miniClima

54% Dehumidify

miniClima HUMIDITY CONTROL

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New: water-free!
EBCeasy

Whatever you show...

miniClima provides **perfect conditions** for your showcase!

Functions, General Description

The miniClima Constant Humidity Devices „EBC" serve to keep the relative air humidity inside a closed case on a constant level without influencing the temperature of the conditioned air. They are used for museum showcases, switchboards, deposit cupboards, containers and similar applications. The essential requirement for efficient operation of the system is that the case should be airtight and manufactured from non-porous materials.

The current series of production uses two different technologies for the control of the air humidity: While the „time-honoured" types EBC10, EBC11 and EBC12 work with condensation/evaporation, our latest model, the newly developped EBCeasy, transports hydrogen ions through a special membrane, exchanging them with the environment. This method neither requires the supply of water, nor produces any waste water, which also makes the EBCeasy suitable for applications where the device would be moved, like mobile showcases.

Independently from the used type of EBC: The showcase must be connected to the EBC with flexible hoses and screw connectors (all part of the delivery), forming together a tight air circulation system. Also, the miniClima sensor for measuring the temperature and relative humidity must be led inside the case. We use digital sensors and deliver them ready-to-use with housing, cable and RJ45 plug.

For the control lines, which are delivered for setting up an EBC chain of one master and one or more slave(s) of the same technology, we use common network cables (twisted pair/non crossed, ferrite cores recommended).

Once set into operation, the EBC monitors the air condition inside the case and initiates the appropriate action as soon as it becomes necessary. This ensures that the actual humidity level will continuously be brought in line with the set point. All the while, the EBC continually circulates the air between case and EBC - independently from the currently required process.

The master/slave classification of series EBC also holds an extra value for the user, i.e. when it comes to rearranging exhibitions or keeping qualified units on stock, as every EBC can become a master and every EBC can become a slave. The decision for one of the two hierarchic states is selected automatically dependant only upon the type of cable connected to the EBC. If it is the cable from the miniClima RH/T sensor, then the EBC becomes a master controller; if it is the control line coming from another EBC then the unit becomes a slave and will duplicate the function of the EBC that is the first in the line.[1]

The alarms that are issued by an EBC i.e. refer to the water level inside

[1] It is not recommended to mix units of type EBCeasy with those of types EBC10, EBC11, or EBC12

the bottle (EBC10, EBC11, EBC12), to the humidity level being above or below the customer preset levels, to the overall water handling system (EBC10, EBC11, EBC12), to the airpassages control (EBCeasy), or to the presence and quality of the signals coming in from the RH/T sensor or the master unit (i.e. broken cable).

If an alarm occurs, the green LED on the front panel turns red and the display informs the user of the alarm status. Each device is equipped with two potential-free switch-over contacts for wiring the EBC with external installations, i.e. in a control room. First, a composite error alarm, and second a signal informing the user about the on/off status of the unit. The user can therefore be ensured of being notified immediately when a non-routine intervention is needed. Furthermore all units are shipped with a built-in audible composite

With its wide setpoint range of 30-75% rH, every EBC enables you to meet almost any requirements that can be found in practice.

error alarm, which can be activated from the menu (default setting is „off").

The miniClima datalogger is part of the control system of the EBC and thus provided with every unit. The software (miniClima Tool), too, is supplied free of charge with each order. All data can be taken from an RS232 interface on the front panel of the EBC. This interface is used for reading out, administrating and controlling the EBC either directly with a computer or over a network (see page 8).

Each device is delivered ready-to-install, complete with all required parts including hoses, hose connectors and cables, as well as a documentation CD with detailed user guides.

