# Zigbee HA1.2 Wireless Duct Temperature Sensor (TPZDS/HA1.2)

The Titan Products Zigbee HA1.2 Duct Temperature Sensor is designed to wirelessly monitor the air temperature in duct works and expose the measured information wirelessly via a Zigbee HA1.2 network.

Using a frequency of 2.4GHz the transmissions from the TPZDS/HA1.2 duct sensors are determined by the Min/Max reporting intervals and the configured COV (change of value) parameters set within the temperature measurement cluster.

The TPZDS/HA1.2 wireless duct temperature sensor is supplied with an IP41 enclosure and polycarbonate probe. The probe has a standard length of 150mm with other lengths available on request.

The sensor uses a 3.7V, 2600mAh lithium thionyl chloride battery. This eradicates the need for wiring to the unit making it extremely easy and cost effective to install.

## Specification

| | |
|---|---|
| Power Supply: | 3.7V, 2600mAh lithium thionyl chloride battery (AA size) |
| Battery Life: | Up to 5 years (depending on transmission intervals and based on default settings – excludes OTA usage) |
| Network Technology: | Zigbee HA1.2 |
| Transmission Frequency: | 2.4GHz |
| Transmission Power: | 8dBm |
| Transmission Range: | Up to 60m indoor (depending on building type) Up to 200m outdoor (line of sight) |
| Measurement Accuracy: | +/-0.5°C @ 25°C |
| Operating Range: | 0 to +50°C 5 to 80% RH (Non-Condensing) |
| Material: | UL L94-V0 Flame Retardant Polycarbonate |
| Enclosure Rating: | IP41 Rated |
| Wireless Module Approvals: | FCC CFR 47 Part 15 DA00-1407 FCC Public Notice Radio: EN 300 328:V1.9.1 EMC: EN 301 489-17 V2.2.1 EMC: EN 62479 2010 EMC: EN 301 489-1 V1.9.2 Safety: EN 60950-1:2006 |
| Approvals: | CE RoHS WEEE |
| Standard Warranty Period: | 60 months (excludes battery) |
| Enclosure Dimensions: | 90mm (h) x 95mm (w) x 60mm (d) |
| Probe Dimensions: | 150mm x 8mm |
| Part Code: | TPZDS/HA1.2 |



