H1F

Digital Hydraulic Bench

User Guide

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 supply 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.

DB/0816

TecQuipment

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Introduction

Figure 1 H1F Digital Hydraulic Bench

TecQuipment's Digital Hydraulic Bench works as a self-contained mobile water source and measuring system. Its body works as a water reservoir or 'Sump Tank'. An electric submersible pump and a hand-operated valve create a controllable and recirculating flow of water. A flowmeter and digital display accurately measure and show water flow. The Hydraulic Bench also has a flat top with a small 'rim'. This will support some of the smaller experiment modules from TecQuipment's Fluid Mechancis range - saving space in the laboratory and helping contain water spills. Larger experiment modules stand next to the bench.

TecQuipment recommend the Hydraulic Bench for use with selected experiments from their Fluid Mechanics Range. However, it will work with any other suitable experiments as a useful water supply and flow measuring system.

escription

Figure 2 Digital Hydraulic Bench

Figure 2 shows an outside view of the Hydraulic Bench. Figure 3 is a simple drawing showing the inside view.

The body of the bench forms the water reservoir, or 'Sump Tank'. An electric submersible pump sits at the bottom of the Sump Tank and pumps water through a flow sensor to a hand-operated Flow Control Valve. The valve controls the flow of water to a Supply Hose that connects to your TecQuipment Experiment Module. A box on the side of the bench contains the flow display, ON/OFF Switch and circuit protection for the pump. Small wheels or 'castors' allow you to move the bench around. Two of them have foot-operated locks to help hold the bench in position.

The Bench Top includes a large central hole fitted with a removeable adaptor (see Figure 5) to enlarge or reduce the hole size if needed. It also helps to guide the water flow from any pipework straight downwards into the reservoir, avoiding any chance of leaks caused by the pipework pointing upwards (see Figure 6).

The Bench Top also has a 'Trough' with a Drain Valve. In a similar way to the adaptor, the Drain Valve helps direct any water flow straight down into the reservoir when needed. It also helps to trap a fixed volume of water in the Trough, useful for some experiment modules. To empty the Trough, you simply lift the Drain Valve and the trapped water falls down back into the Sump Tank (see Figure 7). Determined by your optional experiment module, you aim the outlet of your module into the large central hole or the Trough, so the water returns to the reservoir.

The Bench Top has extra holes to work as overflow to prevent flooding of the bench top. A Sump Plug helps you to drain the sump if you need to change its water.

