

CLIMIA

Humidity measuring unit CMG 100

Operating manual



Edition 1.1
English

*Bedienungs-
anleitung*



deutsch

*Instrucciones
de operación*



español

*Manuel
d'utilisation*



français

*Manuale
d'uso*



italiano

*Gebruiks-
handleiding*



nederlands



HOLD
51 DRY
MAX 51 MIN 00

UP DOWN

MEAS SET

Climia
CMG 100

Humidity measuring unit CMG 100

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**Carefully read this operating manual prior to commissioning/using the units!
This operating manual is a translation of the German original.**

This manual is an integral part of the unit and must always be kept in the vicinity of the installation location or on the unit itself.

Subject to modifications. No liability accepted for errors or misprints!

1.0 Safety information

General safety notes

Carefully read the operating manual before placing the unit in service for the first time. It contains useful tips and notes as well as hazard warnings to prevent injury or material damage. Failure to follow the directions in this Manual can endanger persons, the environment and the equipment itself and will void any claims for liability.

- The product is not a toy. Keep it away from children and pets.
- Do not leave the packaging material carelessly lying around. This could become hazardous to children.
- Protect the product from extreme temperatures, direct sunlight, strong vibrations, excessive humidity, moisture, flammable gases, vapours and solvents.
- Do not expose the product to mechanical stress.
- If safe use is no longer possible, take the product out of service and secure it against accidental use. Safe use is no longer guaranteed if the product:
 - exhibits visible damage,
 - no longer functions properly,
 - has been stored for a longer period of time under unfavourable environmental conditions or
 - has been subjected to considerable transport stresses.

- Handle the product with care. It is damaged by bumps, impacts or falling from even a low height.
- Consult a professional if you have any doubts about the operation, safety or connection of the product.
- Have maintenance, adaptation and repair work carried out exclusively by a specialist or a specialist workshop.
- If you still have questions that are not answered in this operating manual, please contact our technical customer service or other professionals.

The following notes must be observed in full:

People and product

- If the unit is brought from a cold to a warm environment, condensate water may form inside the unit. This can lead to incorrect measurement results. Before using the unit, let it rest for a while until it has adapted to the new ambient air.
- The user is responsible for the measurement results of this unit. We do not guarantee the accuracy of the measurement results, nor do we accept responsibility for them. Under no circumstances do we accept responsibility for damage caused by the application of the measurement results.

Battery/rechargeable battery

- When inserting the battery / rechargeable battery, ensure that the polarity is correct.
- Remove the battery / rechargeable battery if you are not going to use the unit for a long time to avoid damage due to discharge. Discharging or damaged rechargeable batteries can cause acid burns if they come into contact with the skin. You should therefore wear protective gloves when handling damaged batteries/rechargeable batteries.
- Keep rechargeable batteries out of the reach of children. Do not leave rechargeable batteries lying around as they could be swallowed by children or pets.
- Do not disassemble, short circuit or dispose of rechargeable batteries in fire. Never attempt to charge non-rechargeable batteries. There is a risk of explosion!

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2.0 Guarantee

The guarantee conditions are listed in the "General terms and conditions of business and supply". Furthermore, only the parties to a contract can conclude special agreements beyond these conditions. In this case, contact your contractual partner in the first instance.

3.0 Intended use

The product is used for non-invasive, digital humidity measurement. It is ideal for measuring the moisture content of concrete, wood and other building materials. The unit can be used to check whether the surface is ready for painting or coating. Large surfaces can also be measured quickly and effectively using the signal function. The user can concentrate on the object being measured without having to constantly read the measured values on the display. The unit beeps when the humidity level exceeds the limit. The limit value is adjustable. The unit offers a wide measuring spectrum with a measuring depth of about 20 - 40 mm and has a display for min/max values and for low battery. The unit is powered by a 9V block battery. It also has an automatic switch-off function.

