



- Reliable ultrasound measurement
- Maintenance free
- Simple installation/operation
- Rugged stainless steel construction
- Designed specifically for tunnels
- PC utility software included
- Velocities up to +/-60m/s
- Resolution of 0.1m/s
- Isolated 4-20mA analogue outputs
- Alarm relay contacts
- Choice of serial comms protocols

The AIRFLOW tunnel monitor uses proven ultrasound technology to deliver a reliable measurement of air speed and direction in tunnels. It is a single axis monitor that can measure velocities of up to 60m/s in either direction (forward and backward) with a resolution of 0.1m/s. Having been designed specifically for the notoriously harsh tunnel environment, the AIRFLOW monitor is a rugged construction using powder coated stainless steel and flame retardant plastics to achieve an IP65 / NEMA 4X protected instrument that can withstand both the corrosive atmosphere and regular tunnel washing that the tunnel environment demands.

The AIRFLOW monitor is a self contained intelligent analyser with on-board industry standard SCADA/PLC interface options, such as 4-20mA outputs, alarm relay contacts, and a choice of serial communications protocols. As such the AIRFLOW has no need for a control unit (although one is available as an option) and can be set-up and controlled using the PC based utility software supplied. This "stand-alone" capability allows the user to provide power and take away outputs.



An optional control unit (known as an Operator Interface, or OI) is available and can be connected to the AIRFLOW with a single cable length up to 1km. The OI has a display and keypad allowing for direct human interface, but also a complete duplicate set of electrical interface options to those found in the AIRFLOW itself. Using an OI, the operator has the option of making SCADA/PLC interface connections at the AIRFLOW instrument, at the OI, or at both – offering complete versatility.

The AIRFLOW monitor has no moving parts and no regular service requirement, making it a very reliable "fit and forget" monitor. The instrument performs a number of self checking and diagnostic routines which in the unlikely event of a problem can identify the fault report it via the service alarm relay and/or serial comms.



TUNNEL SENSORS

AIRFLOW

Air Velocity and Direction Monitor for Tunnels

Specification:

Measurement Performance

| No. | Parameter | Units | Min | Max | Comment |
|-----|------------------|---------|------|------|-------------------------|
| 1 | Range | m/s | -60 | +60 | |
| 2 | Accuracy | m/s | -0.1 | +0.1 | |
| 3 | Resolution | m/s | | 0.1 | display resolution |
| 4 | Response time | seconds | 1 | 100 | selectable with damping |
| 5 | Measurement Type | | | | Ultrasonic |

Power

| | | | | | |
|---|------------------------------|-----|-----|-----|--|
| 6 | Voltage | VDC | | +24 | |
| 7 | Voltage Tolerance | % | -10 | +10 | |
| 8 | Nominal Current Consumption | mA | | 200 | |
| 9 | Power Up Current Consumption | mA | | 200 | |

Interface Options

| | | | | | |
|----|---|---------|------------|--------------|---|
| 10 | Serial outputs | | | | RS485 (on terminals) RS232 (on 9 pin D header) ModBus, ProfiBus, DeviceNet, Ethernet etc. (on plug in modules in optional OI) |
| 11 | Analogue Outputs (2 outputs, programmable functionality) | V mA | 0.0 4.0 | 10.0 20.0 | Isolated and scalable Isolated and scalable |
| 12 | Digital Relay Contacts | A | 0 | 3 | @30VDC (Service alarm, velocity alarm, direction indicator) |

Physical

| | | | | | |
|----|---------------------------|--------|-----|----------|---|
| 13 | Ingress Protection | | | IP65 | |
| 14 | Operating Temperature | °C | -20 | +50 | |
| 15 | Storage Temperature | °C | -20 | +50 | |
| 16 | Operating Humidity | % | 5 | 100 | |
| 17 | Regulatory Compliance | | | | 89/336/EEC (Electromagnetic Radiation) 73/23/EEC (Low Voltage) |
| 18 | Enclosure Material | | | | Powder coated stainless steel |
| 19 | Transceiver Material | | | | Flame retardant UL rated polycarbonate |
| 20 | Dimensions | cm | | 24x22x16 | L x W x H |
| 21 | Weight | Kg | | 3.5 | |
| 22 | Warranty | Months | | 12 | Return to base warranty |
| 23 | Mean Time Between Failure | Years | | 10 | |



