

AFA4000/1

Airflow Monitor

Installation and calibration guide



Operator Panel

- A** - Airflow bar-graph or timeline display
- B** - Airflow velocity display with LED halo (red/amber/green)
- C** - Status window, airflow alarm status
- D** - Menu pushbuttons & alarm mute



Overview

The AFA4000/1 AIRFLOW Monitor can be configured in the field to suit all applications, with password protected menus and diagnostic menus to aid installation and commissioning. Refer to the full manual for detailed information.

Startup

The AFA4000/1 must be field-calibrated once the room air supply and exhaust is proportionally balanced. When the unit is powered up, the following sequence of events occurs:

1. The alarm performs a self-test of its functions and audible alarm (approximately 3 seconds)
2. At the end of the delay, the unit will do one of two things:
 - a. If the Airflow monitor has been calibrated, the unit enters normal operating mode (displays airflow velocity, LED's and audible alarm enabled).
 - b. If the Airflow monitor has not been calibrated, the unit will display "Requires set up, press Mute to continue"

Airflow Monitor Calibration

1. Press Mute from the “Requires set up” screen or if the monitor is in the Run Screen Press and Hold the Mute button for 5 seconds until the Main Menu is displayed.
2. Using the ↑ / ↓ buttons select SET UP, then select CALIBRATION, then enter the password (the factory default password is 0-0-0-0), press Mute to continue.
3. With the sash open to the normal operating height measure the face velocity using a calibrated instrument. Using the ↑ / ↓ buttons enter the measured face velocity then press Mute, the monitor will then sample the airflow for 5 seconds.
4. If the airflow sample is unstable the monitor will display “Deviations too High”, follow the instructions to repeat the sample or quit the calibration.
5. If the sample is accepted, lower the sash by half and measure the face velocity using a calibrated instrument. Using the ↑ / ↓ buttons enter the measured face velocity and press Mute, the monitor will then sample the airflow for 5 seconds.
6. If the calibration is successful the monitor will return the Main Menu, select RUN to go to normal operating mode and check the velocity reading is accurate and stable.
7. If the airflow sample is unstable the monitor will display “Deviations too High”, follow the instructions to repeat the sample or quit the calibration.
8. The monitor will display “Increase higher airflow sample” if the second sample value is too close to the first value entered, close the sash a little and repeat the higher sample. The minimum difference between the samples that the controller will accept is 0.3m/sec (60fpm).
9. The monitor will display “Sensor diff too low” if the monitor doesn’t detect any difference in the sensor output between the 2 airflow samples, check that the sensor hose is connected and repeat the calibration.
10. If the calibration is stable and accurate Press and Hold the Mute button for 5 seconds until the Main Menu is displayed.
11. The monitor will return to the MAIN MENU, select RUN to go to normal operating mode.

Airflow Monitor Calibration Tips

1. Ensure that the sensor hose is connected correctly at the side wall and rear of the sensor.
2. Ensure that the extract fan is running and the Fume Cupboard is balanced before calibrating the monitor.
3. Take extra time (at least 15 to 20 seconds) to wait for the airflow to settle before capturing the airflow samples. This will minimize the chance of a calibration error due to turbulence or fluctuations.
4. Avoid movement in front of the Fume Cupboard whilst calibrating the monitor.
5. The Low and High air samples must be at least 0.3m/sec (60 fpm) apart to calibrate the monitor. This is to avoid inaccuracy in the calibration due to insufficient difference between the samples. The minimum difference can be changed in the "Low High diff" parameter in the Cal Config menu.
6. Do not use fully open and fully closed sash positions for the calibration points, the recommended positions are normal operating height (e.g. 500mm 20") for the first sample and approximately half the sash opening (e.g. 250mm 10") for the second sample.

Airflow Monitor Coms Settings

The MONITOR CONFIG menu includes the following coms parameters: -

1. **PROTOCOL** - Sets Modbus RTU, BACnet MS/TP or TEL protocol.
2. **MODBUS SETTINGS** - Sets Slave ID, Baud Rate and Parity for the Modbus protocol.
3. **BACnet SETTINGS** - Sets the Device Instance, Station ID, Baud Rate, Parity and Max Masters for the BACnet protocol.

Note - The TEL protocol is used to connect to TEL Config Manager software and the TEL AFA5000 Room Space Controller, the Modbus Slave ID is used when set to TEL protocol.

