Furness Controls
PRESSURE | FLOW | LEAK DETECTION

Differential Pressure Transmitter

400 SERIES

World Leading Accuracy In The Field of Ultra Low Pressure & Flow Measurement

We have been innovating in the field of ultra low pressure measurement for over 50 years

Accuracy

An accuracy better than 0.25% of reading across all ranges

Range

Pressure ranges from ±50 Pa to 10 bar with wide span adjustment

Display

Available with bright O-LED display, regular LCD display, or with no display

Connectivity

4-20 mA current or voltage ouputs, with optional remote zero

Control

Two configurable relays allow direct control of external equipment or alarms

Configuration

Configurable through the keypad, or remotely using RS232, USB or RS485

Accurate measurement and control is the key to automation across the manufacturing sector. Our pressure transmitters are used to monitor industrial processes, environmental conditions and safety parameters, ensuring your critical processes run smoothly.

The 400 series is a cost-effective range of industrial differential pressure transmitters suitable for a variety of clean environment applications. There are 12 models available to cover different pressure ranges, starting at ±50 Pa and going up to -1 to +10 bar, all with an accuracy of 0.25% of reading. Various other configuration options allow you to find the ideal instrument for your application.

Low-powered LCD or display-less options allow the transmitter to be fully powered by a 4–20 mA circuit, while the brighter OLED option provides a much clearer indication in badly lit or hard-to-access locations. Relays allow the transmitter to control external equipment such as alarms.

Our pressure sensors are the result of over 50 years of continual development and are still designed and manufactured in the United Kingdom, ensuring world-leading quality and accuracy

The devices support a wide range of SI and non-SI units, and the user can specifiy custom units if required. The output can be transformed with a root or custom linearisation function, providing linear output for non-linear flow measurement elements such as Pitot tubes.

The instruments can be zeroed through the keypad or an externally-fitted button. An auto-zero option is also available with an adjustable delay.

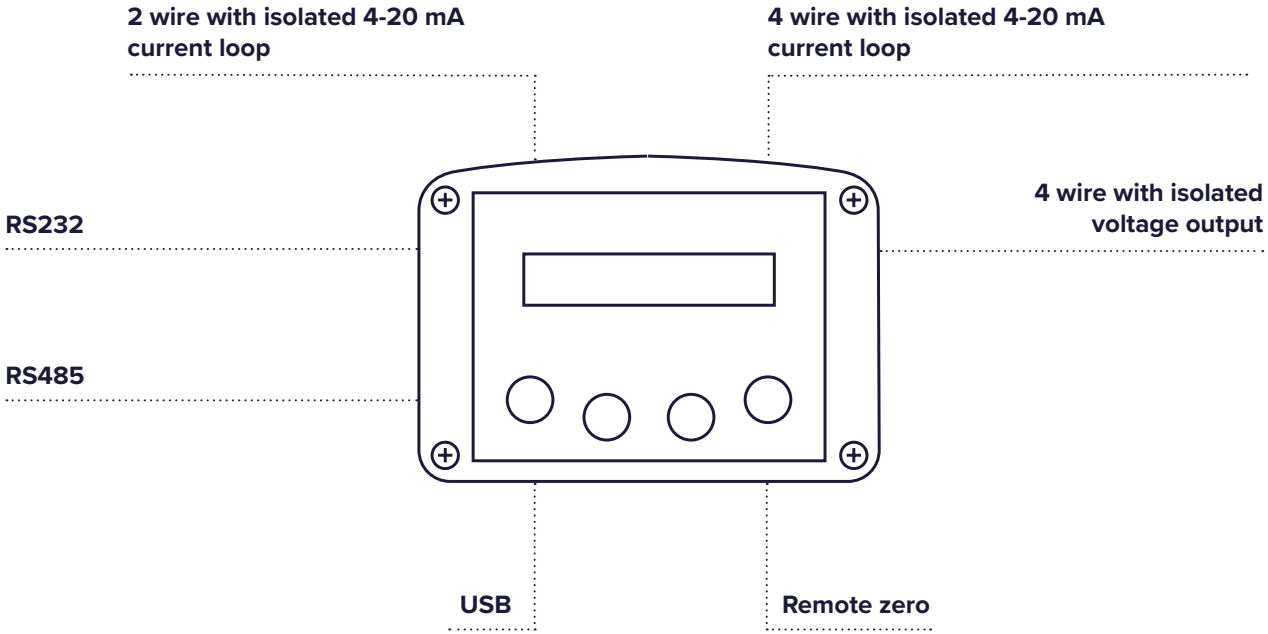
Configuration

A microcontroller is used to control all functions of stability, such as temperature correction and display damping, and to facilitate easy onboard configuration and adjustment using the display and keypad. To set-up and adjust these devices remotely, Windows-based utility software is included, providing an easy-to-use interface for configuration or calibration adjustment. The software can communicate with the instruments via a RS232 or USB cable.

