

AFA5

Differential Pressure Transducer

User Guide

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TecQuipment has taken care to make the contents of this manual accurate and up to date. However, if any errors are found, please let us know so we can rectify the problem.

TecQuipment supplies a Packing Contents List (PCL) with the equipment. Carefully check the contents of the package(s) against the list. If any items are missing or damaged, contact TecQuipment or the local agent.

Symbols used in this manual

NOTE



Important information.

CAUTION



Failure to follow these instructions can damage the unit, other equipment, personal property or the environment.

WARNING



Failure to follow this instruction may cause injury.

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AFA5

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User Guide

Introduction

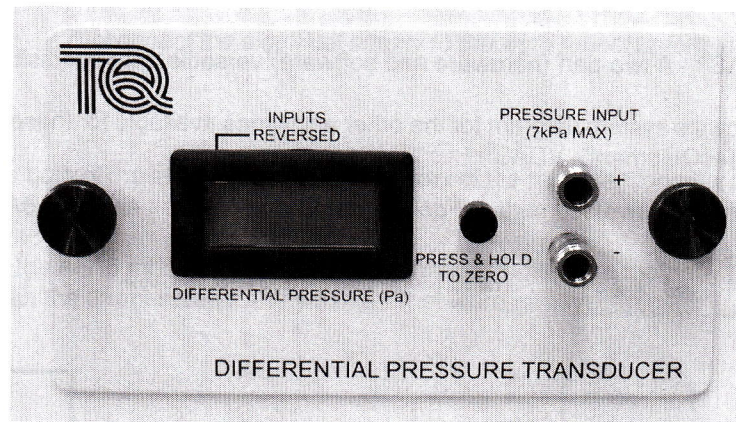


Figure 1 The AFA5 Differential Pressure Transducer



This Product is VDAS[®] Compatible

The AFA5 Differential Pressure Transducer

The AFA5 Module is part of TecEquipment's Modular Wind Tunnel range. It provides a means to measure and display a differential pressure from models, Pitot static tubes and other devices fitted to the AF1300 and AF1450 series wind tunnels.

The module contains a calibrated differential pressure transducer rated at ± 7 kPa. The unit has an integral liquid crystal display that allows the user to read the pressure directly. The unit may be used to measure pressure with respect to atmosphere or as a differential pressure measurement instrument.

The Control and Instrumentation Frame of the TecEquipment Wind Tunnels include slots so that up to two AFA5 modules may be fitted.

The AFA5 can be interfaced to a PC by means of the optional TecEquipment VDAS[®] (Versatile Data Acquisition System), that allows pressure measurements to be displayed, captured, conveniently tabulated, graphed and exported to a spread sheet package for further processing.

When the AFA5 Module is used with TecEquipment's VDAS[®], it gives a great advantage over conventional instruments such as manometers. Many readings can be taken and the user may use a

suitable spreadsheet software package to get a more accurate picture of pressure distributions. These results are usually unstable and difficult to obtain with "spot" readings.

Optional Instrument Modules

- AF1300Z - A basic balance with a single load cell. (Supplied with the AF1300S Bundle)
- AF1300T - A three-component balance
- AFA4 - Angle feedback device for use with the AF1300T
- AFA6 - 32- way pressure display system
- AFA7 - Pitot-static traverse (300 mm)
- VDAS[®] - A two-part (hardware and software) versatile data acquisition system

Figure 2 shows a system diagram for the other ancillaries available for these wind tunnels and how they connect to TecQuipment's VDAS[®].

