home

V-SENSOR LOW AIR VELOCITY SENSOR

- Ultra low velocity pressure measurement
- Traceable Calibration Certificate
- Excellent repeatability
- Self compensating zero
- Climate chamber compensated
- Long term span stability
- Ultra low hysteresis
- Unaffected by humidity
- Factory logged burn in time
- Transducer and PCB is made by CMR
- After Sales Service is provided by CMR
- 24 month warranty
- 20 Years field application experience

V-SENSOR Wall Mount without LCD

GENERAL DESCRIPTION

The V-Sensor is a wall mount Velocity Pessure transmitter which provides an output signal of 0…10V and 4...20mA. The LCD connector always provides 0...10V and the Output Terminals have dual output 0...10V and 4...20mA. Other signal outputs can be supplied on special request. An optional LCD display can show the actual velocity or volume in m/s or m3/s.

The 4...20mA is produced by the V-Sensor and could drive a number of devices. There are many Velocity Pressure ranges available from 0..6.45 m/s (0..25 Pa) up to 0..28.85 m/s (0..500 Pa). The maximum range is 129.10 m/s.
Power supplies in DC or AC are standard.

THE TRANSDUCER

The transducer is manufactured by CMR and consists of precision engineered components, high quality metals and SMD electronics. The principle of the transducer is the measurement of the displacement of the linear diaphragm by means of a push and pull variable reluctance transducer which is not affected by Humidity, hence it can be used in many Industrial and Chemical applications even using high concentration of Formaldehyde.

CMR Transducer

There are no mechanical connections to any of the sensing coils and the diaphragm, hence extreme low pressures can be measured at excellent repeatability and minimal hysteresis.

The movement of the diaphragm is so small that no air volume is required to measure the air pressures over a distance of 200m.

The zero drift is uniquely minimized by the measuring coils which provide excellent self compensation. One coil measures positive and the other negative drift and therefore balances any excessive drift between two tolerance limits in its life cycle. The CMR Transducer has a proven track record of over 20 years. Finally, all CMR V-Sensors are temperature compensated in a computerised climate chamber and go through an ageing burn in cycle.

CMR Climate Chamber

LCD DISPLAY

An Optional LCD Display indicates the actual Velocity in m/s or Volume in m3/s. The LCD is factory calibrated but the user can adjust the zero and span to suit other scales The LCD display is fitted to the front lid and is for internal wall mount use.

V-SENSOR with LCD Display

REMOTE DISPLAY

A remote LCD or LED can be connected to display the information locally.

LED DISPLAY

An Optional LED Display either 3 1/2 or 4 1/2 digit can be supplied which indicates the actual Velocity in m/s or Volume in m3/s. The LED display is fitted into the front lid. It shall provide IP65 protection and is intended for wall mount use.

DISPLAY AND SIGNAL DAMPENING

The displays can be smoothed by means of a switch (LCD) or a jumper (LED) on the rear independently of the output signal of the sensor. The output signal can be smoothed by means of the 'Slow' adjustment on the PCB of the V-Sensor. This dampening acts on the 0..10V, 4...20 mA and the Display simultaneously.

MAGNIFICATION FACTOR SCALING

The display's zero and span has been factory scaled during manufacture. The magnification Factor can be adjusted on the PCB Scaler to suit the CMR Flow Probes, Velo Probes and Velo Grids or any other velocity measurement devices.

ALUMINIUM ENCLOSURE

The V-Sensor can be supplied in an IP65 Aluminium Enclosure with 6mm or 1/4" ferule compression fittings and stainless Cable Gland.

An optional IP65 LED display either 3 1/2 or 4 1/2 Digit is mounted into the Lid.

Stainless Steel Transducers can be supplied on request but then the Aluminium Enclosure shall always be supplied.

