



DP1
Digital
Pressure Display
User Guide



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DP1

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User Guide

Introduction and Description



Figure 1 The Digital Pressure Display (DP1).



This product works with VDAS

The Digital Pressure Display is for use with other TecQuipment products that need to display four analogue pressures - three single input and one differential.



For best results, use this guide alongside any other User Guides supplied with your other TecQuipment product.

The display has four electronic pressure transducers in a module that fits into the *Instrument Frame* of your TecQuipment product. With suitable pipe and connectors (not supplied), it connects to pressure tapings on the product or to existing pressure measurement pipes. You can also use the digital display in parallel with any suitable analogue pressure display (you will need extra 'T' piece connectors).

Three transducers measure pressures above and below atmospheric. These are useful for measuring the outlet (delivery) and inlet pressure of pumps. The displays show a negative (-) sign if the pressure is below atmospheric.

One transducer measures the pressure difference (differential) between two pressures. This is useful for measuring the pressure drop across a flow measurement instrument, such as a Venturi or orifice.

Each transducer includes a bleed port for each pressure connection. This helps to bleed out any trapped air when you measure water pressures.

All pressure connections are push-in type and accept hard-walled plastic pipe directly or soft-walled pipe fitted with straight plastic pipe connectors. The bleed ports are self-sealing.

On the front of the display is a socket for connection to TecQuipment's optional Versatile Data Acquisition System (VDAS). When used with a suitable computer (not supplied), VDAS will automatically display and record all the pressure readings from the Digital Pressure Display. It can also use the pressures to calculate other results for you. This is especially useful if you need to automatically calculate water flow from the pressure drop across a flow measurement instrument, such as a Venturi or orifice.

Technical Details

Item	Details
Operating Environment	Indoor (laboratory) Altitude up to 2000 m Temperature range 5°C to 40°C Maximum relative humidity 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C Overvoltage category 2 (as specified in EN61010-1). Pollution degree 2 (as specified in EN61010-1).
Dimensions	450 mm high x 190 mm wide x 170 mm front to back
Nett Weight	6 kg
Maximum Pressures	Single Input: -0.9 to 2 bar (gauge) Single Input: -0.9 to 2 bar (gauge) Single Input: -0.9 to 6 bar (gauge) Differential: 2 bar
Working Fluid	Clean water
Pressure Connections	Push-in Connections Accept 6 mm outside diameter hard-walled pressure measurement pipes or 6 mm outside diameter straight pipe connectors
VDAS Socket	Extra Low Voltage (ELV) <25 VDC communications
Bleed Ports	Push-in Self-sealing Connections Accept 4 mm outside diameter hard-walled pressure measurement pipes or 4 mm outside diameter straight pipe connectors
Electrical Supply and Fuse	Input: 90 VAC to 250 VAC 50 Hz to 60 Hz and 100 mA Fuse: 6.3 A Type F 20 mm

Electrical Supply

Use the cable supplied to connect the display to a spare outlet on your TecEquipment product, or a fused and earthed single phase supply.

The colours of the cable are:

GREEN AND YELLOW:

EARTH E OR 

BROWN:

LIVE

BLUE:

NEUTRAL

WARNING



Connect the apparatus to the supply through a plug and socket.

The plug and socket to the back of the module is its method of electrical isolation.

Make sure you do not block access to this connector.

You must connect this equipment to a good electrical earth.

Installation and Use of the Digital Pressure Display

WARNING



If you do not use the equipment as described in these instructions, its protective parts may not work correctly.

Disconnect the electrical supply before you change any of the pressure connections.

Disconnect the electrical supply and immediately clean up and dry out any accidental water spills or sprays on the display module.

CAUTION



Do not connect the Digital Pressure Display to pressures that are higher than its rated pressures.

Never use the bleed ports as pressure connection.

1. Hook the display into the Instrument Frame of your TecQuipment product. For most products, put the display to the middle of the frame.
2. Connect the display to a suitable electrical supply (see **Electrical Supply** on page 3). Some TecQuipment products already have extra mains supply sockets ready for this display and other instruments.
3. If you are to use the display with VDAS, connect the VDAS 'Digital Output' socket of the display to any spare 'Digital Input' socket on your VDAS-F Hardware. Make sure you are using the latest version of VDAS. See our website for downloads.
4. Press and hold the 'Press and hold to zero' button. This will set all pressure readings to zero.
5. Cut suitable pipe (not supplied) to the correct lengths to reach the pressure tapping points of your TecQuipment product. Alternatively, if you already have an **analogue** pressure display, cut into the existing pressure pipes and insert suitable 'T' piece connectors (not supplied with the pressure display). Now connect the analogue display in parallel with the digital display (see Figure 2).