Outputs

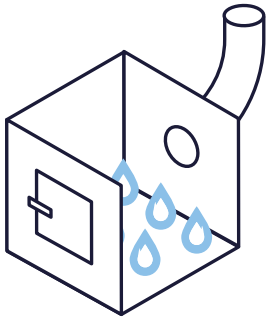
Available with standard 2-wire 4-20 mA and 4-wire isolated 4-20mA current output, as well as voltage options, these transmitters can fit into a variety of industrial set-ups. For additional flexibility, digital readings can be obtained through USB, RS232 and RS485 communication options.

Connectivity Options



Example Applications

Clean Rooms and Glove Boxes
Maintaining positive pressures to prevent ingress of contaminants



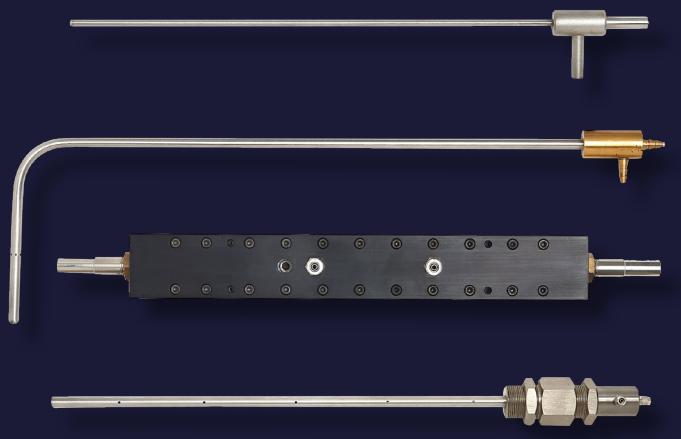
Incinerators, Boilers and Kilns
Control of combustion chamber pressures and monitoring flue function

Available Flow Elements

We supply a range of flow measurement elements to complement our 400 Series transmitters:

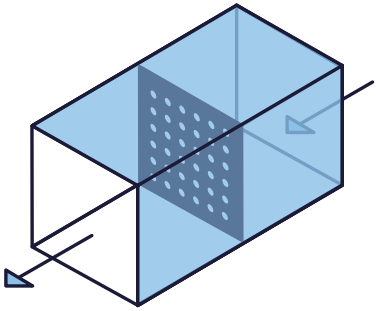
Our Pitot tubes are available in 3 types to suit duct diameters from 50mm to 5 metres: A classical bent-shaft design with a hemispherical nose, a straight shaft with single upstream and downstream ports, and an averaging version with multiple upstream holes.

We also supply Laminar Flow Elements with excellent turn-down properties, to measure air and gas flows from 0.1 ml/min to 40000 litres/min.



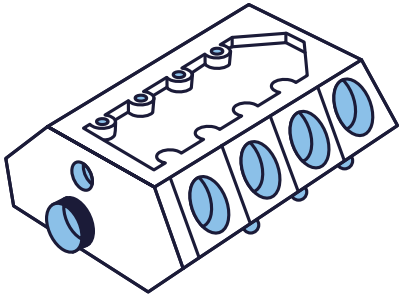
Wind Tunnels

Flow measurement using Pitot tubes for research in automotive and aerospace



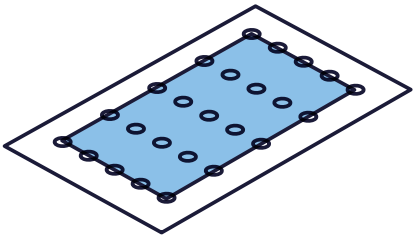
Filtration Systems

Monitoring pressure differentials across HEPA filters in ducts, air intakes etc.