Features

Constant Humidity in Cabinets, Cases, Containers:
- Regulation of the relative air humidity in museum showcases, depository cupboards, switch cabinets, ...
- Cautious approach of the setpoint
- No influence on the temperature
- Constant circulation of the air

Safe Protection for Precious Exhibits or Sensitive Components:
- Tight air circulation system
- No (or in case of the EBCeasy: minor & filtered) intermingle with outside air[2]
- Permanent control and correction of the humidity level
- Optical and (switchable) acoustic alarm signals
- Potential-free contacts for the external display of both the composite error alarm and the EBC's on-off status
- Integrated datalogger with RS232 interface
- Free software (for Windows™) to administrate/monitor/read out all present EBCs via PC/laptop
- Optional accessories for including one or more EBCs into an existing LAN or WLAN (administrating/monitoring/reading out from the desk)
- Support for the ASCII-Modbus protocol
- Calibration of the RH sensor via the menu on the front plate (correction of the sensor signal)

Dehumidification, Humidification as Required:
- Relative humidity measured directly inside the case
- Editable setpoint, editable hysteresis, editable thresholds for the issuing of the humidity alarm
- Immediate start of the appropriate action according to the preset values

Simple, Easy, Effortless:
- The devices require electric supply through a standard socket-outlet only
- No piping required; the EBCeasy not even requires a bottle or any water at all
- Easy to handle, effortless upkeep (EBC10, EBC11, EBC12), almost carefree (EBCeasy)
- General inspection at the factory recommended for about every two years (EBC10, EBC11, EBC12) or three years (EBCeasy). Substitution units for bridging the service works can be delivered on request and dependent on our stock

[2] Due to the used technology, a minor but filtered exchange with the outside air has to take place from time to time during operation

The four base types (EBCeasy, EBC10, EBC11, EBC12) as well as the possibility to combine them in chains of units enable you to virtually cover showcases of any size.

Adaptable:
- Four types of main devices performing air volumes of up to approx. 0.5m³/3m³/5m³/10m³
- Every EBC can become both a master controller and a slave unit that increases the capacity of a master[3]
- With every unit being fully cascadable, such a chain of EBCs can theoretically be extended endlessly
- Optional accessories and variants to meet special requirements, i.e.:
    - Larger water bottles for holding the required distillate and for collecting the accumulated condensate (EBC10, EBC11, EBC12)
    - Detached operating unit (which can i.e. be mounted to the case wall)
    - Filters for cleaning the showcase air
    - Air distribution boxes for running several cases with only one EBC
    - Fans of different strengths
    - Choice of the required water level sensors for the bottle (high mark and/or low mark or no sensor at all; EBC10, EBC11, EBC12)
- Language selection for the display and menu messages (English, German)

Unobtrusive & handy:
- Small, compact devices
- Silent in operation, modest in appearance
- Display on the front panel for the immediate indication of the actual humidity level and the current process
- Additional information provided via the menu, such as the temperature in the showcase or the EBC's hours of operation
- Easy to install & quickly dismantled
- Can be stored and/or put to work on any other climate-ready showcase again

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[3] It is not recommended to mix units of type EBCeasy with those of types EBC10, EBC11, or EBC12.

Buildup
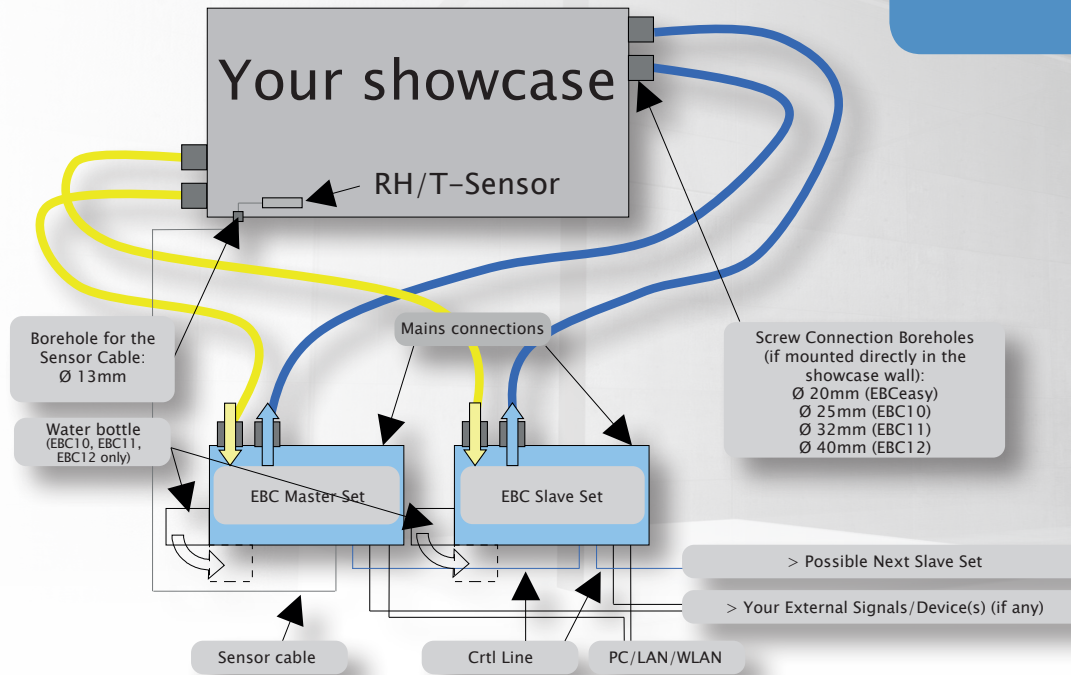
Connections and Operating Elements on the EBC

