



Micro Climate Monitoring System BOSCH CLIMO



BOSCH

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1. Symbols and safety precautions

1.1 Explanation of symbols

1.1.1 Warning notices - Structure and meaning

Warning notices warn of dangers to the user or people in the vicinity. Warning notices also indicate the consequences of the hazard as well as preventive action. Warning notices have the following structure:

Warning symbol	KEY WORD - Nature and source of hazard! Consequences of hazard in the event of failure to observe action and information given. ➤ Hazard prevention action and information.
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The key word indicates the likelihood of occurrence and the severity of the hazard in the event of non-observance

Key word	Probability of occurrence	Severity of danger if instructions not observed
DANGER	Immediate impending danger	Death or severe injury
WARNING	Possible impending danger	Death or severe injury
CAUTION	Possible dangerous situation	Minor injury

1.2 Symbols in this documentation

Symbol	Designation	Explanation
!	Attention	Warns about possible property damage.
i	Information	Practical hints and other useful information.
1. 2.	Multi-step operation	Instruction consisting of several steps.

1.3 On the product

! Observe all warning notices on products and ensure they remain legible.

Abbreviations used in this manual:

AQI	Air Quality Index
GPS	Global Positioning System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
IoT	Internet of Things
IP	Ingress Protection
PCB	Printed Circuit Board
PSK	Pre-Shared Key
SIM	Subscriber Identity Module

1.4 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions before operating the unit.

- Do not install or store the unit near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
- Do not block or cover any of the openings provided in the unit. They are provided for ventilation, to prevent from overheating and to ensure reliable operation. Keep open distance of approximate 200mm all round the unit.
- Do not place objects filled with liquids, such as vases or cups on the unit. Never spill liquid of any kind on the unit.
- Do not open the mating connector and dust cap in rainy season, as the water might enter the unit and lead to fire or electrical shock.
- Disconnect the electrical connection before cleaning. Use only a dry cloth. Do not use liquid cleaners or aerosol cleaners.
- Do not attempt to service a damaged device yourself, unless qualified. Contact your associated channel partner for all types of servicing, such as
 - The power supply cord or plug is damaged;
 - Sensor damaged due to exposure of moisture, water, and/or inclement weather (rain, snow, etc.);
 - Liquid has been spilled in or on the equipment;
 - Unit has been dropped or the unit cabinet is damaged;
 - Unit exhibits a distinct change in performance;
 - Unit does not operate normally when the user correctly follows the operating instructions.
- Install in accordance with the manufacturer's instructions in accordance with applicable local codes.
- Use only attachments or accessories specified by the manufacturer. Equipment change or modification could void the user's guarantee or authorization agreement.

- Be sure that the service technician uses replacement parts specified by the manufacturer, or that which have the same characteristics as the original parts. Unauthorized substitutions may cause injuries or other hazards.
- i** The IMPORTANT SAFEGUARDS and WARNINGS presented in this manual do not cover all possible conditions that may occur. Common sense, caution and care must be exercised when installing, maintaining or operating the unit.

1.5 Important Notices



Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. Use only with mounting solutions specified by the manufacturer. When a cart is used, use caution and care when moving the cart/unit combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart/unit combination to overturn. Mount the unit as per the installation instructions. .

1.5.1 Don'ts

- Do not connect the unit to the electrical power supply using cables that have been damaged.
- Do not remove any of the connectors.
- Do not keep the unit below water body and water pipes.
- Do not keep the unit in temperature range other than indicated in recommendation section.
- Do not power the unit with other power sources than the original provided by RBEI. Voltage and current maximum ratings can be exceeded, stopping unit from working and voiding warranty.
- Do not try to extract, screw, break or move connectors far from necessary usage, waterproof sealing can be damaged and warranty will be voided.
- Do not connect any sensor not provided by RBEI.
- Do not place nodes on places or equipment where it could be exposed to shocks and/or big vibrations.
- Do not keep mating connectors or dust caps in unlock condition.
- Do not use dropped unit.
- Do not replace the sensor or any parts in the mounting condition.
- Do not carry the unit in assembled condition (with sun shade, splash guard, hose clamp and screw hardware).
- Do not mishandle CO₂ and UV sensor as it may cause reading disturbance due to vibration or shock.

1.5.2 Environmental statement

Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

1.5.3 Moving

Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit.

1.5.4 Unpacking

- This equipment should be unpacked and handled with care. If an item appears to have been damaged in shipment, repack it in the original packaging and notify the shipping agent or supplier immediately.
- Verify that all the parts listed in the parts list below are included. If any items are missing, notify your RBEI representative.
- The original packing carton is the safest container to transport the unit and must be used if returning the unit for service. Save it if possible, for future use.











