

# Indoor Air Quality Meter

Alnor® Model CF910  
AIRFLOW™ Model IAQ910

Operation and Service Manual



**Copyright©**

TSI Incorporated / 2007-2008 / All rights reserved.

**Address**

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

**Fax No.**

(651) 490-3824

**LIMITATION OF WARRANTY AND LIABILITY (effective July 2000)**

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 twenty-four (24) months, or 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:

- 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. 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.
- d. 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.**

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 NO EVENT SHALL SELLER BE LIABLE FOR 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).

# CONTENTS

<b>CHAPTER 1 UNPACKING AND PARTS IDENTIFICATION .....</b>	<b>1</b>
<b>CHAPTER 2 SETTING-UP .....</b>	<b>3</b>
Supplying Power to the Alnor CF910/AIRFLOW IAQ910 .....	3
Installing the Batteries .....	3
Using the Integral Probe.....	3
<b>CHAPTER 3 OPERATION .....</b>	<b>5</b>
Keypad Functions .....	5
<b>CHAPTER 4 MAINTENANCE.....</b>	<b>7</b>
Recalibration.....	7
Cases.....	7
Storage .....	7
<b>CHAPTER 5 TROUBLESHOOTING.....</b>	<b>9</b>
<b>APPENDIX A SPECIFICATIONS.....</b>	<b>11</b>



# Chapter 1

## **Unpacking and Parts Identification**

---

Carefully unpack the instrument and accessories from the shipping container. Check the individual parts against the list of components below. If anything is missing or damaged, notify TSI immediately.

1. Carrying case
2. Instrument
3. Calibration collar



## Chapter 2

### Setting-up

---

#### **Supplying Power to the Alnor CF910/AIRFLOW IAQ910**

The Alnor CF910/AIRFLOW IAQ910 is powered with four size AA batteries.

#### **Installing the Batteries**

Insert four AA batteries as indicated by the diagram located on the inside of the battery compartment. The Alnor CF910/AIRFLOW IAQ910 is designed to operate with either alkaline or NiMH rechargeable batteries, although it will not recharge NiMH batteries. Battery life will be shorter if NiMH batteries are used. Carbon-zinc batteries are not recommended because of the danger of battery acid leakage.

#### **Using the Integral Probe**

The sensing probe relies on the diffusion of air. For best results, try to keep the sensing probe surrounded by moving air. Do *not* breathe on the probe. Humans exhale CO<sub>2</sub> levels exceeding 10,000 ppm and it may take time for the probe to re-stabilize.





## Chapter 3

### Operation

---

#### Keypad Functions

<b>ON/OFF Key</b>	Press to turn the Alnor CF910/AIRFLOW IAQ910 on and off. During the power up sequence the display will show the following: Model Number, Serial Number, Software Revision, and Last Date Calibrated.
<b>Sample Key</b>	Press and release to start the sample, then press the <b>END</b> key to stop the sample.
<b>Stats Key</b>	Press to view the minimum, maximum and average of the last sample taken.
<b>CAL Key</b>	<p>Press to begin the field-calibration process. To re-calibrate in the field, first connect zero gas to the instrument and open the regulator. Then use the ▲▼ and ENTER keys to select ZERO. The instrument will automatically make zero itself after one minute.</p> <p>After zeroing the sensor, connect span gas to the instrument and open the regulator. Then use the ▲▼ and ENTER keys to select SPAN. The instrument will take one minute to make a reading. Then use the ▲▼ and ENTER keys to adjust the concentration displayed on the instrument to match the concentration on the gas cylinder.</p>



## Chapter 4

### Maintenance

---

The Alnor CF910/AIRFLOW IAQ910 requires very little maintenance to keep it performing well.

#### Recalibration

To maintain a high degree of accuracy in your measurements, we recommend that you return your Alnor CF910/AIRFLOW IAQ910 to TSI for annual recalibration. Please contact one of TSI's offices or your local distributor to make service arrangements and to receive a Return Material Authorization (RMA) number. To fill out an online RMA form, visit TSI's website at <http://service.tsi.com>.