Front:	Handle (EBC10, EBC11, EBC12 only), on-off/reset button[4], alpha-numeric display[4], status LED (power & alarm)[4], menu buttons[4], RJ45 socket for the sensor cable or the control line coming from a master set, RJ45 socket for the control line to a slave set, cage clamps for the wiring of extern signals (composite error alarm/on-off-status), RS232 interface for PC, LAN[5], WLAN[5] or ASCII-Modbus[6], outlet of the bottle sensor cable(s) as well as of the silicone pipe for the bottle (EBC12 only), bottle with belt and water level sensor(s) (EBC10 and EBC11: optional position, EBC12: standard position).
Left:	EBCeasy: cooling slits, in/outlets for an occasional & minor exchange with the outside air (removable grill with filter pad, optionally: connecting flanges for external air filters); EBC10 and-11: outlet of the bottle sensor cable(s) as well as of the silicone pipe for the bottle, bottle with belt and water level sensor(s) (standard position); EBC12: add. inlet for the device cooling (removable grill with dust filter pad), and on order (extra charge): bracket for positioning the bottle, belt and water level sensor(s) next to the side panel.
Backside:	All types: hose connectors (system air in/outlets), mains connection, rating plate.
Right:	EBCeasy: cooling slits, in/outlets for an occasional & minor exchange with the outside air (removable grill with filter pad, optionally: connecting flanges for external air filters); EBC10, EBC11, EBC12: air inlet for the device cooling (removable grill with dust filter pad).
Top & Bottom:	Air outlets for the device cooling (EBC10, EBC11, EBC12 only).

[4] Optionally on the detached operating unit
[5] The additional (preconfigured) hardware required for integrating the units into your LAN or WLAN (RS232-to-IP converters) can be ordered with us
[6] RS232-to-RS485 converters can also be obtained from us

Your showcase

RH/T–Sensor

Borehole for the
Sensor Cable:
Ø 13mm

Water bottle
(EBC10, EBC11,
EBC12 only)

Mains connections

Screw Connection Boreholes
(if mounted directly in the
showcase wall):
Ø 20mm (EBCeasy)
Ø 25mm (EBC10)
Ø 32mm (EBC11)
Ø 40mm (EBC12)

EBC Master Set

EBC Slave Set

> Possible Next Slave Set

> Your External Signals/Device(s) (if any)

Sensor cable

Crtl Line

PC/LAN/WLAN

- *The shown positions of the screw connections on the showcase do not represent a general solution or recommendation.*
- *A slave set is only needed where the total air volume to be conditioned exceeds the recommended upper limit of the used master set.*
- *The given diameters of the boreholes for the screw connections only apply when the screw connections are going to be fixed directly on the case wall. If this is not possible (i.e. at wall thicknesses of > 6mm), flanges (like our FLANGE20/-25/-32/-40) can be used.*

Software: miniClima Tool
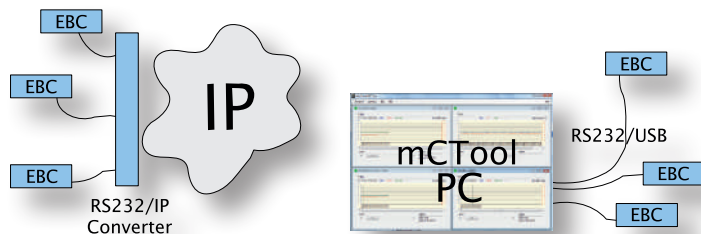
The miniClima Tool enables you to comfortably administrate your miniClima equipment right from the desk.