NOTE



*Take care how you use the Digital Pressure Display alongside any analogue gauges: The Digital Pressure Display can work with pressures above **and** below atmosphere, but other analogue gauges may only work for above **or** below atmospheric (**not both**).*



Figure 2 You May Cut Existing Pipes and Fit a 'T' Piece (not supplied)

6. If you have 6 mm outside diameter hard-walled pressure pipes, push their ends straight into the pressure connections of the display (see Figure 3). If you have soft-walled pressure pipes, insert 6 mm outside diameter straight plastic pipe connectors into the ends of your pipe. Now push these into the pressure connections of the display (see Figure 4).

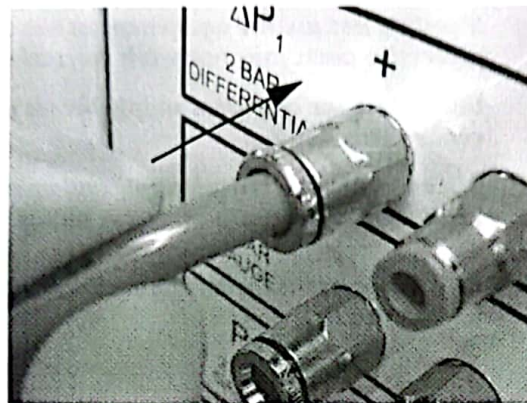


Figure 3 You Can Push 6 mm Outside Diameter Pipes Straight Into the Pressure Connections

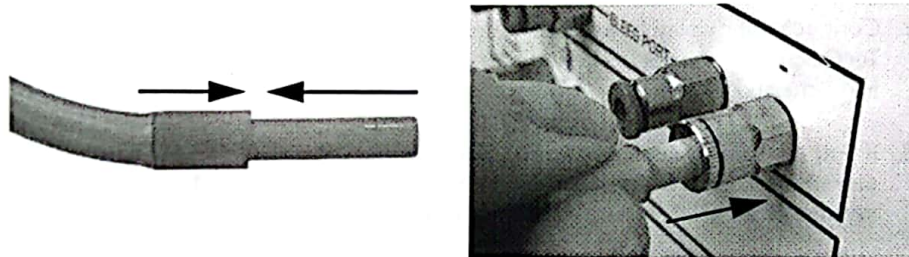


Figure 4 For Soft-walled Pipes Use a 6 mm Outside Diameter Plastic Pipe Connector

7. Run your product as normal and insert a spare 'bleed tube' into each bleed port of the analogue pressure transducers, to drain out any trapped air. For any transducer that will measure pressures lower than atmospheric, put the other end of the bleed tube in water. This allows it to 'suck' water into the transducer and force out any trapped air.



NOTE

Some TecQuipment products already have a bleed tube, ready for use with pressure displays.

8. Remove the bleed tube. The bleed port is self-sealing.
9. You must keep the self-sealing bleed ports free from dust and dirt which may cause them to stop sealing correctly. To help prevent this, TecQuipment fit plastic plugs to the bleed ports of the Digital and Analogue Pressure Displays, which you must refit when you have completed your bleeding procedure. The plug also helps to reduce any chances of the pump suction pressure from drawing air through the bleed port and entering the pump, which would affect your results.
10. Your pressure display is now ready to show the correct pressures.

