WEBTEC®

HYDRAULIC MEASUREMENT AND CONTROL

USER MANUAL

PORTABLE HYDRAULIC TESTERS

Contents

1.0 Introduction

Webtec have been designing and manufacturing flow meters and hydraulics components for over 50 years.

This User manual will cover the following testers in the Webtec Portable Hydraulic Tester range.

- DHT Series Digital Hydraulic Tester
- DHM Series Digital Hydraulic Multimeter

There are varied sizes and porting options to cover a wide range of flows. This manual covers all of the above mentioned testers. For more information on all available Webtec Portable Hydraulic Testers see the website or contact your sales rewpresentative.

1.1 Product description

Webtec Portable Hydraulic Testers have been designed for easy connection to a hydraulic circuit so that flow, pressure, and temperature can be readily checked. Testers can take full back pressure up to 420/480 bar (6000/7000 psi) depending on the model, and the built in loading valve enables many operating conditions to be simulated. The tester can be connected anywhere in the hydraulic system to test pumps, motors, valves, and cylinders in both flow directions.

Caution

- Operate the product strictly within its specified limits for pressure, temperature, and flow, referencing the user manual's mechanical data.
- Use the product only for its intended purpose as described in the user manual.
- Improper handling or operation mandates immediate removal from service and inspection by an authorized service engineer.
- The equipment is configured at the factory and requires no further adjustment. Contact the supplier if normal operation fails to start.
- When used with other equipment, ensure compliance with recommended usage guidelines.
- The manufacturer assumes no liability for any claims arising from operation that deviates from the intended use.

Before first operating the equipment read the whole of these instructions. Safety may be impaired if they are not followed. If in any doubt contact your sales representative.

1.2 Conformity

1.2.1 CE Mark

The device fulfils the requirements of the following standards and legal regulations:

CE

CE conformity

The device complies with the directives, standards and standard-related documents specified in the Declaration of Conformity

1.2.2 BS EN ISO 9001

We operate within a Quality Management System that complies with the requirements of BS EN ISO 9001 which is externally audited and certificated each year.

1.3 Make it Blue

Our new manufacturing approach called Make it BLUE® is a unique four step process to help customers maximise the potential of their hydraulic machinery but without the complexity of costly consultancy. Webtec's Make it BLUE® has been developed following consultation with many customers, who will benefit from a more integrated approach to product customisation. We are now formally offering this process by combining more than 60 years of sales, engineering and manufacturing experience.

If you do have a new requirement, not covered by this product and our exisiting product range. Then please email your sales representative or our sales team on sales-uk@webtec.com who would be happy to discuss with you.

2.0 Safety

It is imperative to thoroughly review all instructions before using the equipment for the first time. Failure to do so may compromise safety.

Under no circumstances should safety features, such as guards or interlocks, be bypassed. Familiarise yourself with all warning symbols and conditions before operating the equipment. Prior to use, inspect the equipment for any signs of damage; if damage is detected, refrain from using the equipment. Ensure all components that have been replaced are a tightened correctly.

It is important to avoid oil spills, promptly clean up any spills to prevent accidents and hazards. Our Portable hydraulic testers are equipped with an Interpass® safety protection system which, in an over-pressure event in either direction, will bypass the oil internally.

Be mindful that certain flow rates, pressures, and oil viscosities may lead to significant cavitation, resulting in pressure imbalances and requiring considerable effort to operate the equipment. Safety should always take precedence, and if unsure at any point, the procedure should be halted, and Webtec should be contacted for guidance.

Following each test, it is recommended to inspect the unit for leaks. Do not repair any leaks whilst the system is pressurised. Exercise caution regarding fluid injection injuries: pressurised hydraulic fluid has the potential to penetrate the skin, resulting in severe harm. Wear appropriate protective gear and follow safety procedures when operating hydraulic systems. Hydraulic fluid at high temperatures will cause some surfaces to become hot, handle with care.

Notes on Environmental Risks:

- Alkaline batteries pose pollution risks; dispose of batteries through local recycling services.
- Operating electronic devices in explosive atmospheres may cause explosions.
- Radio frequency energy from the device may interfere with medical and electronic devices.
- Mishandling or improper repair of the device may cause injury or damage.
- Return damaged devices to Webtec for servicing; do not attempt repairs yourself.

2.1 Technical Personnel

Suitably qualified personnel should perform all tests.

Qualified personnel must always have access to the content of the user manual. It is essential that technical personnel thoroughly read and understand the entire user manual. This comprehension is vital for the correct setup and operation of the equipment, ensuring both efficiency and safety.

Only qualified personnel should undertake the tasks of starting up, operating, maintaining, or handling the removal/refitting of components in hydraulic systems. These actions must strictly adhere to the best hydraulic practices and the relevant regulations and standards pertaining to the system's application area.