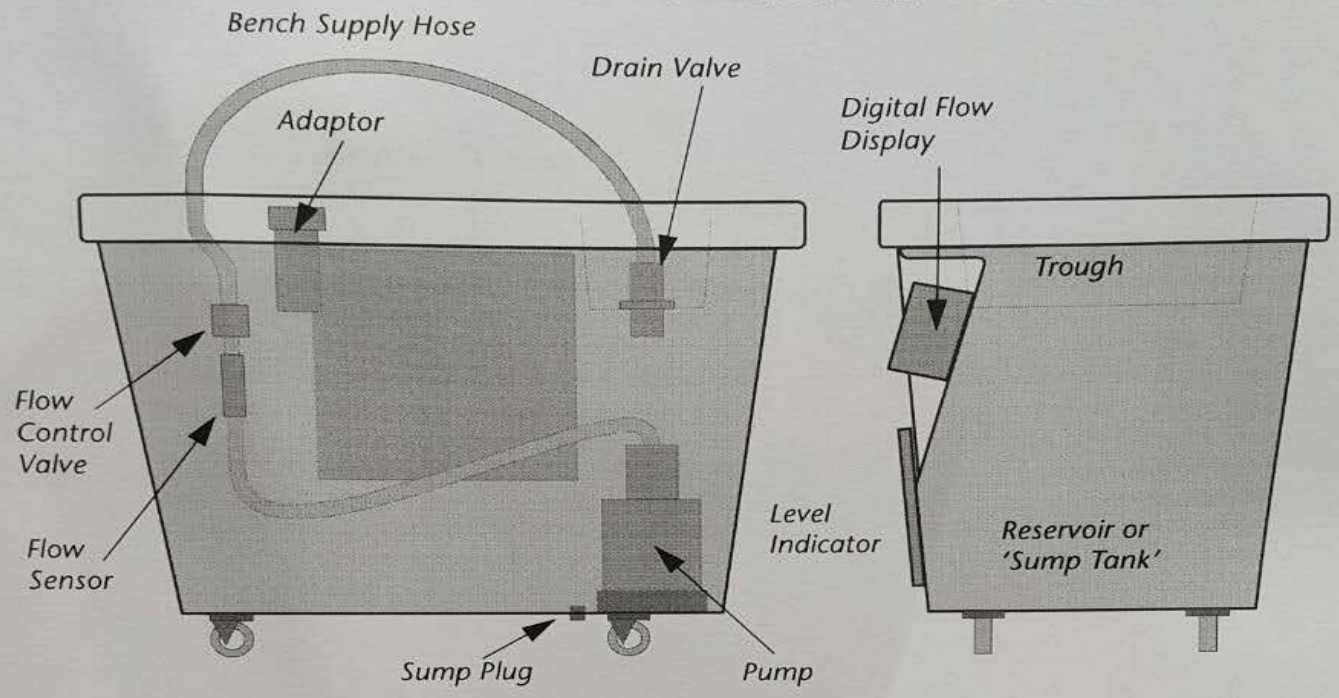

Figure 3 Inside View of the Hydraulic Bench

Figure 4 On/Off Switch, Level Indicator and the Flow Control Valve

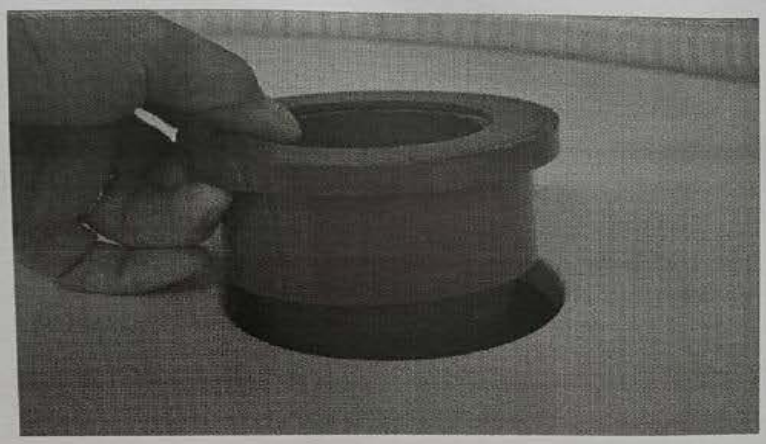

Figure 5 Removeable Adaptor

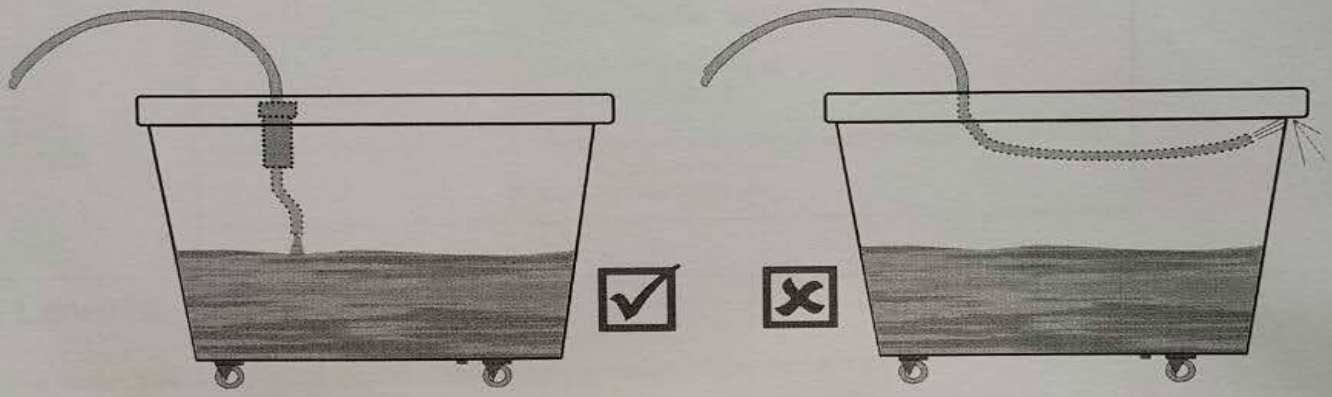

Figure 6 Using the Adaptor

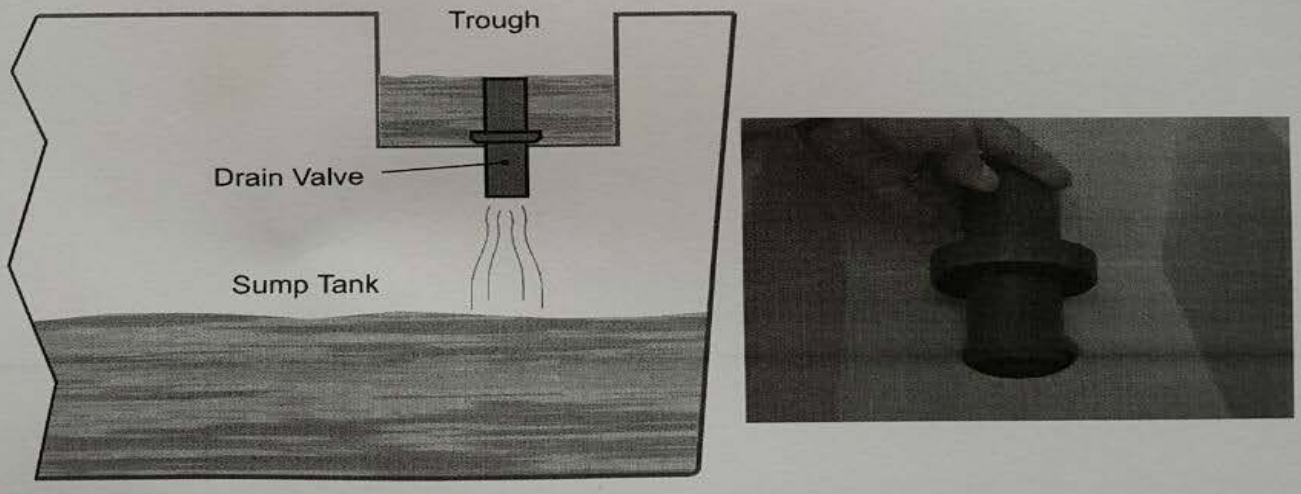

Figure 7 The Drain Valve

Technical Details

Item	Details
Dimensions and weight	Nett: 1250 mm long x 780 mm wide x 950 mm high and 50 kg (no water)
Sump Tank Capacity	Minimum Fill Level 100 Litres Maximum Fill Level 160 Litres
Maximum flow rate and pressure	55 L/min and 450 mbar at lid height and with no experiment module fitted
Pump	Electric Submersible
Water treatment	See datasheet (supplied)
Electrical Supply	220 to 240 VAC 50 Hz 1 A or 110 to 120 VAC 60 Hz 5 A or 220 VAC 60 Hz 2.5 A Specified on order
Circuit protection	Thermal overload and under voltage sensor built into on/off switch. Not user-serviceable.

Noise Levels

The noise levels recorded at this apparatus are lower than 70 dB (A).

nstallation and Assembly

NOTE *Follow any regulations that affect the installation, operation and maintenance of this apparatus in the country where it is to be used.*

CAUTION *Avoid directly spraying water over the electrical enclosure.*

1. Use an external hose (not provided), to pour clean water into the bench until you see the water level in the sight gauge reach the maximum fill level indicator (see Figure 8).
2. Add some of the water treatment supplied with the equipment. The water treatment container will show you the amount you need to add.

