



Johnson
Controls

NEW!

DESCRIPTION

The **Johnson Controls RA-2000 Series** airflow measuring system is equipped with a one-piece ABS plastic flow sensing cross with a 16 inch (406 mm) diameter or less, and a two-piece anodized aluminum extrusion sensing tube with an 18 inch (457 mm) diameter and larger.

The **RA-2000 Airflow Measuring** system is designed to meet industry requirements for a round air measuring system with low leakage and east installation to spiral ductwork. The design of the **RA-2000** system incorporates a low leakage control damper with a neoprene seal placed between two round blades. The airfoil sensing tubes sample the air pressure across the full diameter of the duct.

FEATURES

- *Formed shroud inserts easily into round ductwork*
- *One-piece construction increases rigidity and strength*
- *Optional factory-installed actuator reduces installation and commissioning time*
- *Airfoil shaped flow sensing blades 18 inch (457 mm) diameter and larger or ABS plastic flow cross on all other units limit pressure drop through the damper*
- *DMPR-RA001 pressure transmitter is included*



RA-2000

6

FLOW

SPECIFICATIONS

Leakage - Fully Closed 0.15 scfm maximum per inch of blade circumference at 4-inch w.g.

Operating Torque
8 in diameter at
2 in w.g. 52 lb./in.
16 in diameter at
2 in w.g. 84 lb./in
24 in diameter at
2 in w.g. 116 lb./in

Pressure Drop
(in. w.g.) - Fully Open 1,000 cfm
 2,000 cfm
 3,000 cfm
 4,000cfm
12 in. 0.017
 0.06
 0.15
 0.25
24 in. 0.005
 0.010
 0.010
 0.010

Velocity and Pressure 400 to 4,000 fpm

Operating Temperature

Standard Operating Conditions

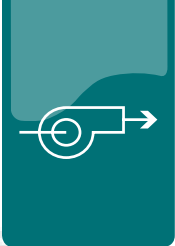
Actuator -40° to 200°F (-40°to 93°C)
Weight -4° to 122°F (-20° to 50°C)
Damper
Actuator 5 lb/sq. ft. (2.7 kg/sq. ft.)
Warranty 2.9 lb (1.6 kg) per actuator
 1 year

OPERATING TORQUE

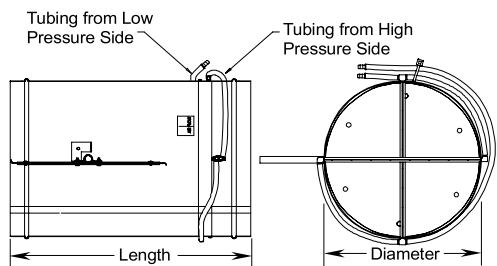
8 in diameter at 2 in W.G.	52 lb in
16 in diameter at 2 in W.G.	84 lb in
24 in diameter at 2 in W.G.	116 lb in

Pressure Drop (IN W.G.) - Fully Open

	1,000 CFM	2,000 CFM	3,000 CFM	4,000 CFM
12 in	0.017	0.060	0.150	0.250
24 in	0.005	0.010	0.010	0.010



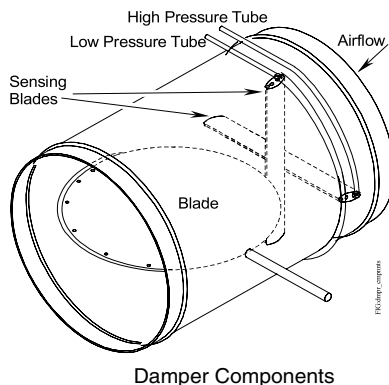
DIMENSIONS



Damper Dimensions

Diameter, in. (mm)	Length, in. (mm)
6 to 10 (152 to 254)	17 (432)
12 to 20 (305 to 508)	27 (686)
Over 20 (508)	31 (787)

Actual size is 1/8-inch (3 mm) less than nominal opening diameter



$$\text{Velocity (FPM)} = K_a \sqrt{\Delta P''WC}$$

Flow Calculations (CFM)

$$\text{CFM} = (\text{Area} \times K_a) \times \sqrt{\text{PAMS}}$$

$$\text{Area} = \pi R^2 / 144$$

$$\text{PAMS} = \text{Velocity Pressure Inches Water Gage} = ''WC$$

Ka Factors by Inlet Size

Inlet Size, in. (mm)	Ka
6" (152mm)	2282
7" (178mm)	2496
8" (203mm)	2590
9" (229mm)	2642
10" (254mm)	2633
12" (305mm)	2408
14" (356mm)	2820
16" (406mm)	2749
18" (457mm)	3450
20" (508mm)	3450
22" (559mm)	3050
24" (610mm)	3200

ORDERING INFORMATION

MODEL	DESCRIPTION
RAG	Airflow Measuring System
	DIAMETER OF DAMPER
dd	Choose either 06 to 10 inches (In 1 inch increments) or 10 to 24 inches (2 inch increments)
	ACTUATOR
W	With actuator, includes M9208-GGA-3 actuator (up to 12 inches) or M9220-GGA-1 actuator (14 inches and larger)
X	No actuator, no differential pressure transmitter

RAG - **14** - **X** **Example: RAG-14-X** Airflow measuring system, 14 inches, no actuator