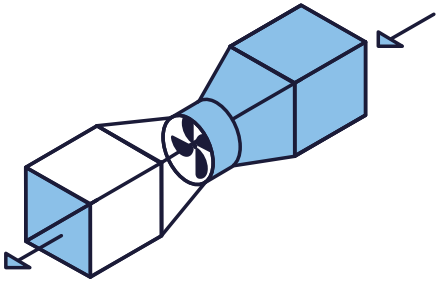
Engine Development and Testing

Measurement of inlet manifold, exhaust and sump pressures



Material Manufacturing

Control of gas and air pressures in the manufacture of glass, nylon and other materials



Building Management

Flow control in air distribution systems

Display and keypad options

There are two choices of display and an optional keypad. The first display option is a large character, low power LCD, which is fully compatible with 4-20 mA loop-powered operation. The second is a high brightness, illuminated OLED display that requires a separate 24V power supply. The device can also be specified without a display, for pure remote monitoring.

Standard LCD Display

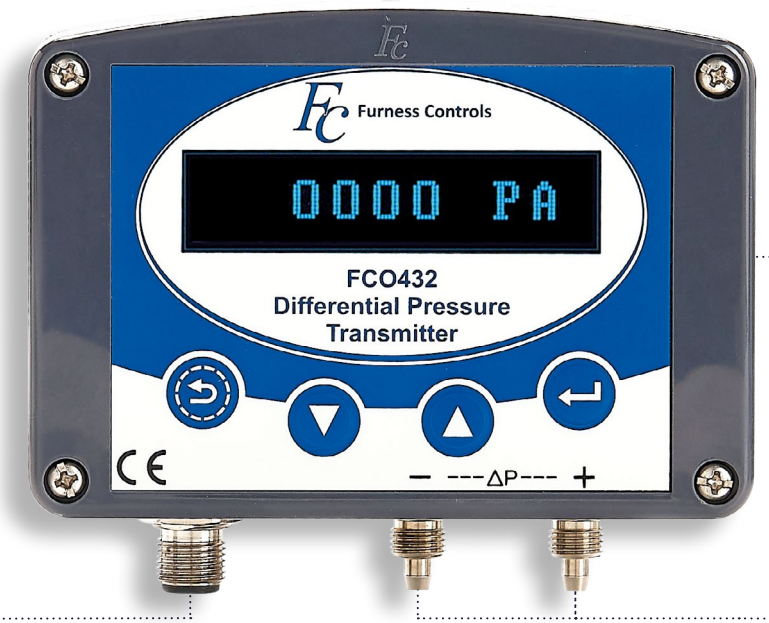
With keypad

High-brightness OLED display
(Requires separate 24v supply)

No display

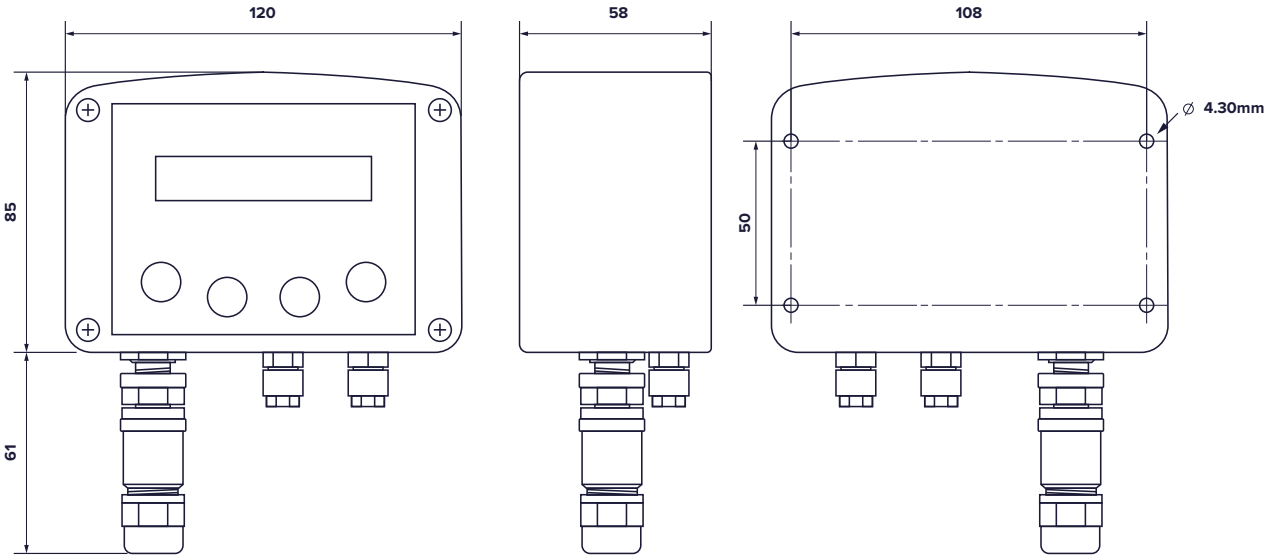
Standard Enclosure (FCO 432)

