



HM-ACTIVE
Humidity Controller

Manual

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The **HM-ACTIVE** is a Humidity Controller that controls the Relative Humidity inside the incubating chamber in the range 51-95% at 37°C (working range depends on working temperature). It must be used in combination with any Okolab digital Gas Controller. The Unit is composed of: a Humidity Sensor Lid with Temperature control, a Heated Tube and a Water Heater, the last one includes a Humidity bottle with its heater (Heated Base). The dry gas flows over the warm water of the bottle, kept at controlled temperature by the water heater. The Humidity Sensor regulates water temperature in order to achieve the desired relative humidity inside the chamber. The Heated Tube allows preventing the water condensation between the Humidity Sensor Lid and the incubating chamber; a temperature controlled tube is employed to prevent water condensation. HM-ACTIVE is operated by any Bold Line Gas Controller via OKO-TOUCH.

2 SYMBOLS DESCRIPTIONS

2.1 SYMBOLS IN THIS MANUAL AND ON THE PRODUCT:

The following symbols identify important information to note:



CAUTION or WARNING: This symbol warns you about the risk of electrical shock.



CAUTION or WARNING or IMPORTANT: This symbol warns you of circumstances or practices that can affect the instrument's functionality. Please refer to accompanying documents.

Tip ► Supplies you with helpful suggestions.

Note ► Supplies you with important information to successfully setup and use the instrument.

2.2 SYMBOLS ON THE PRODUCT LABEL



CE MARKING: This symbol indicates a product's compliance with EU legislation.



PRODUCT DISPOSAL: This symbol indicates that this product must not be disposed as urban solid waste.



This symbol indicates the product production date



This symbol indicates the manufacturer data



This symbol indicates the protection degree against ingress of solids or liquids inside the product.



This symbol warns you to read the user manual before starting the device

3 SAFETY NOTES

Before operating the equipment please read carefully the instructions and the safety notes. If you have any questions, please contact Okolab.

The equipment must only be used as intended and as described in this Manual.

Equipment should only be operated by technically qualified personnel.

Do not start up the equipment if some of its parts are damaged.

This instrument is not intended for use in locations subject to flammable or explosive gases.

Transport the equipment with care.

Equipment and its internal parts can be damaged by dropping and by shock.

Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument. Not following these instructions can result in damage or breakdown of the device and its accessories.

Use bi-distilled water for gas stream humidification.

Some equipment parts may reach temperatures above 40-50°C. Take care when touching it.

Use only the power feeder equipped by Okolab.

Avoid excessive induction noise, static electricity, magnetic fields.

Do not expose this instrument to rain or moisture.

Prevent throttling and kinking of tubing.

Check tubing time to time for possible material usage.

Check the tubes are well fixed to their own connectors so they cannot slip off.

This device is not designed for use under medical conditions.

Power cord of unit should be unplugged from electrical outlet when left unused for long period of time.

Unit should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances or processes that produce heat

Do not start up the equipment if the supply cable is damaged.

Do not disconnect cables while in operation.

Do not open the unit. Do not remove cover or back.

No user serviceable parts inside.

Before starting, assembly the equipment far from electric device.

Unit should never be used where it can fall or be pushed into water.



International caution symbol marks this device. It is important to read the “Safety Notes” before installing, using and commissioning this device, as the notes contain important information. Not following these instructions can result in damage or breakdown of the device and its accessories.

We reserve the right to make technical variations.

IN NO EVENT SHALL OKOLAB S.R.L. BE LIABLE FOR ANY DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY NATURE, OR LOSSES OR EXPENSES RESULTING FROM ANY DEFECTIVE PRODUCT OR THE USE OF ANY PRODUCT.