Troubleshooting

Problem	Check for: -
No LED's, Screen blank	<p>Check the power supply is securely plugged into the monitor.</p> <p>Check the power supply is securely plugged into the mains power socket.</p> <p>Check that there is 15VDC power supply on the monitor terminals (broken wire or snagged cable sheath)</p>
Sensor Error message	<p>Check the sensor cable is securely plugged into the sensor.</p> <p>Check the sensor cable is securely plugged into the monitor.</p> <p>Replace the sensor.</p> <p>If Sensor Error message still displayed replace the sensor cable.</p> <p>If Sensor Error message still displayed replace the monitor.</p>
Audible alarm not working	<p>Check for screen messages - if SETBACK is displayed the monitor has been remotely muted.</p> <p>Check if alarm has been disabled in Cal Config menu.</p>
RS485 Coms not connected	<p>See Diagnostics menu, Coms Data.</p> <p>Check the correct Protocol, Slave ID, Baud Rate, Parity have been set.</p> <p>Tx & Rx = 0 - AFA4000 is not connected to the network</p> <p>Tx & Rx >0 but fixed values – AFA4000 has lost connection to the network</p> <p>Rx is counting but Tx is a fixed value – AFA4000 is connected to the network but the Master is offline or not polling the AFA4000.</p>

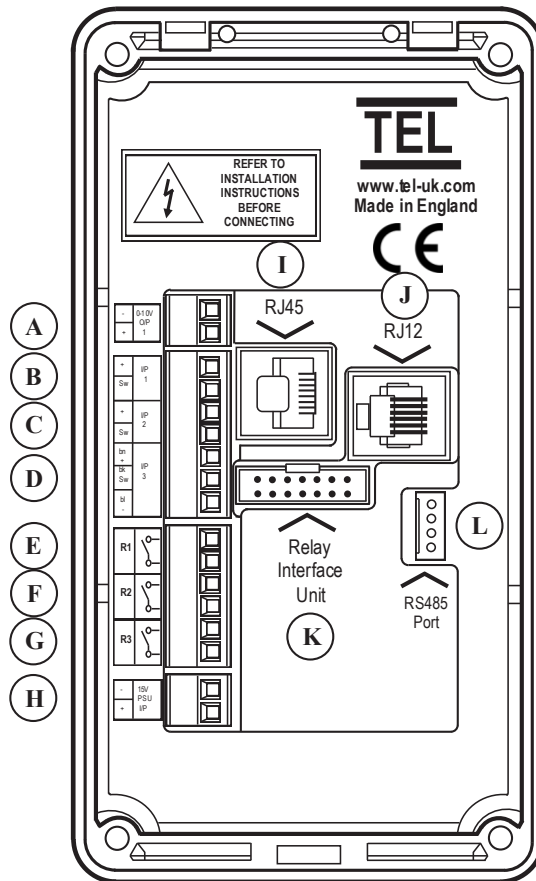


Diagnostics Menu

Press the ↑/ ↓ buttons together from the Run screen to access the Diagnostics menu, the menu contains the following Input and Output data: -

Menu	Parameter	Action
Alarm Test		Sounds the Audible Alarm
Coms Data		Displays the following: - Protocol, Slave ID, Baud Rate, Parity Tx – Number of Data Packets transmitted (increments when transmitting) Rx – Number of Data Packets received (increments when receiving)
I/O Status	Input Data	Displays the following: - Input 1 – On/Off or Analogue Voltage status Input 2 – On/Off or Analogue Voltage status Input 3 – On/Off or Analogue Voltage status
	Output Data	Displays the following: - Relay 1 – On/Off status Relay 2 – On/Off status Relay 3 – On/Off status
	Sensor Data	Displays the following: - Airflow sensor status 0-100% (100% = 0 airflow, 0% = max flow) Temperature °C or °F (Optional with additional Temperature sensor fitted)