1.5.5 3/CP300H (3.6V NI-MH BATTERY) & CR2032H BATTERY:

Caution: Risk of explosion if battery is replaced by an incorrect type.

Dispose of used batteries (3/CP300H & CR2032H battery) according to the instructions.

Refer section 8.1

1.6 Enclosure safe handling instructions

Alert type	Do's	Don'ts
<p><u>No load on hinges</u> Do's: Always provide support at the bottom side for enclosure cover, in cover open condition to avoid load on hinges.</p> <p>Don'ts: Do not keep enclosure cover without proper support. Do not keep any load on enclosure cover from inside.</p>		
<p><u>Cotton gloves for product handling</u> Do's: Always use clean hand gloves to handle the enclosure.</p> <p>Don'ts: Do not touch the enclosure with bare hands and dirty gloves.</p>		
<p><u>Stacking of enclosures</u> Do's: Use spacer material (preferably foam) to stack empty enclosure.</p> <p>Don'ts: Do not stack empty enclosure without any spacer material in-between. Stacking of assembled enclosures are not recommended.</p>		
<p><u>Enclosure movement</u> Do's: Hold horizontally and ensure support from all the sides during hand carry of enclosures. 4 hands support for larger size (control series) is a must.</p> <p>Don'ts: Do not hold enclosure in vertical position and hand carry.</p>		
<p><u>Load on vent kits</u> Do's: Enclosure covers are to be placed at 180° with bottom support.</p> <p>Don'ts: Do not rest enclosure cover on vent kits. Do not rest enclosure itself on vent kit.</p>		

1.7 Short information

All efforts have been made to ensure the accuracy of material provided in this document at the time of release. However, the items described in this document are subject to continuous development and improvement. All specifications are subjected to change without notice and do not represent a commitment on the part of Robert Bosch Engineering and Business Solutions Private Limited (RBEI). RBEI will not be responsible for any loss or damages incurred related to the use of information contained in this document.

- !** Before starting up, connecting and operating this product, it is absolutely essential that the installation instructions and, in particular, the safety instructions are studied carefully. By doing so, any uncertainties in handling this product can be eradicated and will ultimately help to avoid damage to the unit.

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Trademarks

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2. BOSCH CLIMO overview

BOSCH CLIMO is designed to measure certain atmospheric gases and factors of the ambient environment.

BOSCH CLIMO features are:

- It is easy to deploy, technologically advanced and incurs zero added infrastructure investment.
- It connects compact wireless sensors over GSM networks enabling micro-climatic data collection.
- BOSCH CLIMO is powered with the state-of-the-art IoT-friendly Intel Quark processor enabled with a "pattern matching" technology; facilitating energy-efficiency, scalability and sustainability for real-world applications.

▮ Whilst robust in design, the unit is a sensitive piece of scientific equipment and should be treated as such.



▮ The device must be protected from strong direct sunlight as this will quickly raise the temperature of the device beyond its operating range. BOSCH CLIMO unit has been provided with a sun shade guard to protect from the effects of light sunlight.

▮ Mount the unit facing North or South direction

▮ There will be variation in sensor behavior due to limitation of NO, NO₂, and O₃ sensors on higher temperature range beyond 40°C and PM sensor for below -10°C.

2.1 Version of product

There are four versions of product that is available for customer based on connectivity;

- Micro Climate Monitoring System (SC_GSM) A D00 A40 103
- Micro Climate Monitoring System (GSM) A D00 A40 100
- Micro Climate Monitoring System A D00 A40 101
- Micro Climate Monitoring System (Standard- RJ45) A D00 A40 102

2.2 Applications

- Real Estate and Community: BOSCH CLIMO will be the indicator for quality of life index and the breathability of the ambient air. The recommendations and early warning system based on air profiling will help the society to make smarter choices.
- Smart Cities: It will form a mandatory component for any smart city as it aides in awareness and better city management.
- Industries Construction: It assists in perimeter monitoring of the site, measure the factory health and determines the condition in which the workers are working.
- Mining and Oil and Gas: This is a heavily polluting sector by the nature of the industry itself. BOSCH CLIMO will help in compliance adherence by constant monitoring and thus making it a greener sector.

2.3 Site & Parameter selection as per CPCB guidelines on measurement of Ambient Air Pollutants (Air Quality)

Site Selection

- Away from source & other interferences (inlet 15m away from source/traffic artery).
- Height of inlet >3m (preferably 3-10m) Double the height of nearby wall/obstructed.
- Free flowing, well mixed.
- Elevated angle <30 (from inlet to top of building).
- Collocated samplers should be 2m apart.