For safety and approval reasons, you must not convert and/or modify the product. If you use the product for purposes other than those described above, the product may be damaged. In addition, improper use can cause hazards such as short-circuits, fire, etc. Read the operating manual carefully and keep it in a safe place. Only pass the product on to third parties together with the operating manual.

The product complies with the legal, national and European requirements. All company names and product designations contained herein are trademarks of their respective owners. All rights reserved.



Disposal of packaging

All products are packed for transport in environmentally friendly materials. Make a valuable contribution to reducing waste and sustaining raw materials. Only dispose of packaging at approved collection points.

Disposing of the units and their components

Only recyclable materials are used in the manufacture of the units and components. Help protect the environment by ensuring that the units or components (for example batteries) are not disposed of in household waste, but only in accordance with local regulations and in an environmentally safe manner, e.g. using authorised disposal and recycling specialists or council collection points.



5.0 Transportation and packaging

The units are shipped in sturdy transport packaging. Check the unit immediately after delivery and make a note of any damage (please take photos of the damage) or missing parts on the delivery note. Inform the forwarding agent and contractual partner. Please keep the packaging safely for any returns. Claims under guarantee made at a later date will not be accepted.

6.0 Operation

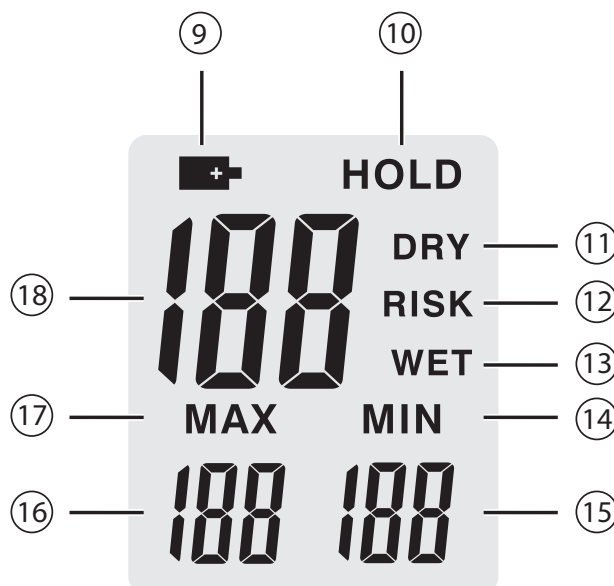
Controls



Legend

- 1 Humidity sensor
- 2 LC Display
- 3 DOWN key
- 4 SET key
- 5 MEAS key
- 6 On/Off key
- 7 UP key
- 8 Battery compartment (on the back)

Fig. 1 Humidity measuring unit



Legend

- 9 Low battery indicator
- 10 "HOLD" data storage symbol
- 11 "DRY" status symbol
- 12 "RISK" status symbol
- 13 "WET" status symbol
- 14 "MIN" symbol
- 15 Min. humidity level
- 16 Max. humidity level
- 17 "MAX" symbol
- 18 Current humidity level

Fig. 2 LC Display

Humidity measuring unit CMG 100

7.0 Commissioning

Inserting and replacing batteries

The humidity measuring unit is powered by a 9 V block battery. When delivered, the battery is enclosed separately. It must be inserted into the humidity measuring unit.

To insert the battery, proceed as follows:

- Using a suitable screwdriver, remove the battery compartment cover from the back of the measuring unit
- Insert a new 9 V block battery into the battery compartment [8], observing the correct polarity. Make sure that the contacts of the unit are well seated
- Replace the battery compartment cover and screw it back in place
- Replace the battery when the low battery indicator [9] lights up on the LC display

NOTE

Ensure that the humidity measuring unit is switched off before changing the battery.

- To change the battery, proceed as described above. However, remove the used battery from the contacts and the battery compartment before inserting a new one.