4 EQUIPMENT AND CONNECTIONS

4.1 EQUIPMENT SUPPLIED AND TUBING DETAILS.

1. **Humidity Sensor Lid with Temperature control.**
2. **Heated Tube.** Use Heated Tube to connect the Humidifier to your device (or to the Okolab incubating chamber).
3. **Water Heater.** It is composed of a Humidity bottle with TUBE E and its Heater (Heated Base)
4. **TUBE C (x1).** 2m long blue rigid tube 6mm OD with attached a 4mm ID silicon transparent tube 1 m long plus PTFE filter in the middle. Use TUBE C to connect the gas output of the Control Unit to the Humidity Sensor Lid input.

5 ILLUSTRATION OF THE MAIN UNITS

5.1 HM-ACTIVE. COMPONENTS ILLUSTRATION

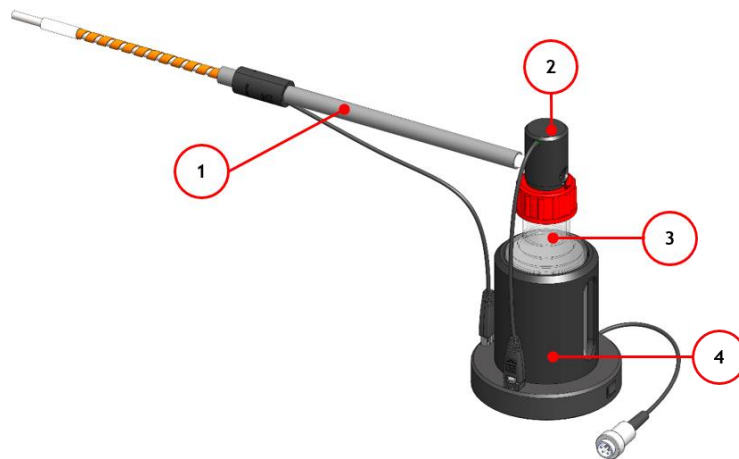


Figure 1. HM Active. Components

1. Heated Tube
2. Humidity Sensor Lid with Temperature control
3. Heated base, heater of the Humidity bottle
4. Humidity Bottle

6 HOW TO ASSEMBLE HM-ACTIVE WITH A BOLD LINE GAS CONTROLLER

The HM-Active cannot be used as a stand-alone device but only in combination with a Bold Line Gas Controller.

Before connecting the HM-Active to the Okolab Gas Controller you have to assemble it (see Figure 2).