Parameter Selection

- Sensitive location (SO₂ & NO₂).
- Health Impact stations (All pollutants).
- Population & exposure (All criteria pollutants).
- Kerb side (Traffic intersection) (criteria pollutants + CO).
- Downtown (Accumulative, 50 m away traffic intersection) (criteria pollutants + O₃).

2.4 Device specifications

This section shows the overall dimensions of the BOSCH CLIMO design. Detailed installation steps are explained in further sections.

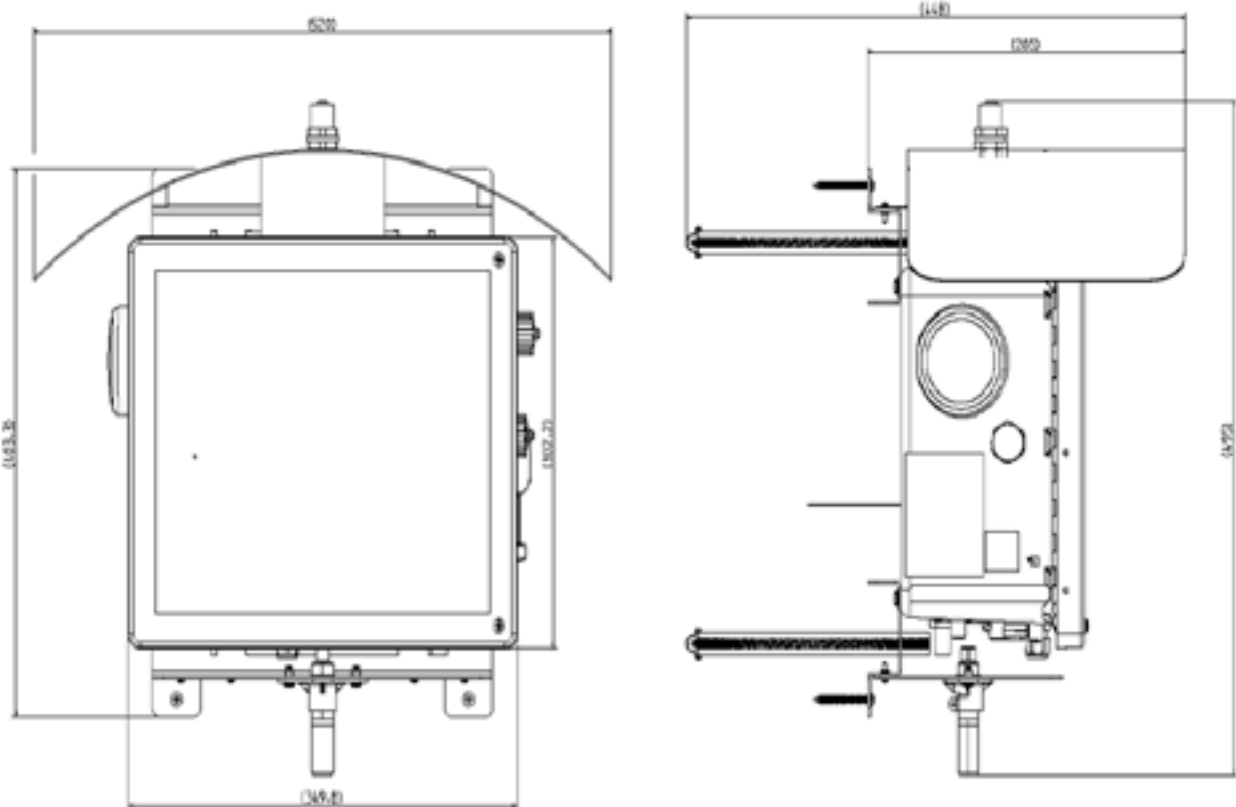


Fig. 1: Mounting envelope

2.5 Technical data

The unit has the following features:

Category	Features	Range	Resolution / Remarks
Gas Sensors	Particulate Matter PM 2.5	0 – 500 µg/m ³	± 5 µg/m ³
	Particulate Matter PM 10	0 – 1000 µg/m ³	± 5 µg/m ³
	Carbon Monoxide (CO)*	0 – 31000 ppb	100 ppb
	Nitrogen Dioxide (NO ₂)*	0 – 300 ppb	10 ppb
	Ozone (O ₃)*	0 – 400 ppb	10 ppb
	Sulphur Dioxide (SO ₂)*	0 – 700 ppb	10 ppb
	Nitric Oxide (NO)* (Optional)	0 – 300 ppb	10 ppb
External Mount Sensors (Optional)	CO ₂	0 – 5% (5000PPM)	
	UV	up to 15 UVI	
Environmental Sensors	Humidity	10% – 95% RH	
	Temperature	-40°C – +70°C	
	Sound	45dBA – 100 dBA	
	Light	up to 188000 Lux	
	Pressure	500 to 1500 mB (hPa)	
Connectivity	GSM/GPRS	WCDMA/3G	
	Ethernet	10/100 baseT	
	USB 2.0		
Physical Attributes	Ruggedness	IP 53 High durability, ingress and shock protection	
	Power supply	100VAC – 240VAC, 50-60 Hz or 9 – 12 V DC	
	Maximum power rating	20W	
	Ambient Operating Temperature	-20°C – +50°C	
	Humidity	15% – 85% RH	
	Enclosure	UV stabilized industrial housing molded fiberglass reinforced polyester	
	Color	RAL 7035 light gray	
	System weight	< 6 kgs	
	Dimension (L x W x H)	L 30cm x W 25cm x H 15cm	Compact housing
	Certifications	GSM & Ethernet version CE and FCC certified. PTCRB (is pending) UL Certificate Number 20170731-E492562	
	Warranty	1 year	
Software	Cloud Connectivity or Infra	Optional	
	API Interface		
	OTA update		
	Data uplink rate to cloud	Configurable (1 Min to 1 Hour)	
	Device Management	Clients and Universality	
	Data backup	Configurable up to 5 days	
	Remote monitoring, fault detection and self-diagnosis		
External Interfaces / add-on accessories	Mounting	Pole or Wall mount	
	Splash guard and Sun shade		
	Battery power pack	DC power provisions	Optional external battery (12V/40Ah/36W)
	Solar power pack	12V DC power from Solar panel	Optional

3. Pre Installation

3.1 Installation Kit

The installation kit contains:

Qty	Component
2	ASSY, Mounting bkt
4	Screw, Pan head Philips with washer
1	Splash guard_smartcity
8	Machine screw, Pan head Phillips m3 x 12lg
2	Vibration-resistant worm-drive clamps for "od 4 inch to 7 inch"
4	Screw, 8 x 80lg self-tapping along with dry wall anchors
1	Sun shade guard_smartcity
1	Template for wall mounting
1	Assembly for external AC power supply cable
1	Assembly for external DC power supply cable
1	CO ₂ sensor
1	Plastic mounting flange (dia 18.5mm)
1	UV sensor

3.2 Tools

The following tools are helpful:

Tool Description	Purpose
Philip head screw driver	For all kinds of screws
Gloves (ESD protected and safety gloves)	Safety for hands
Goggles	To protect from dust during drilling wall
Flat screw driver	To fix pole mounting ring to pole



Use power operated tools to avoid fatigue to the installer.

3.3 Torque table

Part No.	Description	Tightening Torque (N-m)
AD00A43029	CO ₂ Sensor self-tapping screw on Mounting Flange	0.3-0.5
AD00A41073	M5 X 12 CO2 Sensor Mounting Flange	0.5-0.8
AD00A43030	UV Sensor Mounting	0.3-0.6
AD00A41027	M3 x 12 LG Screw of Property class 5.8	0.5 to 0.7
AD00A41030	M3 x 6 LG Screw of Property class 5.8 (Countersunk)	0.5 to 0.7
AD00A41045	M3 x 6 LG Screw of Property class 5.8	0.5 to 0.7

3.4 SIM insertion (for Micro Climate Monitoring System GSM variant AD00 A40 00)

SIM card is not part of the product, it has to be purchased and assembled by the customer or the end user.

- SIM card must be micro-SIM (3ff) industrialization grade robust or super-robust plastic type with operating temperature of -40°C to 105°C.
- Before installing the unit on pole or wall, assemble the SIM and check for the connectivity.

3.5 configuration (Micro Climate Monitoring System variant AD00 A40 002)

Configuration has to be done.

3.6 Ethernet and USB connectors

3.6.1 Panel mount connectors

The table below gives the detailed information of the panel mount connectors which are used in BOSCH CLIMO unit:

Panel mount connector	Part Number	Description
Ethernet	17-10000	CONN MOD Coupler 8P8C TO 8P8C
USB	17-200161	CONN USB ADPT F-F W/Cover IP67

3.6.2 Mating connectors

- ❗ Refer to the Connector [website](#) for installation of Ethernet cable with Ethernet mounting connector.
- ❗ Mating connector is not part of BOSCH CLIMO unit. It is recommended to use IP65 compliant mating connectors mentioned in the table below

Mating connector	Mfr.	Part Number	Description
Ethernet	Conec	17-10001	Plug modular connector 8p8c (RJ45, Ethernet) position shielded Cat5e IDC
USB	Conec	17-200121	USB - A USB 2.0 plug connector 4 position free hanging (In-Line)

- ❗ There is a waterproof dust cap, which protects the connector when it is not mated with the above connectors.