CAUTION *If the water level is too high, the Hydraulic Bench will not work correctly and may leak.*

If the level is too low, the pump may overheat and fail.

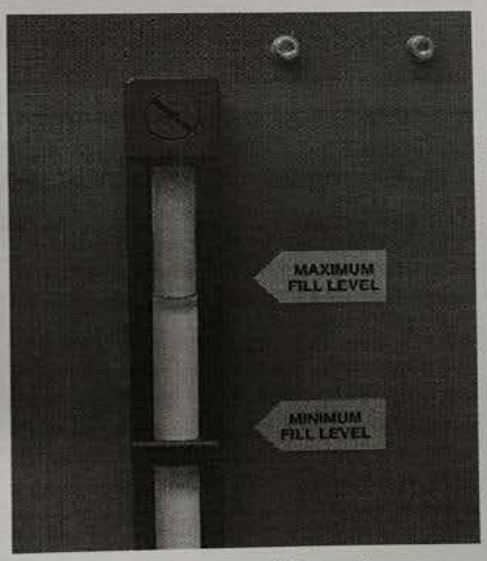

Figure 8 Fill with Water Until You Reach Maximum Fill Level

3. Connect the electrical supply as shown in **Electrical Connection** on page 10.
4. Make sure the bench supply hose either points into the central hole or the hole in the Trough.
5. Press the on button of the on/off switch to start the pump and check for leaks.
6. Switch off the pump.

Electrical Connection

TecQuipment normally fit a suitable plug to the end of the cable. Use the plug and cable supplied to connect the Hydraulic Bench to the electrical supply.

WARNING 

Connect the Hydraulic Bench to the electrical supply through a plug and socket. The apparatus must be connected to earth.

If you need to fit a new plug or alternative plug, these are the colours of each individual conductor:

GREEN AND YELLOW:	**EARTH E OR** ⏚
BROWN:	**LIVE or L1 or Hot 1**
BLUE:	**NEUTRAL**

OR

GREEN OR GREEN AND YELLOW:	**EARTH E OR** ⏚
BLACK:	**LIVE or L1 or Hot 1**
WHITE:	**NEUTRAL**

WARNING 

Connect the Hydraulic Bench through a supply that includes a 30 mA RCD (Residual Current Detection) device.

Use the Hydraulic Bench a safe distance (2.4 m) away from any mains electrical switches and sockets.

Maintenance, Spare Parts and Customer Care

General Maintenance

Regularly check all parts of the apparatus for damage, renew if necessary.

When not in use, store the apparatus in a dry, dust-free area, covered with a plastic sheet. If the apparatus becomes dirty, wipe the surfaces with a damp, clean cloth. Do not use abrasive cleaners.

Regularly check all fixings and fastenings for tightness, adjust where necessary.

NOTE  *Renew faulty or damaged parts with an equivalent item of the same type or rating.*

Change the water every three to four months, or sooner if it becomes dirty. Remember to add the wa additive.

To drain the water:

1. Disconnect the electrical supply.
2. Move the bench over a drain hole in the floor.
3. Use a spanner to undo the sump plug.
4. Allow all the water to drain out (gently tilt over the Bench to help).
5. Refit the sump plug.
6. Use a clean cloth to wipe any dirt from the inside of the Hydraulic Bench.

ctrical Maintenance

There are no user-serviceable electrical parts in this equipment. If the pump or switch fails, contact TecQuipment or their agent for advice.

WARNING ***Only allow qualified electrical engineers to make any electrical repairs to this equipment.***

If you need to replace the mains supply cable, refer to Figure 9.

