www.industrial-needs.com

PCE Instruments UK Ltd

Units 12/13 Southpoint
Business Park
Ensign Way, Southhampton
Hampshire
United Kingdom, SO31 4RF

Phone +44(0) 2380 98703 0
Fax +44(0) 2380 98703 9
info@industrial-needs.com
www.industrial-needs.com

Air Flow Meter
LCA 301

MANUAL

Version 1.0
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Limitations of Warranty and Liability (effective June 2011)

Please read the following instruction manual before operating with the device. Damages caused by disregard of the instructions written in this manual, are excluded from any warranty or liability.

Manufacturer warrants the goods sold here, assumed the operation and service is performed as described in the user manual, the device shall be free from defects in workmanship and material for twenty-four (24) months, or the length of time specified in the operator's manual, starting from the date of delivery to customer. This warranty period is inclusive of any statutory warranty. This limited warranty is subject to the following exclusions:
a. Hot-wire or hot-film sensors used with research anemometers, and certain other components when indicated in specifications, are warranted for 90 days from the date of shipment.
b. Parts repaired or replaced as a result of repair services are warranted to be free from defects in workmanship and material, under normal use, for 90 days from the date of shipment.
c. Distributor does not provide any warranty on goods manufactured by others or on any fuses, batteries or other commercial materials. Only the original manufacturer's warranty applies.
d. Unless specifically authorized in a separate writing by distributor, he makes no warranty respective to, and shall have no liability in connection with goods, which are incorporated into other products or equipment, or which are modified by any person other than distributor.
The foregoing is IN LIEU OF all other warranties and is subject to the LIMITATIONS stated herein. **NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE**. TO THE EXTENT PERMITTED BY LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF DISTRIBUTOR'S LIABILITY FOR ANY AND ALL LOSSES, INJURIES, OR DAMAGES CONCERNING THE GOODS (INCLUDING CLAIMS BASED ON CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) SHALL RESULT IN THE RETURN OF GOODS TO DISTRIBUTOR AND THE REFUND OF THE PURCHASE PRICE, FOR THE REPAIR OR REPLACEMENT OF THE GOODS. IN NO EVENT SHALL DISTRIBUTOR BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES. DISTRIBUTOR SHALL NOT BE RESPONSIBLE FOR INSTALLATION, DISMANTLING OR REINSTALLATION COSTS OR CHARGES. No Action, regardless of form, may be brought against distributor more than 12 months after a cause of action has accured. The goods returned under warranty to distributor shall be at customer's risk of loss, and will be returned to customer, if returned at all, at distributor's risk of loss. Customer and all users are deemed to have accepted this LIMITATION OF WARRANTY AND LIABILITY, which contains the complete and exclusive limited warranty of distributor. This LIMITATION OF WARRANTY AND LIABILITY may not be amended, modified or its terms waved, except by writing signed by an authority representing distributor.

Service Policy
Knowing that inoperative or defective instruments are as detrimental to the manufacturer 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 our technicians and engineers.

Please contact PCE Intruments for any further information!

1. Indtroduction

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 best 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 accordingly to the flow direction. In addition, the instrument measures the temperature of the air flow.

2. Safety

Observe common sense safety precautions when using the RVA801/LCA301. Operate carefully 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 operator's own risk.

3. General Description

3.1 Installing the Battery

The RVA801/LCA301 requires a 9-Volt battery. The battery is not installed at the time of the shipment. 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.

3.2 LCD display

The instrument will indicate the velocity, volume or temperature reading by selection.

3.3 Auto Shutdown

The RVA801/LCA301 has an auto shutdown featured 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.

4. Detailed Description

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

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

4.2 Measuring Air Velocity

Select velocity using the MODE key if required. In order to perform a velocity measurement, 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 a 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 continuous measurement, or time-averaged measurement. The sweep indication will update approximately every second. Release the trigger key to stop the sweep measurement and display the average value.

4.3 Measuring Air Volume

The procedure for air volume measuring is the same as air velocity. To calculate the air volume, the air velocity and area (duct, grille size or Air Cone data) are required. The RVA801/LCA301 air velocity meter allows the user to feed-in the area manually into the instrument and get immediately volume flow values. 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 value displayed from precious feedings. If the new area, that is measured, 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.

4.4 Low battery indication

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

4.5 Serial Number

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

5. Care, Maintenance and Service

Please return the Product Registration Card immediately to the manufacturer. This allows him 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.

5.1 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 the manufacturer’s website or contacting customer service. When obtaining an RMA number, you will also learn the fees for service or calibration and receive shipping instructions.

6. Specifications

Measurement Range:

• Velocity	50 to 6000 fpm	0.25 to 30 m/s
• Temperature	32 to 140 °F	0 to 60 °C
• Volumetric	1-9999000 cfm	1 - 999999 l/s
• Flow Rate	1 - 999999 m^3/h	0.01 – 3000 m^3/s
• Area Input	0.043 - 900 ft^2	0.00399 - 90 m^2

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

General Specifications

Storage Temperature	14 to 140 °F	-10 to 60 °C
Operating Temperature	32 to 140 °F	0 to 60 °C
Power Source	9-Volt battery	
Battery Life	Approximately 40 hours continuous use	
Dimensions (LxWxD)	11 in. × 4.5 in. ×2.6 in.	280 mm × 112mm × 65 mm
Weight (excluding battery)	10 oz.	275 g

7. Disposal

Batteries may not be put in the household waste. They have to be given in the set up collection points.

To follow the WEEE guidelines (Waste of Electrical and Electronic Equipment) we take our devices and either recycle them or give them to a recycling company.

NOTE: "This instrument doesn't have ATEX protection, so it should not be used in potentially explosive atmospheres (powder, flammable gases)."

