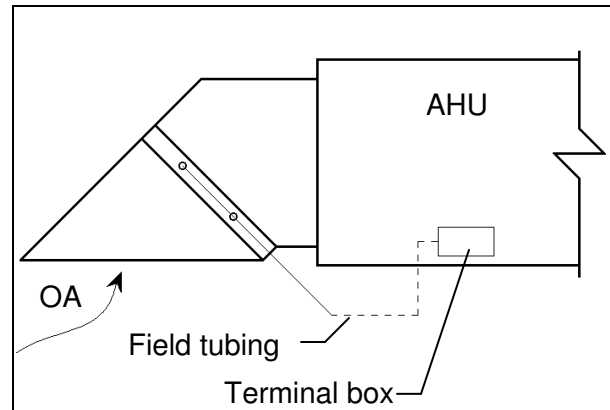
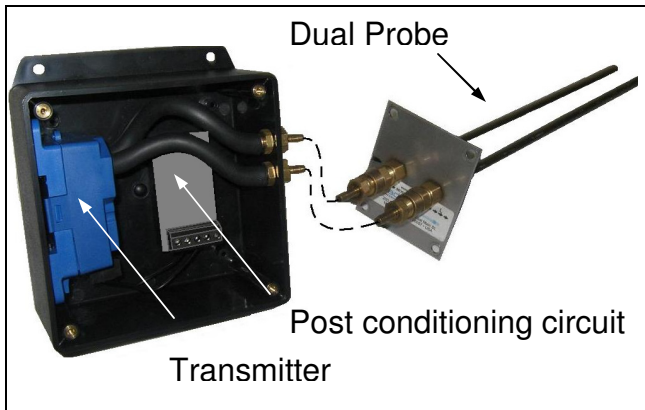


Outside Air Flow Measurement Module

BULLETIN 866 b



Typical Application

Current energy codes are requiring accurate measurement of air flow rates with transmission to a Building Automation Computer.

For direct measurement of Outside Air Waddell offers the time tested model 861 dual probe combined with a high accuracy process transmitter and a post conditioning circuit. The post conditioning circuit minimizes the aerodynamic noise at low flow rates to output clean and very repetitive signals.

The 861 Probe is normally field installed in the OA hood parallel to the local velocities. The probes are then tubed to the enclosure which contains the transmitter and the post conditioning circuit. The enclosure is often installed within the AHU and then wired to the Building Automation Computer with other control wiring.

Advantages

- Stainless Steel probe for long life
- Dual Probe design for low velocities
- Live zero to adapt to field conditions
- Temperature compensation curve available for building computer
- Field adjustable span

Benefits

- Very good energy management
- Adaptable for wide temperature ranges
- Indicates Outside Air loads

Suggestions for OA Management

- Velocities are normally low to minimize rain entrainment. Sensing circuits should output stable and repetitive signals down to 200 ft/min
- OA flow is normally not stable due to wind loads and internal pressure changes with VAV systems. Pressure independent and linear control of the air should be considered.

Technical Specification:

Electronics

Industrial Transmitter

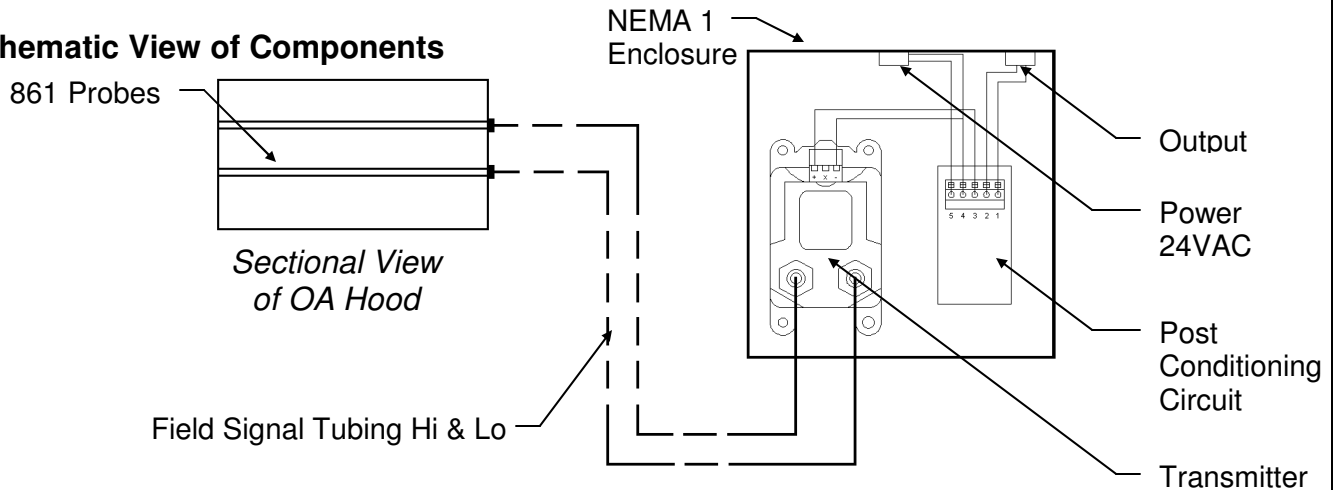
Response Time	250 ms	Zero and Span	Field Adjustable
Temp. calibrated range	32°F-95°F	Accuracy Span	+/- 0.4%
Stability	<0.25% span/year	LED indicates power status	
CE compliant to EN61326		UL	94 5Va
Multiple ranges available		150- 1350 ft/min, 200-2300 ft/min	

