



JOHN BERGER

MINICLIMA

Features (Current Series EBC10/11)

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 and equally distributed air-humidity

Safe Protection for Precious Exhibits or Sensitive Components

tight air circulation system • no intermingle with outside air • permanent control and correction of the humidity level • optical and (switchable) acoustic alarm signals • potential-free contacts for the external display of the composite error alarm and of the EBC's on-off status • integrated datalogger (standard feature) with RS232 interface and free software (for Windows) for storing and reading out all relevant data (humidity and temperature inside the case, alarms that occurred, EBC settings that have been made) • 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 thresholds for the humidity alarm to be issued • immediate start of the appropriate action according to the preset values: dehumidification by condensation of surplus air-humidity or humidification by evaporation of condensate or distillate

Simple, Easy, Effortless

the devices require electric supply through a standard socket-outlet only • no piping • easy to handle • effortless upkeep • general inspection at the factory recommended for about every two years

Adaptable

two types of main devices performing air-volumes of up to approx. 3m³/5m³ • every EBC can become both a master controller and a slave unit that increases the capacity of a master by another 3 or 5m³ • optional accessories and features to meet special requirements: a larger water bottle for holding the required distillate and for collecting the accumulated condensate; filters for cleaning the showcase air; air distribution boxes for running up to six 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) • 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



VITRIINIT

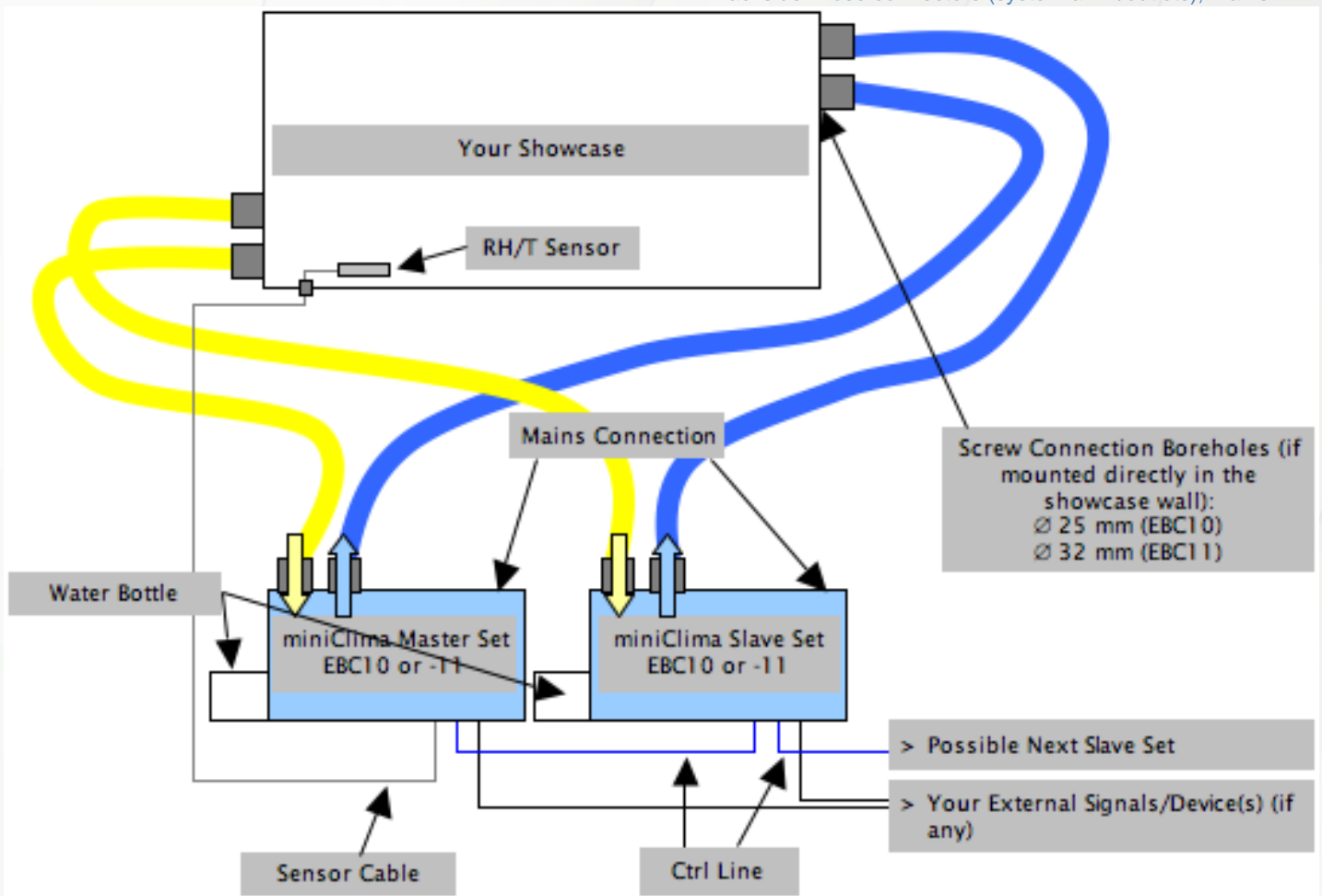
JOHN BERGER OÜ - TOIMIVAN TILAN TAUSTALLA