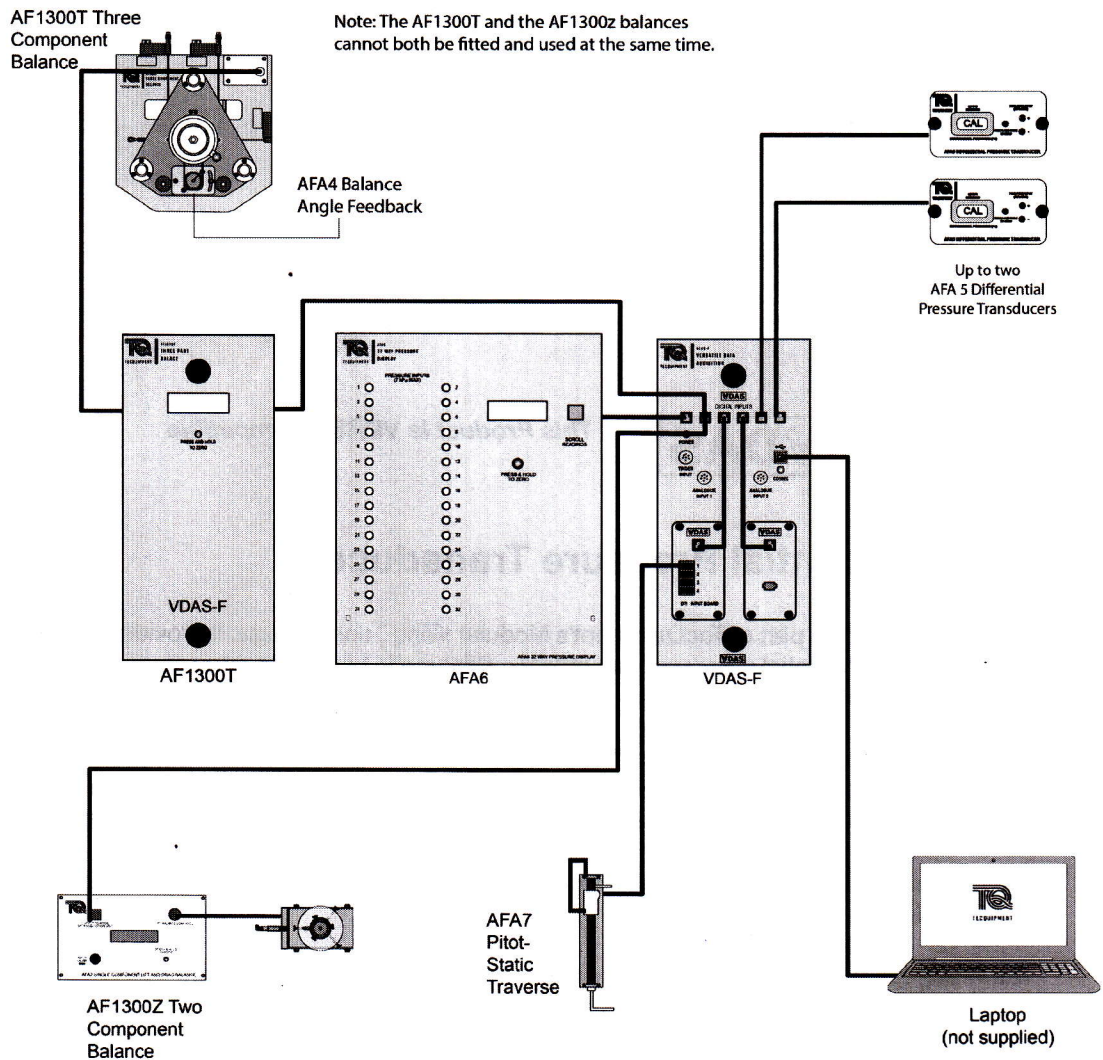


Figure 2 System Diagram/Installation


The terms **left**, **right**, **front** and **rear** of the apparatus refer to the operators' position, facing the unit.

Assembly


Nett Weight: 1 kg

The AFA5 module locates in the main section of the AF1300 or AF1450 Control and Instrumentation Frame. The main section includes the power supply connections for up to two AFA5 modules.

Procedure

WARNING  *Disconnect the electrical supply to the wind tunnel before installing the AFA5.*

1. Remove one or both of the blanking plates on the front of the main section (this depends on whether one or two AFA5 modules have been ordered). Keep the thumbscrews and washers.
2. Carefully slide the AFA5 module (or modules) into place, make sure that they are straight and fix into position with the thumbscrews and washers that were removed in step 1.