Aluminium Enclosure with LED

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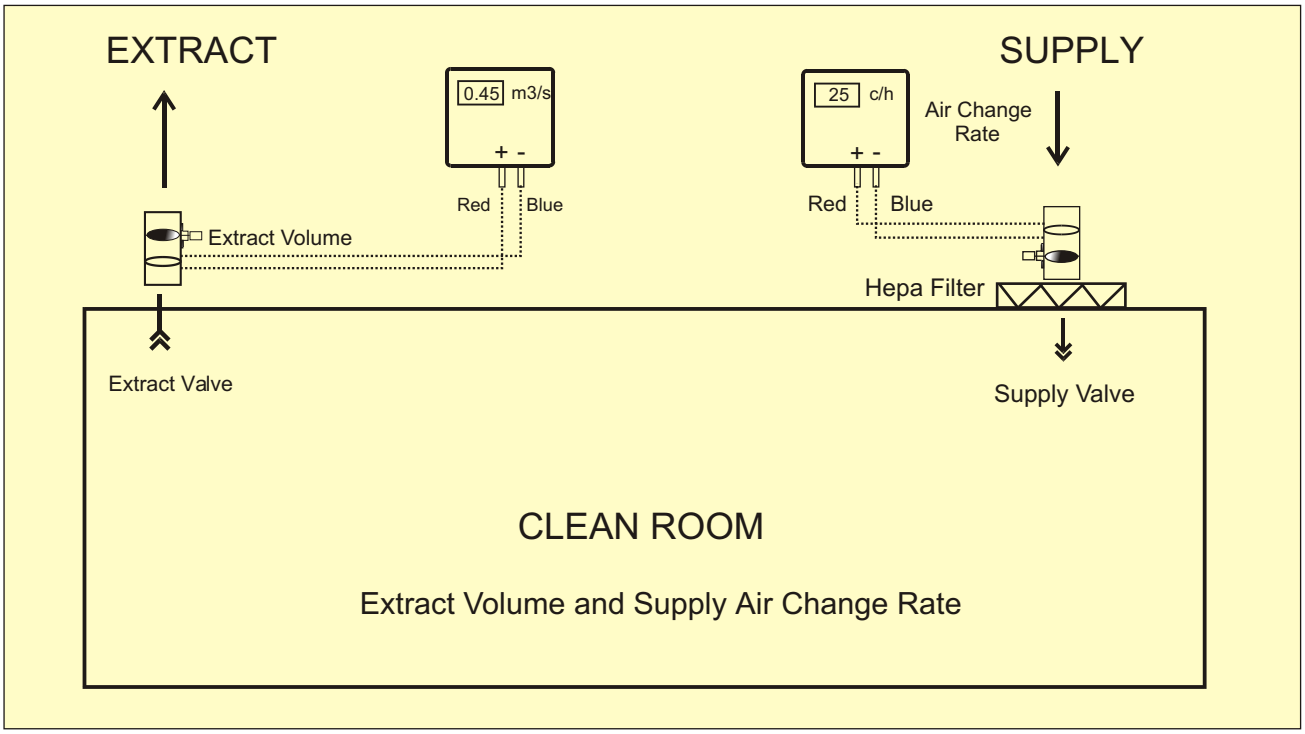
V-SENSOR VELOCITY APPLICATIONS

TYPICAL VELOCITY PRESSURE MEASUREMENT WITH CMR V-SENSORS



The CMR V-Sensor is a true Velocity Pressure Transmitter which has been designed to measure air volumes in Ventilation Ducts accurately. The built in Square Root Extraction and Magnification Factor Scaling makes the V-Sensor the most versatile instrument. It can display in m/s or m3/s. Other displays such as m3/h, litres/s, litres/min or any imperial measurement units are available on request .

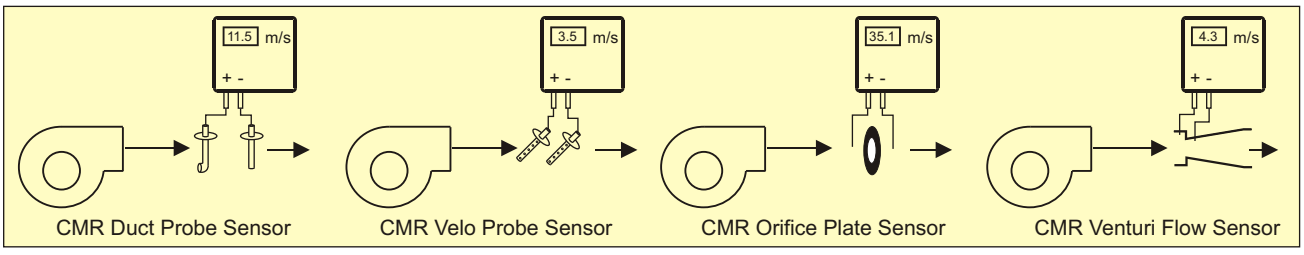
The V-Sensor is ideal for wall or plant room panel mount applications. The CMR PVC tubing can be run up to 200m without losing accuracy of the measurement.

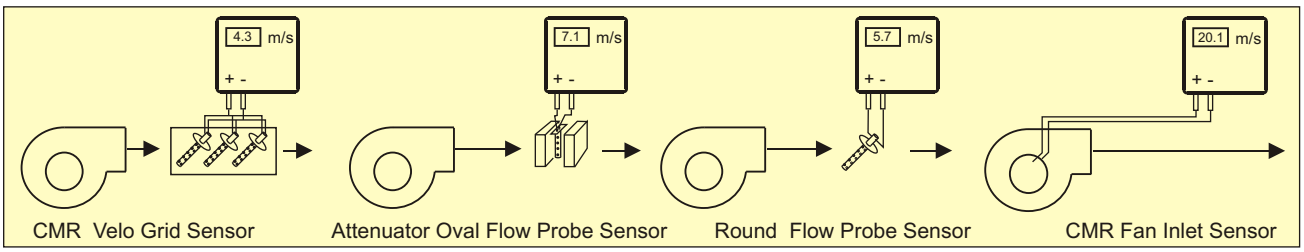
The V-Sensor is used for monitoring or controlling Volume Flow in Commercial or Process Applications

The V-Sensor is designed to be connected to any CMR Velo probes, Duct Probes or Velo grids, but it can also be connected to any existing or custom made duct Flow Measurement Device.

The measured values can be transmitted to remote display plates, Scada and BMS Monitoring Systems. An output signal of 0..10V and 4...20mA is standard. Calibration Certificates traceable to National Standards can be supplied with all V-Sensors.