8.0 Use

General notes before starting measuring

- The displayed humidity level is an average value determined by the moisture on the outer surface as well as inside the material. If there is any visible surface moisture or water, wipe it off and allow the surface to dry for a few minutes before starting the measurement
- Other factors can also influence the measurement. Before the measurement, the corresponding surface must be cleaned of any paint residues, dust, etc
- Before measurement, the measuring point must be cleared of impurities (e.g. dust and other loose components).
- If the measured material contains metal (e.g. nails, screws, leads, pipes, etc.) and this is located in the measuring field of the sensor, the measured value increases abruptly due to strong reflections
- If the spherical head is held in corners (e.g. tile joints or window niches), the measured value is generally higher because there is more substance in the scattering field of the measuring head
- There must be a distance of more than 8 to 10 cm from the corner
- Hold the measuring unit at its outermost end as far away as possible from the ball head of the humidity sensor [1] to avoid a possible influence of humidity by your hand on the measured value
- The measuring unit is not suitable for measuring metal or other highly conductive materials. If there is metal enclosed in the material (e.g. nails, screws, cables, pipes, etc.) in the sensor's measuring range, the measured values increase considerably
- If the humidity sensor [1] is placed in a corner of the wall, the measured values may be higher because there are two or three surfaces in the measuring range. Keep a minimum distance of 8 to 10 cm from other surfaces to avoid interference
- Place the humidity sensor [1] on smooth surfaces. Rough surfaces lead to inaccurate measurement results
- The measuring depth of the unit ranges from 20 to 40 mm. Depending on the density of the material, a measurement of the inner core may not be possible. If the material is less than 2 cm thick, the measured value of the humidity level may be inaccurate due to adjacent material
- The humidity sensor [1] must be held at right angles directly to the surface to be measured
- The density of the measured material plays an important role for the measurement result. The measured value increases with the respective density
- An important area of application for this unit is comparative measurements, where the measured value is compared with a reference value. The reference value is determined by

measuring in a clearly dry area of a similar or identical material. If the subsequent measurements are significantly higher than the reference value, it can be concluded that the measuring ranges are wet. This method is very well suited for assessing water damage, locating leaks and areas of high humidity

NOTE

Measuring head may leave black marks on light-coloured walls or wallpaper. Please place the measuring head carefully on sensitive surfaces

Switching on and off

- To switch on, press the on/off key [6] when the measuring unit is switched off. To switch off, press the on/off key [6] when the measuring unit is switched on.

Humidity level measurement

- Switch on the measuring unit by pressing the on/off key [6]
- The measuring unit must be calibrated each time it is switched on. Hold the measuring unit in the air for calibration so that the humidity sensor [1] does not touch any objects. The minimum distance from any surface or your hand to the ball head of the humidity sensor [1] should be 8 to 10 cm

- Press the **MEAS** key (5) to start the calibration procedure. The LC display shows "CA" during calibration
- After calibration, the LC display [2] shows the current humidity level [18]. This calibration value should be "0". If not, switch off the measuring unit and repeat the calibration procedure after switching it on again.

NOTE

If you have calibrated the measuring unit for a measurement, do not change the position of the hand in the subsequent measurement. Measurement calibration and measurement must be carried out with the same hand position, because a change in the position of the hand, relative to the ball head of the humidity sensor [1], leads to measuring errors.

- The calibration must always be carried out again after each new switch-on as well as each change of the measuring point or the measured object!
- Hold the ball head of the humidity sensor [1] at right angles to the surface. The display shows the measured value (current humidity level [18]).
- Move the measuring unit to take measurements of a larger surface. The LC display should show the current measured value as well as the maximum [16] and minimum [15] measured values.