Conduct a risk assessments and safety checks prior to using any equipment, making sure to use appropriate tools and methods for any work.

Failure to adhere to the provided instructions, especially those related to safety, can pose risks to human safety, the environment, as well as to the equipment and systems.

2.2 Improper Use

Some products can manage considerable hydraulic power, in some cases up to 1MW or 1400 HP. This much energy applied incorrectly can result in death and/or serious property damage. Improper handling or operation mandates immediate removal from service and inspection by an authorised service engineer.

Adhere to the specified guidelines for optimal performance and safety. Any usage contrary to intended use voids guarantee, warranty, and liability claims. The manufacturer bears no responsibility for such deviations.

3.0 General Operation

1. Connect the Tester to the circuit (see Section “Installation Guidance”)
2. Ensure that the pressure loading valve is fully opened by turning the knob counterclockwise.
3. Switch the unit on. On latest models there is a battery charge indicator, but in all cases if the display starts to flash the battery needs replacing.
4. Select the desired units/test using the front panel buttons where applicable.
5. **IMPORTANT:** Ensure that all connections are tightened, and the oil can flow freely throughout the hydraulic system BEFORE running the machine at full speed. Check that the circuit is correctly connected, and any shut-off valves are opened. Also, quick disconnect couplers MUST be open.
6. Start the pump momentarily to ensure there is no obstruction which could cause pressure build up.
7. Check for leaks and free flow of oil.
8. The tester is now ready for use – run the machine and adjust the loading valve as needed.
9. When the test is completed return the loading valve to fully open.

Note: When low pressure testing is required, connect the optional low pressure gauge with automatic cut-out valve to the tester block.

3.1 Fluid

Damage to a product from the use of an incompatible fluid invalidates the warranty.

Do not use with incompatible fluids. If in doubt please contact your sales representative for further information.

The standard Webtec Hydraulic Testers are designed for use with mineral oil having reasonable lubrication properties. They are incompatible for use with water or fluids with a high-water content. If a tester is contaminated with water, it should be flushed immediately with white or methylated spirit or similar and then flushed with mineral oil to minimise any internal corrosion. This may avoid an expensive repair.

3.2 Viscosity Table

	KINEMATIC VISCOSITY (CST)					
	FLUID TYPE					
TEMP °C	ISO15	ISO22	ISO32	ISO32	ISO46	ISO68
0	85.9	165.6	309.3	449.9	527.6	894.3
10	49.0	87.0	150.8	204.7	244.9	393.3
20	30.4	50.5	82.2	105.5	127.9	196.1
30	20.1	31.6	48.8	59.8	73.1	107.7
40	14.0	21.0	31.0	36.6	44.9	63.9
50	10.2	14.7	20.8	23.9	29.4	40.5
60	7.7	10.7	14.7	16.5	20.2	27.2
70	6.0	8.1	10.9	12.0	14.6	19.2
80	4.8	6.4	8.4	9.1	11.1	14.3
90	4.0	5.2	6.6	7.2	8.7	11.1
100	3.3	4.3	5.5	6.0	7.1	8.9
	ISO 15, 22, 32, 46 and 68 based on typical figures for the Esso Nuto range of HM oils. ISO 37 based on Shell Tellus HM oil.					

The shaded area of this table shows the range of viscosities over which the meter can be used with minimal effect on accuracy (less than 1% FS).

3.3 Contamination

Filtration is strongly advised. This must be better than DIN ISO4406: 21/19/16 or NAS 10 (typically achieved with 20-25u filters).

Debris from contaminated oil sometimes adheres to the moving parts of the equipment, leading the equipment to malfunction. Clean fluid is essential to longevity of the product. Use with contaminated fluid will cause premature failure.

Contamination damage caused by inadequate filtration invalidates the warranty.

3.4 Calibration

All hydraulic testers are calibrated at a mean viscosity of 21 cSt using ISO32 hydraulic mineral oil to ISO11158 category HM.

Recommended period between calibrations is 12 months. Maximum period between calibrations is 36 months. Unit accuracy may be affected by operating cycle, fluid condition or extended periods between recalibrations.

Testers can be specially calibrated at a different viscosity to the standard. For further information, recalibration and/or repair please contact your sales representative.

