumophila passed any other way into the air even at very high concentrations of legionella in the circulating water and very high air velocities. The tests were performed both in vitro and in vivo.

How to select FA6?

Selection of the right FA6 is easy with the FA6 Technical manual or the FA6 Dimensioning Program. All you need to know are the following parameters:

- Air volume
- Duct dimensions or the cross-section of the AHU
- Design conditions
- Required control accuracy
- Type of application

You are always welcome to contact your nearest Munters sales office for assistance.

Order information

Humidifier/Cooler FA6-XX-XXX-XXX-XX-X-X

Humidification efficiency
65=65%, 85=85%, 95=95%

Width, cm (see table page 2)

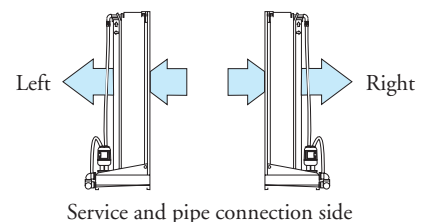
Height, cm (see table page 2)

Water system
C= Circulating water, D=Direct water
1-5=Number of stages (see page 3)*

Droplet separator
0=Without, 1=With

Service and pipe connection side
L=Left, R=Right

e.g., FA6-85-120-090-C1-0-L



Comments

FA6 sizes starting with the 240-240 are delivered disassembled. The delivery does not include water filter, external solenoid valve or water trap.

*When the number of steps=1, no solenoid valve is included. In the case of more steps than one, the number of solenoid valves depends on the number of cassettes in the humidifier. Munters will provide you with full details.

FA6™ is developed and produced by Munters Europe AB.



Munters Europe AB, HumiCool Division, Kung Hans Väg 8, P O Box 434, SE-191 24 Sollentuna, Sweden. Phone +46/(0)8/626 63 00, Fax +46/(0)8/754 56 66.
www.munters.com

Austria via sales organization in Germany, Munters Euroform GmbH, Phone +49/(0)241/89 00 0, Fax +49/(0)241/89 00 199, **Denmark** via sales organization in Sweden, Munters Europe AB, Phone +46/(0)8/626 63 00, Fax +46/(0)8/754 56 66, **Finland** Munters Oy, Phone +358/(0)9/83 86 030, Fax +358/(0)9/83 86 036, **France** Munters France S.A., Phone +33/(0)1/41 19 24 51, Fax +33/(0)1/41 19 00 17, **Germany** Munters Euroform GmbH, Phone +49/(0)241/89 00 0, Fax +49/(0)241/89 00 199, **Italy** Munters S.R.L., Phone +39/(0)2/488 6781, Fax +39/(0)2/488 1171, Munters euroemme S.p.A., Phone +39/(0)183/52 11, Fax +39/(0)183/521 333, **Kingdom of Saudi Arabia and Middle East** Hawa Munters, c/o Hawa United Cooling Syst. Co. Ltd., Phone +966/(0)11/477 15 14, Fax +966/(0)11/476 09 36, **Norway** via sales organization in Sweden, Munters Europe AB, Phone +46/(0)8/626 63 00, Fax +46/(0)8/754 56 66, **South Africa & Sub-Sahara Countries** Munters (Pty) Ltd, Phone +27/(0)11/455 2550/1/2, Fax +27/(0)11/455 2553, **Spain** Munters Spain S.A., Phone +34/91/640 09 02, Fax +34/91/640 11 32, **Sweden** Munters Europe AB, Phone +46/(0)8/626 63 00, Fax +46/(0)8/754 56 66, **Switzerland** via sales organization in Germany, Munters Euroform GmbH, Phone +49/(0)241/89 00 0, Fax +49/(0)241/89 00 199, **United Kingdom** Munters Ltd, Phone +44/(0)1480/442 340, Fax +44/(0)1480/411 332, **Export & Other countries** Munters Europe AB Phone +46/(0)8/626 63 00, Fax +46/(0)8/754 56 66, **Region Americas** Munters Corporation, Phone +1/(0)978 241 1100, Fax +1/(0)978 241 1214, **Region Asia** Munters K.K., Phone +81/(0)3/5970 0021, Fax +81/(0)3/5970 3197