

EAMS015 ELECTRONIC AIR MEASUREMENT STATION

APPLICATION

Ruskin model EAMS015 is an AMCA certified electronic air measurement station with an integral heated mass flow sensor and controller. The complete unit is factory assembled and calibrated to provide effective setpoint monitoring down to 100 FPM (.51 m/s). The compact slip fit design and accuracy makes this a smart solution for duct flow measuring applications. The high performance heated mass flow sensor is positioned behind the air scoop manifold inside the sensor chase, protecting it from large particulate. The unit comes standard with an application specific control panel that provides a 0-10V output, proportional to the flow.

STANDARD CONSTRUCTION

CONTROL ENCLOSURE

12" (305) 18 (1.3) gauge galvanized steel.

AIR SCOOP MANIFOLD

.75" (19) aluminum tube with Venturi duct averaging ports.

SENSOR CHASE

.75" (19) aluminum tube placed at 90° to the air scoop manifold.

SENSOR

Electronic heated mass flow.

CONTROLLER

Application specific set points factory calibrated.
Program logic & calibration in nonvolatile EPROM.

ACCURACY

3% over measuring range.

POWER REQUIREMENTS

24 VAC +/- 15%, 10VA, 50/60 Hz.

OUTPUT SIGNAL

0-10V calibrated output signal (or Field Selectable BACnet).

VELOCITY REQUIREMENTS

Product Range - 100 to 2000 FPM (0.51 m/s to 10.1 m/s)
(Measured through face area)

OPERATING TEMPERATURE

-20°F to 120°F (-29°C to 50°C) standard.

MINIMUM SIZE

Single 12"w x 12"h x 18"d (305 x 305 x 457).

MAXIMUM SIZE

Single section - 18 sq. ft. (1.67m²)

Notes:

1. Values shown in () are millimeters unless otherwise indicated.
2. Refer to installation manual for additional details.
3. Units are furnished actual size ordered and dimensioned to the inside of the flanges.



FEATURES

- Electronic heated mass flow sensor
- Factory calibrated controller in nonvolatile EPROM
- BACnet compatibility
- Temperature and altitude compensated

Ruskin EAMS015 helps satisfy the requirements for minimum outside air as required by the following.

- ASHRAE 62.1, 90.1 and 189.1.
- California Title 24
- International Mechanical Code (IMC)
- International Energy Conservation Code (IECC)

VARIATIONS

The EAMS015 is available with several options to fit your specific application.

- 120 volt primary / 24 volt secondary power transformer shipped loose.
- Aluminum construction

AIR PERFORMANCE

TEST RUN	TEST SET UP FIG 1							TEST SET UP FIG 2						
	Reference Volume CFM		Reference Velocity FPM		Indicated Volume CFM		% Deviation Average = .73	Reference Volume CFM		Reference Velocity FPM		Indicated Volume CFM		% Deviation Average = .335
	CFM	l/s	FPM	m/s	CFM	l/s		CFM	l/s	FPM	m/s	CFM	l/s	
AIR PERFORMANCE SIZE 12" x 12" (305mm x 305mm)														
1	202	95	202	1.0	206	97	2.15	199	94	199	1.0	202	95	1.695
2	287	135	287	1.5	277	131	-3.46	287	135	287	1.5	280	132	-2.344
3	388	183	388	2.0	390	184	0.42	388	183	388	2.0	382	180	-1.626
4	457	216	457	2.3	463	219	1.29	475	224	475	2.4	487	230	2.547
5	964	455	964	4.9	971	458	0.68	968	457	968	4.9	965	455	-0.292
6	1,459	689	1,459	7.4	1,445	682	-0.94	1,445	682	1,445	7.3	1,435	677	-0.674
7	2,056	970	2,056	10.4	2,075	979	0.94	2,053	989	2,053	10.4	2,060	972	0.340
8	2,574	1,215	2,574	13.1	2,573	1,214	-0.03	2,582	1,219	2,582	13.1	2,573	1,214	-0.355
AIR PERFORMANCE SIZE 36" x 36" (914mm x 914mm)														
1	210	99	23	0.1	224	106	6.819	645	304	72	0.4	672	317	4.126
2	646	305	72	0.4	637	301	-1.332	726	343	81	0.4	765	361	5.394
3	636	300	71	0.4	670	316	5.268	1,296	612	144	0.7	1,324	625	2.192
4	1,264	597	140	0.7	1,284	606	1.614	2,546	1,202	283	1.4	2,476	1,169	-2.749
5	2,548	1,203	283	1.4	2,555	1,206	0.284	3,414	1,611	379	1.9	3,349	1,581	-1.915
6	3,271	1,544	363	1.8	3,341	1,577	2.148	3,482	1,643	387	2.0	3,436	1,622	-1.328
7	4,469	2,109	497	2.5	4,343	2,050	-2.817	4,194	1,979	466	2.4	4,165	1,966	-0.695
8	4,511	2,129	501	2.5	4,522	2,134	0.247	4,459	2,104	495	2.5	4,518	2,132	1.317
9	9,594	4,528	1,066	5.4	9,681	4,569	0.903	9,395	4,434	1,044	5.3	9,526	4,496	1.389
10	12,723	6,005	1,414	7.2	12,871	6,074	1.160	12,554	5,925	1,395	7.1	12,613	5,953	0.467
11	18,462	8,713	2,051	10.4	18,215	8,597	-1.336	18,519	8,740	2,058	10.5	18,293	8,633	-1.217
12	23,227	10,962	2,581	13.1	23,347	11,019	0.516	23,326	11,009	2,592	13.2	24,428	11,529	0.436