TYPICAL CMR AIR VOLUME MEASUREMENT APPLICATIONS





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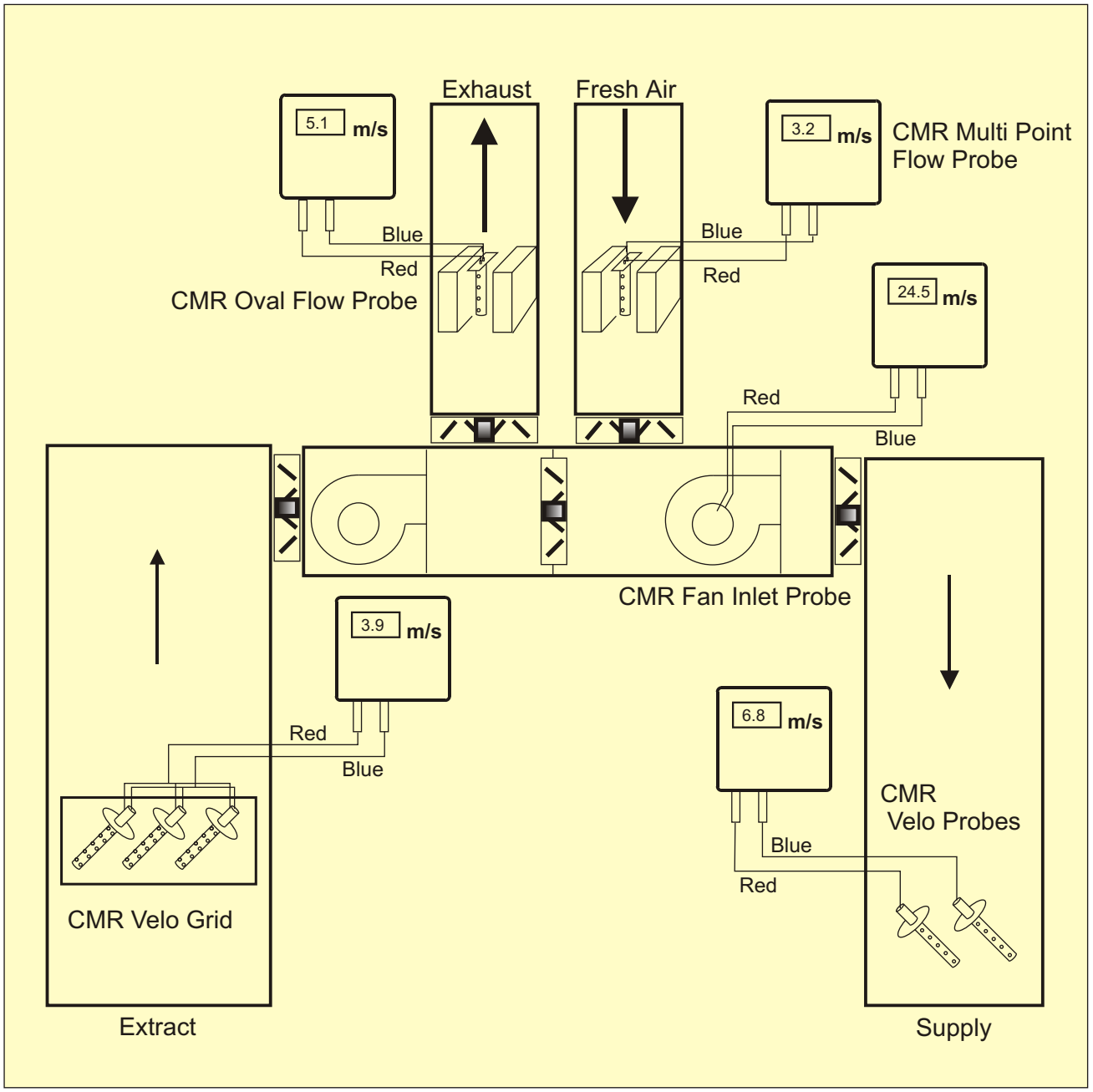
V-SENSOR AHU APPLICATIONS

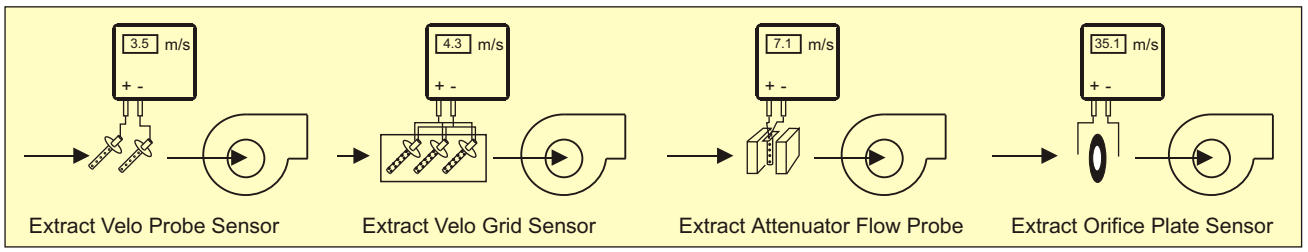
TYPICAL AIR HANDLING UNIT VOLUME AND VELOCITY MEASUREMENTS WITH CMR V-SENSORS



The above schematic shows a practical application in Supply and Extract Air-Handling Unit Control Systems, where Supply and Extract Duct Volumes must be measured.

The V-Sensor is ideal for Fan Tracking, Fresh Air, Re-circulation Air control and monitoring. The CMR V-Sensors are maintenance free and long term accurate.

TYPICAL EXTRACT AIR VOLUME MEASUREMENT APPLICATIONS



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V-SENSORS AND VELO PROBES

GENERAL

The drawing shows a typical application for CMR velocity Velo Probes and V- Sensors.