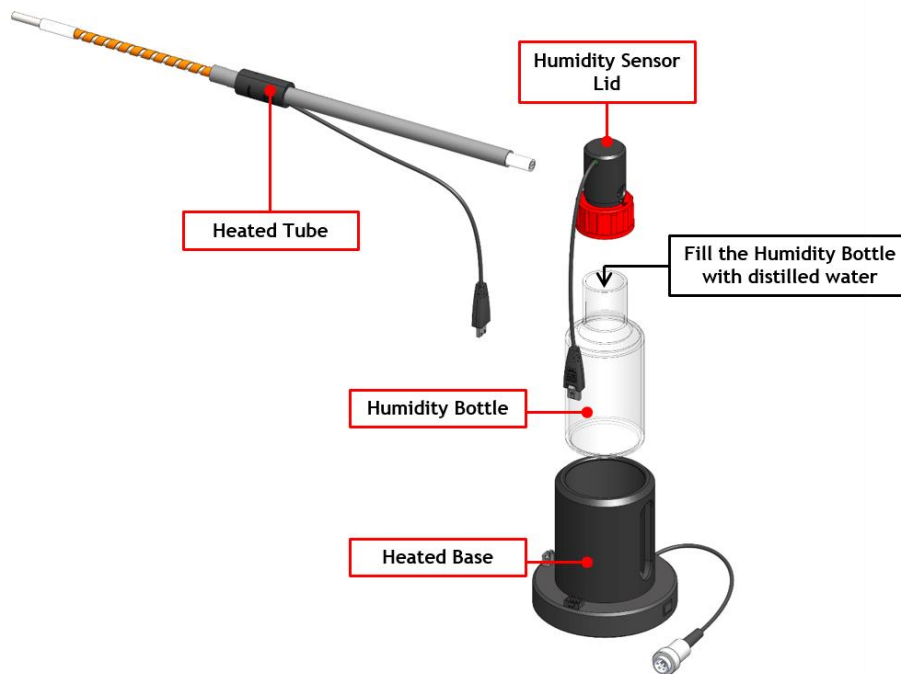


Figure 2. HM-ACTIVE Assembly

6.1 TUBING INSTALLATION

Figure 3 shows how to connect the HM-ACTIVE to an Okolab Gas Controller, the connections are the same to any other Bold Line Gas Controller.



The following instructions shall give you the possibility to install the unit quickly. For safe operation of the unit it is absolutely necessary to read carefully all the instructions and safety notes.

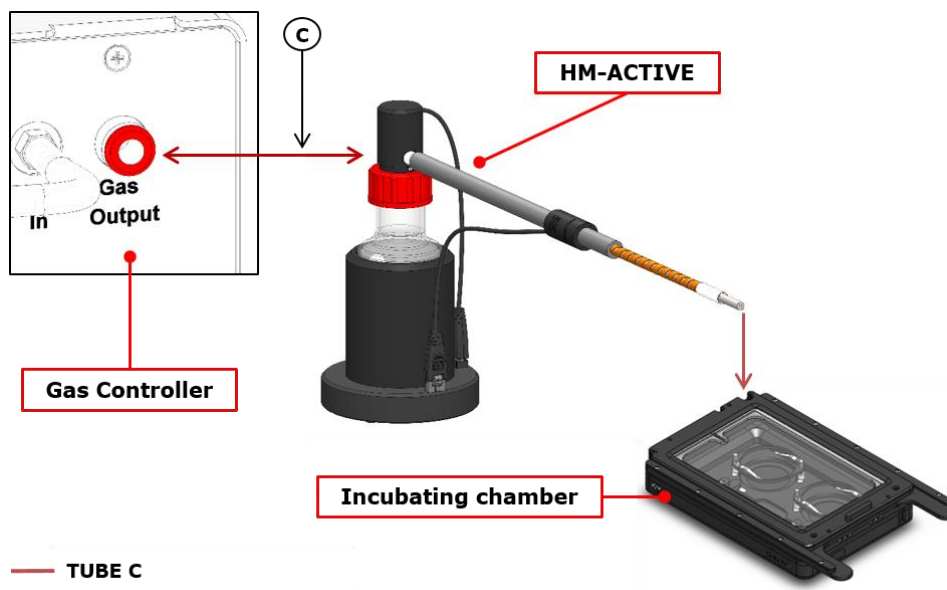


Figure 3. HM-ACTIVE. Tubing connections

Table 1 shows all the Gas Controllers to which you can connect the HM-ACTIVE.

HM-ACTIVE	Bold Line Gas Controller
	CO2 UNIT BL
	CO2-O2 Unit-BL [0-10;1-18]
	CO2-O2 Unit-BL [0-20;1-95]
	CO2-O2 Unit-BL [0-10; 0-1]
	HM-ACTIVE-STANDALONE

Table 1. HM-ACTIVE vs Okolab Gas Controller



Before disconnecting any of the polyurethane hoses connected to the Control Unit, be sure that there is no more pressure in the hoses by checking on the pressure gauges upstream of the system and on the tank manometer.

6.2 ELECTRICAL CONNECTIONS

See Figure 4 in order to connect electrically the HM-ACTIVE to the Okolab Gas Controller (in this case the HM-ACTIVE is connected to the CO2/O2 Controller).

