pico® Technology

WPS600®

600 bar, 60 MPa, 8700 psi
Hydraulic Pressure Transducer

User's Guide

1. Safety terms and symbols

Please review the following safety precautions to avoid injury and prevent damage to this transducer or any equipment that is connected to it.

Appearing on the product:

Danger of personal injury or property damage. Refer to this manual for details.

Appearing in this manual:

A **WARNING** identifies conditions or practices that could result in injury or death.

A **CAUTION** identifies conditions or practices that could result in damage to the product or equipment to which it is connected.

Your help and efforts are required to protect and keep our environment clean. Therefore either return these product to the manufacturer or ensure WEEE compliant collection and treatment yourself at the end of life. Do not dispose of as unsorted municipal waste.

Hazards of hydraulic systems

Hydraulic systems contain several hazards:

- High-pressure leaks, which can inject oil through the skin, causing serious injury including loss of fingers and limbs.
- Ejection of hot oil, which can cause skin burns
- Unsecured high-pressure hoses, which can move at high speed and with large forces, causing injuries
- Unsecured hydraulic machinery, which can move without warning, causing injury

WARNING:

- To avoid damage or injury, this transducer must only be connected using pressure hoses and connectors designed for high-pressure hydraulic testing. Pico Technology cannot accept responsibility for damage or injury caused by the use of unsuitable or damaged pressure hoses or connectors.
- To avoid injury, wear appropriate personal protective equipment (PPE), including safety glasses, when working with pressurized fluids.
- To avoid damage or serious injury, do not use unless you are qualified to work with hydraulic systems.
- To avoid equipment damage and personal injury, do not operate this transducer with the covers removed.
- To avoid personal injury and fire hazard, do not operate this transducer in an explosive atmosphere.
- To avoid damage or injury, do not use the transducer with damaged or modified pressure hoses. Only use pressure hoses that have been pressure-tested and do not use them if they have been disassembled, modified or damaged.

CAUTION:

- To avoid incorrect readings and possible equipment damage, do not operate this transducer in wet or damp conditions, or submerge it in liquid. The transducer is splash-resistant but not immersion-proof.
- To avoid further damage, have a suspected damaged transducer inspected by qualified service personnel. Do not attempt to dismantle or repair it yourself.
- To avoid damage, do not use the transducer in long-term or permanent installations such as installed monitoring systems in vehicles. The WPS600 is intended for immediate diagnostic purposes only.
- To avoid measurement errors do not use the transducer with the charging cable connected.
- To avoid damage to the lithium polymer (LiPo) battery inside the transducer, do not store or operate the unit above 60 °C (140 °F).

2. Description

The WPS600 diagnostic pressure transducer gives you quick and accurate pressure analysis of hydraulic systems.

It offers these features:

- high resolution and accuracy
- zero adjustment
- two pressure ranges:
  - 600 bar / 60 MPa / 8700 psi
  - 60 bar / 6 MPa / 870 psi

Compatible fluid types

The WPS600 is designed for use with hydraulic oils only. Do not use it with any other type of liquid or gas.

3. Re-ordering codes

If you need to re-order spare parts, please use the part numbers listed here:

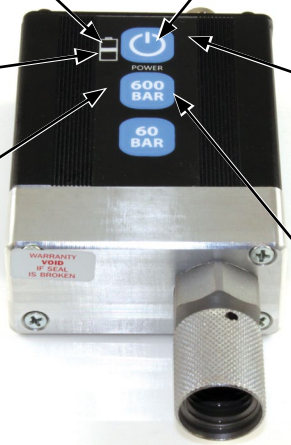
WPS600 pressure transducer kit

Part No	Qty	Description
TA092	1	WPS600 pressure transducer
TA081	1	USB to mini-USB charging cable 2 m
MI030	1	BNC to BNC cable 1 m
DO187	1	WPS600 User's Guide
PA041	1	Single-transducer storage case

4. The parts of your WPS600 pressure transducer

Signal output	Use the BNC-to-BNC cable supplied to connect this to your oscilloscope. **CAUTION**: This connector is plastic mounted to ensure measurement accuracy. It could be damaged by a strong impact.
Front-panel controls	See Section 5.
USB charging port	For battery recharging only (no data connection). Connect to any USB port on a computer or wall charger. Do not operate the unit with the charging cable connected as measurements errors may occur.
Inlet port	M16 x 2 Minimess connector that can be connected to a suitable test port or to an appropriate high-pressure hose.

5. Front-panel controls



Charging indicator

The indicator lights up when the battery is charging.

Low battery indicator

The indicator lights up when the power is on but the battery is low.

Range indicator

The indicator shows if the range is selected.

Power button

Press once to switch on. Press once again to switch off. Conserve battery power by keeping the unit switched off when not in use.

Battery fault indicator

The indicator lights up if there is a problem with the battery

Range button

Press this button to select the indicated range.

Press both buttons to calibrate the transducer.

6. Preparation for use

Before first use

- Remove all packaging.
- Charge the internal battery. For instructions, see Section 7: "Maintenance".

Zeroing the transducer

The WPS600 has a zeroing function to ensure its long-term accuracy. The transducer should be zeroed before first use, and can be zeroed again if the unit starts to show an error in the zero-pressure reading.