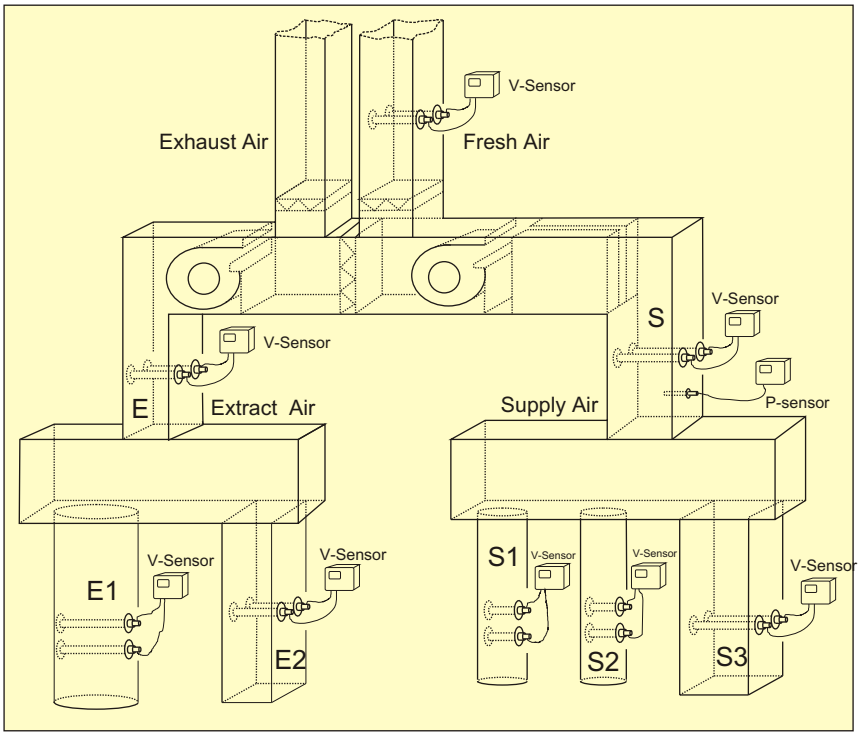
The supply air duct can either be fitted with one central Velo Probe or individual Velo Probes on each of its branches.

In many cases, the positions of the Velo Probes are very much dictated by the design of the building.The CMR Velo Probe can be fitted in almost any position in order to provide the necessary results.

In a single supply and single extract duct application the V-Sensor measures the building's actual total supply and return volumes. As both V-Sensors are calibrated to provide a linear air volume signal, tracking of supply and extract air is made simple.

The Velo probes are easily adjusted by the commissioning engineer during final commissioning.
For multiple duct applications, the total supply air volume is derived by adding measurements from individual ducts.

The same applies to the return air where the following formulae is specified as mentioned under the schematic on the right.



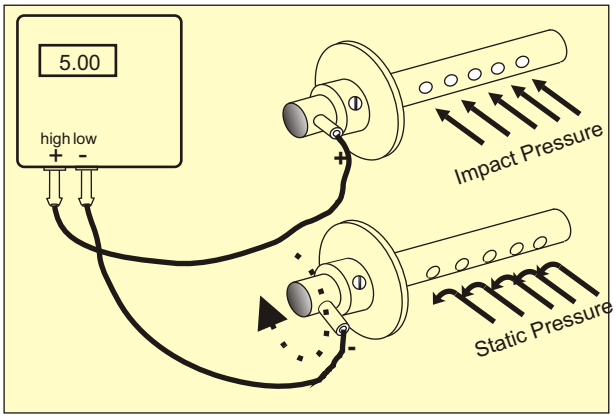
S = E ± an offset for positive or negative building pressure
S1 + S2 + S3 = E1 + E2 ± offset or S = E1 + E2 ± offset

V-SENSOR SCALING BY ADJUSTING THE VELO PROBES

Adjust the Impact Veloprobe to face the Airflow and and adjust the Static Veloprobe to approx. 40º away from the airflow.

Scaling the BMS in m/s
Look at the V-Sensor label and scale BMS to 0V = 0 m/s and 10V = V-Sensor range i.e. 12.91m/s. Take a Pitot reading in the duct and if this is 5.00 m/s adjust the Static Veloprobe by turning it towards or away from the airflow until the BMS Screen shows 5.0 m/s.

Scaling the BMS in m3/s
Multiply the V-Sensor range i.e. 12.91m/s by the duct area i.e 1m x 1m = 1m2. The Sensor range is now 10V=12.91 m3/s. Scale the BMS to 12.91m3/s and work out the Pitot readings in m3/s. If the Volume is 5.00 m3/s, turn the Static Veloprobe until the Screen shows 5.0 m3/s.



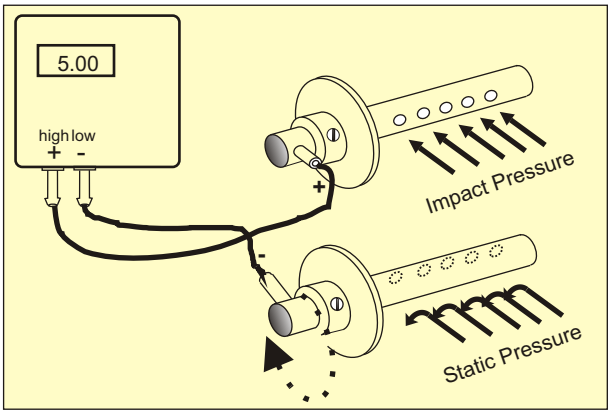
Calibrating by adjusting the Velo Probes

V-SENSOR SCALING BY ADJUSTING THE 'SCALER'

Adjust the Impact Veloprobe to face the Airflow and and adjust the Static Veloprobe to approx. 180º away from the airflow.