Please contact PCE Instruments if you have any questions concerning our products, service etc.

Here you will find an overview of our measuring devices: http://www.industrial-needs.com/measuring-instruments.htm
Here you will find an overview of our scales and balances: http://www.industrial-needs.com/balances.htm
Here you will find an overview of our laboratory equipment: http://www.industrial-needs.com/laboratory-equipment.htm
Here you will find an overview of our control systems: http://www.industrial-needs.com/control-systems.htm

WEEE.-Reg. –Nr.: DE69278128

APPENDIX A

Volume Flow Rate Measurements Using Air Cones

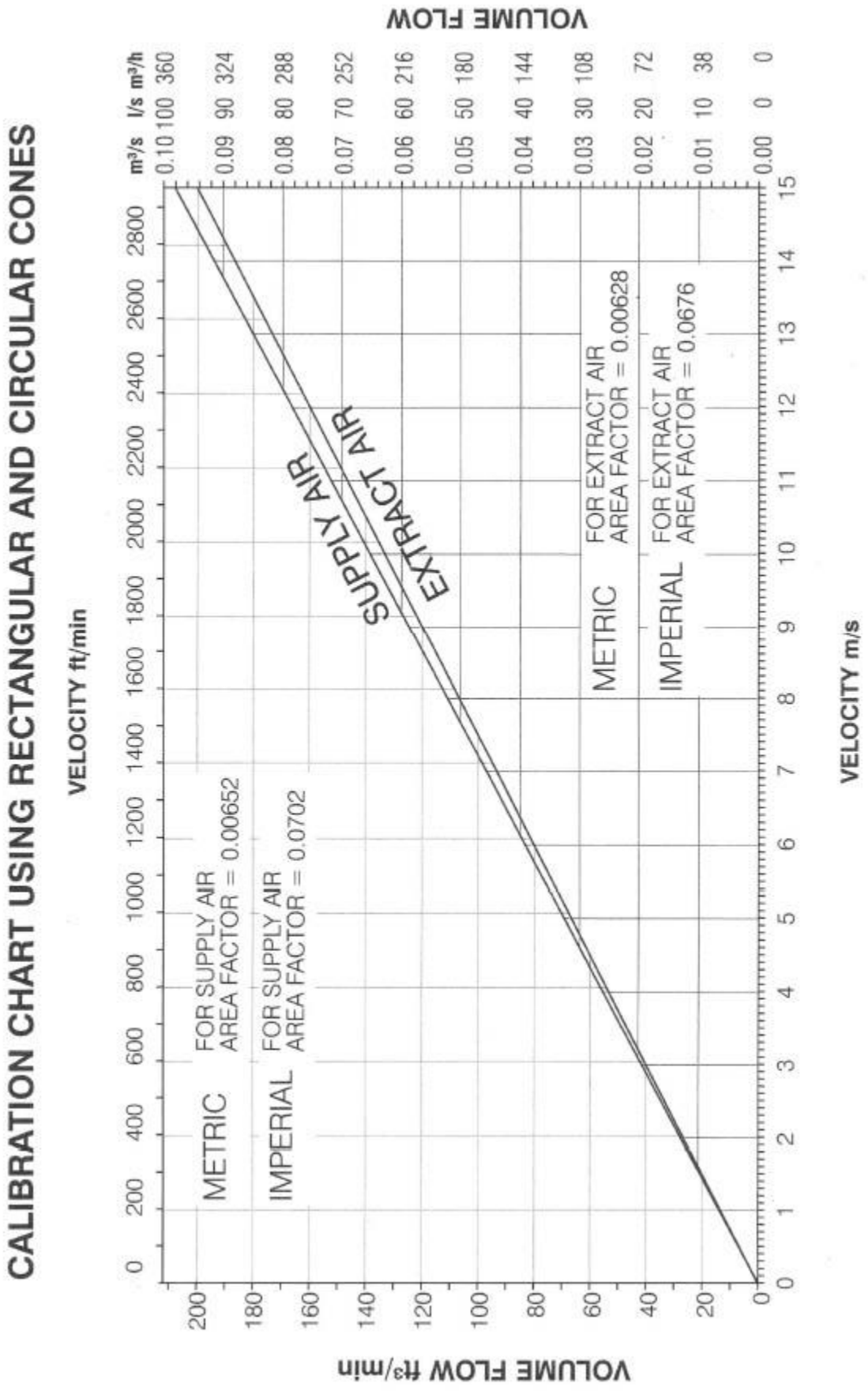
If Air Cones are used to measure the volume flow rate, the area entered in the instrument needs to be set in relation to the 100 mm vane diameter. The correct value to be entered can be found in the Air Cone manual that comes with the cones
(see side pocket of the carrying case).

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

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
$m^3/s, l/s, m^3/h$	0.00652	0.00628
cfm	0.0702	0.0676


CALIBRATION CHART USING RECTANGULAR AND CIRCULAR CONES
VELOCITY ft/min
0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800
m³/s l/s m³/h
0.10 100 360
0.09 90 324
0.08 80 288
0.07 70 252
0.06 60 216
0.05 50 180
0.04 40 144
0.03 30 108
0.02 20 72
0.01 10 38
0.00 0 0
VOLUME FLOW
METRIC FOR SUPPLY AIR AREA FACTOR = 0.00652
IMPERIAL FOR SUPPLY AIR AREA FACTOR = 0.0702
SUPPLY AIR
EXTRACT AIR
METRIC FOR EXTRACT AIR AREA FACTOR = 0.00628
IMPERIAL FOR EXTRACT AIR AREA FACTOR = 0.0676
VOLUME FLOW ft³/min
200 180 160 140 120 100 80 60 40 20 0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
VELOCITY m/s