NOTE  *If using just one AFA5 module, make sure its instance switch is set to 1. If using two AFA5 modules, set one to instance '1' and fit it in the highest of the positions in the main section of the frame. Set the other module to instance '2'. (See **Identification + Important Note for AF1300 Wind Tunnels** on page 5).*

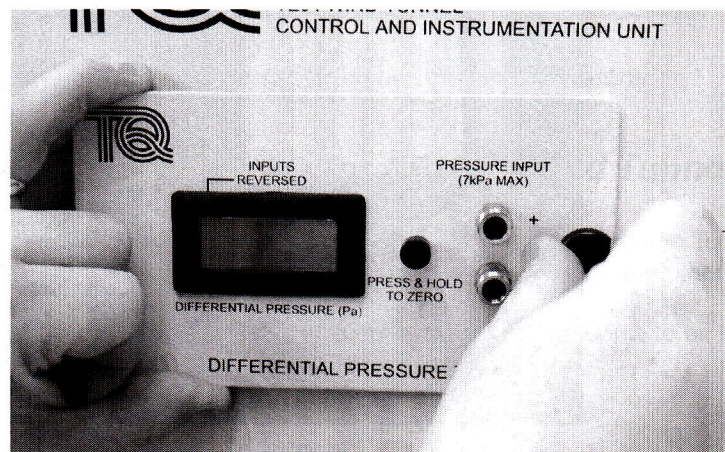


Figure 3 Use the thumbscrews and washers to fix the AFA5 into place.

3. From the rear of the main section two holes can be seen. Reach inside the holes and connect the two power connectors to the AFA5 modules. The power connectors are 4 pin plugs (see Figure 4).

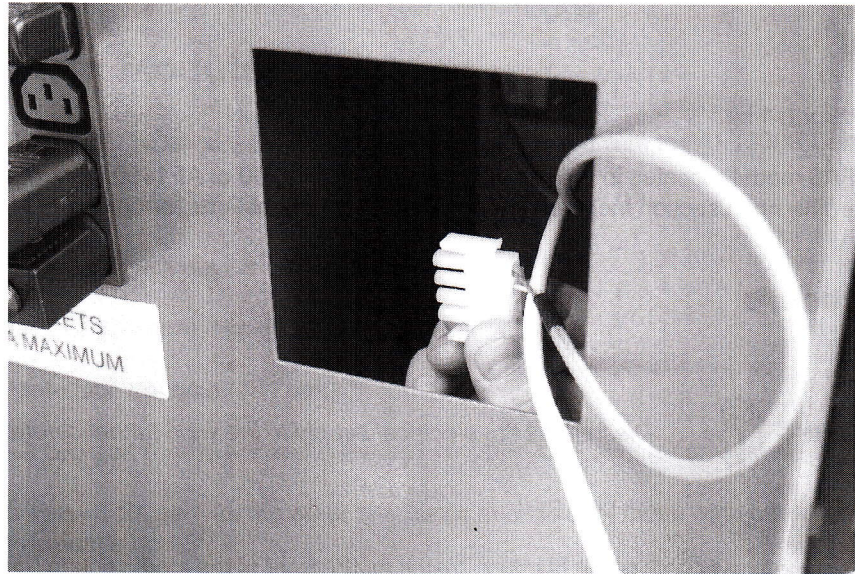


Figure 4 Reach inside the holes at the back of the main section and connect the power connectors

4. If connecting to TecQuipment's optional VDAS[®], use the cables supplied with VDAS[®] and connect them to the sockets marked 'Digital Output' on the AFA5. Refer to the VDAS[®] manual for more details.

