AMERICAN AUTO-MATRIX®
A Cylon Energy Inc. Company

AF-FVR

AF-FVR Slack Membrane Face Velocity Transmitter

DESCRIPTION

The current technology for measuring low velocity air flow uses hot wire anemometers which are not without drawbacks for in-line or continuous use. Some of the more serious anemometer problems include being insensitive to flow direction, slow response times, and changing calibration due to contamination, and being difficult to field calibrate.

Differential pressure transmitters with properly designed pitots do not suffer from the problems of thermal measurement systems, and they make dependable in-line instruments. However, the problem with these types of transmitters is the reliable measurement of extremely low differential pressures. The current pitot technology for full-scale range is approximately 50 in-mils wc (12.5 Pa).

The shortcomings with available technology have been eliminated with the Slack Membrane Transmitter which effectively and accurately measures ultra-low differential pressures. The FVR does this by optically measuring the force on the membrane. Since the membrane mass is low when compared to the force of the measurement, transmitter response is fast, smooth, and free of noise generated by "ringing" associated with low volume transmitters. This allows accurate operation of pitots at flows as low as 50 fpm (0.25m/s). Because this is a membrane device, there is no flow of air through the transmitter

APPLICATIONS

- Continuous measurement of low velocity air flow down to 50 fpm (0.25 m/s) by pilot techniques
- Use with Airfoil Pitot™ for fume hood face velocity control or measurement
- Measurement of ultra-low differential pressures
- When used with American Auto-Matrix Airfoil Pitot products, all components may remain in the uncontaminated air stream
- **CAUTION:** Do not blow directly into the flow ports of the device. Doing so may damage the product and void the warranty.

ADVANTAGES
OVER HOTWIRE ANEMOMETERS

- The measurement is direction sensitive (unidirectional)
- When used with pitots and space pressure sensors, the effect of dust and moisture is minimal
- Stable long-term calibration
- Stable long-term zero
- High and low ports can be separated by up to 30 ft (9.1m)
- Fast response without overshoot
- No flow through the transmitter

ADVANTAGES
OVER OTHER ULTRA-LOW DIFFERENTIAL PRESSURE TRANSMITTERS

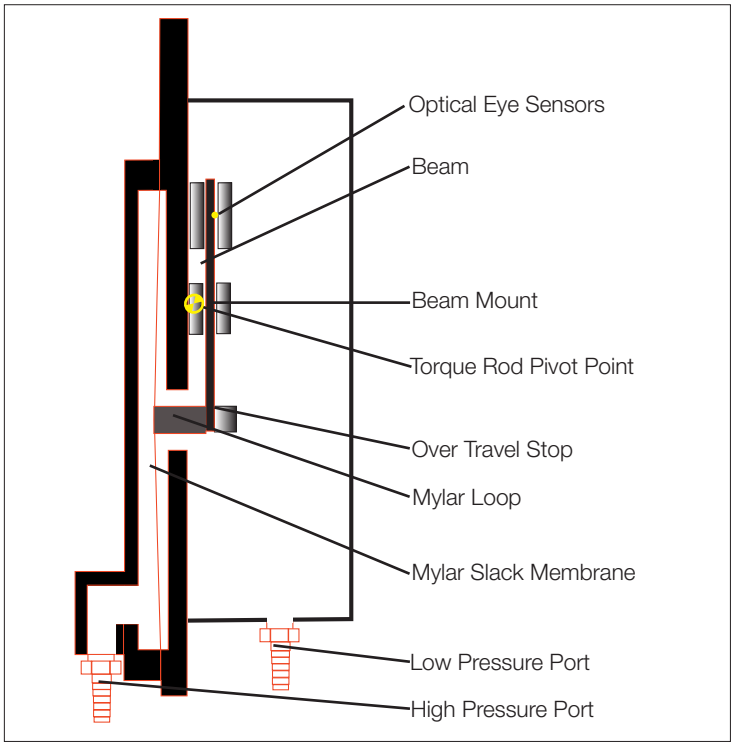
- Full-scale design many times lower than any other currently manufactured pressure transmitter
- Zero stable - does not require auto zero
- Balanced response to high and low pressure
- Relatively vibration insensitive
- Robust design and construction
- Smooth, fast response to input pressure that does not require electronic filtering like low volume capacitance or strain gauge transmitters

OPERATIONAL NOTES

- Transmitter must be mounted with the membrane in the vertical plane. This is necessary to cancel the effects of the membrane's weight
- Due to the design of the transmitter (stable zero), it will measure pressure in one direction only
- The system must be field calibrated via software using actual face velocity measurements once the device is installed
- The system should be re-calibrated a minimum of once every 6 months

$$V = AFC \times 4005 \sqrt{\Delta p}$$

V = Face Velocity (fpm)
AFC = Hood Coefficient
Δp = Differential Pressure (in. wc)



ORDERING INFORMATION

MODEL	Nominal Span (Factory Set)	Over Range Stop	Tube ID < 25 ft	Tube ID > 25 ft
AF-FVR-1a	1.5 in-mil wc (0.375 Pa)	2.0 in-mil wc (0.5 Pa)	3/8 in.	1/2 in.
AF-FVR-1b	3.0 in-mil wc (0.75 Pa)	4.0 in-mil wc (1.0 Pa)	3/8 in..	1/2 in.

AF-FVR SPECIFICATIONS

Measurement	
Accuracy	+/- 10%
Linearity	0.85%
Resolution	minimum 4.8% full scale
Maximum Static Pressure	10 in. wc (2.49 kPa)
Response Time	insignificant
Electrical	
Output	4-20 mA VDC, 2-wire
Minimum Supply Voltage	12 VDC
Maximum Supply Voltage	32 VDC
Reverse Polarity Protected	
Mechanical	
Ports	3/8 ID barbed fittings
Temperature Range	50-122° F (10-50° C)
Position Effect	membrane must be in vertical plane
Wetted Materials	passivated aluminum and Mylar (air and non-corrosive/condensing gases only)
Weight	2.25 lb (1 kg)
Dimensions	6.85 x 6.80 x 3 in (17.4 x 17.3 x 7.6 cm)

UL LISTED CE

American Auto-Matrix products and systems are manufactured and installed under one or more of the following US patents and/or others that may apply.
5,764,579; 6,272,399; 5,920,488; 5,946,221; 5,481,919; 5,402,687; 5,415,583

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