

# **AFA5**

## ***Differential Pressure Transducer***

# ***User Guide***

© **TecQuipment Ltd 2008**

Do not reproduce or transmit this document in any form or by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system without the express permission of TecQuipment Limited.

TecQuipment has taken care to make the contents of this manual accurate and up to date. However, if you find any errors, 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.



# Contents

<b>Introduction</b>	1
The AFA5 Differential Pressure Transducer	1
Optional Instrument Modules	3
<b>Installation</b>	5
Assembly	5
Procedure	5
Identification + Important Note for AF100 Wind Tunnels	7
<b>To Use the AFA5 Module</b>	9
Switch on	9
Calibration	9
Procedure	9
<b>Spare Parts and Customer Care</b>	11
Customer Care	11

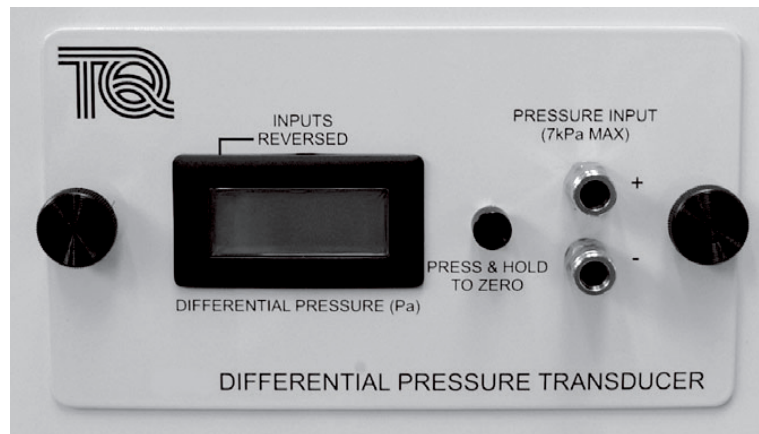


# **AFA5**

## **Differential Pressure Transducer**

### **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 TecQuipment'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 AF100 and AF200 series wind tunnels.

The module contains a calibrated pressure transducer rated at a maximum of  $\pm 7$  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 TecQuipment 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 TecQuipment 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 TecQuipment'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

- AFA2 - A basic balance with a single load cell (AF100 only).
- AFA3 - A three-component balance
- AFA4 - Angle feedback device for use with the AFA3
- AFA6 - 32- way pressure display system
- AFA7 - Pitot-static traverse (300 mm) (AF100 only)
- AFA8 - Pitot-static traverse (450 mm) (AF200 only)
- AFA9 - Traverse frame (AF200 only)
- 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®.