Our Windows™ application is part of every EBC delivery. The software serves to administrate, monitor and control any unit out of our current EBC series using a PC or laptop. The devices can be addressed when being part of a common IP net by means of a RS232/IP converter as well as when being plugged directly to the used computer via RS232 or USB. Up to 15.000 values can be stored and read out per EBC. So, in addition to the possibility of operating every EBC via its front panel, one can also centrally handle an unlimited number of EBCs using the miniClima Tool.

The following tasks can be carried out comfortably on the PC/laptop using the miniClima Tool:

- Live display of the current values for the relative humidity (RH) and temperature (T) inside the showcase.
- Graphically displaying the live and historic data for RH and T inside the showcases.
- Graphically displaying the values for the chosen setpoints and alarm thresholds.
- Printing the RH/T graphs.
- Storing the RH/T datasets as csv files.
- Editing setpoints, hysteresis, alarm thresholds and storage intervals.
- Displaying the alarm statuses of any device.
- Logging of all alarms that might occur as well as of all changes of settings that are going to be taken.

Triple Box Circulation Filter

The purpose-made Triple Box Filter was especially developed for us by Camfil™. The filter box shall be integrated into the hosepipe system between EBC and showcase by use of our pipe connectors. By a combination of fine particle filters and carbon media filters the box is designed to filter pollutants as well as 99% of the particles not smaller than 1μm.

The three-step filter consists of:
1. Ecopleat F7 - a fine particle filter made of wet-laid glass fiber paper
2. Citysorb - a molecular filter (ozone filtration efficiency: 70%) made of multilayer carbon media
3. Citycarb - a molecular particle filter (ozone filtration efficiency: 90%) made of synthetic fibre and broad spectrum carbon

For using an EBC with a filter the EBC should be equipped by a stronger circulation fan or the airstream has to be increased by an additional external circulation fan.

Types & Options

Master Sets & Slave Sets
for volumes of up to approx. 0.5m³ (EBCeasy) / 3m³ (EBC10) / 5m³ (EBC11) / 10m³ (EBC12)

Standard configuration & usual scope of delivery per device:
- Master Sets: RH/T sensor, ready-to-use with housing, cable (2.5 or 5m), ferrite core and RJ45 plug
- Slave Sets: control line (2 or 5m) with ferrite cores and RJ45 plugs- for linking the EBC to a master set[7]
- Mains cable
- Appropriate PA6-hosepipe („UFX") for the interconnections between EBC and case (EBCeasy: 3m / EBC10: 3m / EBC11: 5m / EBC12: 6m)
- 2 hosepipe connectors with rubber gaskets for affixing the UFX on the case
- 0.5l bottle (EBC10/11), 2.0l bottle (EBC12)
- Water level alarm for the high mark of the bottle (EBC10, EBC11, EBC12)
- Built-in datalogger
- miniClima Tool (Software) on CD (1 per order)
- Detailed installation and operation guide on CD (1 per order)

Choice of optional features & accessories:
- 2.0l bottle (for EBC10, EBC11; replacing the standard 0.5l bottle; also available as an upgrade kit for existing installations)
- Water level alarm for the low mark of the bottle (EBC10, EBC11, EBC12)
- Air circulation fans of different strengths
- Alternatively: add. external fans to be integrated into the hosepipe system
- Air circulation filter FLT (see page 9)
- Air distribution boxes LVB for running several showcases with only one EBC
- Detached operating unit (cable-bound remote control)
- External alarm device (alarm and power LEDs)
- Serial data cable RS232 for plugging the EBC to a PC or „Serial-to-USB" adapter cable for plugging the EBC to a PC without RS232 interface
- RS232/IP converter for including one or more EBCs into an existing LAN or WLAN
- RS232/RS485 converter adapting the signal for use with the ASCII-Modbus protocol

[7] *It is not recommended to mix units of type EBCeasy with those of types EBC10, EBC11, or EBC12*