- If necessary, press the **MEAS** key [5] to freeze a value on the display. "HOLD" [10] appears on the display in addition to the last measured value. If the "HOLD" mode is not terminated by pressing the **MEAS** key [5], the measured values are shown on the LC display for another 30 seconds before the measuring unit switches off automatically.
- Before this time has elapsed, press the **MEAS** key (5) in "HOLD" mode to exit "HOLD" mode and perform further measuring procedures.
- After finishing your measurements, switch off the measuring unit by pressing the on/off key [6]. If the measuring unit is not switched off, it will automatically switch itself off after a period of 10 minutes. To do this, it must not be in "HOLD" mode

NOTE

There is a 1/4" (6.3 mm) screw terminal on the back of the measuring unit for attaching the measuring unit to suitable holding devices such as tripods. This allows measurements to be taken on the stationary measuring unit by dragging the smaller part to be measured past the probe.

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Setting the signal function

- The measuring unit also displays three non-numeric measurement formats: "DRY" [13] "RISK" [12] and "WET" [13]

- In addition, an acoustic signal can be activated.

-- In the "RISK" range, the measuring unit beeps approximately once every 2 seconds.

-- In the "WET" range, the measuring unit beeps about four times per second.

- By default, a humidity reading of <30 will display "DRY"; 30 - 60 will display "RISK"; and a reading above 60 will display "WET".
- Different materials have different moisture tolerance. Please refer to the chapter "Technical data" in section b) Humidity limit ranges for further information. Programme your limit range as follows:

-- When the "HOLD" symbol [10] is displayed, press the SET key [4] to enter the signal mode

-- The "RISK" symbol [12] flashes. Press the UP key [7] or the DOWN key [3] to adjust the lower limit for "RISK".

The value can be set from 0 to 50. The factory default setting is 30. Press the SET key [4] to confirm your selection

-- The "WET" symbol [13] flashes. Press the UP key [7] or DOWN key [3] to adjust the lower limit for

"WET" The value can be set from 50 to 100. The factory default setting is 60. Press the SET key [4] to confirm your selection.

-- The display shows „OFF“ or or „ON“. The signal tone can be switched on („ON“) or off („OFF“) by pressing the UP key [7] or the DOWN key [3].

Confirm the entry by pressing the SET key [4].

-- The LC display switches back to the initial mode ("HOLD")

-- The limit value is stored permanently until it is next changed

Backlight

- If no backlight is switched on, press and hold the UP key (7) for some time to switch on the backlight. The LC display is illuminated by white LEDs.]
- If the backlight is switched on, press and hold the UP key (7) for a few seconds to switch off the backlight. The LC display is no longer illuminated

9.0 Care, cleaning and maintenance

Care and cleaning

- Disconnect the product from the power supply before any cleaning
- Never use aggressive cleaning agents, cleaning alcohol or other chemical solutions, as this may attack the housing or even impair its function
- Use a soft, dampened, lint-free cloth to clean the product
- Use only clean water to moisten the cloth

Maintenance

The housing of the humidity measuring unit can be opened for maintenance by a specialist.

- To open the housing, remove the housing screws and the plastic knurled nut on the lower shaft in an anticlockwise direction. It is now possible to separate the two halves of the housing. To reassemble the housing, carry out the process in reverse

10.0 Scope of delivery










- Humidity measuring unit
- 1 x 9 V block battery
- Operating manual

11.0 Technical data

Unit data		CMG 100
Power supply		1 x 9 V battery
Battery life	Hours.	50
Current consumption	µA	4.9
Resolution		1 unit
Accuracy		± 1 unit
Measuring range		0-100 units
Measuring depth	mm	20-40
Screw connection (tripod)	mm / Inches	6.3 / 1/4"
Operating conditions	°C / r.H. %	0 to +50 °C / <70 %
Storage conditions	°C / r.H. %	-10 to + 60 °C / <80 % relative humidity (non-condensing)
Dimensions (H x W x D)	mm	194 x 54 x 34
Weight	g	143 (without battery)

Humidity limit ranges

The following limit ranges can be used as a reference.

Building material	Humidity range (unit)	Humidity status
Plaster	< 30	DRY 
	30 - 60	RISK 
	> 60	WET 
Cement	< 25	DRY 
	25 - 50	RISK 
	> 50	WET 
Wood	< 50	DRY 
	50 - 80	RISK 
	> 80	WET 

We reserve the right to modify the dimensions and design as part of the ongoing technical development process.