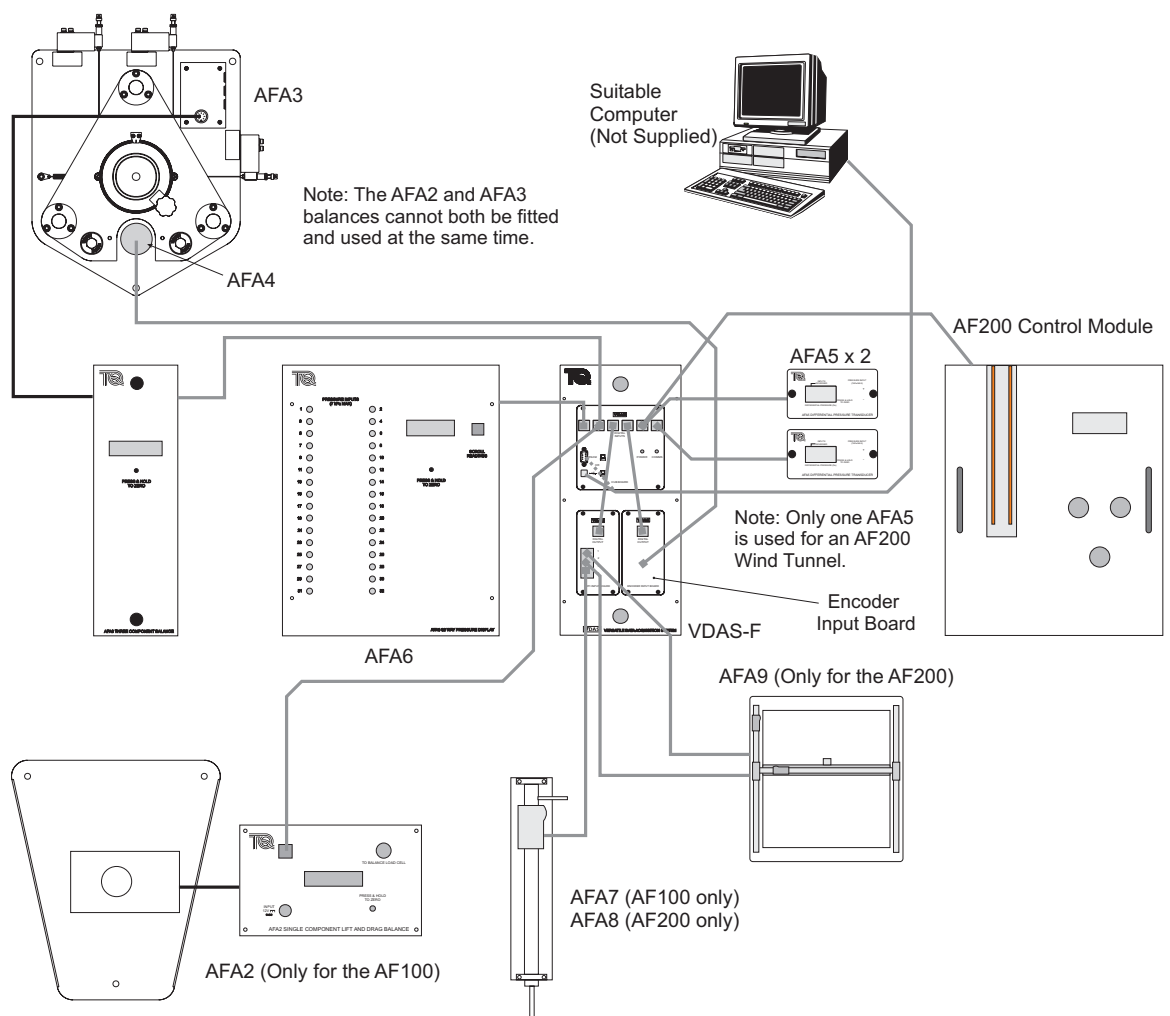


Figure 2 System diagram





# 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 AF100 or AF200 Control and Instrumentation Frame. The main section includes the power supply connections for up to two AFA5 modules.

## Procedure

### WARNING



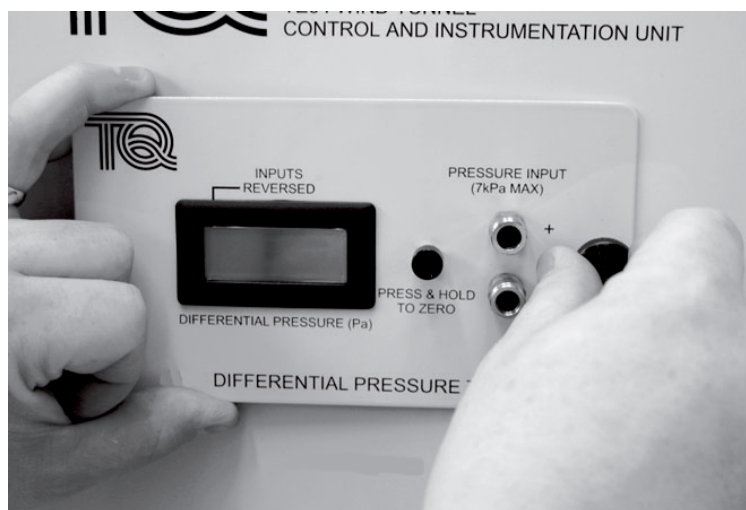
*Disconnect the electrical supply to the wind tunnel before you install the AFA5.*

1. Remove one or both of the blanking plates on the front of the main section (this depends on whether you have ordered one or two AFA5 modules). 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 you removed in step 1.