3.5 Installation Guidance

- Suitably qualified personnel should make all hydraulic connections.
- Avoid excessive bends in connecting hoses as high pressure hoses will deflect and straighten at speed and with force.
- A preliminary check of the hydraulic system's oil supply, pump rotation, filters, oil lines, cylinder rods as well as looking for external leaks should be made, prior to installing the Hydraulic Tester.
- The Bi-Directional tester is designed to operate in both flow directions, where its optimal performance is achieved in the preferred direction suggested by the larger arrow on the serial number plate. During reverse flow tests, slight accuracy fluctuations may result from variables like oil viscosity and density.
- The tester should be connected to the hydraulic circuit by means of flexible hoses 1 - 2 metres long.
- The use of quick-disconnect couplings can save time but having them close to the tester can impair readings. Make sure the hoses are long enough so that the tester can be used safely on the machine.
- The hoses and fittings at the inlet to the tester must be of adequate size for the flow being tested. Elbows, rotary couplings etc., at the inlet and outlet ports of the tester should be avoided to ensure accurate readings.
- The use of the flexible hoses will help to isolate the test unit from vibration which often exists.
- The internal burst discs are to protect the tester not the hydraulic installation. Always ensure the appropriate relief devices are fitted to protect the installation.
- Ensure that all adjustable flow restrictors or loading valves are fully opened prior to use.

3.6 Bi-Directional Loading Valve

The integral loading valve gives progressive pressure loading in either flow direction. Replaceable safety burst discs are a part of Interpass® safety protection system, which bypasses oil internally in the event of the valve being over pressurised in either flow direction. Replacement safety burst discs are stored in an internal holder machined in the rear of the flow block.

The loading valve is not designed to serve as a shut off valve, therefore it is not suitable for holding a static load.

3.7 Measurement

3.7.1 Flow

The tester measures flow using an axial turbine mounted in the aluminium base block. The oil flow rotates the turbine, and its speed is proportional to the oil velocity. The revolutions of the turbine are measured by means of a magnetic sensing head which feeds a pulse to an electronic circuit for every blade that passes. The electronic circuit has a built-in microprocessor; the signal is amplified, counted and linearised to maximise accuracy. The readout is calibrated in L/min or US gpm, units are selectable.

3.7.2 Pressure

Where fitted, the pressure gauge has a spiral Bourdon tube, and the gauge case is filled with glycerine to ensure good dampening of pulsating pressures. The gauge is connected to the base block by a fine bore capillary tube. The DHM series meters have a pressure transducer fitted directly to the base block which improves fast transient capture. All testers are bi-directional and incorporate a shuttle valve which directs the highest pressure (from inlet or outlet) to the measuring point. A gauge port is provided on the back of the base block for the addition of a low-pressure gauge kit.

3.7.3 Temperature

The thermistor temperature sensor is in close contact with the oil flow and readout is on the digital display, with resolution of 0.1 °C.

4.0 Designs and Functions

4.1 DHT Panel View

DHT 1 SERIES DIGITAL HYDRAULIC TESTER			
A	LED Indicator	E	Select Flow Units
B	Digital Display	F	Select Temperature Units
C	On/Off Switch	G	Pressure Gauge
D	Battery Cover	H	Service Icon

4.2 DHT Specification

Flow:

- Selectable units L/min or US GPM

Temperature:

- Thermistor built into flow transducer (maximise contact with the oil flow to ensure fast response)
- Selectable units °C or °F
- Accuracy; ± 1°C, 2°F

Fluid Temperature:

- Celsius: -25°C to 125°C
- Fahrenheit: -13°F to 257°F

Ambient Temperature:

- Celsius: -10 to 50
- Fahrenheit: 14 to 122

Flow Accuracy:

- ± 1% of full scale

Pressure Accuracy:

- ± 1.6% of full scale

LCD Display:

- High contrast, fast response custom display

Battery Life:

- Low power consumption – approximately 240 hours on standard battery

Ingress Protection:

- IP65 for electronic circuits

Flow Measuring Range (see model table at 6.1):

- The display indicates 0.0 when the turbine is stationary.
- Accuracy is not guaranteed below the lowest calibrated flow point.
- If flow exceeds +5% of the maximum measuring range, the display will show “Hi.”

4.3 DHT Features and Functions

4.3.1 Service

The red LED pulses once and the service icon is visible at power on along with the letters SEr. The number is POSITIVE when the unit has been used for <12 months and NEGATIVE when >12 months after a service.

Maximum number of days that can be displayed after a service is -999.

The service reminder counts down from 365 days and provides visual reminders the meter requires recalibration based on our recommendations.

The service reminder countdown only starts after the meter has been measuring flow for more than 5 minutes since last service.

MONTHS SINCE SEr	DAYS TO SEr	SERVICE ICON		LED INDICATOR		SEr SCREEN TIME/ INTERVENTION NEEDED	INTERVENTION NEEDED FOR LED DURING NORMAL OPERATION
		DURING SEr SCREEN	NORMAL OPERATION	DURING SEr SCREEN	NORMAL OPERATION		
0	365	Solid	Not Visible	1 Pulse	Not Visible	3 sec	None
11	30	Slow Flash	Solid	1 Pulse	Not Visible	3 sec	None
12	0	Slow Flash	Slow Flash	1 Pulse	Not Visible	Pressure flow unit button to dismiss	None
36	-730	Fast Flash	Fast Flash	1 Pulse	1 Pulse every minute	Pressure flow unit button to dismiss	Press and hold flow and temperature buttons to cancel pulse

NB. 4000 hours of use will cause the same service warnings as 36 months.

