

## EAMS ELECTRONIC AIR MEASUREMENT STATION

### APPLICATION

Ruskin model EAMS 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 design and accuracy makes this a smart solution for duct flow measuring and plenum wall mounting 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 0-10 V output, proportional to the flow.

### STANDARD CONSTRUCTION

#### FRAME

12" (305) deep double flanged 16 (1.6) gauge galvanized steel.

#### AIR SCOOP MANIFOLD

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

#### SENSOR CHASE

.75" (19mm) 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 (.51 m/s to 10.1 m/s)  
(Face Area)

#### OPERATING TEMPERATURE

-20°F to 140°F (-29°C to 60°C) sensor  
-20°F to 120°F (-29°C to 50°C) controller

#### MINIMUM SIZE

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

#### MAXIMUM SIZE

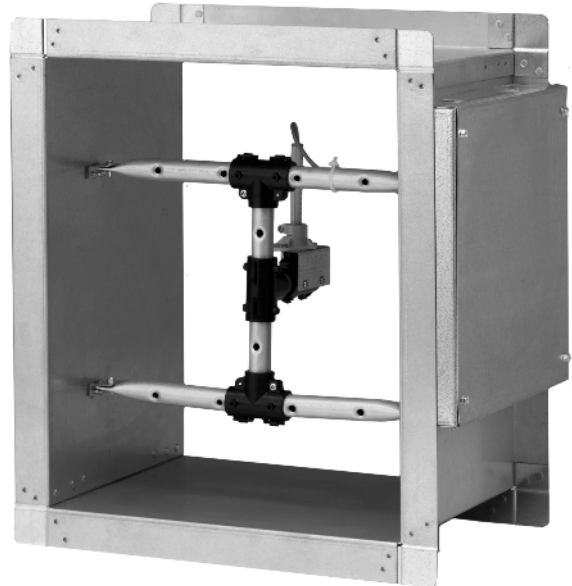
Single section - 18 sq. ft. (1.67m²)  
Multiple section assembly - unlimited.

#### 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.

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

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



### Application Hint:

Multiple units can be combined to accurately measure and control airflow across large openings even if the airflow across the sections is different. Each controller can utilize two sensors, and multiple controllers can be daisy-chained together.

### FEATURES

- Electronic heated mass flow sensor
- Factory calibrated controller in nonvolatile EPROM
- BACnet compatibility
- Single point 24 volt power connection
- Temperature and altitude compensated

### VARIATIONS

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

- Aluminum Frame, 12" (305) deep double flanged .125" (3.2).
- 120 volt primary / 24 volt secondary power transformer shipped loose.
- 12" x 12" x 6" (305 x 305 x 152) NEMA 1 control enclosure (for remote mount or if above 120°F (50°C). Controller, 120/24 VAC transformer and terminal strip mounted and shipped with EAMS..