Helsinki - Tallinn | Tel +358 40 9008520, +372 6 546604 | www.johnberger.fi | info@johnberger.fi

MINICLIMA

Build Up In Principle (Current Series EBC10/11)

Left: Outlet of the silicone pipe for the bottle, bottle with belt and water level sensor(s) (option B).
Backside: Hose connectors (system air in/outlets), mains



Installation of an EBC Master and an EBC Slave to a showcase

Blue: Conditioned air from the EBCs to the showcase.
Yellow: Airflow from the showcase back to the EBCs.

Connections and Operating Elements on the EBC

Front: Handle, on-off/reset button, alpha-numeric display, status LED (power & alarm), menu buttons, 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 displays (composite error alarm/on-off-status), RS232 interface (PC), bottle with belt and water level sensor(s) (option A).

connection, rating plate.

Right: Air inlet for the device cooling (removable grill with dust filter pad).

Top & bottom: Air outlets for the device cooling.

--- Notes

Slave Sets are only necessary, if the air volume that has to be conditioned exceeds the recommended upper limit of the used master unit (which is 3m³ for an EBC10 and 5m³ for an EBC11).

The given diameters of the boreholes for the screw connections only apply when the screw connections are going to be affixed directly to the case wall. If this is not possible (i.e. a wall thicknesses of > 6mm), metal flanges (like our **FLANGE25/-32**) can be used. In that case the



JOHN BERGER

MINICLIMA

required diameters for the boreholes on the showcase wall come to 42,5mm (EBC10) and 49mm (EBC11). The shown positions of the screw connections on the showcase do not represent a general solution or recommendation.

Types & Options (Current Series EBC10/11)

EBC10 (Master Set)
Constant Humidity Device for air volumes of up to approx. 3m³ (1)

Standard configuration & scope of delivery per device:

- RH/T sensor, ready-to-use with housing, cable (2.5m) and RJ45 plug
- Mains cable (1.8m) with 3-pin connector and grounded main plug
- 3m flexible hosepipe UFX25 for the interconnections between EBC and case
- 2 hosepipe connectors with rubber gaskets for fixing the UFX25 to the case
- 0.5l bottle
- Water level alarm for the high mark of the bottle
- Built-in datalogger hardware
- miniClima EBC Tool (Software) on CD (1 per order)
- Detailed installation and operation guide on CD (1 per order)

Optional features:

- 2.0l bottle (replacing the standard one; also available as an upgrade kit for existing installations)
- Water level alarm for the low mark of the bottle
- Stronger air circulation fan ULV+

Optional accessories:

- Flanges for affixing the hosepipe connectors on a case wall of more than 6mm thickness
- Air circulation filter FLT25 (requires an EBC equipped with ULV+)
- Air distribution boxes LVB25 (depending on overall circumstances ULV+ might be required)
- Serial data cable RS232 for plugging the EBC to a PC

- "Serial-to-USB" adapter cable for plugging the EBC to a PC without RS232 interface
- Control line for using the EBC as a slave

EBC11 (Master Set)
Constant Humidity Device for air volumes of up to approx. 5m³ (1)

Standard configuration & scope of delivery per device:

- RH/T sensor, ready-to-use with housing, cable (2.5m) and RJ45 plug
- Mains cable (1.8m) with 3-pin connector and grounded main plug
- 5m flexible hosepipe UFX32 for the interconnections between EBC and case
- 2 hosepipe connectors with rubber gaskets for fixing the UFX32 to the case
- 0.5l bottle
- Water level alarm for the high mark of the bottle
- Built-in datalogger hardware
- miniClima EBC Tool (Software) on CD (1 per order)
- Detailed installation and operation guide on CD (1 per order)

Optional features:

- 2.0l bottle (replacing the standard one; also available as an upgrade kit for existing installations)
- Water level alarm for the low mark of the bottle
- Stronger air circulation fans ULV+ and ULV++

Optional accessories:

- Flanges for affixing the hosepipe connectors on a case wall of more than 6mm thickness
- Air circulation filter FLT32 (requires an EBC equipped with ULV+ or ULV++)
- Air distribution boxes LVB32 (depending on overall circumstances ULV+ or ULV++ might be required)
- Serial data cable RS232 for plugging the EBC to a PC
- "Serial-to-USB" adapter cable for plugging the EBC to a PC without RS232 interface
- Control line for using the EBC as a slave

EBC10 (Slave Set)
Constant Humidity Device for air volumes of up to approx. 3m³ (1)

VITRIINIT

JOHN BERGER OÜ - TOIMIVAN TILAN TAUSTALLA

Helsinki - Tallinn | Tel +358 40 9008520, +372 6 546604 | www.johnberger.fi | info@johnberger.fi

MINICLIMA

Standard configuration & scope of delivery per device:

- Control line (2m) with RJ45 plugs, for interlinking the EBC with a master set (EBC10 or -11), so as to increase the capacity of the master set by another approx. 3m³
- Mains cable (1.8m) with 3-pin connector and grounded main plug
- 3m flexible hosepipe UFX25 for the interconnections between EBC and case
- 2 hosepipe connectors with rubber gaskets for fixing the UFX25 to the case
- 0.5l bottle
- Water level alarm for the high mark of the bottle
- Built-in datalogger hardware
- miniClima EBC Tool (Software) on CD (1 per order)
- Detailed installation and operation guide on CD (1 per order)

Optional features:

- 2.0l bottle (replacing the standard one; also available as an upgrade kit for existing installations)
- Water level alarm for the low mark of the bottle
- Stronger air circulation fan ULV+

Optional accessories:

- Flanges for affixing the hosepipe connectors on a case wall of more than 6mm thickness
- Air circulation filter FLT25 (requires an EBC equipped with ULV+)
- Serial data cable RS232 for plugging the EBC to a PC
- "Serial-to-USB" adapter cable for plugging the EBC to a PC without RS232 interface
- RH/T sensor for using the EBC as a master

EBC11 (Slave Set)

Constant Humidity Device for air volumes of up to approx.



5m³ (1)

Standard configuration & scope of delivery per device:

- Control line (2m) with RJ45 plugs, for interlinking the EBC with a master set (EBC10 or -11), so as to increase the capacity of the master set by another approx. 5m³
- Mains cable (1.8m) with 3-pin connector and grounded main plug
- 5m flexible hosepipe UFX32 for the interconnections between EBC and case
- 2 hosepipe connectors with rubber gaskets for fixing the UFX32 to the case
- 0.5l bottle
- Water level alarm for the high mark of the bottle
- Built-in datalogger hardware
- miniClima EBC Tool (Software) on CD (1 per order)
- Detailed installation and operation guide on CD (1 per order)