### NOTE



*If you have ordered two AFA5 modules, they should be marked '1' and '2'. Fit the module marked '1' in the highest of the two positions.*



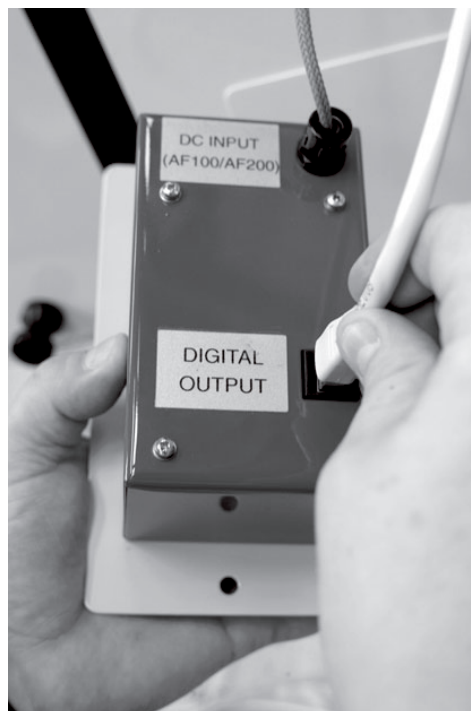
*Figure 3 Use the thumbscrews and washers to fix the AFA5 into place.*

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



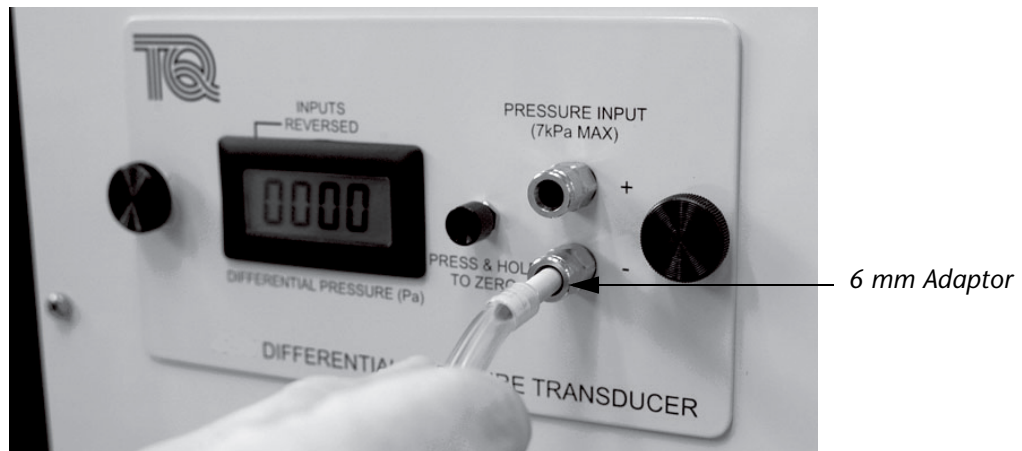
*Figure 4 Reach inside the holes at the back of the main section and connect the power connectors*

4. If you need to connect 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).*

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



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

- 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 AF100 Wind Tunnels**

If you have ordered two AFA5 modules, they are set at the factory to communicate with TecQuipment's VDAS software separately, so that one module identifies itself as number 1 and the other as number 2. Labels are also stuck to the modules to identify them. Single modules are set to number 1 by default.

If you already have one AFA5 module and need to order a second module, make sure that you order a 'number 2' unit. If absolutely necessary, you may contact TecQuipment customer care to help you change the setting.

