



[INSTALLATION MANUAL]



ENISCOPE[®] AIR SENSE

Model AD101/1 Model AD102/2

best.energy

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Warning Notice System

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol.

These notices shown below are graded according to the degree of danger.



DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.



WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.



CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.



CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.



NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not adhered to.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation for the specific task, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, can identify risks and avoiding potential hazards when working with these products/systems.



Proper use of Best.Energy products

Note the following:



WARNING

Best.Energy products may only be used for the applications described in the catalogue and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Best.Energy. Proper transport, storage, installation, assembly, commissioning, operation, and maintenance is required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be adhered to.

The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of the Best Energy Ltd. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

Best.Energy have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

1.1 Important Notes

Purpose of the manual

This manual contains fundamental information and practical tips for installing and correctly connecting the Eniscope® Air Sense product. Commissioning and associating the device with the Eniscope Air Connect LoRa network is dealt with in a separate manual.

Target group

This manual is intended for any user involved in

- Installation
- Servicing and maintaining
- Planning and configuring systems

Basic knowledge required.

A general knowledge of the field of electrical engineering is required to understand this manual.

Scope of validity.

The manual is valid for the Eniscope® Air Sense. It describes the components that are valid at the time of publication. Best.Energy reserves the right to change product or component Information without prior notice.

Standards and approvals.


The Eniscope® Air Sense electrical and operational safety is declared to EN60730.

Disclaimer of liability.

It is the responsibility of the manufacturer to ensure that a system or machine is functioning properly as a whole. Best.Energy, its regional offices, and associated companies cannot guarantee all the properties of a whole plant system or machine that has not been designed by Best.Energy.

Similarly, Best.Energy can assume no liability for recommendations that appear or are implied in the following description. No new guarantee, warranty, or liability claims beyond the scope of the Best.Energy general terms of supply are to be derived or inferred from the following description.

2.1 Before commencing work: Isolating the equipment from the supply system and ensuring that it cannot be reconnected.

-  **DANGER**
Hazardous voltage Will cause death or serious injury.
- Disconnect the system and all devices from the power supply before starting work.
 - Secure against switching on again.
 - Verify that the equipment is not live.
 - Ground and short-circuit.
 - Erect barriers around or cover adjacent live parts.

2.2 Five safety rules for work in or on electrical systems

A set of rules, which are summarized in DIN VDE 0105 as the “five safety rules”, are defined for work in or on electrical systems as a preventative measure against electrical accidents:

-  **DANGER**
Hazardous voltage Will cause death or serious injury.

Qualified Personnel.

The equipment / system may only be commissioned and operated by qualified personnel. For the purpose of the safety information in these Operating Instructions, a “qualified person” is someone who is authorized to energize, ground, and tag equipment, systems, and circuits in accordance with established safety procedures

- 1 Isolate**
- 2 Secure against switching on again**
- 3 Verify that the equipment is not live**
- 4 Ground and short-circuit**
- 5 Erect barriers around or cover adjacent live parts**

These five safety rules must be applied in the above order prior to starting work on an electrical system. After completing the work, proceed in the reverse order.
It is assumed that every electrician is familiar with these rules.

Explanations

1. The isolating distances between live and deenergized parts of the system must vary according to the operating voltage that is applied. “Isolate” refers to the all-pole disconnection of live parts.

All-pole disconnection can be achieved, e.g. by.:

- Switching off the miniature circuit breaker
 - Switching off the motor circuit breaker
 - Unscrewing fusible links
 - Removing LV HRC fuses
2. The feeder must be secured against inadvertent restarting to ensure that it remains isolated for the duration of the work. This can be achieved, for instance, by securing the load and miniature circuit breakers with lockable blocking elements in the disconnected state, either using a lock or by unscrewing the fuses.
 3. The deenergized state of the equipment should be verified using suitable test equipment, e.g. a two-pole voltmeter. Single-pole test pins are not suitable for this purpose. The absence of power must be established for all poles, phase to phase, and phase to N/PE.
 4. Grounding and short-circuiting are not mandatory if the system has a nominal voltage less than 1 kV. The powered version (non-battery version) of the Best.Energy Eniscope® Air Sense is rated at a maximum of 277V nominal single phase.

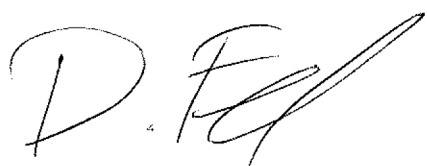
The Eniscope® Air Sense AD101/1 and AD101/2 meets the following requirements:
EN 60730-1:2016 Automatic electrical controls safety standard.



This is to certify that the products described in this manual conform to the requirements of the following standards in respect of the low voltage directive, 73/23/EEC.