Optional features

- 2.0l bottle (replacing the standard one; also available as an upgrade kit for existing installations)
- Water level alarm for the low mark of the bottle
- Stronger air circulation fans ULV+ and ULV++

Optional accessories

- Flanges for affixing the hosepipe connectors on a case wall of more than 6mm thickness
- Air circulation filter FLT32 (requires an EBC equipped with ULV+ or ULV++)
- Serial data cable RS232 for plugging the EBC to a PC
- "Serial-to-USB" adapter cable for plugging the EBC to a PC without RS232 interface
- RH/T sensor for using the EBC as a master

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 manufactured both airtight and steamtight.



JOHN BERGER

MINICLIMA



Left: Hosepipe and parts of the screw connection; Right: Mounted screw connection (Sample images - colours might differ)

The case 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. The same kind of plug is used for the control lines, which are delivered for setting up an EBC chain of one master and one or more slave(s) (common network cables can be used for this purpose as well).

Left: RH/T sensor with cable and plug; Right: Housing and RJ45 plug (Sample images - colours might differ)

Once set into operation, the EBC monitors the air condition

inside the case and initiates the appropriate action as soon as it becomes necessary: Dehumidification of the system air by condensation of surplus air-humidity or humidification by evaporation of condensate or distillate. This ensures that the actual humidity level will continuously be brought into line with the setpoint. The changes in the humidity level are more gradual the closer the actual RH level approaches to the setpoint. All the while the EBC continually circulates the air between case and EBC independently from the currently required process. The air is always exhausted from the case, led into the device where it will be conditioned if required, or left untreated and then returned back into the case again. The whole process takes place without intermingling system air and outside air.

The water (actually: distillate and condensate) that is used for the EBC's work is recirculated from the bottle to the inside of the EBC and back again repeatedly on both a regular basis and following the requirements of the current process. Through this continuous movement biological growth is virtually eliminated and EBC-induced problems with bacteria formation have never been reported to us.

Like its predecessor the new series EBC10/11 consists of two models for different air-volumes to be processed, EBC10 (max. 3m³) and EBC11 (max. 5m³). The new units are no longer classified as masters and slaves. The possibility still exists to add more units to one case for increasing the capacity. Now every model from the series has the potential of becoming both a fully functional master unit or a slave unit as required. The decision for one of the two hierarchic states is selected automatically dependant 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.

This new classification will help the user when he wants to rearrange exhibitions, keep a qualified unit in stock, or when he/she needs to provide for at least some humidity control even if the actual master unit fails.

VITRIINIT

JOHN BERGER OÜ - TOIMIVAN TILAN TAUSTALLA

Helsinki - Tallinn | Tel +358 40 9008520, +372 6 546604 | www.johnberger.fi | info@johnberger.fi

MINICLIMA

EBC10 in standard configuration

The miniClima devices require electric supply through a standard socket-outlet. No water-pipe installation is required, the unit being completely self contained. All condensate or distillate is stored and taken from the unit's own water bottle. The bottle can be positioned to the front of the EBC as well as to the side, so as to fit more easily into restricted areas. The bottle is secured with a belt and (by default) always monitored against overflowing (high level alarm). In addition to this high water level alarm, all devices of series EBC10/11 can be ordered equipped with a low water level alarm (optional extra). And in those cases where the customer requests it, and where it is also possible with respect to safety considerations, an EBC can be delivered without any sensors for the water level in the bottle at all (cost reduction).

Other alarms that are issued by the EBC refer to the humidity level being above or below the customer preset levels, the overall water handling system of the EBC (i.e. torn or blocked silicone pipe), and 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 on/off status of the unit. The user can therefore be ensured of being notified immediately when a non-routine intervention is needed. By popular request series EBC10/11 also brings back the built-in audible composite error alarm, which can be activated from the menu (default setting is "off").