The service icon and the red LED provide visual reminders about service status. If the spanner icon is visible in normal use the meter is a minimum of 11 months since the last service. As the time since last service increases the spanner icon will flash, first slowly and then fast. After 36 months since a service the red LED will also flash once per minute.

NB. The red LED flash can be disabled by pressing and holding the flow and temperature unit buttons for >2 sec.

4.3.2 Additional LED indicator functions

The red LED will indicate if the temperature inside the box (PCB) exceeds its maximum operating limit (70 °C) by flashing at 3 Hz (LCD will show “COOL” for 3 seconds every minute). If this occurs hydraulic flow must be stopped and the DHT must be allowed to cool to prevent permanent damage.

To observe the PCB temperature, hold the temperature units’ button for > 3sec and when the red LED blinks (every 1 sec) the temperature display shows the current PCB temperature.

4.3.3 Battery State Indicators

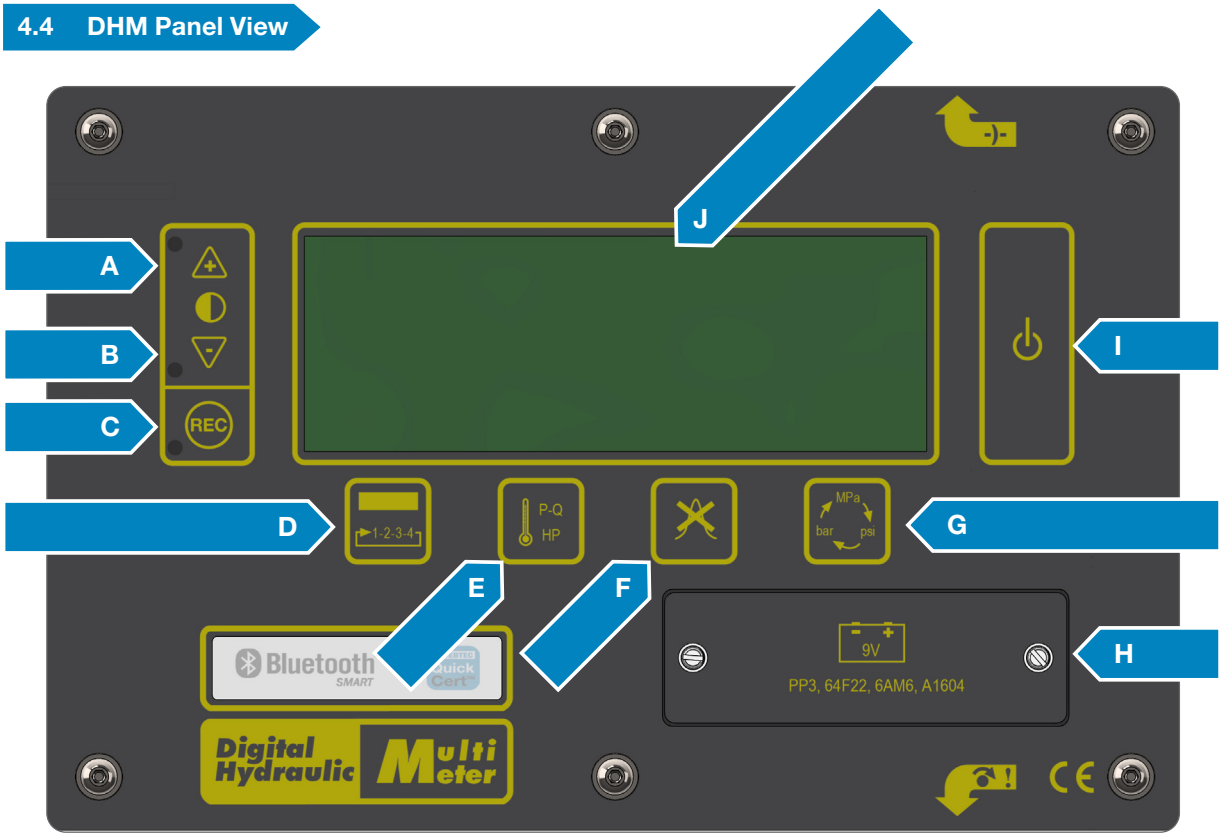
Battery life is typically >240 hours normal use but this will depend on environmental conditions.

The energy state is indicated by the battery icon bars, five bars full, one bar almost empty. After one bar the battery icon will flash, first slow and then fast, culminating in the whole display flashing just before the meter turns off.

Once the battery icon starts to flash there is typically >2 hours of normal use remaining.

NB. Battery flash rates take priority over service flash rates: A battery low fast flash rate will also flash the spanner icon at the same rate.