EBCeasy	EBC10	EBC11	EBC12
Up to 0.5m³	Up to 3m³	Up to 5m³	Up to 10m³
See right colomn.[8]	Works as a „Master" unit when the RH/T sensor cable is plugged onto it.		
See right colomn.[8]	Works as a „Slave" unit with a control line plugged onto it instead of the sensor cable. The control line may come from any other EBC[1], even another slave, as long as the first unit of the chain acts as a Master.		
Does not require any bottle or water.	Comes with a 0.5l bottle. 2.0l bottle available as an optional extra.		Comes with a 2.0l bottle.
W = 206,0 x H = 135,0 x D = 336,0mm [9]	W = 378.5 x H = 133.5 x D = 233.0mm [9]	W = 378.5 x H = 133.5 x D = 238.0mm [9]	W = 482.0 x H = 138.0 x D = 238.0mm [9]
Includ. 3m hosepipe.	Includ. 3m hosepipe.	Includ. 5m hosepipe.	Includ. 6m hosepipe.

[8] It is not recommended to mix units of type EBCeasy with those of types EBC10, EBC11 or EBC12
[9] Dimensions without bottle (where applicable), hoses, edge distances etc.

miniClima
Projects & Contact Data

A. G. Leventis Gallery, Nicosia, CY | Albrechtsburg, Meissen, DE | Bavarian State Archaeological Collection, Munich, DE | Bavarian State Ministry of Education, Science and the Arts/The Centre of Bavarian History, Augsburg, DE | Bermuda Maritime Museum, Sandys, BM | Bibliothèque d'études Rousseauistes, Montmorency, FR Bosworth Battlefield Heritage Centre, Nuneaton, UK | British Museum, London, UK | Burgtheater, Vienna, AT | Cambridge University Library, UK | Deutsches Hygiene Museum, Dresden, DE | Estonian National Library, Tallinn, EE | Fachhochschule Fulda, DE | Mauthausen Memorial, AT | Germanisches Nationalmuseum, Nuremberg, DE | Grassi Museum, Leipzig, DE | Heraklion Archaeological Museum, Crete, GR | Hermitage St. Petersburg, RU | Institute for Experimental Physics, University of Hamburg, DE | International Kunsthistorisches Museum Wien, AT | Mount Athos, GR | Labman Automation Landesmuseum Vorarlberg, Württemberg, Stuttgart, DE | Länsmuseet Lokschuppen Exhibition Centre, Mary Rose Trust, Portsmouth, UK | Vienna, AT | MuCEM Fort St. Archéologique Départemental, Adrien Dubouché, Limoges, FR |

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Slavery Museum, Liverpool, UK St. Panteleimon (Pantaleon's) Monastery, Ltd., Stokesley, UK | Lahti City Museum, FI Bregenz, AT | Landesmuseum Varberg, SE | Le Louvre, Paris, FR Rosenheim, DE | Mary Rose Museum/ MOHAI, Seattle, US | Mozarthaus Jean, Marseille, FR | Musée Jublains, FR | Musée National Museums of the City of Greiz, DE

Museumsverbund im LVR/Rheinisches Landesmuseum Bonn, DE | National Maritime Museum (Neptune Court), London, UK | Norwegian Folk Museum, Oslo, NO Nottingham Trent University, School of Science & Technology, UK | Nowodewitschij Monastyr, Moscow, RU | Oxford Ashmolean Museum (Egyptian Galleries), UK Palace of the Grand Dukes of Lithuania, Vilnius, LT | Powerhouse Museum, Sydney, AU | Qatar Faculty of Islamic Studies, Doha, QA | River Rock Casino, Geyserville, CA, US | Schatzkammer Stift Zwettl, AT | Sir John Soane's Museum, London, UK | Stichting Museum Slot Loevestein, Poederoijen, NL | Stonehenge Museum, UK Tartu Uni Museum, EE | The Maritime Museum of Finland, Helsinki, FI | The National Library of Finland, Helsinki, FI | The Rothschild Archive, London, UK Tianjin Museum, CN | Turkey Topkapi Museum, Istanbul, TR | Uni College London, UK | Wakefield Museum, UK | Warrington Museum & Art Gallery, UK