This is to certify that the products described in this manual conform to the requirements of the following standards in respect of the European EMC directive:

EN60730-1:2016, EN5022: 2010, EN61000-4-2:2009, EN61000-4-3:2006+A2,
EN61000-4-4:2012, EN61000-4-5:2014, EN61000-4-6:2014, EN61000-4-11:2004,
EN 6100-4-8: 2010, EN6100-3-2: 2019, EN6100-3-3: 2013, EN300 220-2 V3.2.1, 4.3.1, 4.2.2



16/03/21

Signed

D. Fellows

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4 PRODUCT DESCRIPTION

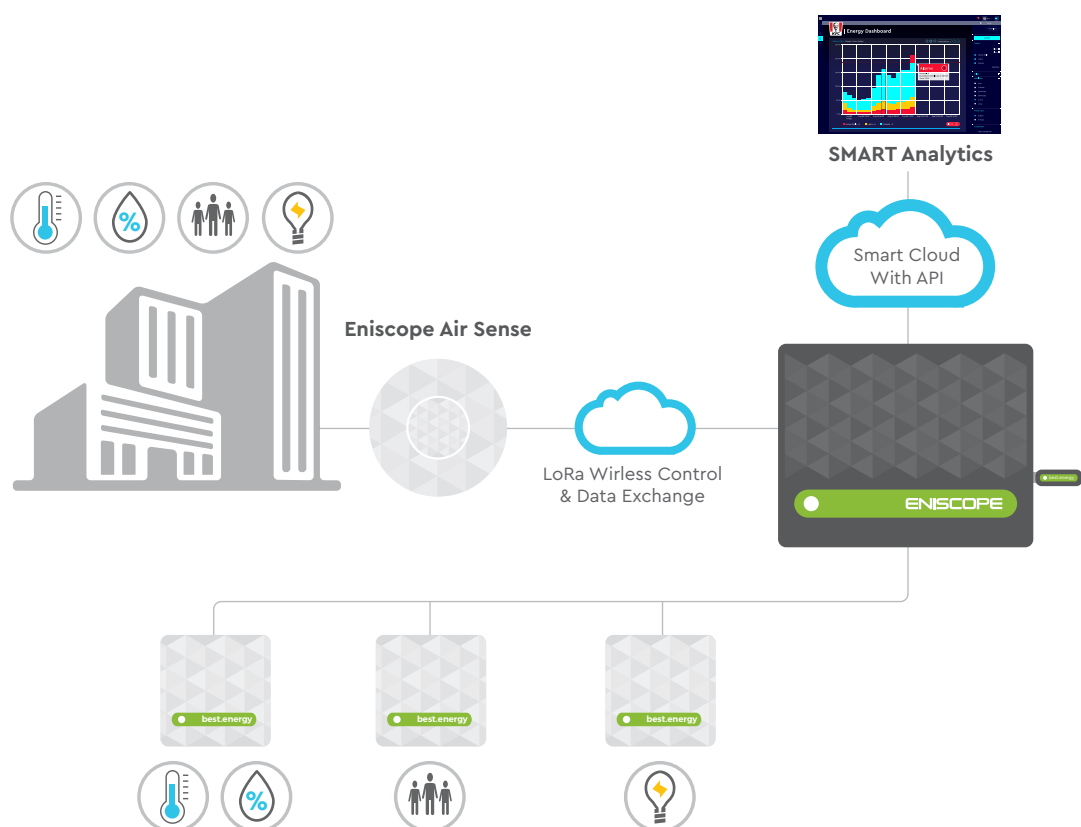
4.1 Elements of the Eniscope® Air Sense

The Eniscope® Air Sense consists of the following components.

1. Non battery versions have an internally fused power supply rated at 100 to 277 VAC.
2. LoRa wireless circuitry for connection to Eniscope Air control and monitoring platform.
3. The Air Sense has the following wireless outputs.
 - a. Temperature
 - b. Humidity
 - c. Lux
 - d. PIR occupancy detection
4. 1 x pulse input

4.2 Description of Operation

The Eniscope Air Sense is a LoRa enabled sensor device for measurement of room temperature, humidity, light levels, and occupancy. The device reports data to the Eniscope Air platform via the Eniscope Air Connect module and Eniscope Hybrid to control room assets such as lighting and HVAC via the Eniscope Air Switch, Eniscope Air Digital and Eniscope Air Ambient devices according to the user's programmed schedule and comfort settings.