AFA4000/1 Monitor Connection Details

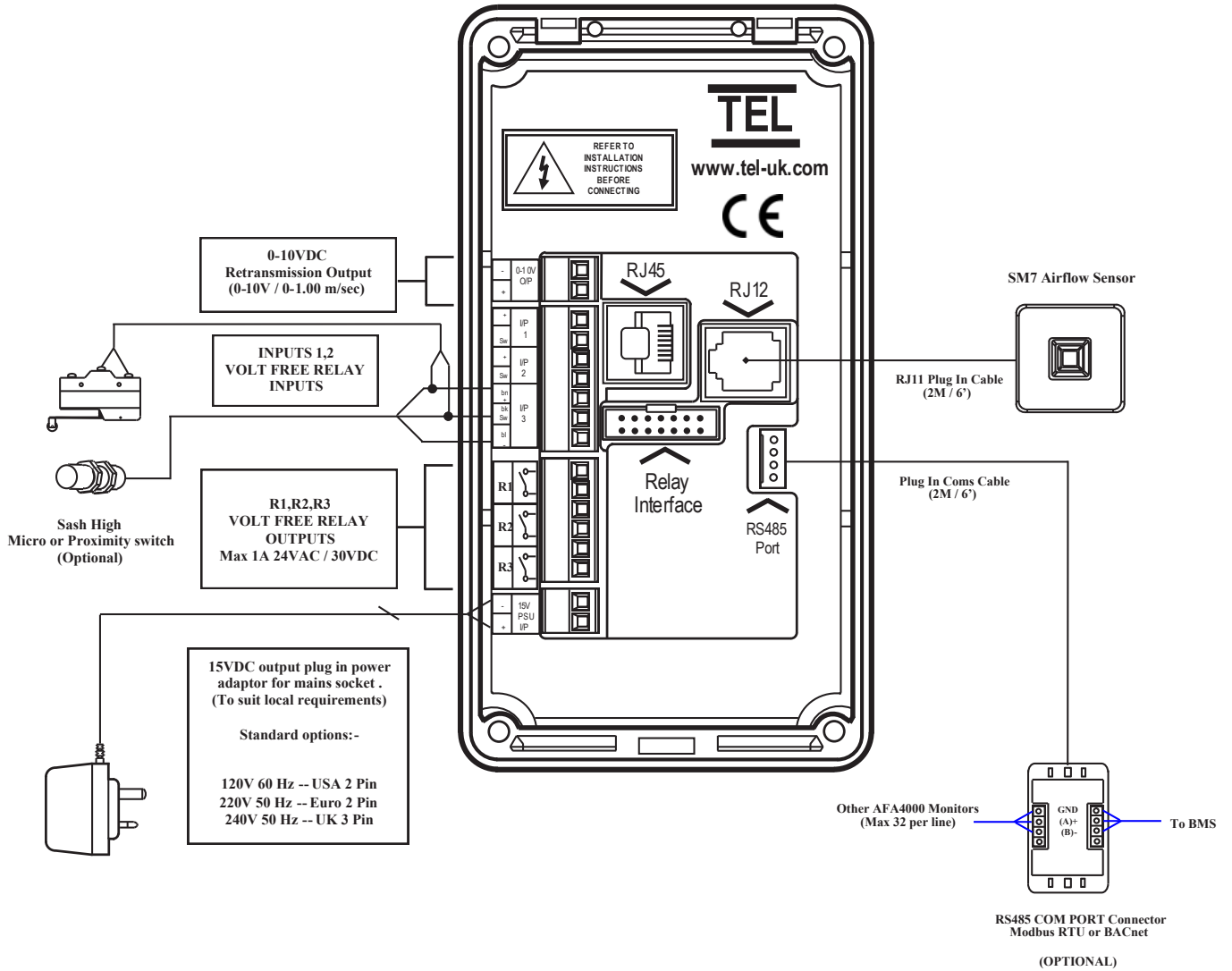


- A** – 0-10V Velocity Retransmission Output,0-10Vdc Over 0-1.00M/Sec / 0-200Fpm
- B** – Input 1 – Digital Or Analogue
- C** – Input 2 – Digital Or Analogue
- D** – Input 3 – Digital Or Analogue
- E** - Relay Output 1 (Used If Relay Interface Is Not Fitted)
- F** – Relay Output 2 (Used If Relay Interface Is Not Fitted)
- G** – Relay Output 3 (Used If Relay Interface Is Not Fitted)
- H** – 15Vdc Power Supply (Used If Relay Interface Is Not Fitted)
- I** – Auto Sash RJ45 Connection (Only Used On AFA4000/1-As Model)
- J** – Airflow Sensor RJ12 Connection
- K** – 14 Way Ribbon Cable Connection To Relay Interface
- L** – RS485 Coms Port Connection