Scaling the BMS in m/s
Look at the V-Sensor label and scale BMS to 0V = 0 m/s and 10V =V-Sensor range i.e. 12.91m/s. Take a Pitot reading and if this is 5.00 m/s adjust the V-Sensor 'Scaler' Potentiometer until the BMS Screen shows 5.0 m/s.

Scaling the BMS in m3/s
Multiply the V-Sensor range i.e. 12.91 m/s by the duct area i.e 1m x 1m = 1m2. The Sensor range is now 10V=12.91m3/s. Scale the BMS to 12.91 m3/s and work out the Pitot readings in m3/s. If the Volume is 5.00 m3/s, turn the V-Sensor 'Scaler' Potentiometer until the Screen shows 5.0 m3/s.



Calibrating by adjusting the V-Sensor scaler

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V-SENSOR OPERATING INSTRUCTIONS

CALIBRATION INSTRUCTIONS

CALIBRATION

The V-Sensor's electronic is accessible by removing the Lid. Connect a Voltmeter to the Terminals 1 and 2 or use a molex connector on the LCD Display connector J7. The output signal on the LCD connector is always 0...10V. Connect a mA Meter to the Terminals 3 and 4. It is important to know that the V-Sensor's base calibration is based on 0...10V, which means, all calibrations must be carried out in 0...10V first. The 4...20mA circuit is simply a convertor of the 0...10V and is factory set. It is therefore recommended never to touch P6 and P5 unless they have been tampered with. To calibrate the 4...20mA circuit it is necessary to have a Voltmeter and a mA Meter connected to obtain overall accuracy.

To check the Scaler, first pump up the sensor to its range i.e. 100 Pa and note down the voltage output in Linear Mode. If the output is i.e 5V then the scaler has been set to calibrate the duct velocity.

ZERO ADJUSTMENT

Switch Slide Switch to UP position which is the linear Pressure Signal Output on the J2 Terminals. Turn Scaler fully clockwise with no scaling.

P1 scales the Zero of the Sensor. Turn the 'SLOW' P8 Potentiometer completely anti clockwise to remove any dampening. Remove all Tubes and let the Sensor settle.

If the Voltmeter is connected to 1 and 2, adjust P1 until 0.00V is achieved.

If the mA Meter is connected to 3 and 4, adjust P1 unil 4.00mA is achieved.

If the Voltmeter, which is connected to the LCD connector or Terminal 1 and 2, displays 0.00V but the mA Meter connected to 3 and 4 is not at 4.00mA only then adjust P6 to achieve 4.00 mA.

SPAN ADJUSTMENT

Check the Zero Adjustment above first. P2 scales the Span of the V-Sensor. Use any CMR Calibrator and pump up the positive nipple of the V-Sensor to 75% of Full Scale as indicated on the label of the V-Sensor i.e. a 100Pa Sensor would be pumped up to 75.0 Pa.

If the Voltmeter is connected to 1 and 2, adjust P2 until 7.50V is achieved.

If the mA Meter is connected to 3 and 4, adjust P2 unitl 16mA is achieved.

If the Voltmeter, which is connected to the LCD connector or Terminal 1 and 2, displays 7.50V but the mA Meter connected to 3 and 4 is not at 16.00mA only then adjust P5 to achieve 16.00 mA.

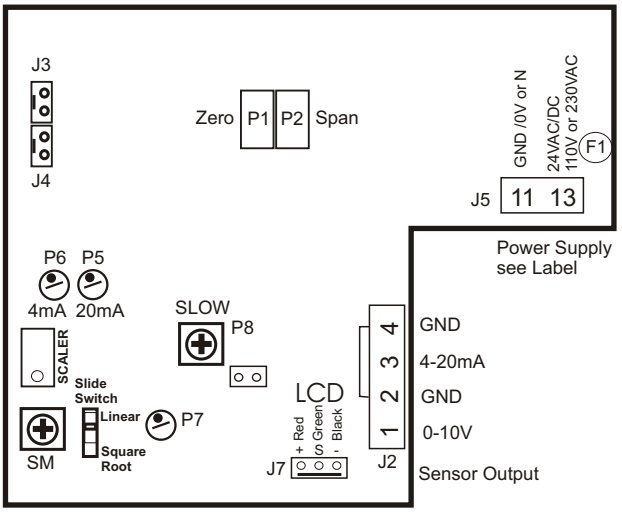
LINEARITY CHECK

Use any CMR Calibrator and pump up the positive nipple of the V-Sensor to 25% of Full Scale as indicated on the label of the V-Sensor i.e. a 100Pa Sensor would be pumped up to 25.0Pa.
25 % = 25 Pa or 2.50V - 8.00mA
50 % = 50 Pa or 5.00V - 12.00mA.
100% = 100 Pa or 10.00V - 20.00mA

The Linearity is the accuracy of the Sensor less any Calibrator deviation. See the following Example:
Zero of Sensor = 0.00 V Zero of Calibrator = 0.0Pa
Span of Sensor = 7.55 V Span of Calibrator = 75.5Pa
The Sensor is 100% linear compared with the Calibrator.

