

Laboratory Room Airflow Measurement Station

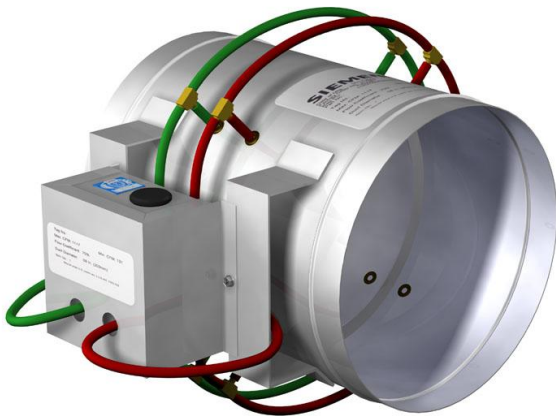


Figure 1. Laboratory Room Airflow Measurement Station.

The APOGEE® Automation Laboratory Room Airflow Measurement Station is an industrial grade, pre-packaged, easy-to-install airflow measurement station, which provides stable and precise exhaust airflow measurement. It is intended for airflow measurement applications where multiple exhaust devices such as canopy hoods, snorkel exhausts, and other constant volume exhaust devices are used within a laboratory.

Measurement of airflow is accomplished by unique orifice plate or four quadrant sensing technology that minimizes pressure loss and duct obstruction while maintaining measurement accuracy at 2% of actual flow (sensor only). Construction is heavy-duty, 22 gauge galvanized steel, including ductwork and orifice plate components. For highly corrosive environments, 316L stainless, 20 gauge steel is available as an option. Slip and flange end fitting connections are available to match the ductwork construction.

Features

- Orifice plate flow measurement or four-quadrant airflow sensor with multipoint, center averaging and signal amplification
- Ultra low non-recoverable pressure loss
- Ten sizes cover airflows from 36 to 8447 CFM
- Built for corrosive environments
- Field commissionable and adjustable -- not dependent upon factory calibration
- Factory-mounted measurement instrumentation to simplify installation (optional)

Description

- The Airflow Measurement Station consists of the following components:
- Galvanized steel round duct and airflow sensor in sizes from 4" (10.2 cm) to 22" (55 cm) diameter. 316L stainless steel is an optional material.
- Galvanized steel equipment enclosure with exterior supply connection (optional)
- Factory-mounted differential pressure transmitter (optional)

Specifications

Materials (within air stream) – Standard

Construction A	22 gauge galvanized steel casing, orifice & blade. Shaft is zinc-plated steel. Type A or B sensors available
Construction B	20 gauge 316L stainless steel casing, orifice & blade. Shaft is solid stainless steel. Type A sensors only.
Construction C	Teflon-coated 18 gauge. Cold-rolled Carbon Steel casing, orifice, blade, shaft, nuts, bolts. Type A sensors only.
Damper Shaft	Teflon shaft bushings. 1/2-inch (1.27 cm) diameter. End marked with blade position.
Flanges	Comply with SMACNA RIDCS. Seam welded BEFORE coating for A or C code.

Materials (outside air stream) – Standard

Control Enclosure (optional)	18 gauge zinc coated steel
Pneumatic Tubing	UL rated 94 V-2 fire retardant Neoprene rubber
Pneumatic Fittings	
Enclosure only	Brass, dual barbed

Airflow Measurement

Sensor Type A	Square edge orifice plate, 4 sets of manifolded pressure taps, same material as duct casing.
Sensor Type B	Four quadrant, with 12 sensing points, center averaging and signal amplification