An all new miniClima datalogger hardware is now part of the control system built into the EBC and is provided with every unit. The new software ("miniClima EBC Tool") is supplied free of charge with each order, and allows up to 15,000 values to be stored and read out. The user can check for alarms that occurred or settings that have been changed. He can also use them to have "live" access to the currently present values.

Each device is delivered ready-to-install complete with all required parts including hoses, hose connectors and cables, as well as (once per order) installation and documentation CDs with the miniClima EBC Tool and detailed user guides.





JOHN BERGER

MINICLIMA

Technical Data (Current Series EBC10/11)

Recommended max. volume of the case (per connected EBC)
(1)

3m³ (EBC10)

5m³ (EBC11)

Dehumidification capacity at ambient conditions of 25°C,
50%RH (1,2)
5.0g/h

Humidification capacity at ambient conditions of 25°C,
50%RH (1,2)
5.0g/h

Exemplarily achievable setpoint range at ambient conditions
of 22°C, 50%RH (1,3)
30-75%RH

Theoretical (adjustable) setpoint range
15-85%RH

Permissible highest value for the relative humidity inside the
case (in order to protect the exhibits, the EBC will issue a
signal error if beyond)
94%RH

Permissible lowest value for the relative humidity inside the
case (in order to protect the exhibits, the EBC will issue a
signal error if beyond)
6%RH

Airflow at the air inlet of the case (1,4)
EBC10: 2.00m/s
EBC10 with stronger fan ULV+: 2.50m/s
EBC11: 2.30m/s
EBC11 with stronger fan ULV+: 3.20m/s
EBC11 with stronger fan ULV++: 4.00m/s

Permissible ambient conditions for operation and storage of
an EBC (5)
5-35°C, 15-80%RH, non-condensing

Permissible ambient conditions for the storage of the RH/T
sensor

10-50°C, 20-60%RH, non-condensing

Tolerance (1,6)

at a setpoint of 30%RH typ. achievable: +/-2%RH; max.: +/-
3%RH

at a setpoint of 75%RH typ. achievable: +/-3%RH; max.: +/-
5%RH

Mains connection (7)

90-264VAC, 47-440Hz

System voltage

12VDC

Power consumption

max. 65W

Weight (device without accessories, bottle, hosepipes, cables
etc.)

6.6kg

Measures

see [dimensions_en.pdf](#) and [drawings.pdf](#)

Noise emission (1,8)

free-standing, measured from 1m: 48.1dB(A)

built-in (9), measured from 1m: 37.0dB(A)

Housing material

coated steel sheet, 1.5mm

Housing colour

pigeon-blue (RAL5014)

- - - Footnotes

(1) Approximately.

(2) Condensed/evaporated water in grammes per hour.

(3) The actual setpoint range in a given specific situation can
be both bigger and smaller, as it depends on a variety of
further variables - additionally to the ambient conditions (such
as the kind of materials stored in the showcase or the quality

VITRIINIT

JOHN BERGER OÜ - TOIMIVAN TILAN TAUSTALLA

Helsinki - Tallinn | Tel +358 40 9008520, +372 6 546604 | www.johnberger.fi | info@johnberger.fi



JOHN BERGER

MINICLIMA

of the case sealing etc).

(4) At typical installations using the hosepipe lengths that are usually delivered (3m/5m) and without any other accessories that may have an impact on the airflow, like air filters FLT.

(5) Applies to the conditions generally obligatory for operation or damage-free storage, but not to the conditions where the full capacity with respect to the achievable setpoint range is given.

(6) The tolerance rises with the chosen setpoint.

(7) Has to be fuse-protected and earthed.

(8) Disregarding the noise during the pump processes (sporadic occurrences). The values were measured during the dehumidification process (increased noise emission through the work of the cooling air fan). The units remain almost noiseless when humidifying.

(9) In the plinth of a wooden showcase with air slots, without sound insulation.

VITRIINIT

JOHN BERGER OÜ - TOIMIVAN TILAN TAUSTALLA

Helsinki - Tallinn | Tel +358 40 9008520, +372 6 546604 | www.johnberger.fi | info@johnberger.fi