Repeat the Zero and Span adjustments a few times.

V-SENSOR LINKS AND POTENTIOMETER SETTINGS



SQUARE ROOT CHECK

The Square Root circuit is factory adjusted. In order to check its accuracy use any of the CMR Calibrators and pump up the positive nipple of the V-Sensor to 20% of Full Scale as indicated on the label of the V-Sensor i.e. a 100Pa Sensor would be pumped up to 20.0Pa. To check the Square Rooter switch the slide switch to DOWN position during measurement. The Results would be as follows:

20% = 20 Pa is 2.00V / 7.20mA in Linear Mode
20% = 20 Pa is 4.47V / 11.15mA in Square Root Mode

50 % = 50 Pa is 5.00V / 12.00mA in Linear Mode
50 % = 50 Pa is 7.07V / 15.31mA in Square Root Mode

SLOW OR DAMPENING OF OUTPUT SIGNAL

Adjust 'SLOW' P8 clockwise for signal output dampening. This adjustment is useful in monitoring applications where the output signal must be smoothed to eliminate fluctuations in the digital data input channels of Scada Monitoring or BMS Computer Systems. During Calibration of the V-Sensor set P8 fully anti-clockwise.

SM SMALL VALUE SHUT OFF

The output signal at very low pressures is extremely high when square rooted. In order to force the signal to have 0V output when there is no airflow, turn the SM Potentiometer clockwise until the signal shows 0V. During calibration turn the SM Potentiometer fully anti clockwise otherwise the zero adjustment is not correct.

MAGNIFICATION FACTOR SCALING

Make sure to re-adjust the 'Scaler' after calibration to its original figures to show the correct velocity or volume on the BMS screen. The original position of the scaler can be adjusted by pumping up the V-Sensor to its commissioning figures i.e the V-Sensor Range is 0-100 Pa or 12.91m/s. The scaler has been adjusted to half position which means the output voltage would be 5V in linear mode or 7.07V in square root mode if pumped up to 100 Pa.

Note: the maximum sensor range i.e. 100 Pa must never be exceeded otherwise the sensor is out of range.

If the scaling factor has been lost, new Pitot readings must be taken to re-commission the system.

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V-SENSOR ORDER DESCRIPTION

GENERAL
CMR manufactures a large range of V-Sensors to suit many Velocity or Volume measurement applications. Because of the variety of velocity pressure ranges, output signals and power supplies, it has been necessary to design an easy to use selection table for anybody to make up a V-Sensor specification to satisfy a requirement. On the V-Sensor Selection Table you will find all specifications available with the associated ordering Code.

V-SENSOR PART NUMBER
The V-Sensor Part Number starts with the selection of the enclosure which depends on the Tube connections. In the Example we have chosen Code '24A' which is a standard ABS V-Sensor enclosure with 6 mm barbed nipples to fit CMR PVC Tube.
The Part Number therefore starts with ' 24A '.

Smaller nipples with a 3 mm O./D to fit the small bore CMR Silicone Tube makes Panel installations easier. The Code is '24B'

Aluminium enclosures are supplied with compression fittings to suit either Stainless or Copper Tube i.e ALU 6 mm Code '24C' or ALU 1/4" Code '24D'.

NEGATIVE PRESSURE RANGE
The Negative Range is not available with V-Sensors as negative velocity pressures are never measured and cannot be square rooted.
The Code '000' always applies to any V-Sensors
The Part Number extends to '24A 000'.

VELOCITY PRESSURE RANGE
It is important to determine the duct velocity pressure. Normally, this information is supplied by the Designer of the Ventilation System. On the V-Sensor SelectionTable are a number of standard velocity pressures listed.

We have chosen 0 - 12.91 m/s (0-100Pa) which has the Code '025'.
The Part Number extends to '24A 000 025'

OUTPUT SIGNAL
The Industry Standard for Output Signals is 0...10V and 4...20mA, but other signals can be supplied by CMR on request and are listed in the Selection Table. The V-Sensor has a dual output as standard .

0-20mA which has the Code 'B' or 5 - 19mA which has the Code 'C' are also available.
In the Example, we have chosen dual output 0...10 V and 4..20mA which has the Code 'A'.
The Part Number extends to '24A 000 025 A'.

POWER SUPPLY
The Industry Standard is 24VDC or 24VAC. 110VAC and 230VAC are less used today for safety and EMC protection reasons. The 15VDC versions are seldom used.

In the Example we have chosen 24VDC which has the Code '2'.
The Part Number extends to '24A 000 025 A 2'.

INTERNAL LCD OR LED BUILT INTO LID
A 3 1/2 digit LCD Display can be supplied as an optional extra to be mounted into the Lid of the V-Sensor. The LCD is a Liquid Crystal Display without illumination. The Protection is IP44 and is only suitable for indoor applications. This LCD is the most popular display as it incorporates the Engineering Units as legends i.e. m/s or m3/s.

We have chosen this 3 1/2 digit LCD which has the Code 'A' .
The Part Number extends to '24A 000 025 A 2 A '.

Please Note, if an IP65 enclosure is required the red illuminated LED displays in 3 1/2 or 4 1/2 digits must be used. The legends are not available on these glasses.