Accuracy

Flow Measurement	±2% of actual flow @ listed ranges (<i>sensor only. Does not include accuracy of controller or transmitter</i>)
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Installation Requirements	Rigid duct of the same diameter 2½x duct diameter upstream from the sensor, or taper angle less than 30 deg, is required
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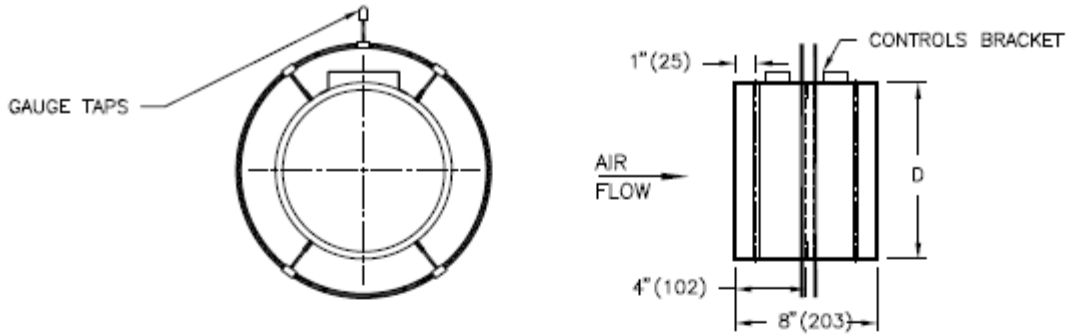
Environmental

Operating Temperature/ % RH	40 to 120°F (4 to 49°C) 0 to 95% non-condensing
Storage Temperature/ % RH	-10 to 150°F (-23 to 65°C) 0 to 95% non-condensing

Dimensions

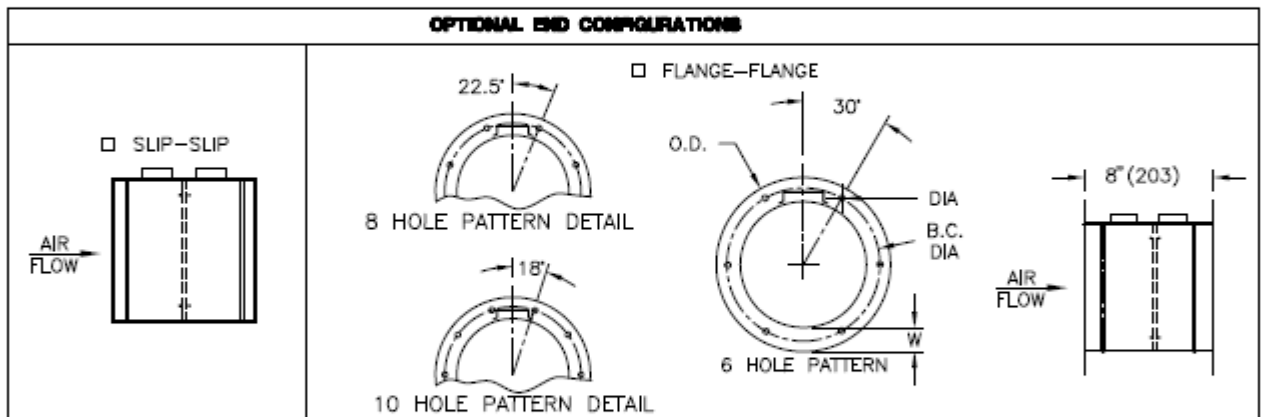
Sizes	See <i>Figure 2</i> and <i>Figure 3</i>
Weight	20 to 32 lbs. (9 to 14.5 kg)

Dimensions



- NOTES:** (AA TYPE)
- 22 GA. GALVANIZED STEEL
 - RIVETED DUCT CONSTRUCTION, SEALED WITH SILICONE.
 - ORIFICE RING FLOW SENSOR

- OPTIONS:**
- (BA TYPE) 20 GA. 316L STAINLESS STEEL CONTINUOUSLY WELDED CONSTRUCTION.
 - (CA TYPE) 18 GA. COLD ROLLED STEEL c/w TEFLON COATING INSIDE, PAINTED OUTSIDE.
 - CONTROLS FACTORY MOUNTED