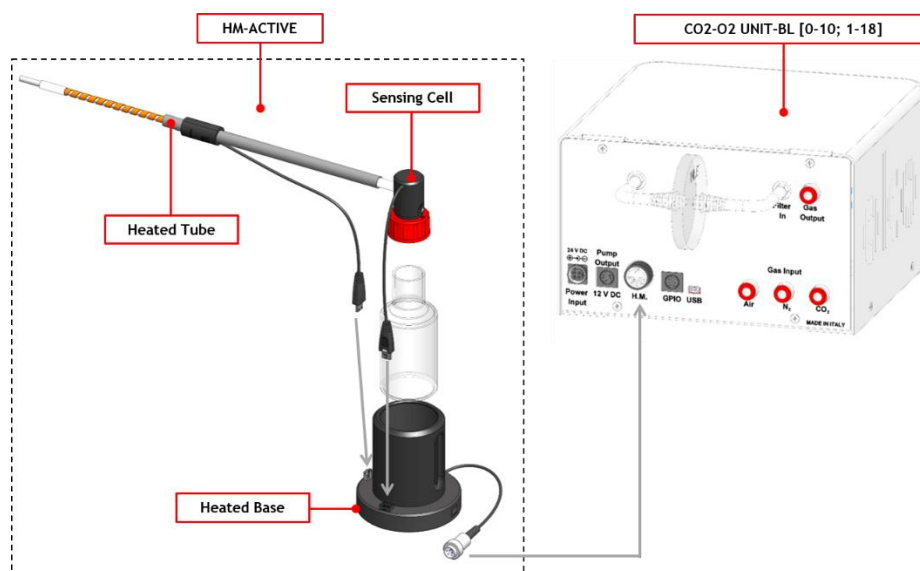


Figure 4. HM-ACTIVE. Electrical connections

6.3 OPERATION THROUGH THE GAS CONTROLLER TOUCH SCREEN.

6.3.1 Colors Meaning



The **GREEN** indicator indicates that the set-point value has been reached (within the tolerance you have set in the alarm subpage) and that the system is working properly.



The **YELLOW** indicator means that the system is working towards reaching the set-points (transient state). No actions on your part are required. Please note the Yellow light will also appear every time you change Humidity set-point.



The **ORANGE** indicator means that the current Humidity value is out of the tolerance you have set. This is usually related to gas leaks or gas source(s) running low. Verify that all cables are properly connected. Check all tubing for gas leaks and pressure in gas supply tank.



The **RED** indicator means that there is a problem with the unit itself (for example the Humidity sensor is broken). Turn the system off, wait 5 minutes, and turn it back on. If the problem continues, contact Okolab at www.oko-lab.com.

6.3.2 Home page. HM-ACTIVE and Gas Controller

When your Gas Controller or your HM-ACTIVE-STANDALONE is connected to HM-ACTIVE, a Humidity tab will appear on the home page of the Gas Controller or HM-ACTIVE-STANDALONE touch screen and you can see the current humidity value and change the humidity set point (see paragraph 6.4.1).

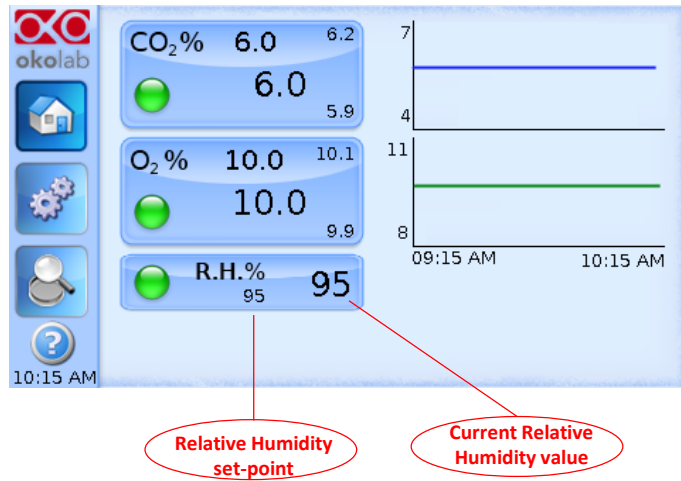


Figure 5. Home page. HM-ACTIVE and Gas Controller

Tip ► The Touch Screen is pre-set at the following value: Relative Humidity at 90%, so once you turn it on it will start operating to reach this set-point value.