SCALED UNITS
The range is printed on a product label fixed to the lid of the sensor. Normally, the range is printed as Pa (m/s) but other ranges can be selected under this order code. If and LCD or LED is required then the LCD's or LED's must be scaled to suit the application
i.e. 0-100 Pa (12.91m/s) which means it is scaled in m/s. The 3 1/2 Digit LCD Display has the additional benefit that a small legend m/s appears on the glass of the LCD. All other LED's have no descriptions on the glass.
The LCD or LED's can be scaled in m3/s, but the exact duct area must be known. Consult CMR to confirm the scaling.

We have chosen the Code '1' .
The Part Number extends to ' 24A 000 025 A 2 A 1'.

DECIMAL POINTS
If no LCD is fitted then this is N/A (not applicable).
The 3 1/2 digit LCD can only display 1999 or 199.9 or 19.99 or 1.999. The 4 1/2 digit LCD or LED can display 19999 or 1999.9 or 199.99 or 19.999 all depending on the decimal point setting..

It is essential to know the velocity or volume in order to determine the display on the LCD/LED glass. In the example we have chosen one decimal point, which can display i.e. 12.9m/s .

One decimal point has the Code 'B'.
The Part Number extends to ' 24A 000 025 A 2 A 1 B'.

LINEARITY
The V-Sensor is available in two Linearity Grades, 0.5% and 1.0%in Linear Mode which is 1% or 2% in Square Root Mode.

In the Example, we have used 0.5% which has the Code 'A'.
The Part Number extends to '24A 000 025 A 2 A 1 B A'.

TRACEABLE CALIBRATION CERTIFICATE
The V-Sensor can be supplied with a Calibration Certificate traceable to National Standard which has the Code 'T' .

In the Example we have to chose Code 'T'.
The Part Number extends to '24A 000 025 A 2 A 1 B A T'.

FINAL PART NUMBER
The Part Number to order is 24A000025A2A1BAT.

Now try and select your own V-Sensor using the V-Sensor Order Selection Table.

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V-SENSOR ORDER SELECTION TABLE

The selection Table has been prepared to make ordering easy. Each Column contains a number of different options which are available and a Part Number can be established depending on a specific requirement. The Example Part Number 24A 000 025 A 2 A 1 B A T which is printed above the Selection Table can be identified as being a V-Sensor Velocity Pressure Sensor having 6mm barbed tube connectors with a Negative Range of 0 Pa and a Positive Range of 100 Pa (12.91m/s), with a dual Output Signal of 0-10V and 4-20mA. The power Supply is 24VDC. The Sensor would be supplied with a 3 1/2 digit LCD Display mounted internally. The display is scaled in m/s. The Decimal Points are adjusted to 1 which indicates 0 -12.9 m/s. The Linearity is 0.5% in Linear Mode and it comes with a traceable Calibration Certificate to National Standards.

EXAMPLE PART NUMBER SELECTION (The code after the (=) sign is used i.e. 6mm = 24A)

24A	000	025	A	2	A	1	B	A	T
V-SENSOR	Negative	Positive	Output	Power	Internal	Scaled	Decimal	Linea-	Certifi-
Part No.	Range	Range	Signal	Supply	LCD/LED	Units	Points	rity	cate
6mm = 24A	0 Pa = 000	25Pa (6.45m/s) = 010	Dual = A	15 VDC = 1	NONE = N	m/s = 1	N/A = N	0.5% = A	Trace = T
3mm = 24B		50Pa (9.12m/s) = 015	0..20mA = B	24 VDC = 2	LCD 3 1/2 = A	Pa = 2	000 = A	1.0% = B	None = N
6cp = 24C		60Pa(10.00m/s) = 020	5..19mA = C	24 VAC = 3	LED 3 1/2 = B	m3/s = 3	00.0 = B		
1/4cp = 24D		100Pa(12.91m/s) = 025		110 VAC = 4	LED 4 1/2 = C	m3/h = 4	0.00 = C		
		125Pa(14.43m/s) = 030		230 VAC = 5		lit/s = 5	.000 = D		
		150Pa(15.81m/s) = 035				ACR = 6			
Stainless		200Pa(18.25m/s) = 040							
6cp = 24E		250Pa(20.41m/s) = 045							
1/4cp = 24F		300Pa(22.36m/s) = 050							
		400Pa(25.82m/s) = 055							
		500Pa(28.86m/s) = 060							
		750Pa(35.35m/s) = 065							
		1000Pa(40.82m/s) = 070							
		1500Pa(50.00m/s) = 075							
		2000Pa(57.73m/s) = 080							
		2500Pa(64.55m/s) = 085							
		3000Pa(70.71m/s) = 090							
		4000Pa(81.65m/s) = 095							
		5000Pa(91.28m/s) = 100							
		6000Pa(100.00m/s) = 105							
		7000Pa(108.01m/s) = 110							
		8000Pa(115.47m/s) = 115							
		9000Pa(122.47m/s) = 120							
		10000Pa(129.10m/s) = 125							

HOW TO ORDER

Make up your own V-Sensor selection below using the empty cells

EXAMPLE

A wall mount pressure transmitter is required of the Type V-Sensor.
The tube connections must be 6mm for CMR PVC Tube
The negative pressure range must be 0 Pa (no others can be supplied)
The positive pressure range must be +25Pa (6.45 m/s)
The output signal must be dual 0-10V and 4-20mA.
The power supply must be 24V AC isolated
The internal LCD Display must be a 3 1/2 digit LCD with legends.
The scaled units must be in metres/second (m/s)
The indication must be 6.45 with two decimal points
The linearity must be 1% of full scale
The Certificate must be traceable to National Standards