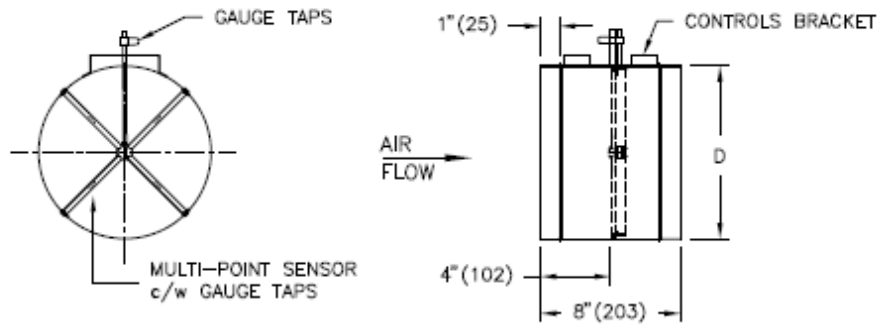


IMPERIAL/(METRIC)

NOM SIZE	D (mm)	# OF HOLES	FLANGE W (mm)		HOLE DIA (mm)		B.C. DIA (mm)	O.D. (mm)	
			BA	CA, AA	BA	CA, AA		BA	CA, AA
4	3 ⁷ / ₈ (99)	6	1 (25)	1 (25)	7 ¹ / ₁₆ (11)	7 ¹ / ₁₆ (11)	5 ¹ / ₄ (133)	6 (152)	6 (152)
6	5 ⁷ / ₈ (149)	6	1 (25)	1 (25)	7 ¹ / ₁₆ (11)	7 ¹ / ₁₆ (11)	7 ¹ / ₄ (184)	8 (203)	8 (203)
8	7 ⁷ / ₈ (200)	6	1 (25)	1 (25)	7 ¹ / ₁₆ (11)	7 ¹ / ₁₆ (11)	9 ¹ / ₄ (239)	10 (254)	10 (254)
10	9 ⁷ / ₈ (251)	6	1 (25)	1 (25)	7 ¹ / ₁₆ (11)	7 ¹ / ₁₆ (11)	11 ¹ / ₄ (286)	12 (305)	12 (305)
12	11 ⁷ / ₈ (302)	6	1 (25)	1 ¹ / ₂ (38)	7 ¹ / ₁₆ (11)	7 ¹ / ₁₆ (11)	13 ¹ / ₄ (337)	14 (356)	15 (381)
14	13 ⁷ / ₈ (353)	8	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)	7 ¹ / ₁₆ (11)	7 ¹ / ₁₆ (11)	15 ³ / ₄ (400)	17 (432)	17 (432)
16	15 ⁷ / ₈ (403)	8	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)	7 ¹ / ₁₆ (11)	1 ¹ / ₂ (13)	17 ³ / ₄ (451)	19 (483)	19 (483)
18	17 ⁷ / ₈ (454)	8	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)	7 ¹ / ₁₆ (11)	1 ¹ / ₂ (13)	19 ³ / ₄ (502)	21 (533)	21 (533)
20	19 ⁷ / ₈ (505)	10	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)	7 ¹ / ₁₆ (11)	1 ¹ / ₂ (13)	21 ³ / ₄ (552)	23 (584)	23 (584)
22	21 ⁷ / ₈ (556)	10	1 ¹ / ₂ (38)	1 ¹ / ₂ (38)	7 ¹ / ₁₆ (11)	1 ¹ / ₂ (13)	19 ³ / ₄ (603)	25 (635)	25 (635)

ALL METRIC DIMENSIONS () ARE SOFT CONVERTED. IMPERIAL DIMENSIONS ARE CONVERTED TO METRIC AND ROUNDED TO THE NEAREST MILLIMETER.

Figure 2. Laboratory Room Airflow Station with Orifice Ring Flow Sensor.



NOTES: (AB TYPE)

- 22 GA. GALVANIZED STEEL.
- RIVETED DUCT CONSTRUCTION, SEALED WITH SILICONE.
- MULTI-POINT AIR FLOW SENSOR.