6.4 HUMIDITY SETTINGS AND OVERVIEW

6.4.1 How to change the Humidity set point

To change the Humidity set point you have to press on the R.H. tab, another page will open and you can choose your desired Humidity value, as shown in Figure 6.

If you have only the Gas Controller or HM-ACTIVE-STANDALONE, when you change the humidity set point the system will ask you to specify the temperature of your incubating chamber. It will refer to that temperature value to control the Humidity and create the desired humidity value at the set temperature. If the temperature value is not correct, condensation or excessive evaporation may occur.

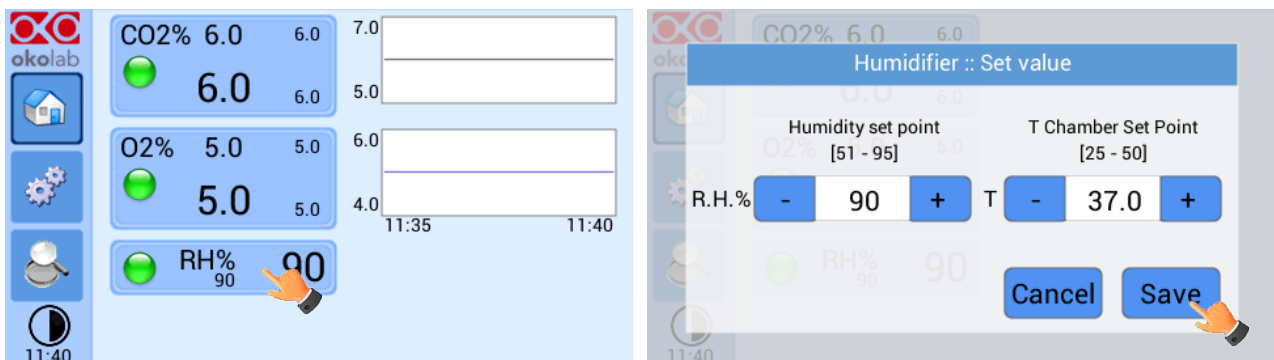


Figure 6. How to change the Humidity set point with only Gas Controller

If you have a Gas Controller in a stack with an Okolab Temperature Unit, when you press on Humidity tab, you have to insert only the Humidity set point that you want (see Figure 7).

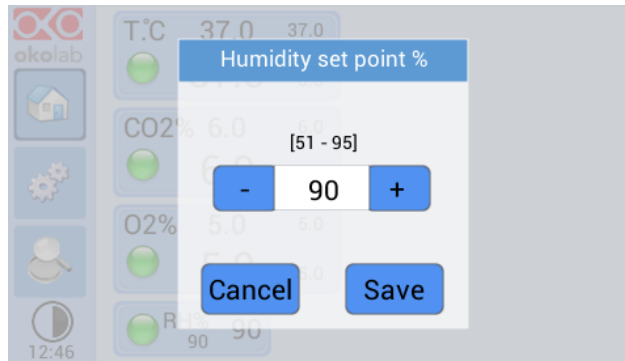


Figure 7. How to change Humidity Set Point with T Unit connected

In this case, the system will refer to the Temperature set point set by the Okolab Temperature Unit, and it will ensure the required humidity to the set temperature.

6.4.2 Gas Controller Status Page and Overview

6.4.2.1 Status Page

In the Status page of the Gas Controller you can read the Status of the parameters controlled and therefore also the humidity parameters (see section ‘Humidity Control’ in Figure 8); so it is mainly useful to check the proper working of the system. Most of parameters displayed are mainly technical/control parameters that you may be asked to communicate in case you have asked for Okolab support.