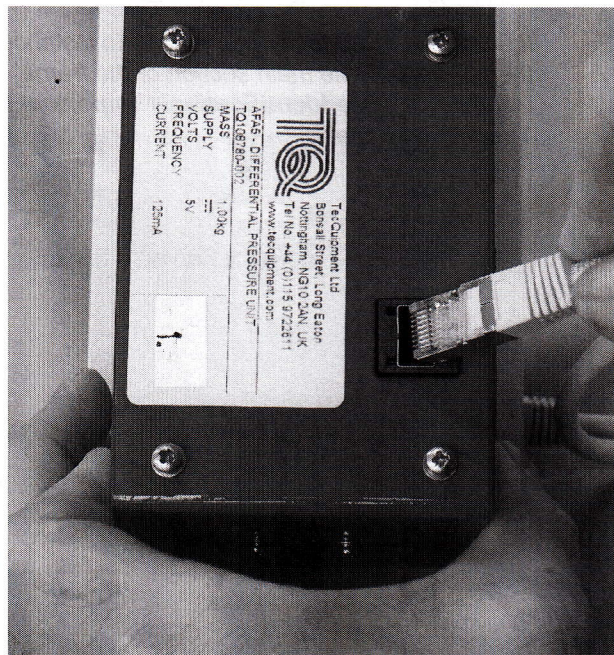


Figure 5 If required, use the lead supplied with VDAS[®] for ADA (AFA5 shown away from the main section for clarity).

5. Two 6 mm adaptors are supplied with the AFA5 module. Fit these adaptors to the ends of the pipework, then insert the adaptors into the pressure sockets of the AFA5 module (see Figure 6).

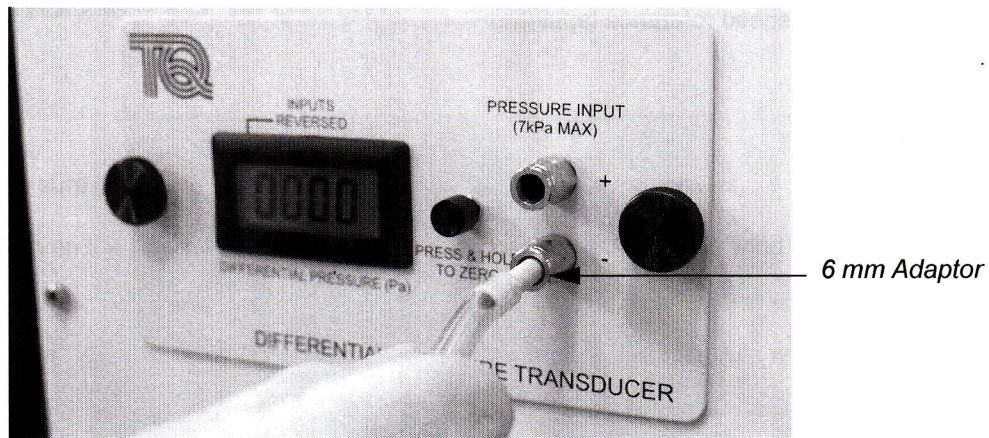


Figure 6 Fit the 6 mm adaptors to the pipework, then insert the adaptors into the sockets

6. To remove the pipe connection, push and hold the collar on the pressure socket, pull the pipe and adaptor from the socket (see Figure 7).

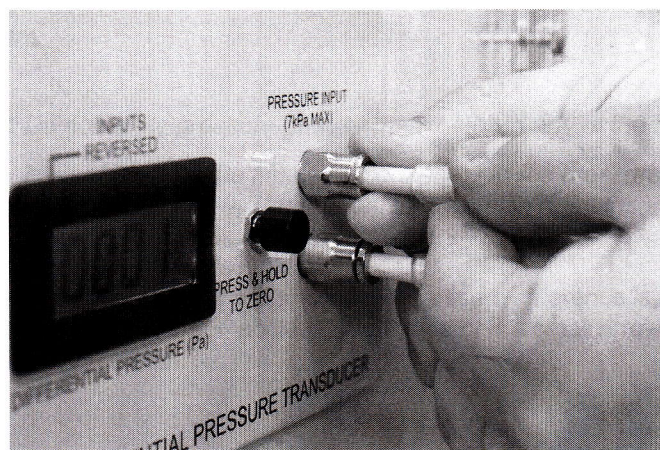


Figure 7 Push and hold the pressure socket to remove the pipe connection

Identification + Important Note for AF1300 Wind Tunnels

If two AFA5 modules have been ordered, they must be set to communicate with TecEquipment's VDAS[®] software separately, so that one module identifies itself as number 1 and the other as number 2.