4.4 DHM Panel View



DHM 4 SERIES DIGITAL HYDRAULIC MULTIMETER			
A	Contrast up	F	Clear Peak
B	Contrast down	G	Toggle pressure and power units
C	Record Data	H	Battery Cover
D	Toggle screen	I	On/Off Switch
E	Toggle: Temperature & Power	J	Digital Display

4.5 Specification

Flow:

- EU version: Displayed in L/min
- US version: Displayed in US gpm

Temperature:

- Thermistor built into flow transducer (maximise contact with the oil flow to ensure fast response)
- Units; EU version - °C, US version - °F
- Accuracy; ± 1°C, 2°F

Fluid Temperature:

- Celsius: 0 to 105
- Fahrenheit: 32 to 220

Ambient Temperature:

- Celsius: 5 to 40
- Fahrenheit: 41 to 104

Flow Accuracy:

- Reading 15% to 100% of flow range - 1% of indicated reading.
- Readings below 15% of full-scale flow - fixed accuracy of 0.15% of full scale.

Pressure Accuracy:

- Built-in pressure transducer (rated to 600 bar / 8700 psi)
- Response time: 1 ms (enables the accurate capture of peak pressures)
- Sampling rate: 1000 times per second
- Engineering units: Changeable via 'Pressure Units' button (BAR, PSI, MPA, KSC)
- Accuracy: 0.5% FSD, Peak 1% FSD
- Peak Pressure capture rate: 1ms

Power:

- Calculated from flow and pressure
- Display units: HP or KW (linked to pressure units)
- Accuracy: ± 3 kW / 4 HP (≤ 100 kW / 134 HP), ± 5 kW / 6.7 HP (> 100 kW / 134 HP)

Volumetric Efficiency:

- Calculated from a ratio of flow at high pressure under reference conditions
- Expressed as a percentage at constant rpm
- Accuracy: ± 1% point

Data Recording:

- Store up to 12 sets of data points internally

LCD Display:

- High contrast, fast response 4-line display
- Update rates: Digital values @1.4Hz, Analogue bars @ 14Hz, Peak Pressure capture @1ms

Battery Life:

- Approximately 15 hours of normal use with high-capacity Alkaline unit

Ingress Protection:

- IP54 for electronic circuits

iOS® App:

- Compatibility: Requires Apple iOS v8.1 or higher
- Devices: iPhones 5S upwards & iPads
- Connectivity: Bluetooth® Smart (v4.1) or greater
- App Name: Webtec Quick Cert App
- Availability: Apple App Store

Note: Ensure your device meets compatibility requirements before downloading the app.

4.6 Features and Functions

4.6.1 DHM Operations

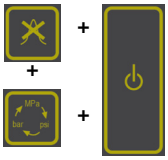
To turn the meter ON press this button momentarily.
To turn the meter OFF press and hold this button.

As the meter turns on two information screens display status data including

- Current version of software running on the meter.
- Total run time in minutes.
- Turbine type.
- Turbine calibration number.
- Calibration date.
- Meter serial number.

After the two information screens the meter reverts to the previously used display screen.

Note: Low battery warning is issued by the display screen flashing. Reliable operation cannot be expected in these circumstances - the battery must be replaced.



Holding the clear peaks button at power on will toggle the temperature units.

Holding the pressure units button at power on will toggle the flow units.

Holding both buttons at power on will toggle the temperature and flow units.

When the meter is turned ON the contrast buttons can be used to adjust the display to suite the ambient light conditions. Settings are saved.

Pressing the P-Q button while on screen 1 will toggle the bottom line, temperature display between power and temperature.

As pressure changes the actual and peak values are updated on the display. Peak pressure is captured at a typical rate of 1ms, allowing the display of rapid transition spikes, otherwise missed.

Pressing the clear peaks button clears the peak capture memory.

Pressing the pressure units button scrolls through the available pressure engineering units. If power is being displayed, then its engineering units will change to suite the selected pressure units.

Pressing the screen selection button scrolls through the four available screens: digital display, digital + bar graphs, power/efficiency and record review.

Pressing the P-Q/HP button while in screen 3 initiates the efficiency display. It captures the flow and pressure to memory and treats this as the 100% reference point. The bottom line of the display shows the flow and pressure that are saved as the reference marker:

In efficiency mode, as the flow and pressure vary the % value on line 3 changes to indicate the difference from the starting point:

Pressing the record button while in screens 1, 2 or 3 (live data view) will save the instantaneous flow pressure and temperature values to memory. If there is available memory the display acknowledges by displaying “SAVED”. If there is no available memory the display warns “MEMORY FULL”.

This is screen 4, recorded data review and delete screen:

This display shows a table of captured data points that can be navigated by the ‘soft menu’ keys designated on the bottom line.

Clear peaks button becomes the scroll “UP” key.

Pressure unit’s button becomes the scroll “DWN” key.