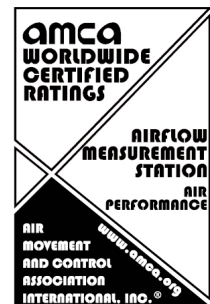
$CFM = (ax^4 + bx^3 + cx^2 + dx + e) * 3.281 * 60 * area$						
	a	b	c	d	e	area
12" x 12" (305mm x 305mm) Fig. 1	0.0106	-0.0527	0.657	-1.3975	1.579	1
12" x 12" (305mm x 305mm) Fig 2	0.0682	-0.7791	3.8696	-7.3241	0.54532	1
36" x 36" (914mm x 914mm) Fig 1	0.0178	-0.0926	0.5266	-0.2953	0.1689	9
36" x 36" (914mm x 914mm) Fig. 2	0.0028	0.0746	-0.1239	0.6467	-0.2596	9

x = sensor voltage

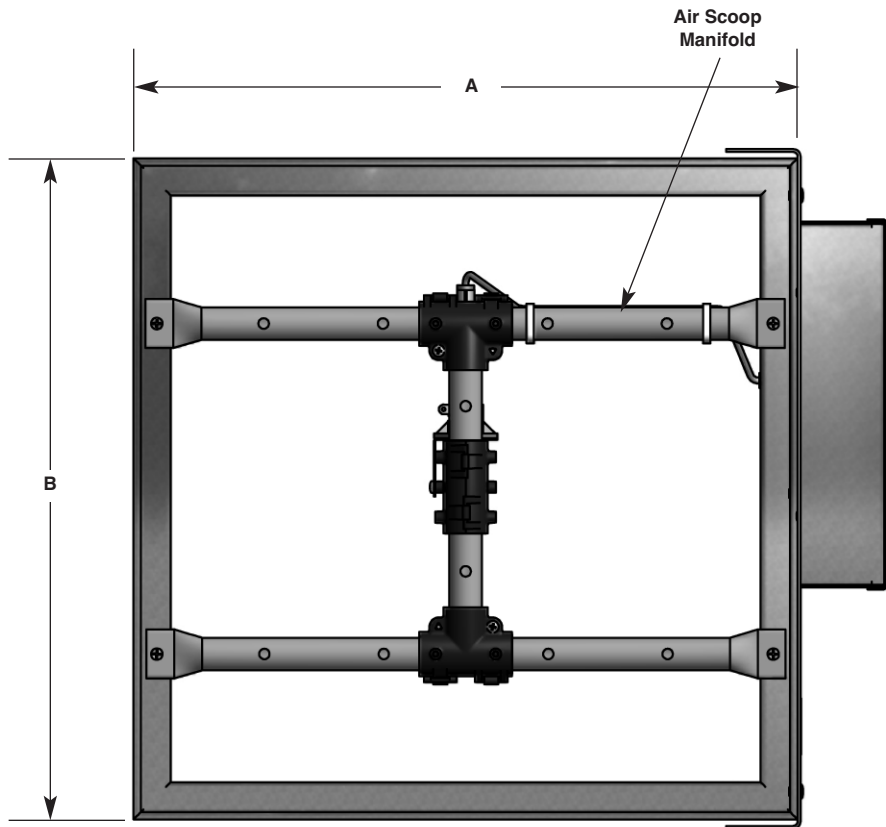
AIRFLOW RESISTANCE

Pressure Drop Through Manifold						
Test Run	Pressure Drop		Volume CFM		Velocity	
	In WG	Pa	CFM	l/s	FPM	m/s
Airflow Resistance Size 12" x 12" (305mm x 305mm)						
1	0.158	39	2,584	1,220	2,584	13.1
2	0.103	26	2,065	975	2,065	10.5
3	0.052	13	1,465	691	1,465	7.4
4	0.027	7	968	457	968	4.9
5	0.005	1	460	217	460	2.3
Airflow Resistance Size 36" x 36" (914mm x 914mm)						
1	0.041	10	23,247	10,971	2,583	13.1
2	0.026	6	18,477	8,720	2,053	10.4
3	0.016	4	12,735	6,010	1,415	7.2
4	0.010	2	9,603	4,532	1,067	5.4
5	0.005	1	4,509	2,128	501	2.5

Ruskin Company certifies that the EAMS015 Air Measurement Station shown herein is licensed to bear the AMCA Certified Rating Seal - Airflow Measurement Station Performance. The ratings shown are based on tests and procedures performed in accordance with the requirements of the AMCA Certified Ratings Program. The AMCA Certified Ratings Seal applies to airflow measurement performance only.