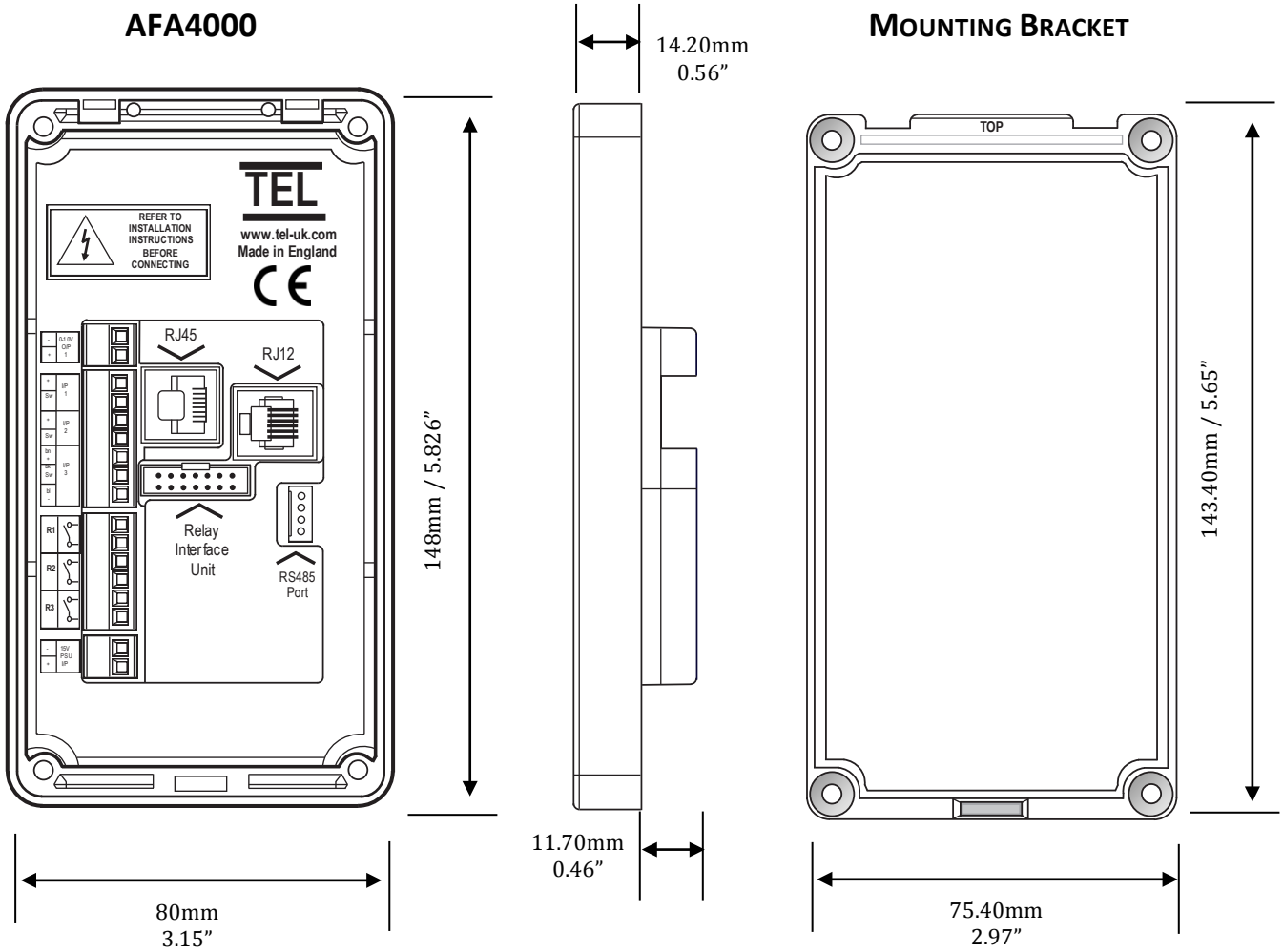
AFA4000/1 Typical Connection Diagram

AFA4000/1 AIRFLOW MONITOR

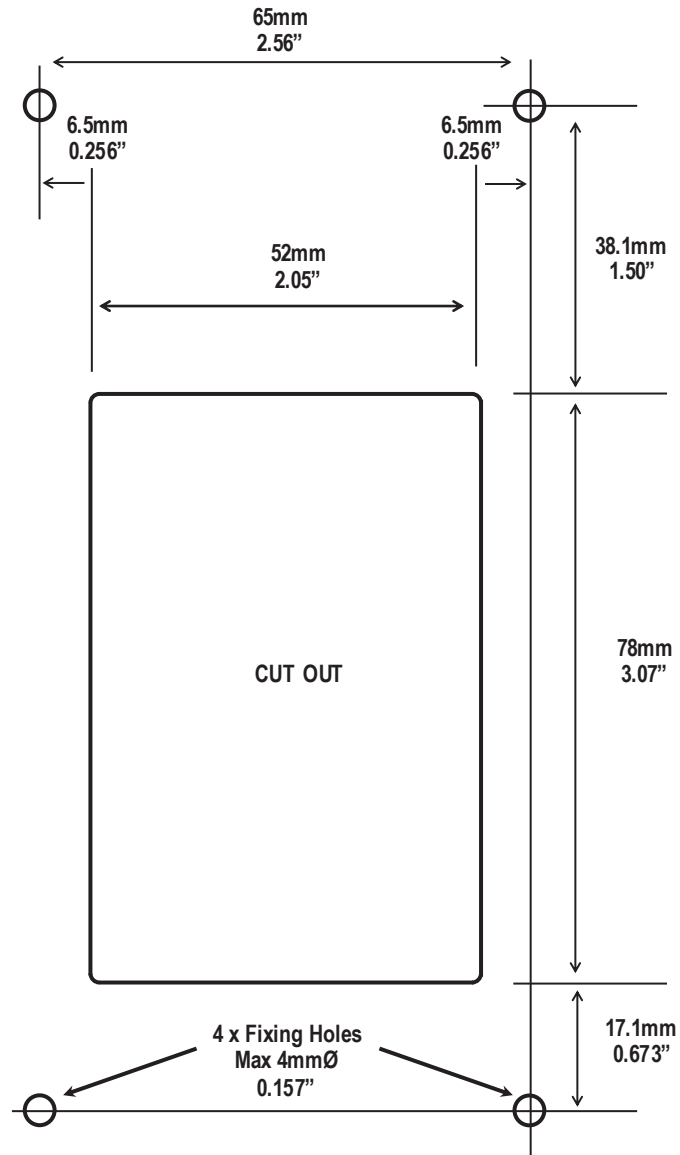




AFA4000/1 Dimensions

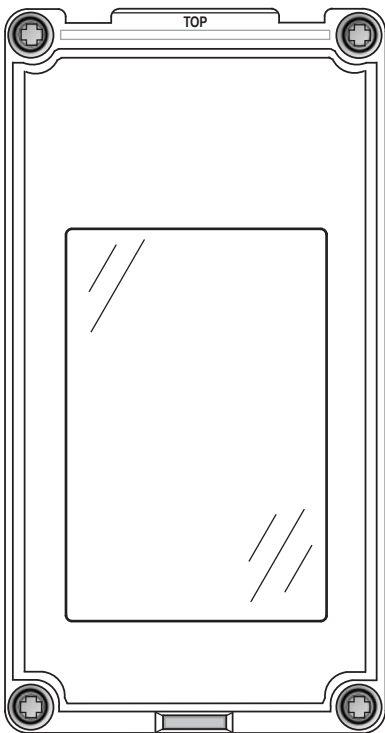


AFA4000 Cut Out Template