PQ/HP button becomes the “DEL” key.

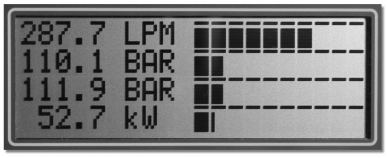
The ‘soft menu’ action of these buttons allows the user to scroll up and down the recorded data table with an option to delete data.

The delete options are indicated by ‘soft menu’ designators on line 4 and allow either the last data item or all data items to be erased.

Screen 1 (Digital)

This screen displays the measurement type, value and engineering units in digital format. Bottom line displays either Power or Temperature depending on selection.

Screen 2 (Analogue)



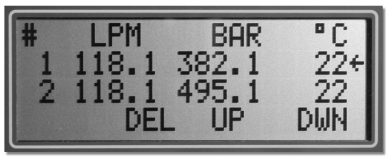
This screen displays the measurements in the same order as in SCREEN 1, but this time displays the value, engineering units and a bar graph which corresponds to the value indicated. The bar graph is scaled from zero to the maximum value for the tester (see below). Bottom line displays Power or Temperature depending on selection.
NB. Analogue bars update @14Hz to provide a visual indication of rapid activity.

		BAR GRAPH SCALING: EU US				
		EU			US	
		DHM404	DHM804		DHM404	DHM804
Flow	**LPM**	0 - 400	0 - 800	**GPM**	0 - 100	0 - 210
Pressure	**BAR**	0 - 600	0 - 600	**PSI**	0 - 8700	0 - 8700
Peak	**BAR**	0 - 600	0 - 600	**PSI**	0 - 8700	0 - 8700
Temperature	**°C**	0 - 120	0 - 120	**°F**	32 - 250	32 - 250
Power	**kW**	0 - 400	0 - 800	**HP**	0 - 536	0 - 1072

Screen 3 (P - Q)

This screen is used for testing pump volumetric efficiency. The screen initially displays flow and pressure on the top two lines as in SCREEN 2 and power on the bottom two lines. Once the efficiency reference point has been captured, then the third line displays the current efficiency and the bottom line shows the reference point, the top two lines will continue to display the current flow and pressure.

Screen 4 (Data Review)



This screen displays any recorded parameters and provides delete options.

4.6.3 Troublshooting

Failure to connect to mobile device

If there are persistent failures when attempting to Import data with a mobile device the following reset procedure may help:

- Turn the meter OFF
- Hold down the REC button and turn the meter ON. Keep the REC button pressed until normal display screen appears.

5.0 Maintenance and Service

5.1 Battery replacement

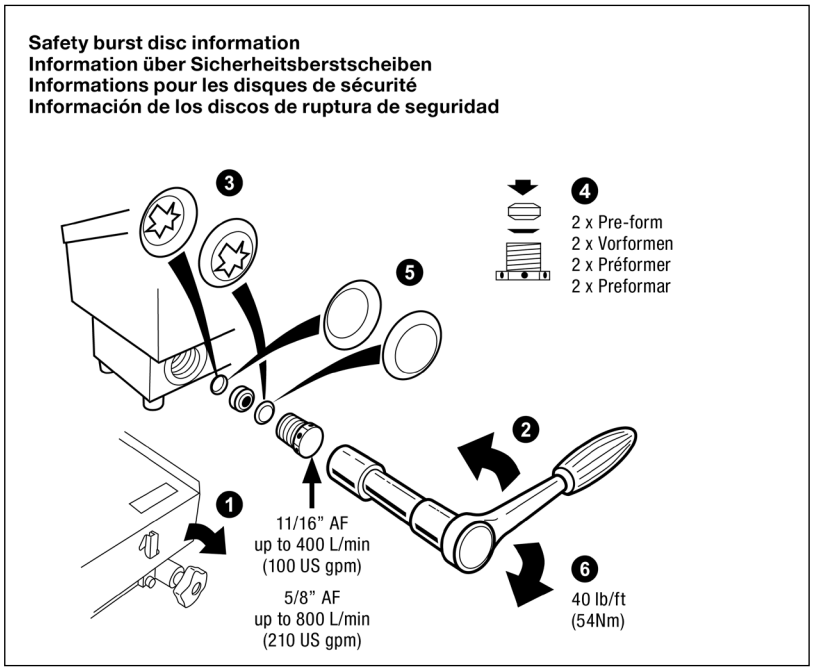
1. Turn tester off.
2. Loosen the two captive screws at either end of the battery cover.
3. Carefully remove battery and disconnect.
4. Connect new PP3 battery (See section “Product Data” for details), place in tester and replace battery cover.

Note: Only replace with matching size and type of battery.