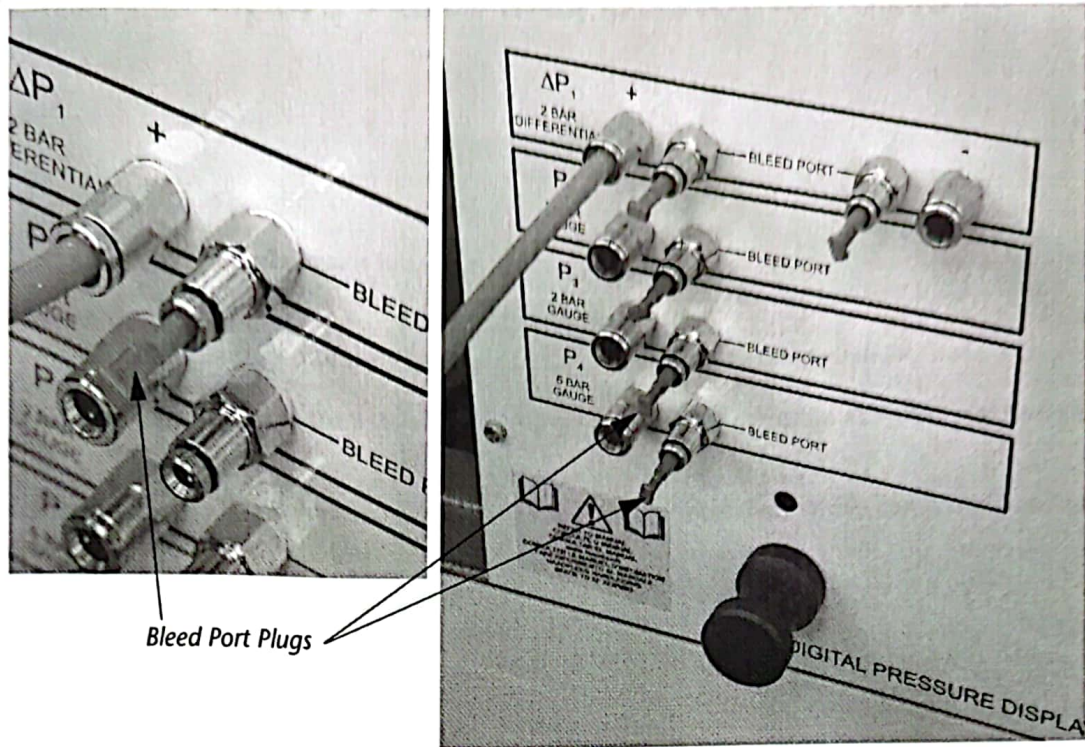


Figure 5 Bleed Port Plugs

To Remove a Pipe

To remove a pipe from a pressure connection, push forwards on the small ring of the connection and carefully pull the pipe out.

Witness Hole

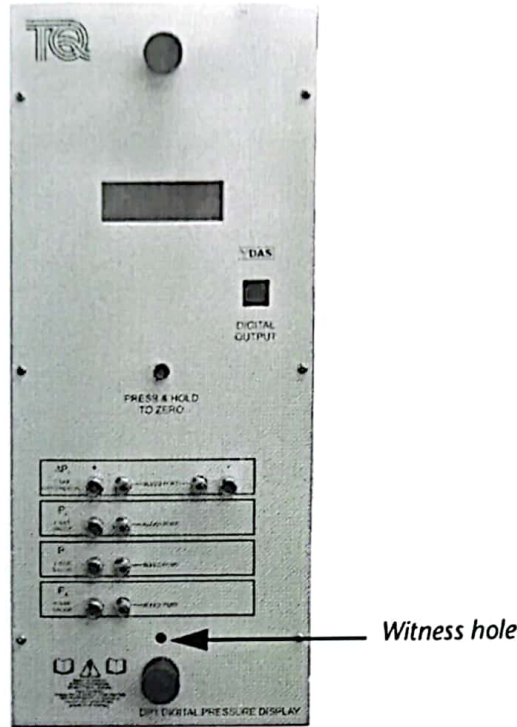


Figure 6 Witness Hole

As a safety feature, the Pressure Display includes a small water leak 'witness' hole below all the pressure connections. If the transducer seals ever fail, the water will drain out of the witness hole at the bottom of the module to indicate the fault.

CAUTION



If water leaks from the Witness Hole, disconnect the module from the electrical supply. Do not use the module again unless a qualified engineer confirms that it is safe to use, or send the unit back to TecQuipment for repair.

Maintenance, Spare Parts and Customer Care

General

After use:

- Disconnect from the mains supply
- Drain out any water that is in the tubes that you use to connect the pressure transducers
- Disconnect the tubes
- Allow the transducers to dry out naturally - do not use hot or compressed air.

You may leave the display on the Instrument Frame or remove it and store it in a dry and dust free area, suitably covered.

To clean the apparatus, disconnect from the mains supply and wipe clean with a damp cloth - do not use abrasive cleaners.

Electrical



Only qualified persons may do electrical maintenance on this equipment.

Use this procedure:

- Assume the apparatus is energised until it is known to be isolated from the electrical supply.
- Use insulated tools where there are possible electrical hazards.
- Confirm that the apparatus earth circuit is complete.
- Identify the cause of a blown fuse or tripped circuit breaker before renewing or resetting.

To Replace the Fuse

- Isolate the apparatus from the electrical supply.
- Renew the faulty fuse or reset the circuit breaker.
- Reconnect the apparatus to the electrical supply and switch on.
- If the apparatus fails again, contact TecQuipment Ltd or your agent for advice.



Renew faulty or damaged parts or detachable cables with an equivalent item of the same type or rating.

Fuse Location

There is one fuse located at the IEC socket at the back of the module, use a small screwdriver to access and change the fuse.

Spare Parts

Check the Packing Contents List to see what spare parts we send with the apparatus.

If you need technical help or spares, please contact your local TecQuipment Agent, or contact TecQuipment direct.

When you ask for spares, please tell us:

- 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 you know it)
- The serial number
- The year it was bought (if you know it)

Please give us as much detail as possible about the parts you need and check the details carefully before you contact us.

If the product is out of warranty, TecQuipment will let you know the price of the spare parts.

Customer Care

We hope you like our products and manuals. If you have any questions, please contact our Customer Care department:

Telephone: +44 115 954 0155

Fax: +44 115 973 1520

email: customer.care@tecquipment.com

For information about all TecQuipment Products and Services, visit:

www.tecquipment.com