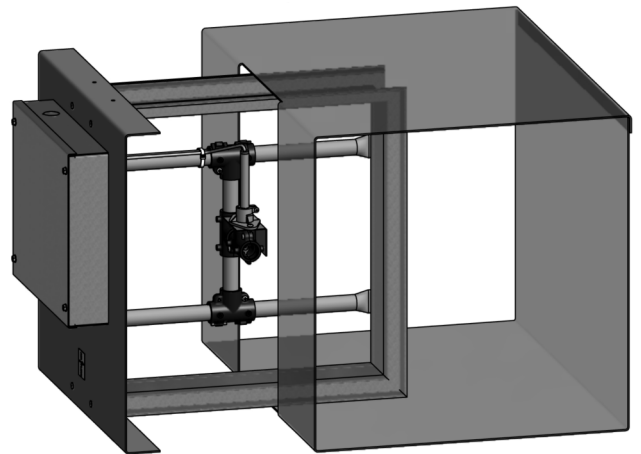
DIMENSIONAL DETAILS



INSTALLATION

The EAMS015 Electronic Air Measurement Station with integral controller is a NEMA 1 rated electrical enclosure.

1. Remove the EAMS015 from its shipping container and inspect for damage. Always handle the EAMS015 unit by its frame. **DO NOT LIFT** by the air scoop manifold. Do not drop or apply excessive bending, twisting or racking loads. Inspect the duct work for any obstruction or irregularities that might interfere with its installation. If it is to be installed in ductwork, the ductwork may need to be supported to prevent sagging due to the EAMS015 unit's weight.
2. The EAMS015 integral controller is factory calibrated and tested in order to perform correctly in its job specific application. The integral control unit is mounted directly to the side of the EAMS015, under a protective cover. A wiring schematic label is located on the cover for field wiring connections. The enclosure is NEMA 1 rated and should only be used in an environmentally controlled space that is free from moisture and excessive airborne particulate.
3. Loosen the enclosure cover screws, remove the cover and connect 24 VAC supply to exposed terminal block on the EAMS015 unit. The air measurement sensor is powered from the EAMS015 controller. Refer to wiring schematic on the cover plate or in this document for further details.