5.2 Burst disc replacement

1. Disconnect the tester from the hydraulic circuit.
2. Locate the new discs - the tester is shipped with spare discs located in the block.
3. Screw the load valve fully shut - (clockwise)
4. Unscrew the safety disc holder from the valve.
5. Remove the disc spacer and ruptured discs from the valve and disc holder.
6. Carefully shape the two new discs by pressing them by hand between the disc holder and spacer
7. Place the first disc inside the valve.
8. Replace the spacer.
9. Place the second disc on top of the spacer.
10. Screw in the disc holder, tighten to 54 Nm (40 lb. ft)
11. Unscrew the load valve fully.
12. Re-connect the tester if required.

Safety burst disc information
Information über Sicherheitsberstscheiben
Informations pour les disques de sécurité
Información de los discos de ruptura de seguridad



6.0 Technical Data

Testers have an auto power off timer that disconnects the battery from the circuits after a period of 20 minutes of no flow measurement. A single press of the power button restores operational power.

6.1 Model Table

PORTABLE HYDRAULIC TESTER SERIES	MODEL CODE	CALIBRATED FLOW RANGE	MAXIMUM RATED PRESSURE	PORTS
Digital Hydraulic Tester	DHT03-B	8 - 300 L/min	420 bar / 6000 psi	1” BSPP
	DHT03-S	2 - 80 US gpm	420 bar / 6000 psi	1-5/16” SAE
	DHT04-B	10 - 400 L/min	420 bar / 6000 psi	1” BSPP
	DHT04-S	2.5 - 100 US gpm	420 bar / 6000 psi	1-5/16” SAE
	DHT08-S-L*	20 - 800 L/min	480 bar / 7000 psi	1-7/8” SAE
	DHT08-S*	5 - 210 US gpm	480 bar / 7000 psi	1-7/8” SAE
Digital Hydraulic Multimeter	DHM404-B-6	10 – 400 L/min	420 bar / 6000 psi	1” BSPP
	DHM404-S-6	2.5 – 100 US gpm	420 bar / 6000 psi	1-5/16” SAE
	DHM804-S-7-L*	20 – 800 L/min	480 bar / 7000 psi	1-7/8” SAE
	DHM804-S-7*	5 – 210 US gpm	480 bar / 7000 psi	1-7/8” SAE

* Limited pressure control below 86 L/min (23 US gpm).
The maximum controllable pressure in this region is calculated by: max pressure (in bar) = 5 x flow (L/min) + 30

6.2 General Product Data

Fluid Type:

- Mineral oil to ISO 11158 category HM
- For other fluid types, please contact your sales representative.

EMC Environment:

- Intended for use within industrial and residential environments
- Operation remains unaffected under requisite standard test conditions

Construction Materials:

- Case: Painted mild steel
- Flow block: High tensile aluminium
- Seals: FKM

Battery Details:

- Type: PP3 9 volt Alkaline (IEC6LR61, ANSI/NEDA 1604A)

It is the user’s responsibility to ensure the digital display panel does not exceed 70°C (158°F), some models of testers include a warning indicator, during high fluid and ambient temperature operations. Failure to do so will invalidate the warranty.

Dimensions and Weight

MODEL NUMBERS	WIDTH		HEIGHT		DEPTH		WEIGHT	
	MM	INCHES	MM	INCHES	MM	INCHES	MM	INCHES
DHT03/04 DHM404	222	8.74	202	7.95	181	7.13	6.5	14
DHT08 DHM804	235	9.26	227	8.94	208	8.19	10	22

6.3 Bluetooth

Meters with Bluetooth Contain Transmitter Module FCC ID: T9JRN4020 - IC: 6514A-RN4020
Tester mit Bluetooth enthalten Transmittermodul FCC ID: T9JRN4020 - IC: 6514A-RN4020
Débitmètres avec la fonctionnalité Bluetooth, contient un émetteur
FCC ID: T9JRN4020 - IC: 6514A-RN4020
Medidores con Bluetooth contienen Módulo Transmisor FCC ID: T9JRN4020 - IC: 6514A-RN4020

EU - English

This product contains a Bluetooth® Low Energy Module which broadcasts in the license free ISM Band as follows:

- 2.402 to 2.480GHz
- Channels 0-39
- Transmit power: +7dBm

EU - Deutsch

Dieses Produkt enthält ein Bluetooth® Low Energy Modul, welches im lizenzfreien ISM-Band sendet und zwar wie folgt:

- 2.402 bis 2.480GHz
- Kanäle 0-39
- Sende-Leistung: +7dBm

UE - Français

Ce produit contient un module basse consommation Bluetooth® qui fonctionne avec la licence gratuite ISM comme ci-dessous :

- 2.402 à 2.480GHz
- 0-39 voies
- Puissance transmise: +7dBm

UE - Español

Este producto contiene un módulo Bluetooth® de energía baja que emite en la licencia libre ISM Band de la siguiente:

- 2.402 a 2.480GHz
- Canales 0-39
- Potencia de transmisión: +7dBm

United States

Contains Transmitter Module FCC ID: T9JRN4020
This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