Ensure battery polarity is correct when inserting battery

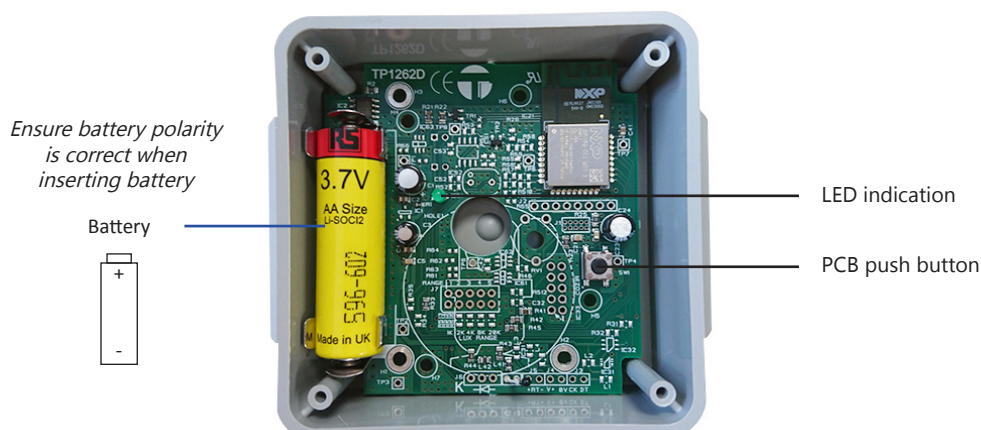Battery

LED indication

PCB push button

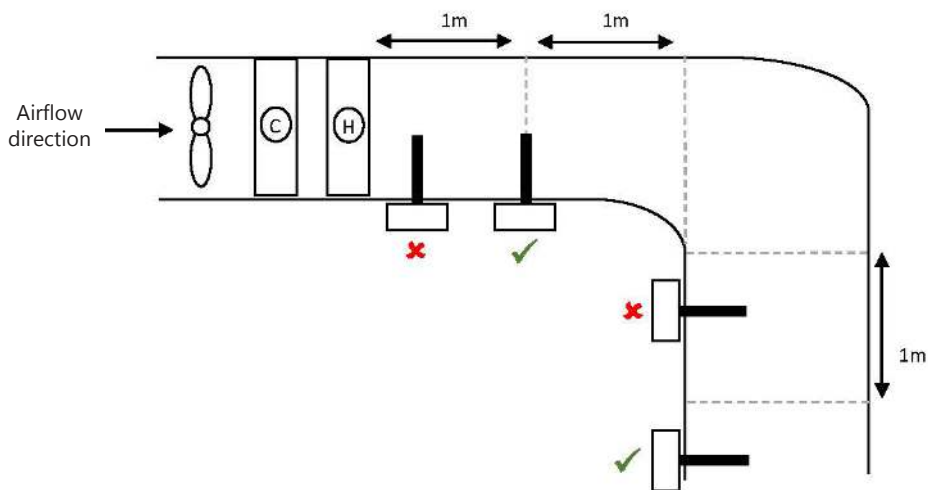**Fig 1.0**

## Installation and Dimensions:



**Fig 2.0**

Please ensure:

- Sensors are mounted with a minimum of 1m downstream of any heating or cooling source within the duct work.
- Sensors are mounted a minimum of 1m away from any bends or air turbulence within the duct work.
- Probe ventilation holes are aligned with the air flow direction.
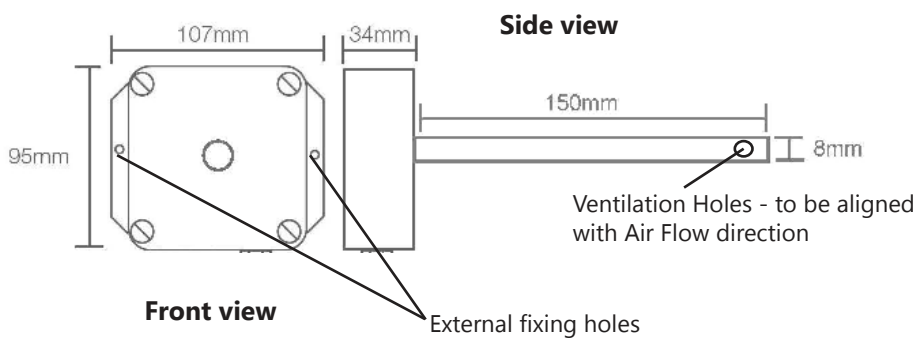- External fixing holes are used - DO NOT drill enclosure.



**Side view**

Ventilation Holes - to be aligned with Air Flow direction

**Front view**

External fixing holes

**Fig 3.0**

## Commissioning LED indication:

Do not insert the sensor battery until the device is ready for commissioning and the WAC is powered up and available to pair with the wireless sensors.

When the sensor is initially powered up with the battery inserted it will be un-paired and the LED will flash every second. This shows that the sensor is searching for an available network.

Once the sensor has joined the network the LED will remain OFF at all times.

| LED Indication | Sensor Status |
|---|---|
| LED flashing every 1 second | Sensor is not paired and is searching for a network. |
| LED off | Device is paired. |

**Factory Reset**: (It is possible to restore the device to its factory settings). Also see LED timing below.

*To reset an end device; remove the battery, press and hold the PCB push button down while re-inserting the battery. Once the battery is inserted, release the PCB push button.*

Upon resetting, the device will leave its current network, restore the factory default settings for the minimum, maximum and delta change reporting along with the polling intervals. Once reset the device will search for strongest HA1.2 and attempt to join.