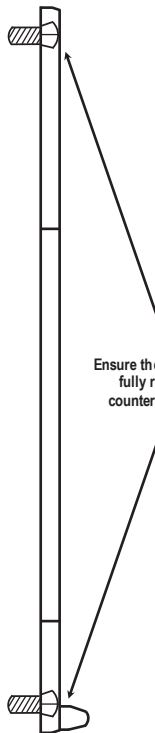


Note – Print to A4, do not scale or print to fit page.

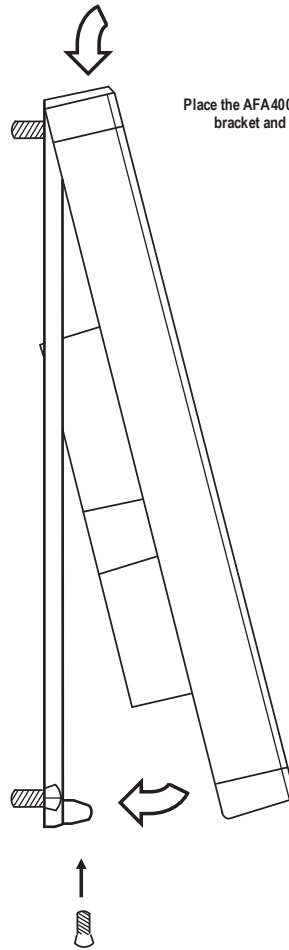
AFA4000 Installation



Fix the Bracket to the Front Panel using 4 Fixing screws.



