

ROTATING VANE ANEMOMETER  
ALNOR® MODEL RVA801  
AIRFLOW™ INSTRUMENTS  
MODEL LCA301

OPERATION AND SERVICE MANUAL

P/N AFL9021485, REV C  
NOVEMBER 2014



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### **Service Policy**

Knowing that inoperative or defective instruments are as detrimental to TSI as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call Customer Service department at +44 (0) 149 4 459200 (UK), (800) 874-2811 (USA), or (1) 651-490-2811 (International).

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## **SECTION 1**

### **General Description**

The RVA801/LCA301 is intended for measurement of air velocity and volume flow at return grilles, fume hoods, kitchen exhausts, etc. It features a 180-degree rotating head which functions satisfactorily in the 0° and 180° positions. This allows the LCD display to be viewed from the front of the instrument while the head is oriented with the flow direction.

In addition, the instrument measures the temperature of the air flow.

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## **SECTION 2**

### **Safety**

Observe common sense safety precautions when using the RVA801/LCA301. Exercise care to ensure that the instrument does not interfere with any moving equipment or electrical wiring.

This instrument is not designed for gas mixtures other than air. Use with explosive and/or other dangerous gas mixtures is not recommended and is at the user's own risk.

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## **SECTION 3**

### **About the RVA801/LCA301**

#### **Installing the Battery**

The RVA801/LCA301 requires a 9-volt battery. The battery is not installed when the instrument is shipped. Remove the battery cover by pressing on the two lines and sliding downwards. Connect the battery to the flying lead, insert the battery into the instrument and replace the battery cover.

#### **LCD display**

The instrument will display the velocity, volume or temperature reading as selected.

#### **Auto Shut Off**

The RVA801/LCA301 has an auto shut off feature to help preserve battery life. If no keys are pressed for 3 minutes (5 minutes in temperature mode), the instrument will automatically turn itself off. This function cannot be disabled by the user.

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## SECTION 4

### Detailed Operation

Press the ON\OFF key to turn the RVA801/LCA301 on and off. When the instrument is turned on, it will power up in the mode last used.



#### English/Metric Unit Selection

RVA801/LCA301 instruments can display Metric or Imperial units. To select metric or imperial units, press the Mode key while turning on the

unit. Then press the trigger to select the unit type and press the Mode key again to save your setting.

### **Measuring Air Velocity**

Select velocity using the MODE key if required. In order to take a velocity reading, hold the rotating vane in the airstream noting the flow direction arrow on the instrument head. Keep the vane in the airstream for about five seconds before pressing the trigger key to take a reading. This enables the vane anemometer to reach steady speed and the average reading will be more accurate.

To take a single reading, press the trigger key momentarily. The instrument will display the measured value.

Press and hold the trigger key to take a sweep, or time-averaged, reading. The sweep reading will update approximately every second. Release the trigger key to stop the sweep measurement and display the average value.

### **Measuring Air Volume**

The operation for air volume measuring is the same as air velocity. To calculate air volume, the air velocity **and** area (duct, grille size or Air Cone data) are required. The RVA801/LCA301 rotating vane anemometer allows the user to



enter the area into the instrument and get direct volume flow readings.

To measure air volume, determine the cross-sectional area of the duct or grille for which the volume flow rate is required. If working in metric units, calculations must be in  $m^2$ . If working in Imperial units, calculations must be in  $ft^2$ . Switch the instrument to "Area +" mode and observe the area figure displayed from the memory. If the new area required is larger than the one displayed press the trigger to increase the displayed area to the calculated figure. If the area is less than the figure displayed push the Mode Button to change to "Area -" mode and press the trigger to reduce the displayed area to the calculated figure. When the correct area has been displayed use the Mode key to select the required "Vol" mode.

**Note:** If the area is entered incorrectly, the volume flow rate reading will also be incorrect. The last area value will be retained in the memory even when the instrument is switched off.

### **Low Battery Indication**

When the "**BAT**" icon appears, the RVA801/LCA301 has about 60 minutes of battery life remaining. If the battery is not replaced, measurement accuracy will decrease.

## Serial Number Display

The instrument's serial number can be verified by holding both the trigger and mode key when switching the unit on.

