# AIR VELOCITY METER
# ALNOR® MODEL AVM410
# AIRFLOW™ INSTRUMENTS
# MODEL TA410

OPERATION AND SERVICE MANUAL

P/N 1980575, REV G
NOVEMBER 2020


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Seller warrants the goods, excluding software, sold hereunder, under normal use and service as described in the operator's manual, to 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. This warranty does not cover calibration requirements, and seller warrants only that the instrument or product is properly calibrated at the time of its manufacture. Instruments returned for calibration are not covered by this warranty;

f. This warranty is **VOID** if the instrument is opened by anyone other than a factory authorized service center with the one exception where requirements set forth in the manual allow an operator to replace consumables or perform recommended cleaning;

g. This warranty is **VOID** if the product has been misused, neglected, subjected to accidental or intentional damage, or is not properly installed, maintained, or cleaned according to the requirements of the manual.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.

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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

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# CONTENTS

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® Incorporated immediately.

1. Carrying case
2. Instrument

Chapter 2

# Setting-up

### Supplying Power to the Alnor® AVM410/Airflow™ Instruments TA410

The Alnor® AVM410/Airflow™ Instruments TA410 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® AVM410/ Airflow™ Instruments TA410 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 Telescoping Probe

The telescoping probe contains the velocity and temperature sensors. When using the probe, make sure the sensor window is fully exposed and the orientation dimple is facing upstream.

**NOTE**

For temperature measurements, make sure that at least 3 inches (7.5 cm) of the probe is in the flow to allow the temperature sensor to be in the air stream.

#### Extending the Probe

To extend the probe, hold the handle in one hand while pulling on the probe tip with the other hand. **DO NOT** hold the cable while extending the probe as this prevents the probe from extending.

#### Retracting the Probe

To retract the probe, hold the handle in one hand while pulling gently on the probe cable with the other hand.

Chapter 3

# Operation

**Keypad Functions**

| | |
|---|---|
| **ON/OFF** Key | Press to turn the Alnor® AVM410/Airflow™ Instruments TA410 on and off. During the power up sequence the display will show the following: Model Number, Serial Number, Software Revision, and Last Date Calibrated. |
| **ft/min / m/s** Key | Pressing this key changes the display to read air velocity. |
| **°C / °F** Key | Pressing this key changes the display to read temperature. |
| **Changing Units** | To change units, first put the desired measurement (air velocity or temperature) on the display. Then press and hold the left, unlabelled key for five seconds. Finally, use the ▲▼ and **ENTER** key to select the units. |

Chapter 4

# Maintenance

The Alnor® AVM410/Airflow™ Instruments TA410 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® AVM410/Airflow™ Instruments TA410 to TSI® Incorporated for annual recalibration. Please contact one of TSI's offices or your local distributor to make service arrangements and to receive a "Service Request" number. To fill out an online "Service Request" form, visit TSI's website at

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**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® AVM410/Airflow™ Instruments TA410. If the enclosure of the Alnor® AVM410/Airflow™ Instruments TA410 becomes broken, 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® AVM410/Airflow™ Instruments TA410. If your symptom is not listed, or if none of the solutions solves your problem, please contact TSI® Incorporated.

**Table 5-1: Troubleshooting the Alnor® AVM410/Airflow® Instruments TA410**

| Symptom | Possible Causes | Corrective Action |
|---|---|---|
| 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. |
| Velocity reading fluctuates unstable | Fluctuating flow | Reposition probe in less-turbulent flow |
| Instrument Error message appears | Fault in instrument | Factory service required on instrument. |

| W A R N I N G ! |
|---|
| 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.

**Velocity:**
Range:..... 0 to 4000 ft/min (0 to 20 m/s)
Accuracy[1&2]: ..... ±5% of reading or ±5 ft/min (±0.025 m/s), whichever is greater
Resolution: ..... 1 ft/min (0.01 m/s)

**Temperature:**
Range:..... 0 to 200°F (-18 to 93°C)
Accuracy[3]: ..... ±0.5°F (±0.3°C)
Resolution: ..... 0.1°F (0.1°C)

**Instrument Temperature Range:**
Operating (Electronics): ... 40 to 113°F (5 to 45°C)
Operating (Probe): ..... 0 to 200°F (-18 to 93°C)
Storage:..... -4 to 140°F (-20 to 60°C)

**External Meter Dimensions:**
3.3 in. × 7.0 in. × 1.8 in. (8.4 cm × 17.8 cm × 4.4 cm)

**Meter Weight:**
Weight with batteries:..... 0.6 lbs (0.27 kg)

**Power Requirements:**
Four AA-size batteries (included)

1 Temperature compensated over an air temperature range of 40 to 150°F (5 to 65°C).
2 The accuracy statement of ±5.0% of reading or ±5 ft/min (±0.025 m/s), whichever is greater, begins at 30 ft/min through 4000 ft/min (0.15 m/s through 20 m/s).
3 Accuracy with instrument case at 77°F (25°C), add uncertainty of 0.05°F/°F (0.03°C/°C) for change in instrument temperature.