An 'instance switch' on the side of the unit allows the number of the module to be set (see Figure 8).



Disconnect the power to the module before changing the instance switch position. This helps the internal electronic circuits reset correctly for communication with VDAS[®].

When the AFA5 is used with TecEquipment's VDAS[®], the VDAS[®] software (AF1300 wind tunnels only) uses the signals from the number 1 AFA5 module to calculate the reference wind tunnel air speed. If

using two AFA5 modules, make sure that the number 1 module pressure sockets are connected to the wind tunnel wind speed reference tapings.

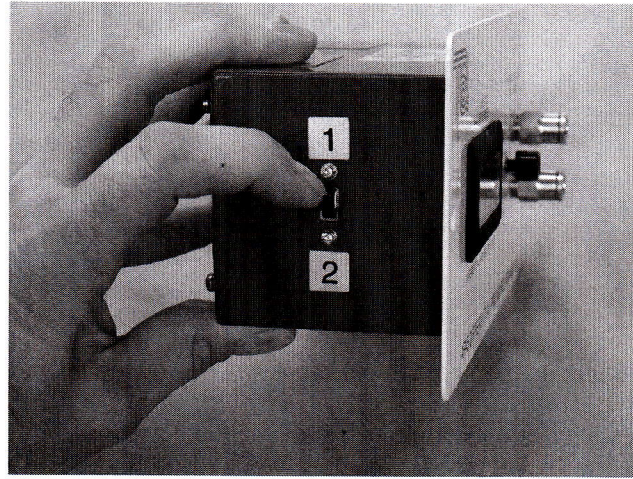


Figure 8 Instance Switch

To Use the AFA5 Module

Switch on

1. Make sure that there is no pressure applied to the pressure sockets.
2. Switch on the power to the Control and Instrumentation Unit of the wind tunnel.



Do not press the 'zero' button on the AFA5 module when the power is first applied.

3. The AFA5 display will show all zeros (0000).
4. Leave the module to stabilize for 10 to 15 minutes.
5. Press and hold the zero button for at least four seconds to re-zero it.
6. Start the experiment.



Do not apply pressure greater than 7 kPa to any of the pressure sockets.

Never blow into the pipework connected to the pressure sockets, human saliva can cause the instrument to give false readings.

7. The display includes an indicator that will show if the pressure difference is negative (there is more pressure at the '-' socket than at the '+' socket). The indicator is a small arrow underneath the 'Inputs Reversed' line.

Calibration

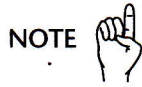
The AFA5 unit is calibrated at the factory and should not need re-calibrating. If it is suspected that the calibration has been accidentally upset or is wrong for any reason, it may be re-calibrated. The following will be required:

- A common 'pressure chest' with 2 tapings
- A variable pressure source 0 to 7 kPa
- A precision manometer or calibrated pressure meter with a 7 kPa range

Procedure

1. Connect the AFA5 to the pressure chest and manometer as shown in Figure 9. Note that the '+' connection is used. The '-' connection is left open to atmospheric pressure. Do not apply any pressure yet.
2. Press and hold the zero button on the AFA5 module, at the same time, switch on the electrical supply.

3. The AFA5 display will show '---'. Then it will show 'CAL'.



If the power is disconnected at this point, the settings will remain unchanged

4. Use the variable pressure source to apply exactly 6895 Pa (1 PSI or 703 mm H₂O).
5. Press the zero button on the AFA5 module. The AFA5 module is now calibrated.