Post Conditioning Circuit

The circuit conditions the transmitter output during low flow minimizing the aerodynamic and electrical noise.

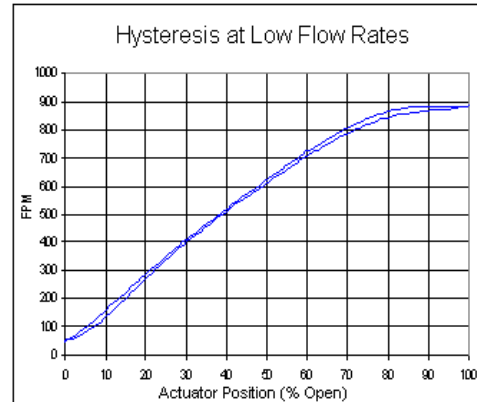
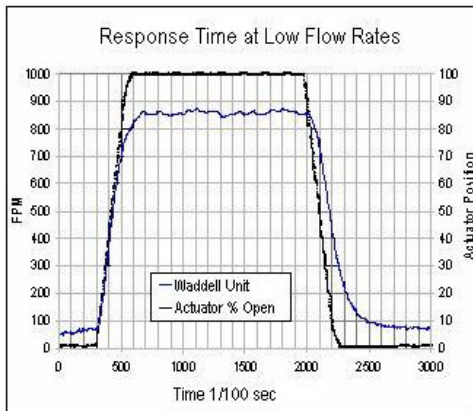
Output	2-10V, 0-5V, 0-10V	Temp. Range	32°F to 100°F
Zero and Span	Field Adjustable	Compensation curve from	0°F-130°F
Enclosure	NEMA 1 – Locate in Non-Condensing Atmospheres		

Schematic View of Components



Performance

These graphs illustrate low velocity flow measurement and control using a pressure independent and linear damper. The graph on the left shows the repetition of low flow rates at two near closed positions. Velocities below 150 ft/min may not be repetitive in the field. The curve on the right illustrates the linearity as well as no real hysteresis from open to closed and return.



Performance Data – Lower Flow Rates

Data based on Transmitter Module Model 509B

Diamond Shaped Sensor for Small Round Valve Inlets

Model No. ALV-W-A-0.1	
Velocity (f/m)	Output 2-10V
116.50	2.16
164.75	2.32
201.78	2.48
233.00	2.64
368.40	3.6
521.00	5.2
638.09	6.8
736.81	8.4
823.77	10

Model No. ALV-W-A-0.5	
Velocity (f/m)	Output 2-10V
186.00	2.16
368.40	2.32
451.20	2.48
521.00	2.64
823.77	3.6
1164.99	5.2
1426.82	6.8
1647.55	8.4
1842.01	10

Model No. ALV-W-A-0.25	
Velocity (f/m)	Output 2-10V
140.20	2.10
260.50	2.32
319.05	2.48
368.40	2.64
582.50	3.6
823.77	5.2
1008.91	6.8
1164.99	8.4
1302.50	10

Model No. ALV-W-A-0.75	
Velocity (f/m)	Output 2-10V
210.00	2.08
451.20	2.32
552.60	2.48
638.09	2.64
1008.91	3.6
1426.82	5.2
1747.49	6.8
2017.82	8.4
2256.00	10

861 Sensor for Rectangular Duct

Model No. ALV-W-A-0.1	
Velocity (f/m)	Output 2-10V
125	2.16
215	2.32
305	2.48
395	2.64
480	3.6
570	5.2
660	6.8
750	8.4
845	10

Model No. ALV-W-A-0.1	
Velocity (f/m)	Output 2-10V
218	2.16
439	2.32
660	2.48
881	2.64
1100	3.6
1320	5.2
1540	6.8
1760	8.4
1980	10

Model No. ALV-W-A-0.75	
Velocity (f/m)	Output 2-10V
199	2.08
349	2.32
499	2.48
649	2.64
790	3.6
940	5.2
1090	6.8
1240	8.4
1401	10

Model No. ALV-W-A-0.75	
Velocity (f/m)	Output 2-10V
245	2.08
509	2.32
173	2.48
1047	2.64
1311	3.6
1575	5.2
1849	6.8
2111	8.4
2369	10