#### U.S. & International

TSI Incorporated  
Alnor Products  
500 Cardigan Road  
Shoreview MN 55126-3996  
Tel: (800) 874-2811  
(651) 490-2811  
Fax: (651) 490-3824

#### UK

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

The Alnor CF910/AIRFLOW IAQ910 can also be recalibrated in the field using the CALIBRATION menu. These field adjustments are intended to make minor changes in calibration to match a user's calibration standards. The field adjustment is NOT intended as a complete calibration capability. For complete, multiple-point calibration and certification, the instrument must be returned to the factory.

#### Cases

If the instrument case or storage case needs cleaning, wipe it off with a soft cloth and isopropyl alcohol or a mild detergent. Never immerse the Alnor CF910/AIRFLOW IAQ910. If the enclosure of the Alnor CF910/AIRFLOW IAQ910, it must be replaced immediately to prevent access to hazardous voltage.

#### Storage

Remove the batteries when storing the unit for more than one month to prevent damage due to battery leakage.



# Chapter 5

## Troubleshooting

---

Table 5-1 lists the symptoms, possible causes, and recommended solutions for common problems encountered with the Alnor CF910/AIRFLOW IAQ910. If your symptom is not listed, or if none of the solutions solves your problem, please contact TSI.

**Table 5-1: Troubleshooting the Alnor CF910/AIRFLOW IAQ910**

<b>Symptom</b>	<b>Possible Causes</b>	<b>Corrective Action</b>
No Display	Unit not turned on	Switch unit on.
	Low or dead batteries	Replace batteries or plug in AC adapter.
	Dirty battery contacts	Clean the battery contacts.
High CO <sub>2</sub> levels	Breathing on probe	Shield probe from breath and allow instrument to re-stabilize.
Instrument Error message appears	Fault in instrument	Factory service required on instrument.

### **WARNING!**

Remove the probe from excessive temperature immediately: excessive heat can damage the sensor. Operating temperature limits can be found in [Appendix A, Specifications](#).



# Appendix A

## Specifications

---

Specifications are subject to change without notice.

### **CO<sub>2</sub>:**

Range: 0 to 5000 ppm  
Accuracy<sup>1</sup>: ±3% of reading or ±50 ppm, whichever is greater  
Resolution: 1 ppm  
Sensor type: Non-Dispersive Infrared (NDIR)

### **Instrument Temperature Range:**

Operating (Electronics): 40 to 113°F (5 to 45°C)  
Storage: -4 to 140°F (-20 to 60°C)

### **Instrument Operating Conditions:**

Altitude up to 4000 meters  
Relative humidity up to 80% RH, non-condensing  
Pollution degree 1 in accordance with IEC 664  
Transient over voltage category II

### **External Meter Dimensions:**

3.3 in. × 9.6 in. × 1.8 in. (8.4 cm × 24.4 cm × 4.4 cm)

### **Meter Weight:**

Weight with batteries: 0.6 lbs (0.27 kg)

### **Meter Display Dimensions:**

Primary display: 4-digit LCD, 0.6 in. (15 mm) digit height  
Secondary display: 3.5-digit LCD, 0.3 in. (8 mm) digit height

### **Power Requirements:**

Four AA-size batteries (included)

<sup>1</sup> At 77°F (25°C). Add uncertainty of ±0.2%/°F (±0.2%/°C) away from calibrated temperature



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

E-mail: [customerservice@alnor.com](mailto:customerservice@alnor.com)  
Web: [www.alnor.com](http://www.alnor.com)



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

E-mail: [info@airflowinstruments.co.uk](mailto:info@airflowinstruments.co.uk)  
Web: [www.airflowinstruments.co.uk](http://www.airflowinstruments.co.uk)

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

E-mail: [tsifrance@tsi.com](mailto:tsifrance@tsi.com)  
E-mail: [tsigmbh@tsi.com](mailto:tsigmbh@tsi.com)

Website: [www.tsiinc.fr](http://www.tsiinc.fr)  
Website: [www.tsiinc.de](http://www.tsiinc.de)

*Quality Assured to ISO 9001:2000*