This device complies with Industry Canada license exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Contains transmitter module IC: 6514A-RN4020

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

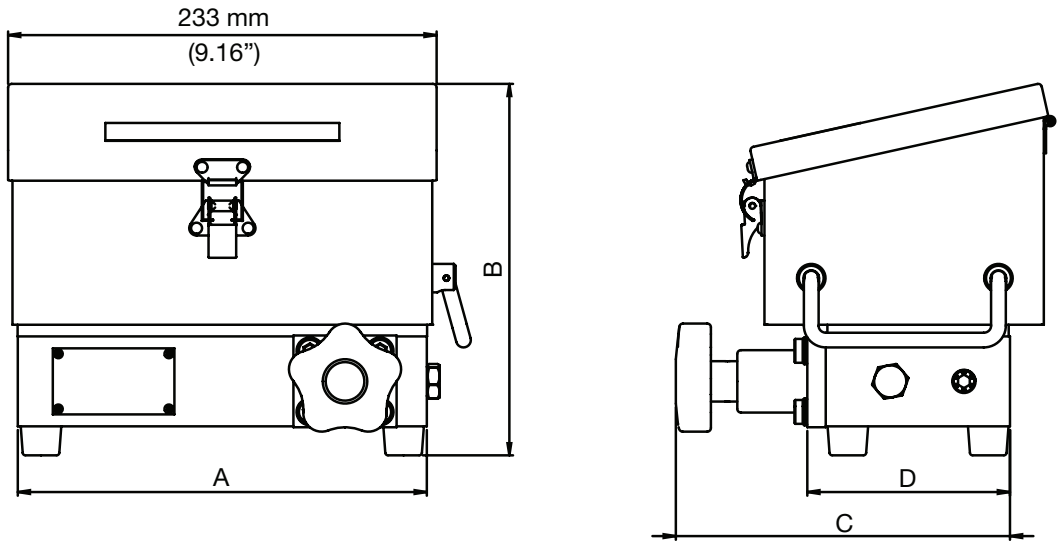
Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

7.0 Appendix

7.1 Accessories

A wide range of general accessories are available, these include pressure transducers, high pressure temperature sensors adaptors, cables, and remote displays, please consult your sales representative. Only use Webtec approved parts and accessories, using other parts could cause permanent damage to the tester or comprise safety.

7.2 Dimensional Drawings



7.3 Certificate of Conformity

The basic certificates and Declaration of Conformity are provided upon request. This can the obtained through your sales representative.

7.4 Manufacturer’s Five Year Limited Warranty

Webtec Products Ltd. warrants to the original purchaser, for the period of five years from the date of purchase, that each new hydraulic tester is free from defect in materials and workmanship.

This warranty does not cover any hydraulic tester that has been damaged due to abuse or operation beyond the maximum specifications stated by Webtec Products Ltd. in the associated hydraulic tester literature or by use on incompatible fluids.

Webtec Products Ltd. sole obligation under the warranty is limited to the repair or the replacement of parts, at no charge, found to be defective after inspection by Webtec Products Ltd. or one of its divisions. Repair or replacement of parts will be at Webtec Products Ltd. discretion.

Written authorisation from Webtec Products Ltd. is required before any hydraulic tester can be returned under warranty. Cost of shipping and handling is covered during the first 12 months from the date of purchase. After 12 months from the date of purchase, cost of shipping and handling is not covered by the warranty.

Webtec Products Ltd. is not liable for any consequential damages or any contingent liabilities arising out of the failure of any hydraulic tester, component part or accessory.

The above warranty supersedes and is in place of all other warranties, either expressed or implied and all other obligation or liabilities. No agent, or representative or distributor has any authority to alter the terms of this warranty in any way.

HYDRAULIC MEASUREMENT AND CONTROL

Webtec reserve the right to make improvements and changes to the specification without notice.

HYDTESTER-MA-MUL-4248.pdf - Version 1.0 - 06/24

Your local distributor

Webtec Products Limited
St. Ives, Cambridgeshire, PE27 3LZ, UK
Tel: +44 (0) 1480 397 400
sales-uk@webtec.com

Webtec LLC
1290 E. Waterford Ave, St. Francis, WI 53235 U.S.A.
Tel: +1-414-769-6400
sales-us@webtec.com

Webtec (Europe) GmbH
Bonner Strasse 2m, 51379 Leverkusen, Germany
Tel: +49 (0) 2171 – 79 14 910
sales-eu@webtec.com

Webtec (Hong Kong) Ltd.
Room1109, CRE Centre, 889 Cheung Sha Wan Road, Cheung Sha Wan, Kowloon, Hong Kong
Tel: +85230183090
sales-hk@webtec.com

www.webtec.com

Designed and produced by Webtec

Make it BLUE