If the above mating connectors are not used then the required IP is not guaranteed.

3.7 Calibration

The gas sensors that are available as part of the BOSCH CLIMO are pre-calibrated by the sensor manufacturer and should have expected response to change in ambient air conditions within the first 7 days, post installation. However, these gas sensors are known to drift over time. Hence they require frequent recalibration. BOSCH CLIMO uses the following 2 methods for recalibration:

- Regular recalibration cycles or field recalibration: This is done by using data from an EPA graded instrument, co-located along with or available in the near vicinity of the BOSCH CLIMO. This recalibration is handled remotely using the remote device management platform.
- In-house recalibration: This is carried out by unmounting the device and recalibrating it in a laboratory environment with NIST certified calibration gases or completely replacing the sensor to have a new one in place of the existing one.

i For use cases which require greater accuracy of data, frequent recalibration would be required. The best suited recalibration cycle can be defined by observing the trend of sensor data from the BOSCH CLIMO in its current deployment location for the first few days.

i Environment and particulate matter sensors do not exhibit any behavioral drift over time and hence may not need regular recalibration cycles.

3.8 Health indicators

You can know the device is functional by checking the red LED indicator. Blinking of this LED, indicates that there is a proper connection of the BOSCH CLIMO device with cloud and the data is being transmitted successfully.

3.9 Pre installation Acceptance checklist

i Take the print out of the checklists, sign and store it for every unit.

Sl. No.	Description	Test Passed (Yes/No/NA)	Comments
1	Availability of product handling or installation safety precaution (ex. hand gloves, ladder, helmet, safety belt)		
2	Availability of ESD protection for SIM installation		
3	Device Serial number		
4	Device Mac ID		
5	Location		
6	Latt and Long		
7	SIM card number		
8	SIM ID Number		
9	SIM must be industrial grade and WCDMA/3G MICRO SIM (3ff) (Micro-SIM (3ff) industrialization grade robust or super-robust plastic type with operating temperature -40 ° c to 105 ° c)		
10	Availability of Ethernet mating connector along with cable		
11	Availability of Ethernet connection at location		
12	Confirmation of signal strength from Service provider at the installation location		
13	Availability and verification of dispatch checklist		
14	Physical verification of the complete product and accessory kit		
15	Test report available		
16	Torque controlled Tools availability for installation		
17	Installation manual (soft copy)		
18	Availability of DC/AC power socket		
19	Ensure the proper voltage (12v DC/230v ac)		
20	Ensure no obstruction in north and south direction at the installation pole		
21	Installation height must be within 8 to 12 feet		
22	Date and time of installation		

3.10 Post installation Acceptance checklist

Sl. No.	Description	Test Passed (Yes/No/NA)	Comments
1	Torque measurement and record of the mounting		
	- Mounting bracket		
	- Splash guard		
	- CO2 Sensor assembly		
	- UV sensor assembly		
	- Solar Shade		
2	Ensure mating connectors and dust caps should be in locked condition		
3	Connection details (Ethernet/GSM)		
4	Switch on the unit and observe blinking of the red LED		
5	Ensure the device updating the data on the cloud verified by customer using their system		
6	Picture of installation in four direction		
7	Details of the four direction at the location		
	North		
	East		
	West		
	South		

4. Installation

The right behaviour of BOSCH CLIMO unit depends on a reliable installation. RBEI provides the necessary accessories to make it easier, like mounting bracket, screws, connectors, and other accessories.

Wherever BOSCH CLIMO unit is placed, make sure that you tight it firmly and the enclosure is not affected by wind, vibrations and other environmental conditions. RBEI does not take responsibility of damages caused due to tampering or bad installation.

- ❗ During the process of unpacking, installing, assembly and servicing, all relevant ESD precautions must be undertaken and handled with care in order to avoid damage and accident.
- ❗ Ensure to place the unit on the table that is sturdy and use soft cover that will not damage the unit.

4.1 Unpacking

1. Detach the upper box from the outer carton package.
2. Remove the unit from the box carefully and verify whether there is any damage or not on the unit, during transporting.
3. Open the carton box of the installation kit.
4. Check the delivery carefully to make sure that all parts have been delivered. If there is any mistake, please contact your authorized dealer at once.



Fig. 2: Packaging

- ❗ In the installation kit, parts for both wall mounting and pole mounting are available.
- ❗ Keep the original package for the future transporting.

