

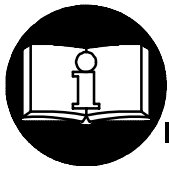
OPERATORS MANUAL FOR MODEL ST102 TORQUE TESTER

NOTICE

This ST102 Torque Tester is used for calibration of torque tools, power and hand operated, using internal and/or external transducer(s). This Tester can also be used for joint development and as a failure analysis instrument (using internal or external transducers).

Ingersoll-Rand is not responsible for customer modification of units for applications on which Ingersoll-Rand was not consulted.

⚠ WARNING



IMPORTANT SAFETY INFORMATION ENCLOSED.

READ ALL THESE INSTRUCTIONS BEFORE PLACING UNIT IN SERVICE OR OPERATING THIS UNIT AND SAVE THESE INSTRUCTIONS.

IT IS THE RESPONSIBILITY OF THE EMPLOYER TO PLACE THE INFORMATION IN THIS MANUAL INTO THE HANDS OF THE OPERATOR.

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

WHEN USING ELECTRIC TOOLS, BASIC SAFETY PRECAUTIONS SHOULD ALWAYS BE FOLLOWED TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK AND PERSONAL INJURY, INCLUDING THE FOLLOWING.

PLACING TORQUE TESTER UNIT IN SERVICE

- Always operate, inspect and maintain this unit in accordance with all regulations (local, state, federal and country), that may apply.
- Inspect extension cords periodically and replace if damaged.
- Do not remove any labels. Replace any damaged label.

USING THE TORQUE TESTER UNIT

- Always wear eye protection when operating or performing maintenance on this unit.
- Power tools can vibrate in use. Vibration, repetitive motions, or uncomfortable positions may be harmful to your hands and arms. Stop using any tool if discomfort, tingling feeling or pain occurs. Seek medical advice before resuming use.

- **Guard Against Electric Shock.** Prevent body contact with earthed or grounded surfaces. For example; pipes, radiators, ranges, refrigerator enclosures.
- **Keep work area clean.** Cluttered areas and benches invite injuries.
- **Consider work area environment.** Don't expose unit and chargers to water. Keep work area well lighted. Do not use unit in explosive or flammable atmospheres.
- **Keep bystanders and children away.** Do not permit unauthorized personnel to operate this unit.
- **Store idle units.** When not in use, units should be stored in a dry, high or locked up place, out of reach of children.
- **Dress properly.** Do not wear loose clothing or jewelry. They can be caught in moving parts. Rubber gloves and non-skid footwear are recommended when working outdoors. Wear protective hair covering to contain long hair.

NOTICE

The use of other than genuine Ingersoll-Rand replacement parts may result in personal injury, decreased performance and increased maintenance, and may invalidate all warranties.

Have your unit repaired by a qualified person. This electric unit is in accordance with the relevant safety requirements. Repairs should only be carried out by qualified persons using original spare parts, otherwise this may result in considerable danger to the user.

Repairs should be made only by authorized, trained personnel. Consult your nearest Ingersoll-Rand Authorized Servicenter.

⚠ WARNING

FAILURE TO OBSERVE THE FOLLOWING WARNINGS COULD RESULT IN INJURY.

USING THE TORQUE TESTER UNIT
(Continued)

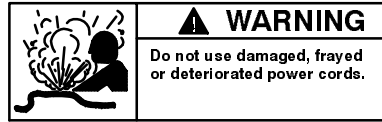
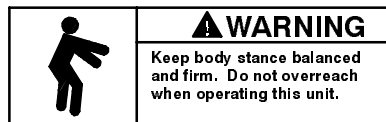
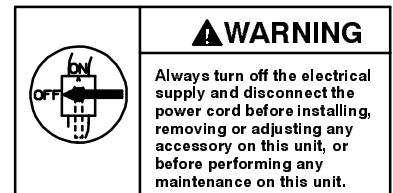
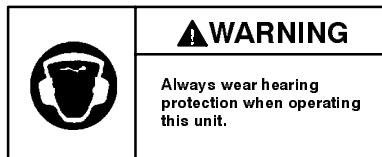
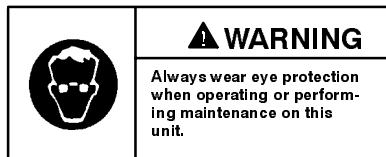
- **Secure work.** Use clamps or a vise to hold work. Operators often need both hands to perform job functions.
- **Don't overreach.** Keep proper footing, balance, and a firm grip on the tool at all times.
- **Maintain unit with care.** Keep unit clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect unit cords periodically and if damaged, have them repaired by an authorized service facility. Inspect extension cords periodically and replace if damaged. Keep handles dry, clean, and free from oil and grease.
- **Do not drop or abuse the unit.**
- **Whenever a unit is not being used, position the Power Switch to the "OFF" position and unplug the power cord.**
- **Stay alert.** Watch what you are doing. Use common sense.
- **Check damaged parts.** Before further use of the unit, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this operation manual.
- **Have defective switches replaced by an authorized service center.**
- **Do not use the unit if the switch does not turn it on and off.**
- **Do not allow chemicals such as acetone, benzene, thinner, ketone, trichloroethylene or other similar chemicals to come in contact with the housing, as damage will result.**
- **The use of any accessory or attachment other than recommended in this manual can present a risk of personal injury.**

CAUTION

FAILURE TO OBSERVE THE FOLLOWING CAUTIONS COULD RESULT IN INJURY.