Call CMR for assistance at any time

The part Number for this V-Sensor is 24A 000 010 A 3 A 1 C B T

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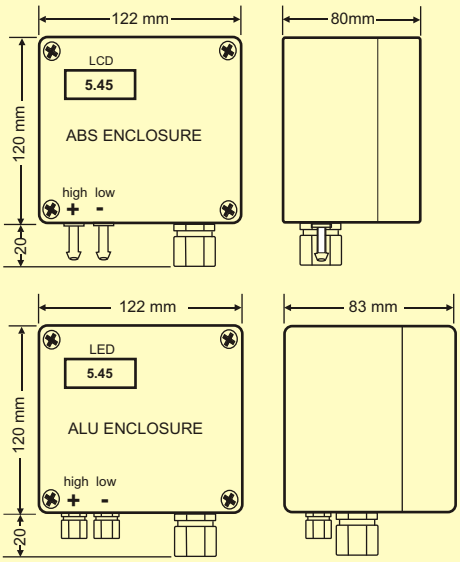
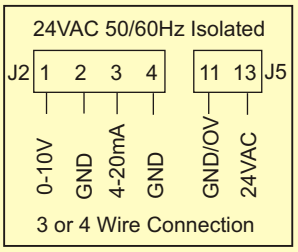
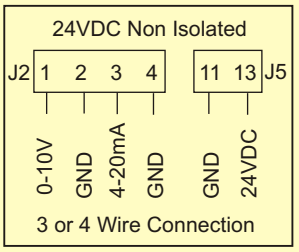
V-SENSOR TECHNICAL SPECIFICATION

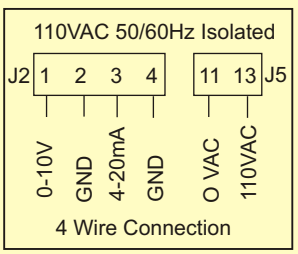
Measurement Range	See Order Selection Table V-Sensor
Optional Range	Any Range from 25Pa (6.45m/s) up to 10 000Pa (129.10m/s)
Overload Capacity	Ranges 25Pa - 150Pa up to max 1400Pa. Ranges from 200 - 10000Pa 10 times of range
Media	Non Corrosive Gases such as Air,N2,O2,CO2,N2 O, inert Gases
Diaphragm Unit	Bronze Beryllium Copper suitable for high concentration of Formaldehyde - All Stainless on request.
AC Power Supplies	24 VAC 50/60Hz 140mA Fuse 300mA Auto Reset
	110VAC 50/60Hz 32mA Fuse 315mA Wickmann
	230VAC 50/60Hz 10mA Fuse 315mA Wickmann
DC Power Supplies	15 VDC smoothed. Sensor without remote LCD and Volt output only. (50mA)
	24 VDC (19 to 31VDC) smoothed. Sensor with remote LCD and mA output (80 mA)
Voltage Output Signal	0-10V (0...100% of Range) 0..12.91m/s in square root mode RL = 5kOhm min.
	The output voltage is the result of square rooting the linear pressure i.e 100 Pa.
	100 Pa square rooted = 10 m/s . Multiply the 10 m/s by the density of air x 1.291 = 12.91m/s
Current Output Signal	4...20mA (0...100% of Range) i.e. 0...12.91m/s RI = 500 Ohm max.
	The mA circuit is a direct conversion of the 0..10V and therefore all calculations should be
	made in 0..10V. The 4..20mA is linear from 0...12.91m/s.
Hysteresis/Repeatability	0.1% Typical of Full Scale
Linearity (Accuracy)	+/- 0.5% or 1.0% of Full Scale in Pressure Mode
Zero Drift	0.05%K (+10°C to +50°C)
Operating Temperature	-10°C to +70°C
Mounting Position	Vertical
Weight	0.7 kg
Electrical Connections	1 x PG13 Gland Internal Plugs with Screw Connections (Other Gland Sizes on request)
Air Tube Connections	Positive and Negative Pressure Barbed Nipple 6.5mm O/D x 15mm long or
	Positive and Negative Pressure Straight Nipple 3.0mm O/D x 15mm long
Enclosure	ABS Grey Prtoection IP65 without LCD. With CMR LCD IP44 and ABS or ALU with/without LED IP65
Conformity	EN61326-1 EMC EN61010-1 SAFETY
Calibration Certificate	Supplied with Certificate traceable to National Standards

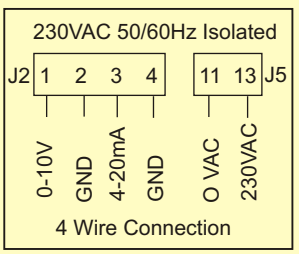
DIMENSIONS AND CONNECTIONS











TUBE CONNECTIONS
ABS 2 x 6mm for PVC or 3mm for Silicone Tube
ALU 2 x Compression Fittings for 6mm or 1/4" O/D

CABLE ENTRY GLANDS
1 x PG13 Gland for ABS Enclosure
1 x PG13 Metal Gland for Aluminium Enclosure

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