

# FORT100, FORT250, FORT1000, FORT5000



# FORT100, FORT250, FORT1000, FORT5000

*Load Cell Force Transducers*

## Warranty

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of one year\* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

## Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

## Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

*\* Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*



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## INSTRUCTION MANUAL

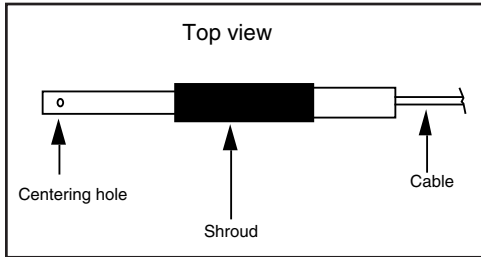
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**World Precision Instruments**

# FORT100, FORT250, FORT1000, FORT5000

## Operation and Use



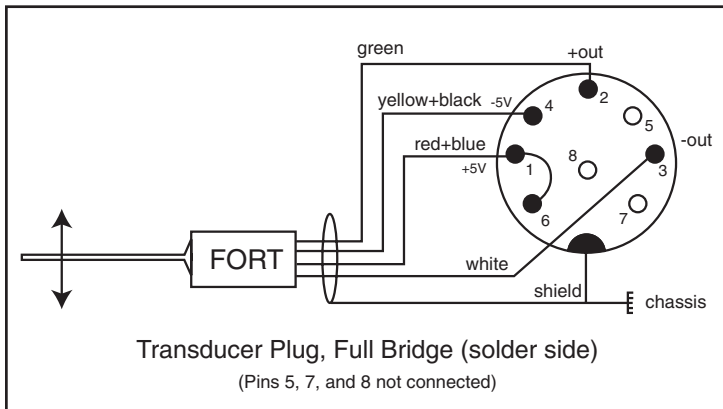
Rigid lever force transducers, **FORT100**, **FORT250**, **FORT1000** and **FORT5000**, transform applied force into a proportional voltage. Using balanced strain gauges, FORT transducers produce linear output voltage vs

applied force input with very little deflection.

Clamp the round handle of the transducer to a firm anchor and apply the forces to be measured to a screw or hook mounted in the hole at the end of the flat sensing leaf. To calibrate the device, connect FORT to a signal conditioner such as WPI's **Transbridge** (Part #TBM4M) or **Bridge-8**.

In the Differential (Full Bridge) mode, zero the output and then apply a known weight (for example, 100 grams) perpendicular to the flat face of the sensing leaf. The sensitivity will change if the loading force is applied at points on the sensor other than exactly at the center of the load screw hole. Using an amplification of x10, x100, x1000 or x5000 record the output deflection caused by the applied load. Do not allow the sustained application of forces to greatly exceed the device's force range (*i.e.*, 100 grams for FORT100, 250 grams for FORT250, 1000 grams for FORT1000 and 5000 grams for FORT5000).

Each FORT transducer is connected to an 8-pin DIN plug for direct insertion into WPI bridge amplifiers and data acquisition instruments. Should the user



require a plug different from the one supplied, a wiring plan showing the color code of the transducer cable is shown in the figure below. Pins 1, 4, 2, and 3 are the relevant connectors for adaptation to non-WPI equipment. Toward this end, an 8-pin female DIN connector (WPI part #3492) has been provided since opening up the FORT 10's male DIN connector is not recommended.

Forces exceeding the Absolute Maximum Applied Force rating may permanently damage the device. Do not apply more than 10 volts DC or AC to power the transducer.

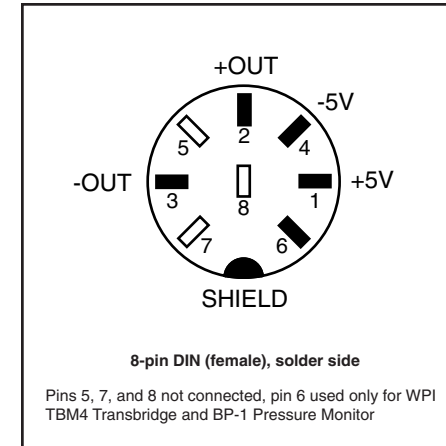
## FORT Specifications

### Full Bridge Configuration

<b>Force Ranges</b>	100, 250, 1000 and 5000 grams, full scale
<b>Output Sensitivity</b>	FORT 100: 7 $\mu$ V/volt/gm, nominal FORT 250: 3 $\mu$ V/volt/gm, nominal FORT 1000: 0.84 $\mu$ V/volt/gm, nominal FORT 5000: 0.38 $\mu$ V/volt/gm, nominal
<b>Resolution</b>	0.01 % of full scale force
<b>Linearity Error</b>	Less than 0.1% of full scale
<b>Resonant Frequency</b>	300 Hz
<b>Maximum Operating Voltage</b>	10 V AC or DC
<b>Output Resistance</b>	350 Ohms (nominal)
<b>Absolute Maximum Applied Force</b>	3x rated full scale force
<b>Dimensions</b>	7.6 mm diam x 10.16 cm long 0.3 in. diam x 4 in. long

## 3492 8-Pin Female DIN

This accessory is included with your WPI transducer to facilitate its adaptation to non-WPI bridge-type amplifiers. You should make certain before proceeding that your amplifier is compatible with the transducer requirements as explained below and on your transducer specification sheet.



The information contained in the diagram at left and the paragraphs below should let you quickly reconfigure your WPI transducer to any compatible third-party bridge amplifier.

Your WPI transducer is supplied ready to use with our **TBM4** Transbridge and **BP-1** Pressure Monitors and can be quickly connected to the **DA100** Differential Amplifier module available for the **MP100WS** data acquisition system via the

optional **TCI102** Transducer Connector Interface. In addition, if you need to, you can adapt the transducer to most non-WPI bridge amplifiers. Along with the pin-out information for your WPI transducer, you need to know the pin-out information for your particular bridge amplifier's required connector.

We recommend that you first use the female DIN connector provided as an intermediate step to test the transducer/amplifier combination before permanently removing our 8-pin DIN and replacing it with the required connector (if you wish to make the modification permanent).

WPI transducers require two excitation voltage inputs, a positive 5 volt input connected to pin 1 and a negative 5 volt input connected to pin 4. These two input voltages "excite" or power the bridge transducer. To record the transducer's output signal also requires two pins. Pin 2 carries the positive signal "out" of the transducer and Pin 3 carries the negative signal "out" of the transducer. The diagram to the left shows these connections as they would be made on the solder side of the female 8-pin DIN (WPI part # 3492). Therefore, pins 1, 4, 2, and 3 are the relevant connectors for adaptation to non-WPI equipment. The connection between pins 1 and 6 found in the male DIN connector attached to the end of all WPI transducers should not be duplicated on the 8-pin female DIN as it is useful only in conjunction with WPI bridge amplifiers. Finally, if you do choose to make the modification permanent by replacing the male 8-pin DIN with your amplifier's connector, you must also make sure that the shield is connected from the WPI transducer's cable to your new connector.

**Note:** For your convenience, WPI has available for sale the same shielded cable stock used for our transducers in 25-ft lengths, part # **5385**.