Tunnel Sensors Ltd, Furlong House, Crowfield, Brackley, Northamptonshire NN13 5TW United Kingdom
Telephone: +44 (0)1280 850563, **Facsimile:** +44 (0)1280 850568
Email: contact@tunnelsensors.com, **Web site:** www.tunnelsensors.com



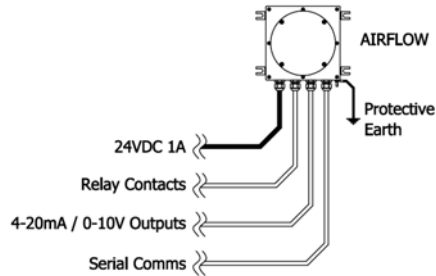
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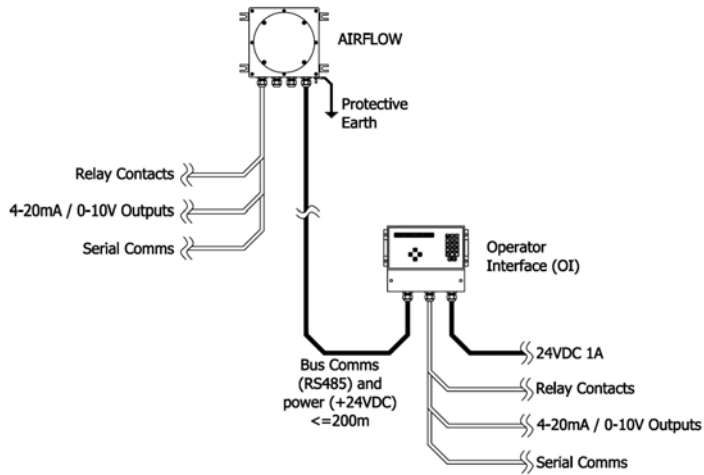


Configuration Options:

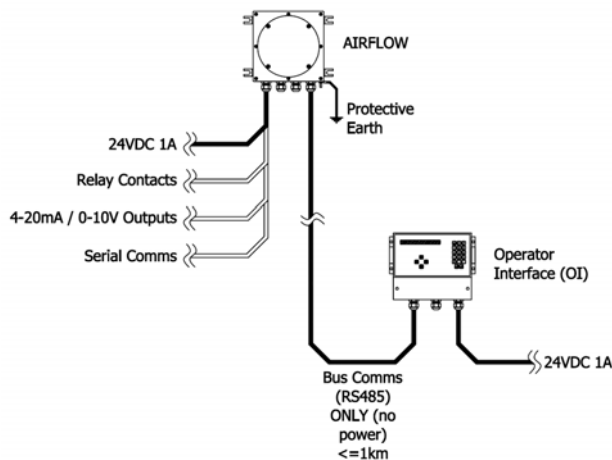
Stand-alone Configuration



Remote OI <=200m Configuration



Remote OI <=1km Configuration



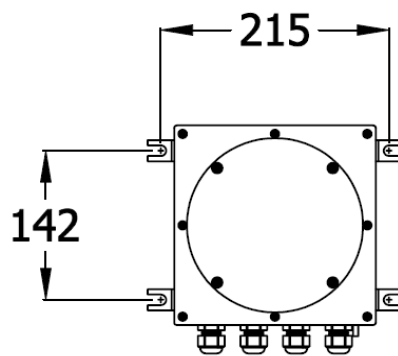
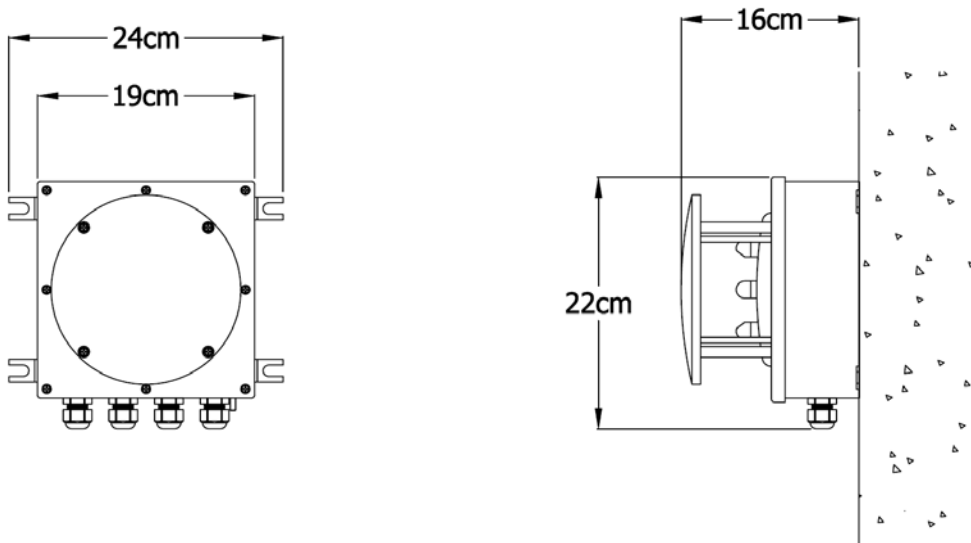


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Dimensions:



Tunnel Sensors Ltd, Furlong House, Crowfield, Brackley, Northamptonshire NN13 5TW United Kingdom
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Email: contact@tunnelsensors.com, Web site: www.tunnelsensors.com

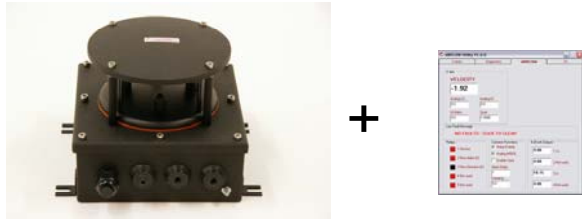
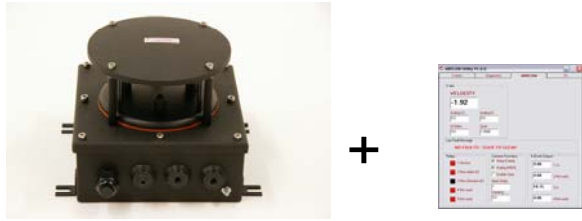





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Accessories & Ordering:

Ordering Details



| Description | Order Code | Notes |
|---|---------------|-----------------------------|
| AIRFLOW single axis velocity and direction monitor with utility software  | TSL-AIRFLOW | 24VDC power supply required |
| AIRFLOW dual axis velocity and direction monitor with utility software  | TSL-AIRFLOW-D | 24VDC power supply required |
| Operator Interface (OI) for single axis AIRFLOW  | TSL-OI-AF-02 | 24VDC power supply required |
| Operator Interface (OI) for dual axis AIRFLOW  | TSL-OI-AF-04 | 24VDC power supply required |
| 25W 24VDC power supply with universal single phase AC input, boxed in IP67 protected polycarbonate enclosure with dual gland entries  | PSU-007 | |



TUNNEL SENSORS

AIRFLOW

Air Velocity and Direction Monitor for Tunnels

| | | |
|--|----------------|--|
| <p>LSZH screened multi-core cable for AIRFLOW/OI connection</p>  | <p>CBL-046</p> | <p>Order by the meter i.e. for 10m order 10off</p> |
| <p>Belden equivalent screened multi-core cable for AIRFLOW/OI connection</p>  | <p>CBL-078</p> | <p>Order by the meter i.e. for 10m order 10off</p> |



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