When the AFA5 is used with TecQuipment's VDAS®, the VDAS® software (AF100 wind tunnels only) uses the signals from the number 1 AFA5 module to calculate the reference wind tunnel air speed. If you have two AFA5 modules, make sure that the number 1 module pressure sockets are connected to the wind tunnel wind speed reference tappings.



# 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 your 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 your 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

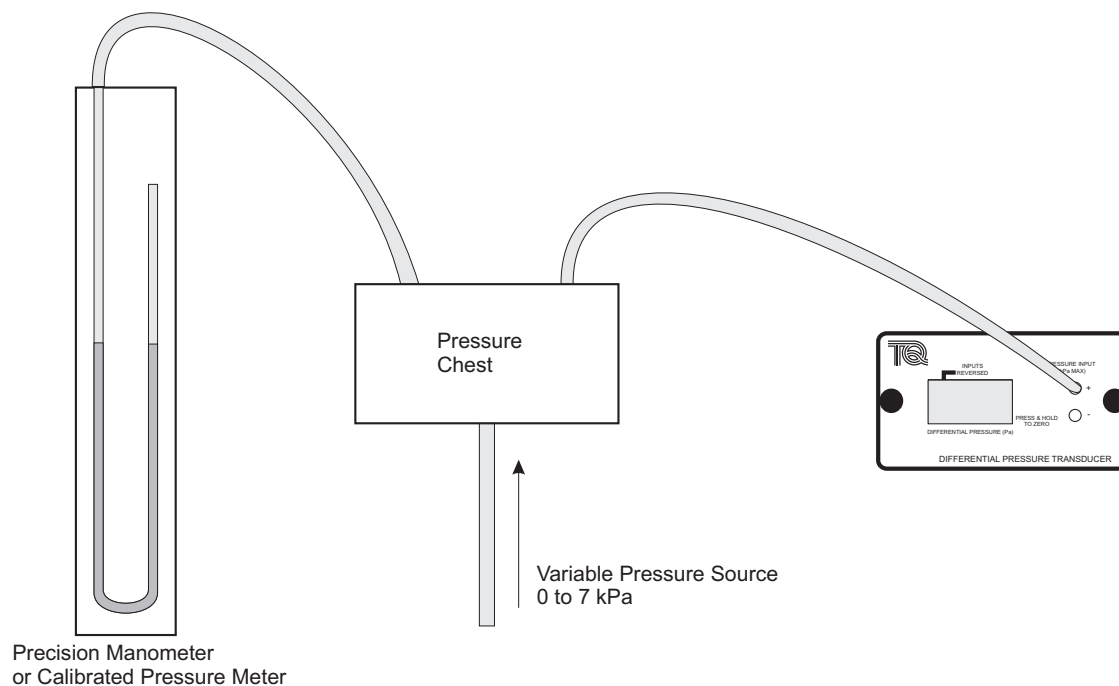
The AFA5 unit is calibrated at the factory and should not need re-calibrating. If you suspect that the calibration has been accidentally upset or is wrong for any reason, you may recalibrate it. You will need:

- A common 'pressure chest' with 2 tappings
- 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 8. 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'. Note: If you disconnect the power at this point, the settings will remain unchanged.
4. Use your variable pressure source to apply exactly 6895 Pa (1 PSI or 703 mm H<sub>2</sub>O).
5. Press the zero button on the AFA5 module. The AFA5 module is now calibrated.



*Figure 8 Connections for calibration*

# Spare Parts and Customer Care

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

If you require technical assistance or spares, please contact your local TecQuipment Agent, or contact TecQuipment direct.

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

- Your Name
- The full name and address of your college, company or institution
- Your 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 you require and check the details carefully before contacting us.

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

## Customer Care

We hope you find our products and manuals satisfactory. If you have 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](http://www.tecquipment.com)**