4.2 Installing SIM

To install SIM in the unit:

- ❗ Ensure to take necessary ESD precautions during inserting and removing the SIM card.
 - ❗ Do not insert or remove the SIM card while the unit is plugged to power supply.
1. Unscrew the two screws.
 - ❗ Do not remove the screws from the cover panel.
 2. Locate the SIM card carrier in the Processor Board.
 3. Slide the metal cover of the SIM card holder towards the back of the box to unlock.
 4. Insert the SIM card into the slot and slide the metal cover to its original position.



Fig. 3: SIM card in the unit

5. Tighten back the screws of the cover panel.

4.3 Mounting bracket assembly

To mount bracket to the unit:

1. Place the unit on the table.
2. Fix the mounting bracket to the rear side of the unit with the screws provided (M5 x 12LG 4Nos "AD00A41031").
- ❗ The surface on which the unit is placed should be smooth and soft, such that the unit is not damaged,



Fig. 4: Mounting bracket fixed to unit

4.4 Pole mounting

To pole mount the unit:

1. Insert the provided vibration-resistant worm-drive clamps, to the mounting bracket slots.
2. Wrap the clamps around the pole.

i The pole mounting clamp provided in the installation kit suits for "5 inch to 6 inch" diameter. If the pole diameter is outside this limit, the installer or user should take care of the mounting clamp.



Fig. 5: Pole mounting

3. Tighten the hexagonal bolt with respect to the pole.

i Assemble worm-drive clamps to the mounting bracket before assembling Sun shade and Splash guard.

4.5 Wall mounting

To wall mount the unit:

1. Use the wall mounting template to mark out the four mounting holes on the wall.
2. Drill holes on the marked points of the wall.

i The mounting holes should be such that it can accommodate the proposed wall plugs and screws.

3. Insert the supplied mounting plugs into the mounting holes.
4. Fix the unit to the wall with self-tapping screw that is provided, to securely mount the unit to the surface.
5. Fasten the screws.

i Use the screws provided, for the unit to be safe on wall.

i Any screws and wall plug can be used that is suitable for the hole provided in the mounting bracket.

i Fix the splash guard, after the unit is fixed on the wall.

i Fix the unit on a flat wall, otherwise mounting of splash guard could be difficult and RBEI will not be responsible for the damage caused.

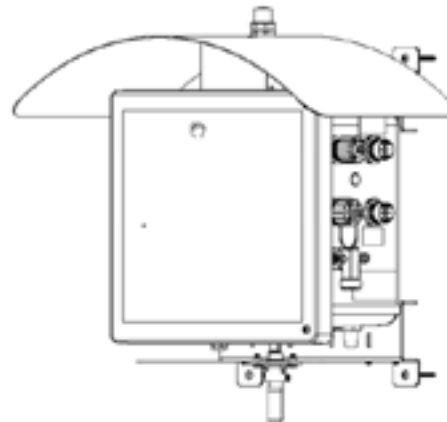


Fig. 6: Wall mounting

4.6 Sun shade and UV sensor assembly

To assemble sun shade and UV sensor on the unit:

i Sun shade has to be assembled when the unit is mounted on pole or wall. This is needed as space is required to fix the screw through the mounting bracket.

1. Fix the UV sensor on the sun shade from bottom first, and lock nut on top.
2. Fix the sun shade on to the top mounting bracket with the provided screws.
3. Connect the USB mating connector.

! Take care not to apply excess load while installing the sun shade, as the unit is not a load carrying component and can cause damage.

! Do not rest the unit on sun shade.

i While assembling handle UV sensor with care.

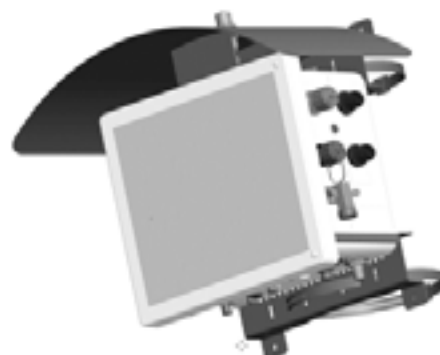


Fig. 7: Sun shade with UV sensor

4.7 Splash guard and CO₂ sensor assembly

To assemble splash guard and CO₂ sensor on the unit:

- ❗ Splash guard has to be assembled when the unit is mounted on wall. This is needed as space is required to fix the screw through the mounting bracket.
 - ❗ Avoid installing any other equipment around sensors (CO₂ & UV sensors).
1. Assemble the CO₂ sensor, and plastic mounting flange with self tapping screw.
 2. Fix it to the Splash guard with the provided M5 screws.
 3. Fix the Splash guard to the bottom mounting bracket with help of provided screws.
- ❗ Take care not to apply excess load while installing the splash guard, as the unit is not a load carrying component and can cause damage.
 - ❗ Do not rest the unit on splash guard.
 - ❗ While assembling handle, CO₂ sensor with care and avoid installing any other equipment around the sensor.