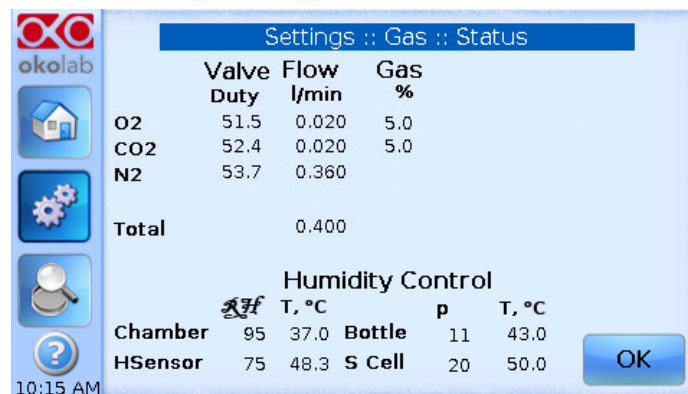


Figure 8. Gas Controller Status Page

Only information that may be of interest to users are ‘Flow’ and ‘Gas’ and ‘Relative Humidity’. All other parameters are just to be communicated to our technicians in case you ask for Okolab support.

6.4.2.2 Overview Page

In each Okolab Gas and Temperature Controller, the Overview is reached by pressing the third button on the left vertical menu.

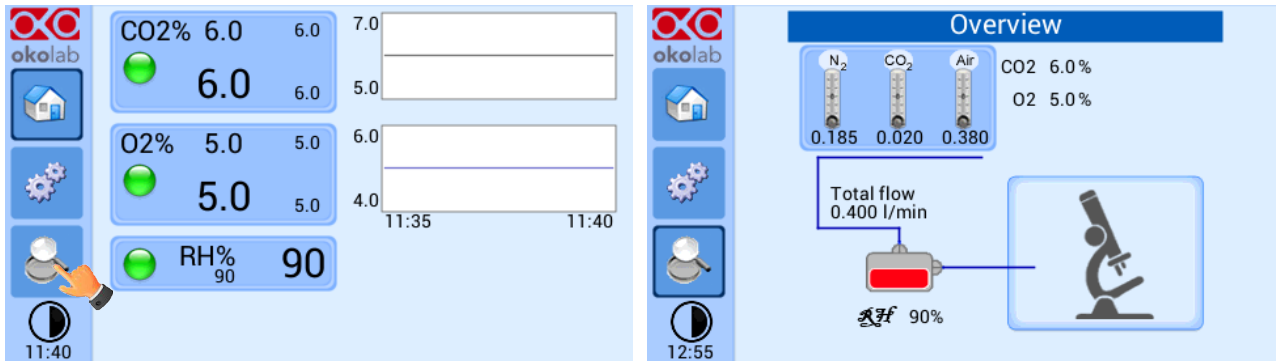


Figure 9. Overview page

The first page appearing is an overview of the complete system displaying current values of all controlled parameters (controlled gas flow, relative Humidity inside the incubating chamber and CO₂/O₂ compositions); moreover it allows you to reach the Humidity Status/Settings. By pressing the area representing the Humidity Module, you go to the Humidifier Status/Settings page (see Figure 10).



Figure 10. Humidifier Overview

As for other Status pages, here you have several technical/control parameters that become of interest only if you are asked to provide them during a request for assistance. The only operational function in this page is the possibility to change the Humidity set-point by pressing on the drop/incubating chamber.

7.1 QR CODES FOR SUPPORT

In order to send directly an email to the Okolab staff, you can use the QR codes shown in the following images:

- For commercial info:



Figure 11. QR code for commercial info contact

- For technical info:



Figure 12. QR code for technical info contact

7.2 SUPPORT CONTACTS

Please, do not hesitate to contact Okolab if you need any further commercial information or technical support.

Please, check Okolab web site www.oko-lab.com for news, events, new products and general FAQs.