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# SECTION 5

## Care, Maintenance and Service

Please return the Product Registration Card immediately. This allows us to send service reminders, special offers, and important information about your product.

- Remove batteries from instrument if not used for an extended period of time.
- Do **not** bend or touch blades; accuracy will be affected.
- Do **not** immerse in liquids.
- Do **not** drop the instrument.
- Use carrying case for storage, transport, and protection from dust.
- Use a clean damp cloth to wipe the instrument case. Do **not** wipe the blades.

## Service Return Process

Return the RVA801/LCA301 for service in case the instrument was dropped, blades were

deformed, or liquid spilled on the instrument, particularly the blades.

Before sending your instrument for calibration or repair, obtain a Return Material Authorization (RMA) number by visiting our website at <http://rma.tsi.com> or contacting customer service. When obtaining an RMA number, you will also learn the cost of service or calibration and receive shipping instructions.

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## **Appendix A**

### **Volume Flow Rate Measurements Using Air Cones**

If Air Cones are used to measure the volume flow rate, the area entered in the instrument needs to be related to the 100 mm vane diameter.

The correct value to be entered can be found in the Air Cone manual that comes with the cones (see side pocket of the carrying case).



The following sticker can be found on the latest Air Cone offerings:

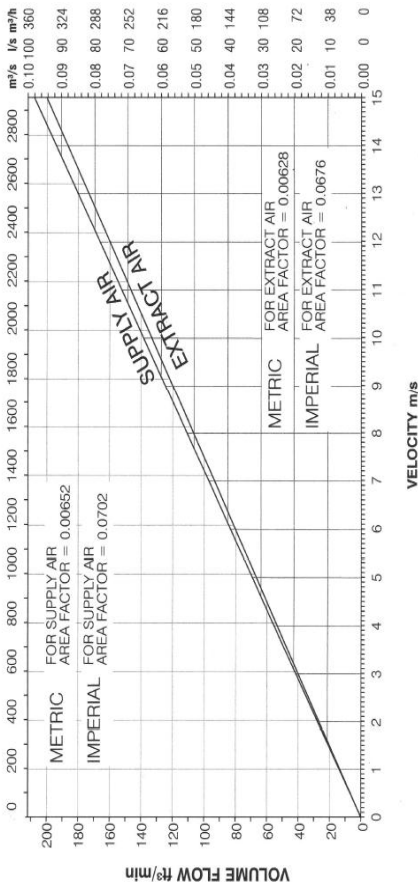
**IMPORTANT:**    **AIR CONE USE**

For accurate flow measurement when using an LCA301/RVA801 you must enter one of the following area factors into the instrument:

	Supply Air	Extract Air
m <sup>3</sup> /s, l/s, m <sup>3</sup> /h	0.00652	0.00628
cfm	0.0702	0.0676

# **CALIBRATION CHART USING RECTANGULAR AND CIRCULAR CONES**

VELOCITY ft/min



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# MODEL RVA801/LCA301

## SPECIFICATIONS

(subject to change without notice)

### Measurement Range

Velocity	50 to 6000 fpm	0.25 to 30 m/s
Temperature	40 to 113 °F	5 to 45 °C
Volumetric	1-9999000 cfm	1 - 999999 l/s
Flow Rate		1 - 999999 m <sup>3</sup> /h
		0.01 – 3000 m <sup>3</sup> /s
Area Input	0.043 - 900 ft <sup>2</sup>	0.00399 - 90 m <sup>2</sup>

*Actual range is a function of velocity and area input.*

### Display Resolution

Velocity	1 fpm	0.01 m/s
Temperature	1 °F	0.1 °C

### Accuracy

Velocity	±1% reading ±4 fpm	±1% reading ±0.02 m/s
Temperature	±2 °F	±1 °C

<b>Storage Temperature</b>	-4 to 140 °F	-20 to 60 °C
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### Operating Temperature

<b>Operating Temperature</b>	40 to 113 °F	5 to 45 °C
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<b>Power Source</b>	9-volt battery
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<b>Battery Life</b>	Approximately 40 hours continuous use
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<b>Dimensions (LWD)</b>	11 in. × 4.5 in. × 2.6 in.	280 mm × 112 mm × 65 mm
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<b>Weight (excluding battery)</b>	10 oz.	275 g
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