Fig. 8: Splash guard with CO₂ sensor

4.8 AC DC connection

To connect AC or DC cable to the unit:

1. When the unit is assembled either on pole or wall, check that the unit is in perfect condition and without any damage.
2. Fix the AC or DC cable harness as per the label indicated on the unit.



Fig. 9: Notch for mating connector

3. Insert the mating connector keeping notch as reference.

- ❗ Mating connector should be in unlock position and inserted completely as shown in the figure below.

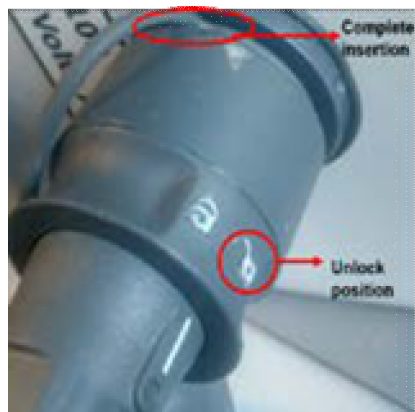


Fig. 10: Mating connector insertion

4. Lock the mating connector.

- ❗ Carefully insert the connector into the notch with a gentle push and it should not give crunch sound. Smooth lock should happen.

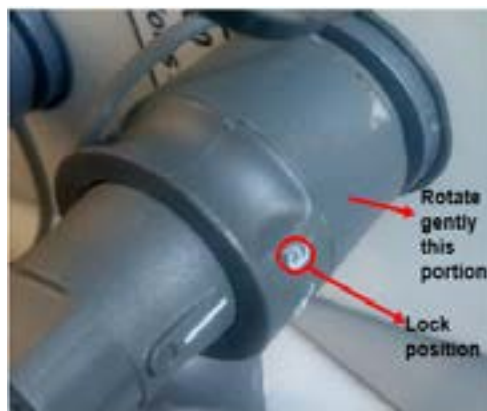


Fig. 11: Mating connector locked

■ In the accessory kit, a separate compatible AC and DC connectors are available with a cable length of around 3m. Before assembling the unit, the other end of the cable has to be assembled to a power socket which is not part of the accessory kit.

1. Based on the power socket on the other end of the cable, fix the necessary plug and connect to power socket. Switch ON the unit and check if the unit is working.

■ A red glow of the LED indicates that the unit is ON and working.

5. User Interface

5.1 Air Quality Index

AQI (Air Quality Index) formulated by the Central Pollution Control Board along with State Pollution Control Boards is an effective tool for dissemination of air quality information to people. There are six AQI categories, namely: Good, Satisfactory, Moderately polluted, Poor, Very Poor, and Severe. The range and associated health risks for each category are as follows:

AQI category	Range	Associated health impacts
Good	0-50	Minimal impact
Satisfactory	51-100	May cause minor breathing discomfort to sensitive people.
Moderately polluted	101–200	May cause breathing discomfort to people with lung disease such as asthma, and discomfort to people with heart disease, children and older adults.
Poor	201-300	May cause breathing discomfort to people on prolonged exposure, and discomfort to people with heart disease.
Very poor	301-400	May cause respiratory illness to the people on prolonged exposure. Effect may be more pronounced in people with lung and heart diseases.
Severe	401-500	May cause respiratory impact even on healthy people, and serious health impacts on people with lung/heart disease. The health impacts may be experienced even during light physical activity.

5.2 User Interface

The user interface is a medium through which personas associated with the business entity owning the product (or general public, if allowed) can view device information and sensor data. The APIs available in the platform enable the presentation of data as a web application, mobile

application or as part of a customer specific enterprise platform.

These content rich visual displays helps to understand not only the device location and status (online or offline or error prone, etc.) but also, view the instantaneous value of sensor data. The Air Quality Index (AQI) parameter, usually displayed prominently in all these applications, is an important element to understand the overall ambient air conditions within specific geographical boundaries. The AQI is calculated by the analytics platform on the cloud and is based on the incumbent of air quality regulations in the region of deployment. The APIs also allow construction of intuitive dashboards to represent the trend of data over time thereby providing an understanding of changing atmospheric conditions in relation to seasonal or specific events. These applications also generate, customized reports for offline analysis which can aid planning of corrective actions to make the ambient air safer.