5 TECHNICAL SPECIFICATIONS



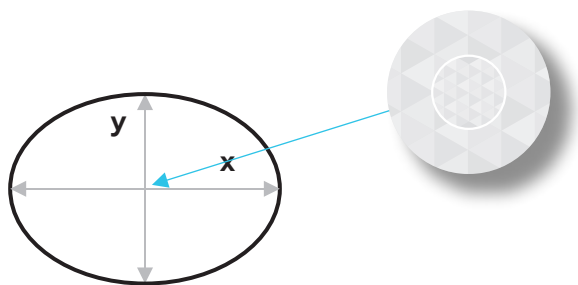
Enoscope Air Sense – AD101/1 Mains Powered

Enoscope Air Sense – AD101/2 Battery Powered

Supply Voltage (AD101/1)	100 – 277 VAC -10%/+6% (internally fused) or, 12V to 30V AC/DC – 0.1 amps
Fuse Rating (AD101/1)	100 – 277 VAC – 15mm 1 amp, Littlefuse 209 series
Power Requirements (AD101/1)	Less than 0.1 amps
Battery Specifications (AD101/2)	Cell Size R6-AA Lithium-thionyl chloride Li-SCoI2 Voltage 3.6V Recommended battery type SAFT 14500
Battery Quantity	Maximum of 5 cells
Battery Life	2 cells, 5-minute update rate = 10 years 5 cells, 1-minute update rate = 5 years
Temperature Range	-20°C to +60°C
Temperature Accuracy	+/- 0.2°C
Relative Humidity	0-100% RH
Relative Humidity Accuracy	+/- 2%
PIR	Maximum mounting height 7 Meters Detection angle 46° Maximum detection range 12 meters Yellow PIR activation LED
Light Levels	16 bit A-D, Range scalable in Analytics platform
Pulse Input x 1	2 Wire Input Volt Free 1.5mA Pulse Current
Enclosure Type	Polycarbonate
Enclosure Rating	IP20
Operating Temperature	-20 – +60°
Altitude	1000M
Dimensions	Diameter 115mm, Height 65mm
Weight	0.240Kg
Safety	EN 60730-1:2016
LoRa Wireless Bands	Band 1 – 16 Channels, 865MHz – 870MHz Band 2 – 16 Channels, 915MHz – 925MHz

6 PIR COVERAGE DATA

Ceiling mounting



PIR Activation LED

A PIR event can be observed when the yellow LED in the PIR lens is triggered.

PIR Coverage Ceiling Mounting

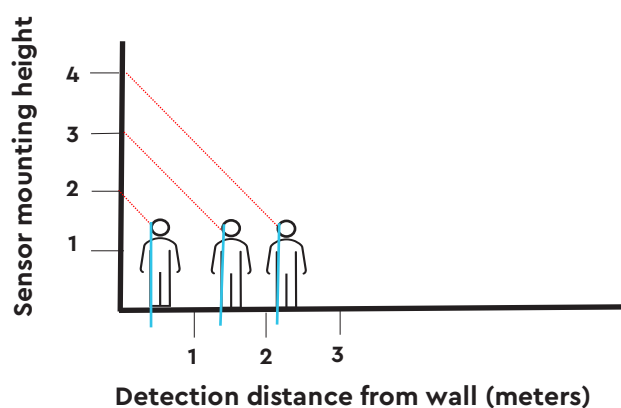
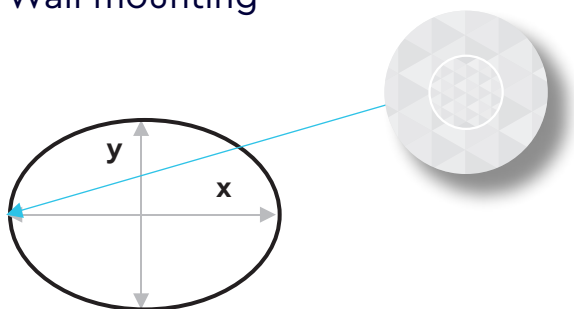
Mounting Height (Meters)	Detection Range Y Axis (Meters)	Detection Range X Axis (Meters)
7	10	12
6	8.7	9.5
5	7.5	8.6
4	7.1	7.8
3	6.8	7.2
2	4.5	5.2



NOTICE

The distances in the above table relate to the whole of the x and y axis length.

Wall mounting



PIR Coverage Wall Mounting

Mounting Height (Meters)	Distance (Meters) from Sensor Before Movement Detection (1.5M height person)	Detection Range Y Axis (Meters)	Detection Range X Axis (Meters)
7	4.5		
6	3.7		
5	2.7	10	12
4	2.1		
3	1.3		
2	0.4		

7 PRIOR TO INSTALLATION



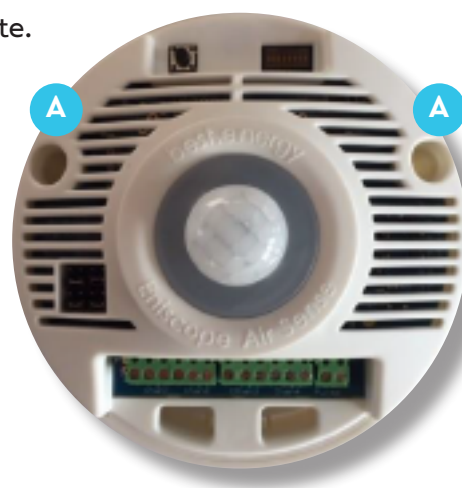
CAUTION

1. Carefully remove the unit from the packaging and check that the parts supplied identify with the delivery note and the purchase order.
2. Check the Voltage rating of the unit correspond with the input voltage.
3. Check that there are no loose parts or objects within the unit.
4. Check enough space exists to correctly install the unit.
5. Check you have enough tools to correctly install the unit.
6. Avoid extremes of temperature and/or humidity beyond published limits.