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12.0 Air dehumidification

The correlations occurring when air is dehumidified are based on physical laws.

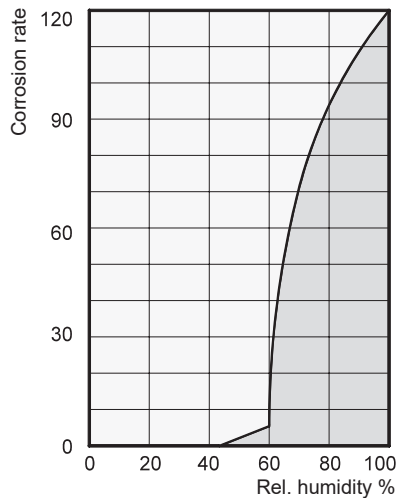
These are depicted here in graphical form in order to provide you with a brief overview of the principles of air dehumidification.

Using

Climia air dehumidifiers

- Even if windows and doors are well insulated, water and moisture are still capable of penetrating thick concrete walls.
- The water required for setting in the production of concrete, mortar and plaster etc. may only be diffused after 1-2 months.
- Even moisture trapped in the masonry after high-water or a flood is released very slowly.
- The same is also true of moisture contained in stored materials for example.

The moisture (water vapour) released from parts of a building or materials is absorbed by the surrounding air. As a result, the moisture content increases, which ultimately gives rise to corrosion, mould, rot, peeling of paint and other unwanted damage.



The diagram opposite illustrates the corrosion rate, e.g. for metal, at different humidity levels. It can be seen that the corrosion rate is insignificant below 50 % relative humidity (RH) and negligible below 40 % RH.

The corrosion rate increases significantly above 60% RH. This threshold for damage as the result of humidity also applies to other materials, such as powdery substances, packaging, wood and electronic units.

Buildings may be dried in a variety of ways:

1. By heating and air exchange:

The air in the room is heated in order for moisture to be removed and then this air is fed outside. All of the energy that is involved is lost together with the moist air that is released.

2. By air dehumidification:

The moist air that is present within an enclosed space is continuously dehumidified according to the condensation principle.

With regard to energy consumption, air dehumidification has one distinct advantage:

Energy expenditure is limited exclusively to the air volumes present. The mechanical heat that is released by the dehumidification process is fed back into the room.

Under normal use, the air dehumidifier uses approximately 25% of the energy that is required for the "heating and ventilating" principle.

Relative air humidity

Our ambient air is a gaseous mixture which always contains a certain volume of water in the form of water vapour. This volume of water is specified in g per kg of dry air (absolute moisture content).

1m³ of air weighs approx. 1.2 kg at 20°C

Depending on the temperature, each kg of air is only capable of absorbing a certain volume of water vapour. Once this capacity has been reached, the air is referred to as "saturated" and has a relative humidity (RH) of 100 %.

Relative humidity is understood to mean the ratio between the current quantity of water vapour in the air and the maximum possible quantity of water vapour at the same temperature.

The ability of the air to absorb water vapour increases as the temperature rises. I.e. the maximum possible (absolute) water content becomes greater as the temperature rises.

Temp. °C	Water vapour content in g/m ³ at humidity of			
	40%	60%	80%	100%
-5	1.3	1.9	2.6	3.3
+10	3.8	5.6	7.5	9.4
+15	5.1	7.7	10.2	12.8
+20	6.9	10.4	13.8	17.3
+25	9.2	13.8	18.4	23.0
+30	12.9	18.2	24.3	30.3

Drying materials

Building materials and structures are capable of absorbing considerable volumes of water, such as brick 90-190 l/m³, heavy concrete 140-190 l/m³ and limestone 180-270 l/m³.