5.3 Interpreting the outputs

5.3.1 To access the device through Web app

1. Contact your installation agent for getting website link and user credentials i.e. username and password.

■ Once it is activated you will be able to access the UI.

2. Enter your user name and password.

3. Click Login to proceed.

6. Troubleshooting

Malfunction	Possible causes	Solution
Unit does not operate.	Power failure	Check AC or DC power supply
	Faulty cable connections	Check all cables, plugs, contacts and connections.
No connection established, no data transmission	Network unavailability	Check the required telephone network is available in the area
	Faulty installation	Check the SIM card for proper installation
	NO cloud connection	Check for blinking of panel LED .

■ If you find any other malfunctions apart from the above mentioned ones, please contact your associated channel partner.

7. Maintenance

Although BOSCH CLIMO unit is highly resistant to external environment and load, periodic maintenance and care of the unit is required for a longer useful life.

- Handle BOSCH CLIMO unit with care during installation, transportation and maintenance.
 - While transporting the unit, proper packaging needs to be taken care.
 - Avoid placing the unit in place where there is chance of reaching high temperatures, this could damage the electronic components.
 - The locknut of connectors are gentle, do not apply excessive force upon installing or it may get damaged.
 - CO₂ and UV sensors are highly sensitive and extra care is required for assembly handling and storage.
 - Do not use any type of paint on the device, it could deteriorate the properties.
 - Do not use aggressive chemical products for cleaning.
- i** Gas sensors may require replacement for optimal accuracy. The periodic replacement depends on the location at which the unit is installed.
- i** Automatic system notification is sent to the administrator, whenever the maintenance is required.

8. Recommendations

RBEI gives some recommendations to improve performance and efficiency of BOSCH CLIMO unit, enlarging useful life of all of its elements.

- Keep the unit and its sensors out of direct sunlight and glare. It is known that, sun rays accelerates plastic elements deterioration.
- BOSCH CLIMO unit is waterproof (rated at IP53). Extra precautions are taken to protect the unit against most weather conditions, however make sure that the water does not enter the unit directly. If your model includes external solar panel, it is recommended to place the unit under the solar panel, to keep the node out of the rain. Ensure that the solar panel is faced to south (north if you are on the south hemisphere) and tilted 45°.
- Always place the unit such that the connectors and antenna face towards either to west or east.
- Keep the unit out of range of people who can damage installation, wet sensors, etc.
- As per sensor manufacturer's specification, sensors are capable of producing accurate data under stable temperature & humidity. The standard test conditions are 20°C and 80% RH and in the absence of interfering gases.
- RBEI takes no responsibility of any damage to third parties caused by a bad installation.

- i** Periodic maintenance is required for all the sensor probes like particle matter sensor, temperature and humidity, UV sensor and CO₂ sensor to ensure accurate readings.

8.1 Disposal



Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, as per the law of the land.

- !** Hand over the old/discarded electronic equipment only to authorized collection centers for disposal.

See also:

Contact No: 180042535287 (toll-free)

E-mail: recycle@ewasteindia.com

Online website: www.ewasteindia.com

9. Warranty

- This unit is guaranteed, to the original end user purchaser, against defect in materials and workmanship for a period of 12 months from the date of the shipment to the user. During this period Bosch will repair or replace defective parts on an exchange basis. The decision to repair or replace will be determined by Bosch.
- To maintain this warranty, the purchaser must perform the installation and maintenance as prescribed in the manual. Only the parts supplied by Bosch should be fitted. Normal wear and tear, and parts damaged by abuse, misuse, negligence, or accidents are specifically excluded from the warranty.
- Exposure to temperature outside the range of -20°C to +50°C (with clause for PM sensor, NO, NO₂ and O₃ sensor) or to relative humidity outside the range of 15% to 85% will void the warranty.

10. FCC Warning statement 15.19

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
 1. This device may not cause harmful interference, and
 2. This device must accept any interference received, including interference that may cause undesired operation.
- Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.
- This device and its antenna must not be colocated or operating in conjunction with any other antenna or transmitter.
- End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.
- For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

11. FCC Warning statement 15.105

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

12. Statement

- Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.
- This device and its antenna must not be colocated
 - or operating in conjunction with any other antenna or transmitter.
- End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

13. Mobile Device

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

14. RED Requirement

- Ensure that the equipment can operate in at least one Member State. "The radio equipment can be used in one member state at least"
- CE mark
- A copy DoC / simplified DoC which shall accompany the product
 - Copy of DoC is made available to user.
K W W S

Robert Bosch Engineering and Business Solutions Private Limited
123, Industrial Layout,
Hosur Road, Koramangala,
Bangalore 560 095
INDIA