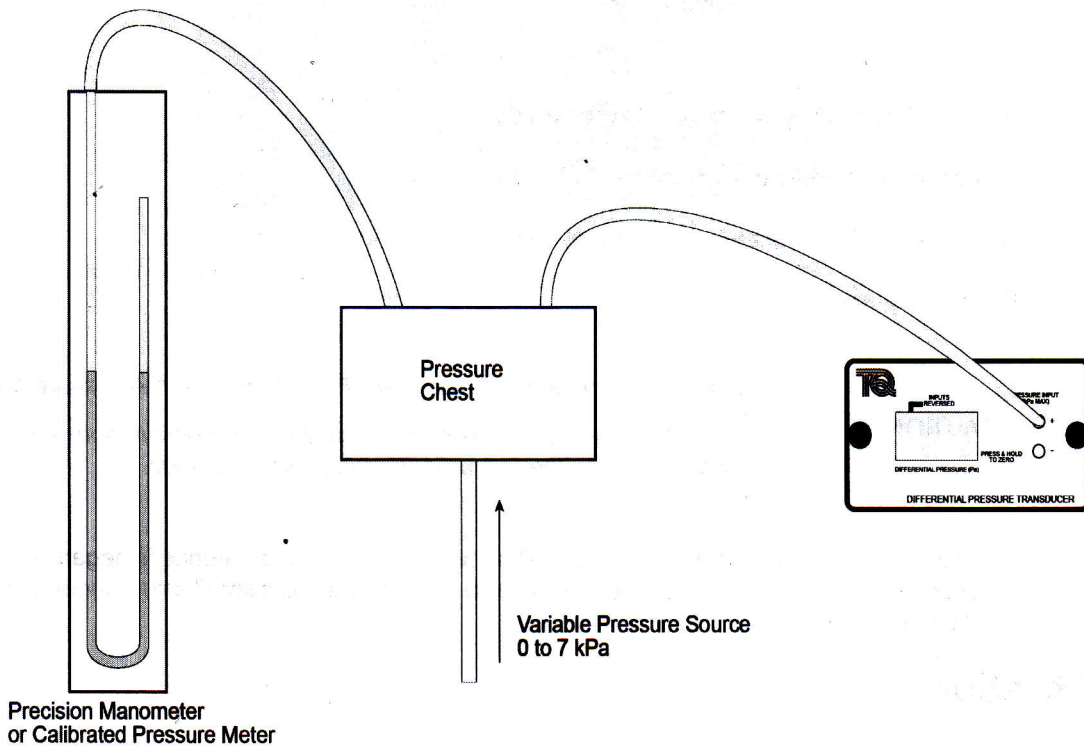


Figure 9 Connections for calibration

Spare Parts and Customer Care

Refer to the Packing Contents List for any spare parts supplied with the apparatus.

If technical assistance or spares are required, please contact the local TecQuipment Agent, or contact TecQuipment direct.

To assist us in processing the request quickly and efficiently, when requesting spares please include the following:

- Contact Name
- The full name and address of the college, company or institution
- Contact email address
- The TecQuipment product name and product reference
- The TecQuipment part number (if known)
- The serial number
- The year of purchase (if known)

Please provide us with as much detail as possible about the parts required and check the details carefully before contacting us.

If the product is no longer under warranty, TecQuipment will send a price quotation for confirmation.

Customer Care

We hope our products and manuals are satisfactory. If there are any questions, do not hesitate to contact our Customer Care department immediately.

Tel: +44 115 954 0155

Fax: +44 115 973 1520

email: customercare@tecquipment.com

For information about all TecQuipment products visit:

www.tecquipment.com

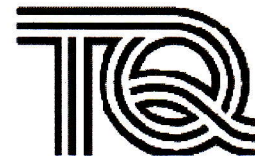
TEST CERTIFICATE

Product name: AFA5 - DIFFERENTIAL PRESSURE UNIT

Serial number: TQ272629-001

This apparatus has passed the comprehensive inspection and test procedures employed by TecEquipment Ltd

www.tecequipment.com



TECEQUIPMENT