5-Pole M12 female, Code A, shielded, straight, field installable connector with screw terminals and a PG9 cable gland



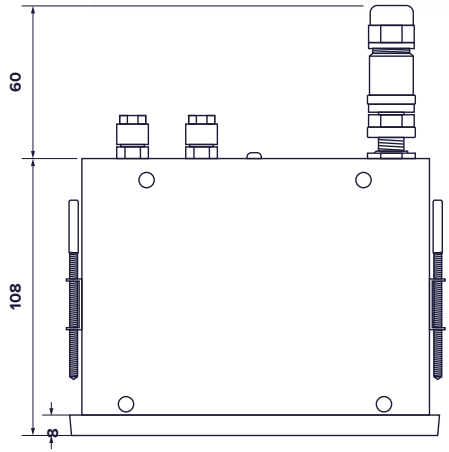
IP54-rated ABS enclosure

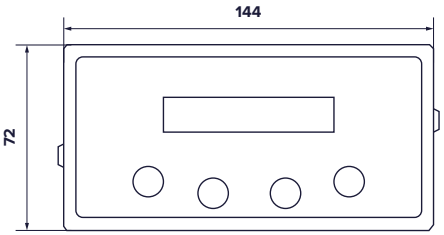
Positive and negative pressure terminals

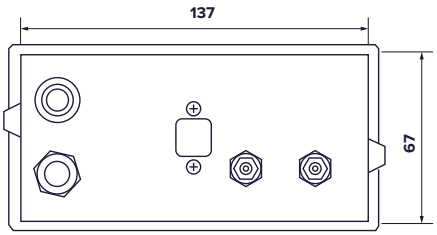


Panel Mount (FCO 418)