Ensure the 4 fixing screws are fully recessed into the countersunk fixing holes.



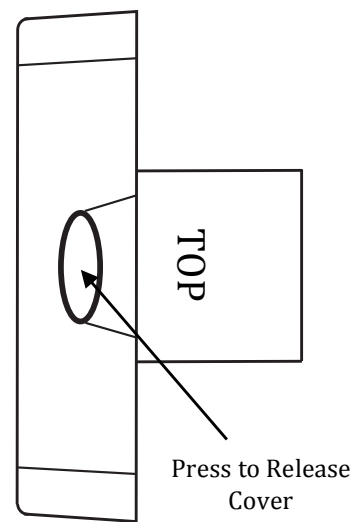
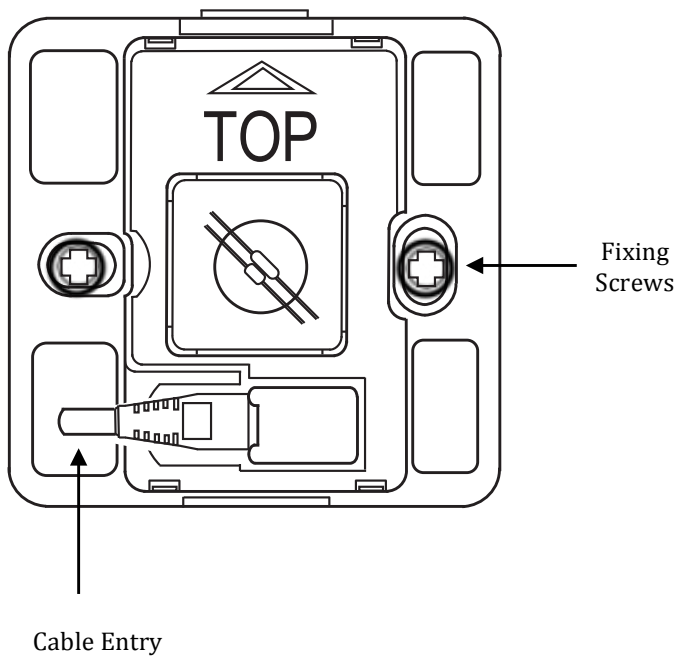
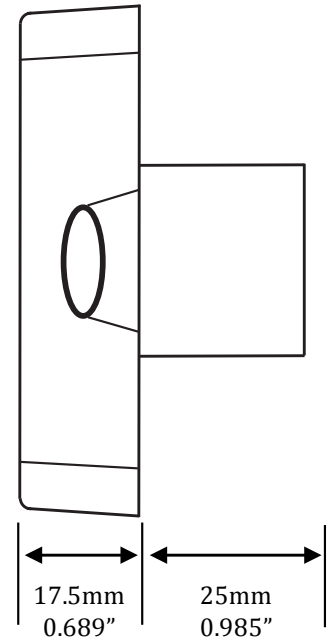
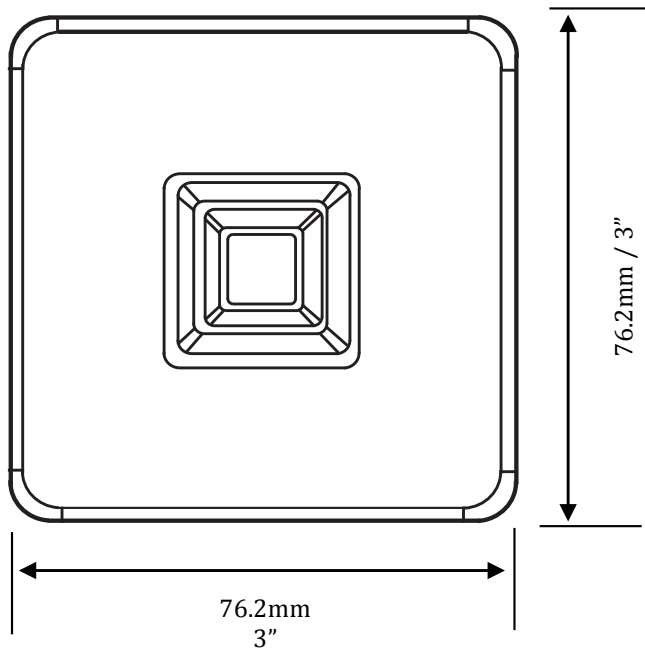
Place the AFA4000 onto the top of the bracket and click into place.