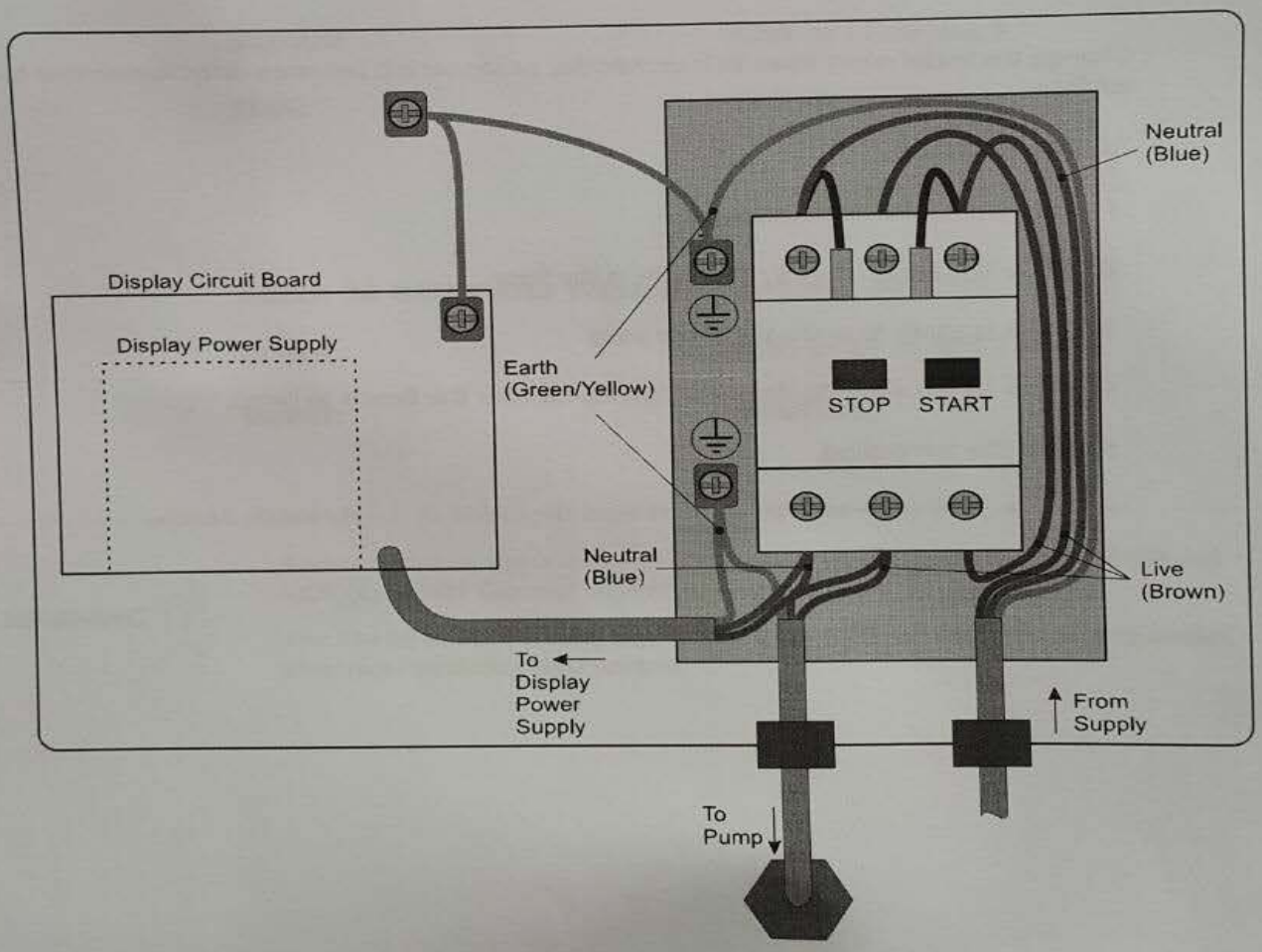

Figure 9 Mains Cable Connections

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 visit:

www.tecquipment.com