8 MECHANICAL INSTALLATION

8.1 Mounting the Eniscope Air Sense

- If using the PIR feature mount the unit in a position to attain the required coverage.
- Remove the push fit cover.
- Wall or ceiling mount the unit using both fixing holes (A).
- Use 3.5mm diameter screws suitable for the fixing substrate.
- Replace cover.



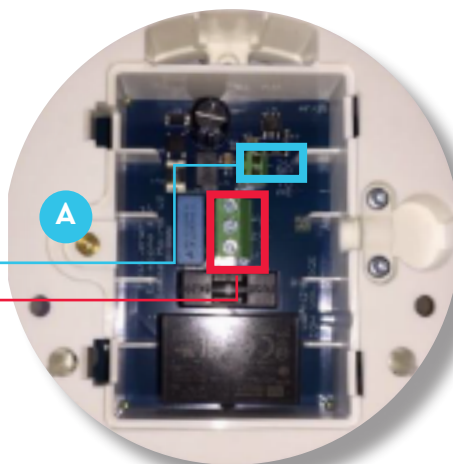
! DANGER

Hazardous voltage Will cause death or serious injury.

- Disconnect the system and all devices from the power supply before starting work.
- Secure against switching on again.
- Verify that the equipment is not live.
- Ground and short-circuit.
- Erect barriers around or cover adjacent live parts.

9.1 Eniscope Air Sense Model AD101/1.

- Remove screw A.
- Remove cover.
- Supply voltage options
 - 5-30V AC/DC or
 - 100-277V AC
- Cable size 0.75mm 300V rated.
- Use cable clamp to secure cable.
- Replace cover.



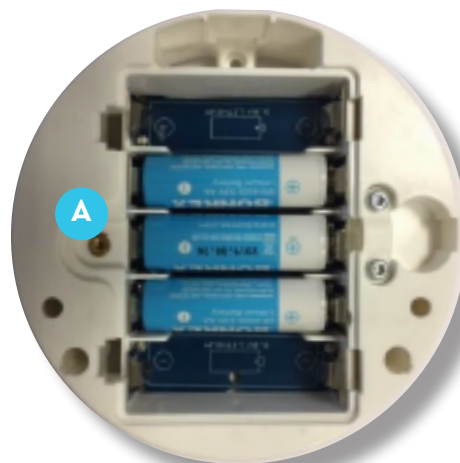
! WARNING

Use only copper cables.

Sensor power supply terminal torque setting 1Nm.

9.2 Eniscope Air Sense Model AD101/2.

- Remove screw A.
- Remove cover.
- Insert batteries ensuring the correct polarity.
- Replace cover.



9.3 Connecting the Eniscope Air Sense External Sensors.

Sensors

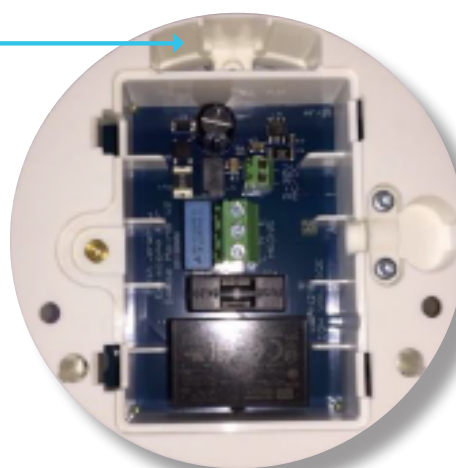
- Remove top cover (push fit)
- External sensor cables should be a minimum of 0.2mm CSA and screened.
- External sensor cables should be kept as short as possible and not routed adjacent to mains cables.
- External sensor cable routing
 - Rear of sensor to terminal block.



WARNING

Use only copper cables.

Sensor power supply terminal torque setting 1Nm.



10 LoRa NETWORK INSTALLATION



Associating the Eniscope Air Switch with the LoRa network is covered in a separate manual.

RF Association

- RF frequency band selection switch (A)
- RF association push button (B)
- RF association Red LED (C)
- RF association Blue LED (D)



NOTICE

The Eniscope Air has 2 radio bands each with 16 channels.
The choice of the band and channel will be down to local licencing, interference, and existing LoRa networks.