Indicator lamps for relays



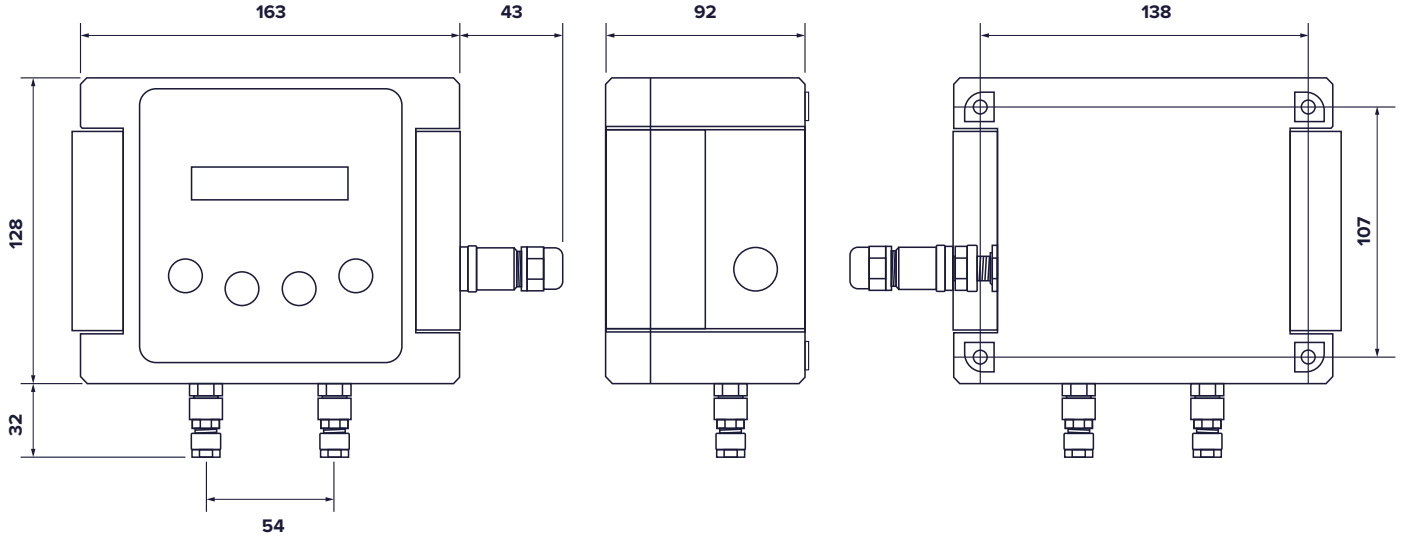




IP66 Enclosure (FCO 452)

The IP66 enclosure is ideal for mounting the transmitters externally, or in a dirty environment. The unit can be fitted with a mounting block for process manifolds.

Optional manifold block



Features

Models/Ranges	Model 1: ±50 Pa Model 2: ±150 Pa Model 3: ±500 Pa	Model 4: ±2500 Pa Model 5: ±10 kPa Model 6: ±20 kPa	Model 7: ±30 kPa Model 8: ±1 bar Model 9: -1 bar to +2 bar	Model 10: -1 bar to +6 bar Model 11: -1 bar to +10 bar Model 12: 0 to +1.5 bar abs
Output Options	2 wire 4-20 mA (only available for models 1 to 7) 4 wire isolated 4-20 mA: (only available for models 1 to 7) 4 wire isolated voltage: 0-1 Vdc to 0-10 Vdc full scale 4 wire isolated voltage: ±1 Vdc to ±10 Vdc full scale			
Display options	Low power LCD High brightness blue OLED (Requires local 24 Vdc power)			
Keypad	Membrane keypad for easy field configuration (optional on FCO 432)			
Adjustable Damping	0.0 to 60.0 seconds			
Measurement functions	Linear, square-root, custom linearisation, various selectable engineering units			
Trip Level Relays	Optional: 2 relays, rated 2 A @ 55 Vac or 30 Vdc			
Zero Control	Optional automatic or remote			
Pneumatic Ports	Barbs with locknuts for 6 mm OD x 4 mm ID for flexible tubing Options for 4 mm OD x 3 mm ID tube fittings, ⅛” BSPF or ¼” BSPF			
Communications	Internal micro-USB for configuration (optional external RS232, RS485 or USB port on FCO 432 and 418)			
Communication Protocols	Modbus-RTU, FBus, 300 series legacy			

Performance

Enhanced Accuracy @ 20°C	10% to 100% range: < ± (0.25% reading + 1 digit) 0 to 10% range: < ± (0.025% range + 1 digit)	
Standard Accuracy @ 20°C	10% to 100% range: < ± (0.5% reading +1 digit) 0 to 10% range: < ± (0.05% range +1 digit)	
Span Adjustment	10% to 100% of range	Note: Span can be set anywhere within instrument range. For span < 20% of range, accuracy is reduced to the standard specification
Long Term Drift	Typically 0.2% per annum	
Temperature Coefficients	Standard Zero: < 0.2% /°C Range: < 0.4% /°C	Enhanced Zero: < 0.02% / °C Range: < 0.02% / °C
Working Temperature	-10 to 60°C	
Output Resolution	0.3 µA for output 4-20 mA 0.1 mV for outputs 0-1 V, ±1 V, 0-2 V, ±2 V 0.35 mV for outputs 0-5 V, ±5 V, 0-10 V, ±10 V	
Overload	Models 1 - 7: 20 x range	Models 8 - 12: 1.5 x range
Static Pressure	Models 1 - 7: ±1 bar gauge	Models 8 - 12: Do not exceed range
Minimum Step Response	100 ms	
Output Update	50 ms	

Compatibility

Power Supply	2-wire 4 to 20 mA: 4-wire isolated: Relays, OLED display or autozero:	9 to 40 Vdc, 22 mA 24 Vdc ±10%, 30mA 24 Vdc ±10%, 100mA
Materials in Contact with Media	Standard: Copper, brass, nickel, mica & PVC	Process manifold version (FCO 452 only): Stainless steel, mica and PTFE
Media Compatibility	Air and non-corrosive gases max 95% humidity non-condensing	

All information in this document is provisional and is subject to change without notice

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