- Begin with the transducer switched off.
- If the transducer is connected to a pressurized system, make sure that the system is switched off and the pressure has been safely released.
- Disconnect any items that are connected to the transducer's inlet port.
- Switch the transducer on and check that one of the range LEDs is lit.
- Press both the "60 BAR" and "600 BAR" buttons at the same time, then release them. Both range LEDs will flash for a few seconds, and then the "600 BAR" LED will remain continuously lit.
- The transducer is now zeroed.

7. Using the WPS600

Preparing the transducer

- Ensure that the transducer's internal battery is charged.
- Unplug the charging cable from the transducer.
- Switch the transducer on.
- The "600 BAR" LED will light up to show that the unit is ready.

Measuring pressure

WARNING:

- ALWAYS safely depressurize the system under test before connecting the transducer. DO NOT connect the transducer to a system that is already pressurized.
- ALWAYS check that the pressure connector is securely fastened to the transducer BEFORE pressurizing the system. ALWAYS check for leaks when connecting the unit and NEVER leave it connected to a vehicle unattended.

- Connect the transducer to the hydraulic system, either directly or through a suitable high-pressure hose.

CAUTION:

- Use ONLY pressure hoses specifically designed for high-pressure testing. Pico Technology cannot accept responsibility for damage or injury caused by the use of unsuitable or damaged pressure hoses or adaptors.

- Use a BNC cable (supplied) to connect the output of the transducer to the input channel of the oscilloscope.
- Switch on the computer and run the PicoScope software.
- In the PicoScope software, select the pressure sensor in the drop-down menu and then the appropriate pressure test.
- If necessary, press one of the Range buttons on the transducer to select the desired measuring range.
- Start the test using the appropriate procedure directed by the manufacturer of the machine being tested.
- A waveform showing the pressure of the system will appear on the PicoScope display.

Releasing the pressure in the measurement chamber

After a measurement, some fluid may remain in the measurement chamber. When disconnecting the pressure hose from the transducer, hold both items over a suitable container to catch any fluid expelled.

WARNING:

- DO NOT disconnect the transducer or the high-pressure hose from a pressurized system.

8. Maintenance

Cleaning the housing

Clean the transducer's housing by wiping it with a cloth moistened with clean water or water-based detergent. Allow the housing to dry before use.

- Do not use fuel or any other solvent
- Do not use abrasive cleaning agents
- Do not submerge the unit in any liquid
- Do not dismantle the unit
- Do not use the unit until it is completely dry

Recharging the internal battery

- To charge using a computer, switch on the computer and allow it to boot. Disable any power-saving modes to ensure that the computer does not switch off before recharging is complete. Connect the transducer to the USB port of the computer using the USB charging cable provided.
- To charge using a USB wall charger, connect the transducer to the charger using the USB charging cable provided.
- Leave the transducer to charge for 5 hours.
- Unplug the USB cable from the transducer before use. Leaving the cable plugged in may affect measurement accuracy.

The battery inside the WPS600 is designed to give a long service life and is not user-replaceable.

Repairs

If the unit is damaged or stops working, or the battery is not charging or holding charge, return it to Pico Technology or an authorized Pico distributor for repair. Do not attempt to dismantle or repair the unit yourself.

Disposal

The WPS600 contains a lithium polymer (LiPo) battery. If the battery has reached the end of its life, you may return the unit for repair. When the transducer reaches the end of its life, take the entire unit to a battery recycling facility for safe disposal.

YOU MUST observe the instructions below. Incorrect disposal of the battery could cause a fire or an explosion.

- Do not open the unit to remove the battery
- Do not crush or shred the unit
- Do not dispose of in fire

9. Specifications

Inlet		
Pressure ranges	0 to 600 bar 0 to 60 MPa 0 to 8700 psi	0 to 60 bar 0 to 6 MPa 0 to 870 psi
Connector	M16 x 2 Minimess test port	
Output		
Scaling	1 V / 100 bar 1 V / 1450 psi 1 V / 10 MPa	1 V / 10 bar 1 V / 145 psi 1 V / 1 MPa
Offset (typical)	Manual zeroing	
Connector	BNC female	
Performance		
Accuracy	1% of scale	
Response time (10% to 90%)	100 µs	
Power supply		
Type	Built-in LiPo battery, not user-serviceable	
Charging current	500 mA (max.) at 4.75 V to 5.25 V from USB charger cable	
Charging connector	USB mini, fits cable TA081	
Ambient operating temperature	60 °C (140 °F) max.	
Ambient storage temperature	60 °C (140 °F) max.	
Environmental protection	Splash-resistant against water, gasoline, diesel and hydraulic fluids. Not immersion-proof.	
Weght	332 g (11.7 oz)	
Dimensions	132 x 64 x 31 mm (5.2 x 2.5 x 1.2 in)	
Compliance	CE, FCC Part 15 class A	

10. Conversion Factors

The SI unit of pressure and vacuum is the pascal, symbol Pa. This is related to psi (pounds per square inch) and bar as follows:

- 1 bar = 100,000 Pa
- 1 psi ≈ 6895 Pa

11. Technical Support

For assistance with operating this device, please contact Pico Technology at www.picotech.com

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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