Push the bottom of the AFA4000 onto the bracket.

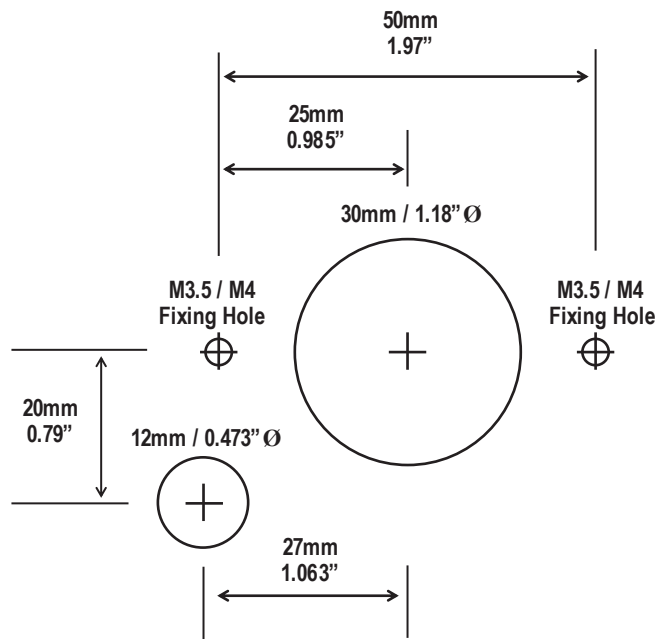
Secure the AFA4000 to the bracket using the Fixing screw in the bottom face of the monitor.



SM7 Airflow Sensor Dimensions



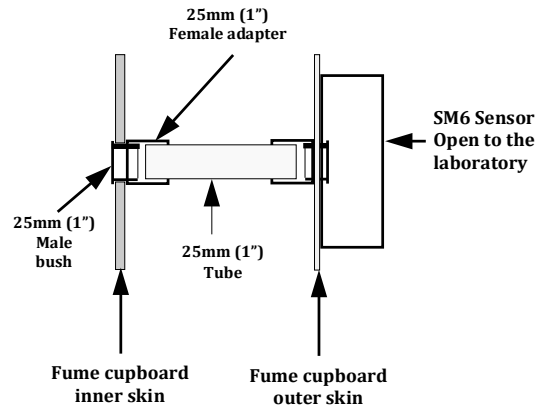
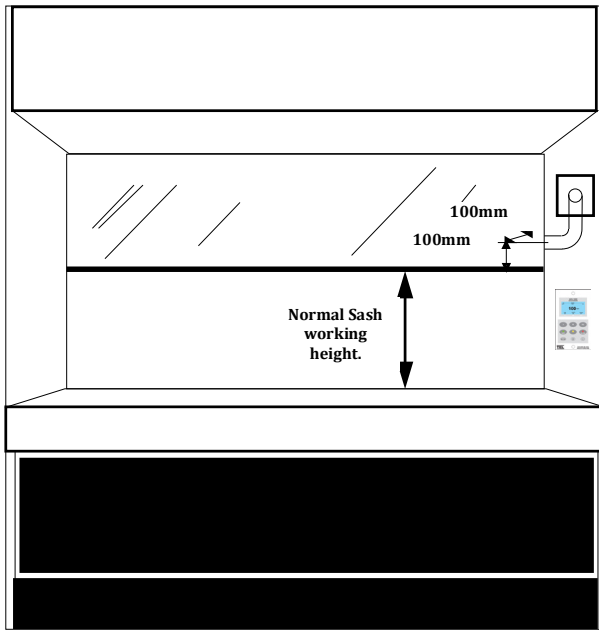
SM7 CUT OUT TEMPLATE



Note – Print to A4, do not scale or print to fit page.



Airflow Sensor Installation Diagram



For complete manual and product information, log on to www.tel-uk.com