OPTIONS:

- CONTROLS ENCLOSURE 18 GA. ZINC COATED.
- CONTROLS FACTORY MOUNTED

END CONFIGURATIONS AS SHOWN:

- SLIP - SLIP
- FLANGE - FLANGE (NOT AVAILABLE ON GALV. PRODUCT)

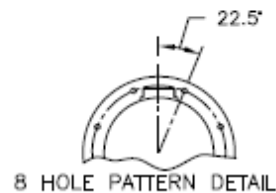
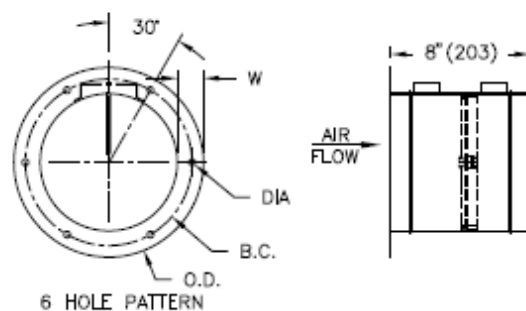
OPTIONAL END CONFIGURATION

- SLIP-SLIP



OPTIONAL END CONFIGURATION

- FLANGE-FLANGE



IMPERIAL/(METRIC)

NOM SIZE	D (mm)	# OF HOLES	DIA (mm)	B.C. (mm)	O.D. (mm)	W (mm)
6	5 ⁷ / ₈ (149)	6	7 ¹ / ₁₆ (11)	7 ¹ / ₄ (184)	8 (203)	1 (25)
8	7 ⁷ / ₈ (200)	6	7 ¹ / ₁₆ (11)	9 ¹ / ₄ (239)	10 (254)	1 (25)
10	9 ⁷ / ₈ (251)	6	7 ¹ / ₁₆ (11)	11 ¹ / ₄ (286)	12 (305)	1 (25)
12	11 ⁷ / ₈ (302)	6	7 ¹ / ₁₆ (11)	13 ³ / ₄ (337)	15 (381)	1 ¹ / ₂ (38)
14	13 ⁷ / ₈ (353)	8	7 ¹ / ₁₆ (11)	15 ³ / ₄ (400)	17 (432)	1 ¹ / ₂ (38)
16	15 ⁷ / ₈ (403)	8	1 ¹ / ₂ (13)	17 ³ / ₄ (451)	19 (483)	1 ¹ / ₂ (38)

ALL METRIC DIMENSIONS () ARE SOFT CONVERTED. IMPERIAL DIMENSIONS ARE CONVERTED TO METRIC AND ROUNDED TO THE NEAREST MILLIMETER.

Figure 3. Laboratory Room Airflow Station with Multi-Point Sensor

Table 1. Flow Range for Orifice Airflow Sensor.

Flow Range for Sensor "A"							
Inlet Size	Maximum flow @ 1.0" dp		Minimum flow @ 0.02" dp		Flow Sensor Inlet Area		Flow Coefficient
	CFM.	Lps	CFM	Lps	SQ.FT	M2	
4	252	119	36	17	0.087	0.008	0.721
6	627	296	89	42	0.196	0.018	0.797
8	1049	495	148	70	0.349	0.032	0.750
10	1686	796	238	112	0.545	0.051	0.772
12	2394	1130	339	160	0.785	0.073	0.761
14	3254	1536	460	217	1.069	0.099	0.760
16	4429	2090	626	295	1.396	0.130	0.792
18	5591	2639	791	373	1.767	0.164	0.741
20	6981	3295	818	386	2.181	0.203	0.729
22	8447	3987	990	467	2.640	0.245	0.727

Table 2. Flow Range for Multi-Point Airflow Sensor.

Note: The multi-point flow sensor option is not available for size 4, 11, 18, 20, and 22 units.

Flow Range for Sensor "B"							
Inlet Size	Maximum flow @ 1.0" dp		Minimum flow @ 0.02" dp		Flow Sensor Inlet Area		Flow Coefficient
	CFM.	Lps	CFM	Lps	SQ.FT	M2	
6	468	221	66	31	0.196	0.018	0.596
8	923	436	126	59	0.349	0.032	0.660
10	1487	702	210	99	0.545	0.051	0.681
12	2141	1010	303	143	0.785	0.073	0.681
14	3045	1437	431	203	1.069	0.099	0.711
16	4074	1923	576	272	1.396	0.130	0.729

Table 3. Minimum Pressure Drop at Listed Airflow.

