

Rotating Vane Anemometer

Alnor® Model RVA801
AIRFLOW™ Model LCA301

Operation and Service Manual



START SEEING THE BENEFITS OF REGISTERING TODAY!

Thank you for your TSI instrument purchase. Occasionally, TSI releases information on software updates, product enhancements and new products. By registering your instrument, TSI will be able to send this important information to you.

<http://register.tsi.com>

As part of the registration process, you will be asked for your comments on TSI products and services. TSI's customer feedback program gives customers like you a way to tell us how we are doing.



UNDERSTANDING, ACCELERATED

TSI Incorporated - Visit our website www.tsi.com for more information.

USA	Tel: +1 800 874 2811	India	Tel: +91 80 67877200
UK	Tel: +44 149 4 459200	China	Tel: +86 10 8251 6588
France	Tel: +33 491 11 87 64	Singapore	Tel: +65 6595 6388
Germany	Tel: +49 241 523030		

P/N 2090174 Rev G

©2012 TSI Incorporated

Printed in USA.

Copyright©

TSI Incorporated / 2007-2012 / All rights reserved.

Address

TSI Incorporated / 500 Cardigan Road / Shoreview, MN 55126 / USA

Fax No.

(651) 490-3824

LIMITATION OF WARRANTY AND LIABILITY (effective June 2011)

(For country-specific terms and conditions outside of the USA, please visit www.tsi.com.)

Seller warrants the goods sold hereunder, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for **24 months**, or if less, the length of time specified in the operator's manual, from the date of shipment to the customer. This warranty period is inclusive of any statutory warranty. This limited warranty is subject to the following exclusions and exceptions:

- 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. Pumps are warranted for hours of operation as set forth in product or operator's manuals;
- c. 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;
- d. Seller does not provide any warranty on finished goods manufactured by others or on any fuses, batteries or other consumable materials. Only the original manufacturer's warranty applies;
- e. Unless specifically authorized in a separate writing by Seller, Seller makes no warranty with respect 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 Seller.

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. WITH RESPECT TO SELLER'S BREACH OF THE IMPLIED WARRANTY AGAINST INFRINGEMENT, SAID WARRANTY IS LIMITED TO CLAIMS OF DIRECT INFRINGEMENT AND EXCLUDES CLAIMS OF CONTRIBUTORY OR INDUCED INFRINGEMENTS. BUYER'S EXCLUSIVE REMEDY SHALL BE THE RETURN OF THE PURCHASE PRICE DISCOUNTED FOR REASONABLE WEAR AND TEAR OR AT SELLER'S OPTION REPLACEMENT OF THE GOODS WITH NON-INFRINGEMENTS.**

TO THE EXTENT PERMITTED BY LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF SELLER'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 BE THE RETURN OF GOODS TO SELLER AND THE REFUND OF THE PURCHASE PRICE, OR, AT THE OPTION OF SELLER, THE REPAIR OR REPLACEMENT OF THE GOODS. IN THE CASE OF SOFTWARE, SELLER WILL REPAIR OR REPLACE DEFECTIVE SOFTWARE OR IF UNABLE TO DO SO, WILL REFUND THE PURCHASE PRICE OF THE SOFTWARE. IN NO EVENT SHALL SELLER BE LIABLE FOR LOST PROFITS OR ANY SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES. SELLER SHALL NOT BE RESPONSIBLE FOR INSTALLATION, DISMANTLING OR REINSTALLATION COSTS OR CHARGES. No Action, regardless of form, may be brought against Seller more than 12 months after a cause of action has accrued. The goods returned under warranty to Seller's factory shall be at Buyer's risk of loss, and will be returned, if at all, at Seller's risk of loss.

Buyer and all users are deemed to have accepted this LIMITATION OF WARRANTY AND LIABILITY, which contains the complete and exclusive limited warranty of Seller. This LIMITATION OF WARRANTY AND LIABILITY may not be amended, modified or its terms waived, except by writing signed by an Officer of Seller.

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).

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.

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.

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.

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.

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.

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.

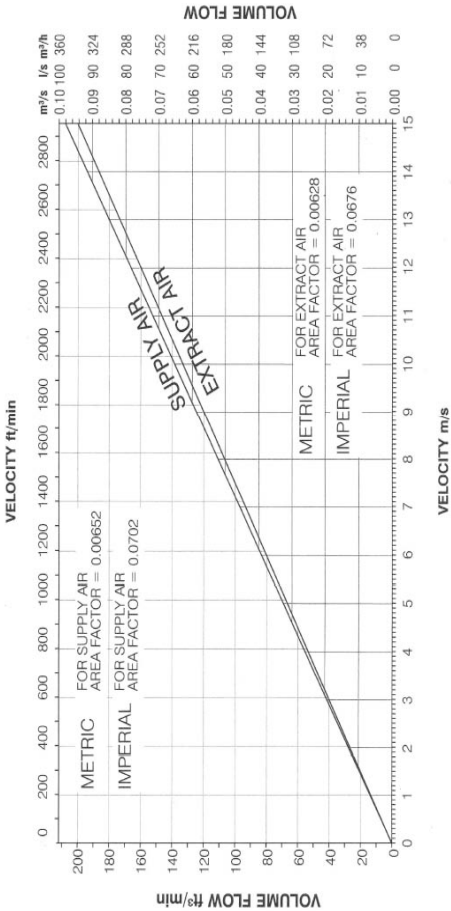
The correct value to be entered can be found in the Air Cone manual that comes with the cones (see side pocket of the carrying case).



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
m³/s, l/s, m³/h	0.00652	0.00628
cfm	0.0702	0.0676

CALIBRATION CHART USING RECTANGULAR AND CIRCULAR CONES



(This page intentionally left blank)

MODEL RVA801/LCA301

SPECIFICATIONS

(subject to change without notice)

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

Storage Temperature 14 to 140 °F -10 to 60 °C

Operating Temperature

Operating Temperature 32 to 140 °F 0 to 60 °C

Power Source

Power Source 9-volt battery

Battery Life Approximately 40 hours continuous use

Dimensions (LWD) 11 in. × 4.5 in. × 2.6 in. 280 mm × 112 mm × 65 mm

Weight 10 oz. 275 g
(excluding battery)



TSI Incorporated
500 Cardigan Road
Shoreview, MN 55126 USA
Toll Free: (800) 874-2811
Tel: (651) 490-2811
Fax: (651) 490-3824

E-mail: customerservice@alnor.com
Web: www.alnor.com



TSI Instruments Ltd.
Stirling Road
Cressex Business Park
High Wycombe
Bucks
HP12 3ST United Kingdom
Tel: +44 (0) 149 4 459200
Fax: +44 (0) 149 4 459700

E-mail: info@airflowinstruments.co.uk
Web: www.airflowinstruments.co.uk

France Tel: +33 491 95 21 90
Germany Tel: +49 241 523030

E-mail: tsifrance@tsi.com
E-mail: tsigmbh@tsi.com

Website: www.tsiinc.fr
Website: www.tsiinc.de

Quality Assured to ISO 9001:2008