**Default and Recommended Settings**:

| Setting | Default | Range |
|---|---|---|
| Minimum Reporting Interval | 60 seconds | 0-65536 seconds |
| Maximum Reporting Interval | 300 seconds | 0-65536 seconds |
| Delta Change Reporting Threshold | 0.5°C | 0-32767 (0-327.67°C) |
| Polling during normal operation | 60 seconds | 0-65536 seconds (Polling will match the Min Reporting Value) |
| Polling (accelerated) upon joining/re-joining network | Every 2 seconds for 60 seconds | N/A |

***It is possible to force specific features within the sensor by holding the PCB push button and releasing at certain points of the LED sequence. To perform one of the below tasks, press and hold the PCB button, the LED will begin to flash every second, release at the relevant point of the sequence to perform the associated task.***

| LED Timing | Feature |
|---|---|
| Release after 1st LED flash | Sensor reads sensor value and updates clusters |
| Release after 2nd LED flash | No action |
| Release after 3rd LED flash | Initiates the OTA update process |
| Release after 4th LED flash | Factory reset |

**Supported Clusters & Attributes**:

The below Server/Client clusters are supported by the TPZDS/HA1.2 temperature sensor:

**Sensor Server Clusters**:

| Cluster Name | Cluster ID | Cluster Attributes |
|---|---|---|
| Basic | 0x0000 | Application Version<br>Stack Version<br>Hardware Version<br>Manufacturer Name<br>Model Identifier<br>Date Code<br>Software Build Id<br>Device Enabled |
| Power Configuration | 0x0001 | Battery Voltage<br>Battery Percent Remaining<br>Battery Alarm Mask<br>Battery Alarm State<br>Battery Voltage Minimum Threshold<br>Battery Voltage Threshold 1<br>Battery Voltage Threshold 2<br>Battery Voltage Threshold 3 |
| Identify | 0x0003 | Identify time |
| Commissioning Cluster | 0x0015 | Extended Pan ID<br>Channel Mask<br>Start-up control |
| Temperature Measurement | 0x0402 | Measure Value<br>Min Measured Value<br>Max Measured Value |

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**Sensor Client Clusters**:

| Cluster Name | Cluster ID | Cluster Attributes |
|---|---|---|
| OTA | 0x0019 | N/A |

**Battery Information**:

Please make sure batteries are disposed of in accordance with EC Directive 2006/66/EC, amended by EU Directive 2008/12/EC or in line with your territory battery disposal guidelines.

It is important not to short-circuit, crush, disassemble, heat above 100°C, incinerate, or expose the batteries to water. Do not solder directly to the cell. The recommended batteries for the Titan Products wireless sensors are 3.7V 2600mAH AA size lithium-thionyl chloride. These are not rechargeable.

All batteries should be stored in a clean, cool, dry and ventilated area. When installing or replacing a battery please make sure the polarity is correct. Batteries are not covered by the Titan Products product warranty.

**FCC Information**:

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.

**Conditions of Use**:

- The sensor is to be firmly fixed to the ventilation duct work using the sensor's external fixing holes. See Fig 3.0.
- The sensor should be mounted in a location representative to the duct air to be measured and must be situated away from and bends or junctions as well as any turbulent air movement patterns within the duct work.
- The sensor is designed to monitor air temperature within a duct work and should not be exposed to any harmful or corrosive gases within the duct work.
- Ensure the sensor is installed in the correct orientation and location. See Fig 2.0.
- The sensor should not be used outside of its operating temperature range of 0 to 50°C.
- The sensor should not be used outside of its operating humidity range of 5-80% RH (non-condensing).
- The sensor is for use within internal duct works only.
- The sensor enclosure is rated at IP41 and should be used in environments where suitable. The sensor is not suitable for environments where contaminants, moisture or corrosive substances can cause harm or impact on the performance of the sensor.
- The stated battery life is estimated based on Titan Products' recommended minimum, maximum, delta change reporting and polling settings.
    - Min reporting of 60 seconds
    - Max reporting of 300 seconds
    - Change of value of 0.5°C
    - Polling set to 60 seconds
- It is the responsibility of the buyer/installer to ensure the sensor is suitable for integration in to their ambient temperature monitoring system.
- The sensor is designed for the monitoring and transmission of ambient temperature conditions only.
- The receiving Zigbee Wireless controller should be set up to alarm if out of range conditions are transmitted by the sensor.
- Battery status clusters are available in the sensor device. These clusters should be used in a maintenance program to monitor when the battery needs replacing.
- It is the installer's responsibility to ensure a site survey is completed ensuring the sensor location is suitable for the environment to allow consistent and stable transmissions between the sensor(s) and receiving device. Repeaters may be required.
- It is the customer's/installer's responsibility to ensure the sensor standards are acceptable for the country or state the device is being installed within.

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