## 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

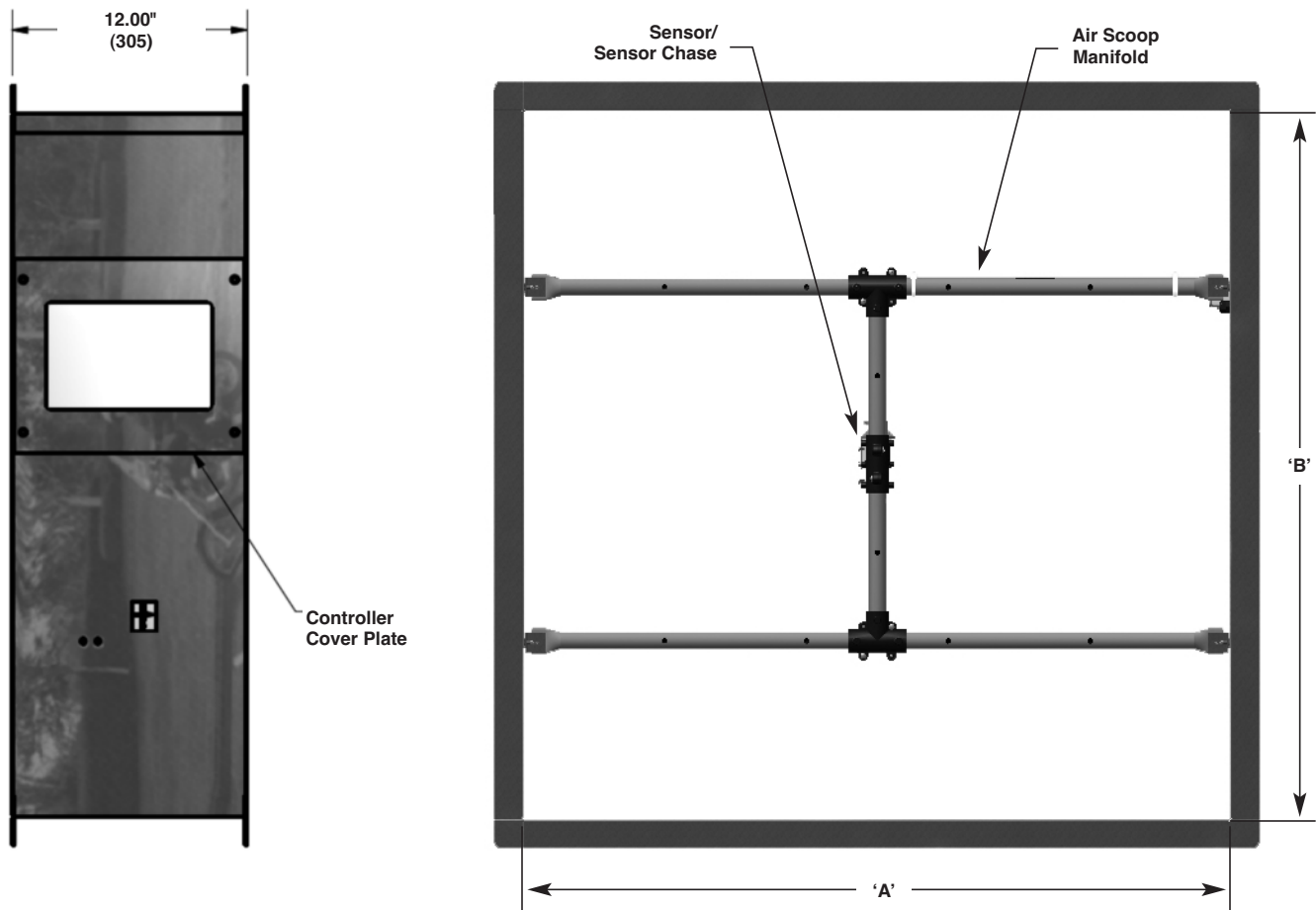
Pressure Drop Through Manifold						
Test Run	Pressure Drop		Volume CFM		Velocity	
	In WG	Pa	CFM	l/s	FPM	m/s
<b>Airflow Resistance Size 12" x 12" (305mm x 305mm)</b>						
1	0.158	39	2,584	1,220	2,584	13.1
2	0.103	26	2,065	975	2,065	10.5
3	0.052	13	1,465	691	1,465	7.4
4	0.027	7	968	457	968	4.9
5	0.005	1	460	217	460	2.3
<b>Airflow Resistance Size 36" x 36" (914mm x 914mm)</b>						
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 EAMS 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.



the factory prior to performing any service on the factory wiring.  
For more detailed information refer to the online installation and maintenance manual at [www.ruskin.com](http://www.ruskin.com).

## DIMENSIONAL DETAILS



## SUGGESTED SPECIFICATION

Furnish and install an electronic mass airflow measuring station capable of measuring a range from 100 to 2,000 FPM (0.51 m/s to 10.1 m/s) at a temperature range of -20°F to 120°F (-29°C to 50°C). The air measuring station shall consist of a 1.50" x 12" x 1.50" (38 x 305 x 38), 16 gauge (1.6) galvanized steel air scoop manifold frame, .75" (19) air scoop manifold with duct averaging ports, sensor chase, electronic heated mass flow sensor(s) and a factory programmed control module. All sensors in the assembly shall be installed in a protective sensor chase behind an air scoop manifold to prevent water penetration and large airborne particulate from settling on the sensing element. The assembly shall yield a 3% average measuring accuracy over the entire specified measuring range. 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. Each unit shall be tunnel tested 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 0-10V linear output that is proportional to the flow and shall be altitude and temperature compensating. Controller shall have a field selectable BACnet communication feature to facilitate digital communications when required. Installing contractor shall coordinate proper sizing and placement of the air measuring station with a qualified manufacturer's representative prior to installation. Complete assembly shall be constructed, programmed, wired and calibrated in an ISO 9001 certified facility. Air Measuring Stations shall be, in all respects, equivalent to Ruskin Model EAMS.

**RUSKIN®**

3900 Dr. Greaves Rd.  
Kansas City, MO 64030  
(816) 761-7476  
FAX (816) 765-8955  
www.ruskin.com