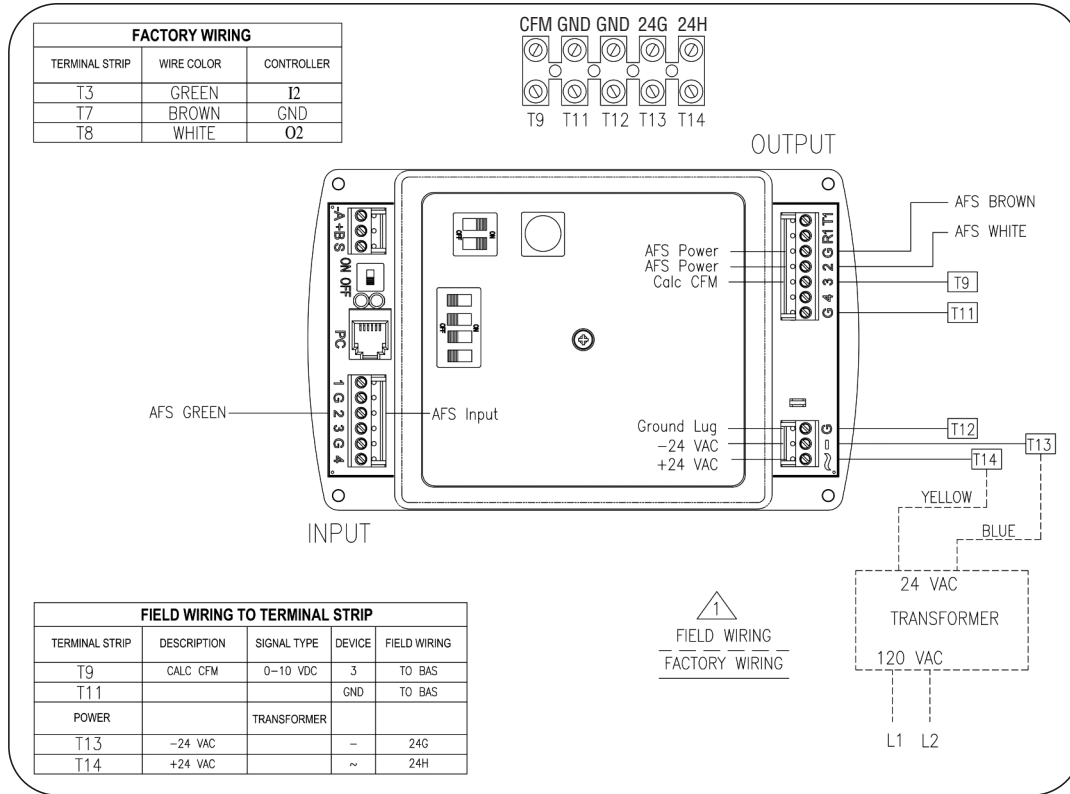


CONTROL WIRING SCHEMATIC

Ruskin's EAMS015 is supplied and calibrated with a dedicated controller. Attempting to use another controller (not supplied by Ruskin) or tampering with the wiring under the control panel cover plate will void

the warranty and could render the EAMS015 unit ineffective. Please contact the factory prior to performing any service on the factory wiring.

Standard Wiring Schematic (one sensor)



SUGGESTED SPECIFICATION

Furnish and install, at locations shown on plans or as in accordance with schedules, an electronic air measurement station capable of measuring a range from 100 to 2,000 FPM (.51 m/s to 10.1 m/s). The complete air measurement package shall be factory assembled into one turnkey product and calibrated to the specific job requirements. Unit shall be assembled and calibrated in an ISO 9001 certified facility. The air measurement station shall consist of air scoop manifold and an electronic heated mass flow sensor. The sensor in the assembly shall be installed in a protective sensor chase behind an air scoop manifold to prevent large airborne particles from settling on the sensing element. Electronic sensing elements directly exposed to the air stream are unacceptable. The assembly shall provide a $\pm 3\%$ average measuring accuracy over the product measuring range. Each unit shall be factory calibrated and the assembly shall be licensed to bear the

AMCA Certified ratings seal for Airflow Measurement Station Performance. Controller shall be field adjustable to provide an output signal within 1% of setpoint. All performance and accuracy ratings shall be supported by data collected from tests performed on an AMCA registered wind tunnel. A factory furnished and calibrated controller shall be programmed, in nonvolatile EPROM, with the job specific flow range. Factory calibration shall be available to ensure accuracy of the final assembly prior to shipping to the job site. The manufacturer shall furnish a data chart that is a representation of the final test. The test data chart shall show, as a minimum, output signal and corresponding flow. The controller shall report a 0-10 V linear output that is proportional to the flow and shall be altitude and temperature compensating. Air measurement stations shall be, in all respects, equivalent to Ruskin Model EAMS015.



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