Terminal Size	Airflow	Pressure Drop	Terminal Size	Airflow	Pressure Drop	
	CFM	In. wg		CFM	In. wg	
4	50	0.021	14	500	0.007	
	100	0.084		750	0.015	
	150	0.189		1000	0.027	
	200	0.337		1250	0.042	
	250	0.526		1500	0.060	
6	100	0.011		2000	0.107	
	150	0.024		2500	0.167	
	200	0.043		3000	0.241	
	250	0.068		16	600	—
	300	0.098			1000	0.013
	350	0.133	1250		0.021	
	400	0.173	1500		0.030	
	450	0.219	2000		0.053	
500	0.271	2500	0.083			
8	200	0.014	3000		0.120	
	300	0.032	3500	0.163		
	400	0.056	4250	0.240		
	500	0.088	18	700	—	
	600	0.126		1000	0.007	
	700	0.172		2000	0.029	
	800	0.224		2500	0.045	
	900	0.284		3000	0.065	
	1000	0.350		3500	0.089	
10	300	0.008		4000	0.116	
	400	0.015		5000	0.182	
	600	0.033	20	1000	0.005	
	800	0.059		2000	0.021	
	1000	0.092		3000	0.047	
	1200	0.132		3500	0.064	
	1500	0.207		4000	0.083	
	1650	0.250		4500	0.105	
12	400	0.009		5000	0.130	
	500	0.014		6000	0.187	
	750	0.031	22	1500	0.007	
	1000	0.054		2000	0.012	
	1250	0.085		3000	0.027	
	1750	0.167		4000	0.047	
	2000	0.218		5000	0.074	
	2500	0.340		6000	0.107	
		7000		0.145		

Ordering Information

Part numbers are created based on the selections you choose. There are no spaces or dashes in the SAP part number.

NOTE: Not all combinations or configurations will yield a valid part number in SAP.

Sample: LGFE851R14BAS

Model Number	Control Package	Mounting Side	Inlet (Duct) Size	Duct and Sensor Type	End Fitting
LGF	E851	R	14	BA	S

1. Begin with the Model Number, **LGF**.
2. Select a Control Package number, and append it to the Model Number:

Control Package	...includes the following Control Components:			
	Actuator Part Number	Transducer Part Number	Flow Transmitter Part Number	Controller Part Number
E000	—	—	—	—
E500	—	—	550-818A	—
E851	—	—	590-780	—
Control Components Legend				
Part Number	Description	Part Number	Description	
550-818A	OAM - Offboard air Module used in LCM-OAVS controllers	590-780	Differential Pressure Transmitter, 1" WC, 4-20 mA, 0.4% accuracy	

3. Choose **R** for the Mounting Side configuration, and append the letter to the part number:
R = Right side. (The **R** is required.)
4. Choose the Inlet size (the size of the duct), and append the 2-digit number to the part number.

Inlet Size (in inches)	2-digit Number	Inlet Size (in inches)	2-digit number	Inlet Size (in inches)	2-digit Number	Inlet Size (in inches)	2-digit number
4	04	10	10	16	16	22	22
6	06	12	12	18	18	—	—
8	08	14	14	20	20	—	—

5. Choose the Duct type and the Sensor, and append the letters to the part number:

Duct and Sensor Type	
AA	Galvanized steel duct with Orifice sensor.
AB	Galvanized steel duct with multi-point sensor. (Applies to sizes 6, 8, 10, 12, 14 & 16 only.)
BA	Stainless steel duct with orifice sensor.

6. Select the End fitting, and append that letter to the part number:

S = Slip

F = Flange

After completing your selections, you should have an SAP orderable part number that looks similar to the example given here:

SAMPLE Part Number: LGFE851R14BAS

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