The drying of moist materials such as masonry is effected as follows:

- The moisture moves from the inside of the material to its surface



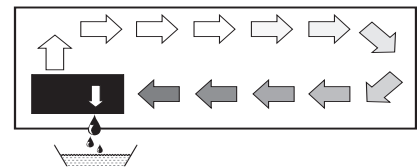
- Evaporation occurs on the surface = Transfer of water vapour to the ambient air

- The air containing water vapour is constantly circulated through the air dehumidifier. The air is dehumidified and, slightly heated, leaves the unit in order to re-absorb water vapour

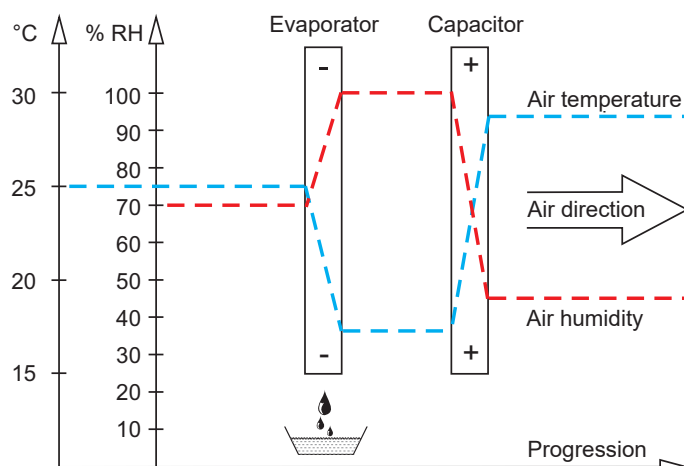
- In this way, the moisture contained in the material is reduced gradually.

The material is dried!

The accumulated condensate is collected in the unit and drained off from there.



As it flows through or over the evaporator, the air stream is cooled to dew point. The water vapour condenses, and is collected in a condensate trap from where it is drained off.



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Water vapour condensation

Because the capacity for the maximum possible volume of water vapour increases as the air is heated, the volume of water vapour contained remains constant and so relative humidity falls.

In contrast, because the capacity for the maximum possible volume of water vapour decreases as the air is cooled, the volume of water vapour contained remains constant and so relative humidity increases.

If the temperature continues to fall, the capacity for the maximum possible volume of water vapour is reduced so much so that it is ultimately equal to the volume of water vapour contained in the air. This temperature is referred to as the dew point. If the air is cooled to below dew point, the volume of water vapour in the air will become greater than the maximum possible volume of water vapour.

At this point, the water vapour begins to precipitate.

This condenses to water and moisture is removed from the air.

Examples of condensation include steamed-up window panes in winter, or the moisture on the outside of a cold drinks bottle.



As the relative humidity of the air increases, so too does the dew point, making it easier for the temperature to fall below it.

Condensation heat

The energy transferred to the air from the condenser consists of:

1. The amount of heat derived beforehand in the evaporator.
2. The electrical drive energy.
3. The condensation heat released by liquefying the water vapour.

Energy must be supplied when liquid is converted into a gas. This energy is designated as evaporation heat. It does not cause any increase in temperature, but is required to convert a liquid into a gas. Conversely, energy is released when gas is liquefied, this is designated as condensation heat.

The amount of energy from evaporation heat and condensation heat is the same.

**For water, this is:
2250 kJ/kg (4.18 kJ = 1 kcal)**

From this it is evident that the condensation of water vapour causes a large quantity of energy to be released.

If the moisture that it is to be condensed is not introduced by evaporation in the room itself, but from outside, e.g. through ventilation, the condensation heat released contributes to the heating of the room. With drying operations, a heat cycle is created, whereby heat is consumed for evaporation and released for condensation. When dehumidifying fed air, a larger contribution of heat is created, which manifests itself as a temperature increase.

Generally speaking, the time required for the drying process is not only dependent on the output of the unit, but is determined to a greater extent by the speed at which the material or building section loses its moisture.

Notes



Area containing multiple horizontal lines for taking notes.

Humidity measuring unit CMG 100

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