For	<u>COMMERCIAL SUPPORT:</u>	lanzaro@oko-lab.com
	Phone	+39 081 806 2624
	Fax:	+39 081 876 4410
	Mobile:	+39 348 9680717
For	<u>TECHNICAL SUPPORT:</u>	sibillo@oko-lab.com
	Phone	+39 081 806 3470
	Mobile:	+39 348 9680718

Okolab S.r.l.
Via A. Olivetti, 1 - 80078 Pozzuoli, NA
Italy

7.3 WEB CONFERENCE FOR ASSISTANCE AND TRAINING

In case you requested on line support and/or web conference assistance for system assembling and experiment support, you received a web cam. Please follow these guidelines to receive optimum service.

- Webcam installation (instruction and Cdrom included)
- Latest Skype® software installed (www.skype.com)
- Register yourself on www.skype.com to have an account (Skype_ID)
- Set the audio and video and test them using Skype.

- Contact our technical support (sibillo@oko-lab.com) by e-mail to take an appointment for the web assistance.

8 TROUBLESHOOTING

Incorrect operations are often mistaken for trouble and malfunctions. If you think that there is something wrong with a component, check the points below. Sometime the trouble may lie in another component. Investigate the other components, electrical appliance and pneumatic system being used. If the trouble cannot be rectified even after exercising the checks listed below, ask for Okolab support.

Symptom	Probable cause	Remedy
The Home Page Humidity led is red	Power feeder is disconnected from the Gas Controller Unit. The Humidity Sensor Lid, Heated Base or Heated Tube connectors are disconnected.	Insert the power feeder into proper connector. Check all the connections on the rear panel of the Control Unit.
Acoustic alarm sounds	The current Humidity value is far from Humidity set point	Check the gas supplies Check the tubing and electrical connections between the Control Unit and the HM-ACTIVE.
Gas leak on the Humidity Sensor Lid connector	Not properly inserted tube	Strongly push the tube into the Swift-Fit connector
If check the previous troubleshooting but I cannot solve	Contact Okolab to receive assistance	

HM-ACTIVE Technical Specifications	
Humidity	Range: <ul style="list-style-type: none"> • 85-95% @25 °C • 51-95% @37 °C • 26-95% @50 °C Step size: 1.0% Accuracy: 1.0%
Input Gas	Mixed Gas
Max Gas output Flow rate	It depends on the Control Unit to which it is connected
Operating Temperature	0 °C ~ +55 °C
Storage Temperature	-5 °C ~ +60 °C
Operating Humidity	0-70%

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WARRANTY

Okolab S.r.l. warrants its products to be free of defects in materials and workmanship for a period of one year starting from invoice date. If the unit malfunctions, it must be returned to the factory for evaluation. If the equipment has to be returned to the factory, please ensure that is carefully and properly packed. Okolab S.r.l. accepts no responsibility for damage due to unsatisfactory packing.

Upon examination of Okolab S.r.l., if the unit is found to be defective, it will be repaired or replaced at no charge. This warranty does not apply to defects resulting from any actions of the purchaser. Okolab S.r.l. neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from any action of the purchaser that discord from instructions listed in the operation manual. This warranty does not cover or involve any other equipment that may be used along with the Okolab System (i.e. mini-incubators, any gas tank, etc.), whose usage should be considered independent and performed according to their own operational instructions.

Okolab S.r.l. warrants only the parts manufactured by it will as specified and free of defects. Okolab S.r.l. makes no other warranties or representations of any kind whatsoever, express or implied, except that of title, and all implied warranties including any warranty of merchantability and fitness for a particular purpose are hereby disclaimed. LIMITATION OF LIABILITY: the total liability of Okolab S.r.l. shall not exceed the purchase price of the component upon which liability is based. In NO event shall Okolab S.r.l. be liable for consequential, incidental or special damages.

11 REVISION TABLE

Revision Number	Additions or changes	Date	Editor
01	Edited	March 2017	Francesco Marino