- **The unit should be checked periodically to ensure that the zero point is adjusted properly and that the torque readings are accurate. The zero point may drift due to changes in the temperature.**
- **DO NOT store the Torque Tester in relative humidity above 85%.**
- **DO NOT operate the Torque Tester without an adapter between the tool and the Tester.**
- **Have the unit calibrated at least once a year.**
- **Keep the exterior of the Tester clean and dry.**

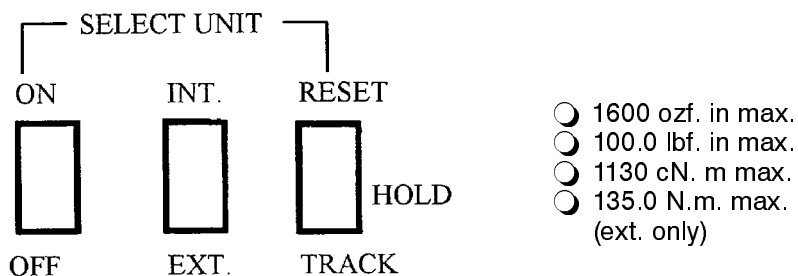
WARNING LABEL IDENTIFICATION



OPERATING INSTRUCTIONS

Control Switch Functions

The switches and LED unit indicators are defined as shown:



Operation of switches is as follows:

ON/OFF

This switch turns power to the unit ON or OFF. The ON position provides two other functions: holding it in the ON position while simultaneously pressing the RESET switch allows the desired Range/Unit selection; and holding it in the ON position while in the TRACK mode is used to RESET zero when/if necessary.

INT/EXT

This switch provides for selection between the internal transducer or an external transducer.

RESET/HOLD/TRACK

This is a three position switch. RESET is a momentary position used to return the unit to zero between readings in the HOLD mode. It is also used in conjunction with the ON switch to select the desired Range/Units as described under ON/OFF. In "normal" operation the HOLD position is used to take and display maximum torque readings. The reading will be held for at least 30 seconds to allow recording of the value. The display should return to a zero value when the RESET switch is pressed. If the unit does not return to zero, hold the ON switch in the TRACK mode to reset zero. TRACK is used to follow the applied torque reading and display it.

INTERNAL TRANSDUCERS

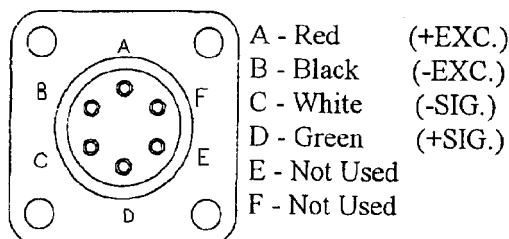
1. When testing, the analyzer should always be clamped to a bench, desk top, or other solid base to avoid damage to the tester and/or injury to the operator. The four clamping screws located on the analyzer flange should be used whenever possible.
2. With the MODE selection switch in TRACK, press the ON switch to activate the unit. Always allow the analyzer enough time (approx. four minutes) to thermally stabilize or it may display inconsistent readings.
3. To select the desired units of measurement, depress the ON button while pressing the RESET button. The LED lamps will indicate the scale selected.
4. For internal transducer operation, select INTERNAL transducer and proceed. For EXTERNAL transducer operation, see specific applicable instructions that follow.
5. Apply a preload between 80 – 85% of the range in the direction in which the analyzer will be used (clockwise or counter-clockwise).
6. Verify that the analyzer returns to zero after the preload step has been completed. If necessary, reset zero by pressing the ON switch with the mode selection switch in TRACK and no load applied. In use, the unit may be reset to zero by pressing the RESET switch whenever the display moves away from zero with no load applied.

OPERATING INSTRUCTIONS

7. The analyzer may be operated in two modes, TRACK or HOLD. In the TRACK mode, the analyzer continuously measures input torque. In the HOLD mode, the analyzer retains the highest reading for at least 30 seconds after the load is removed. By pressing the RESET switch, the unit will return to zero. (If the unit will not return to zero, press the HOLD switch in the TRACK mode to RESET zero.)
8. When the tester is not in use, press the OFF switch. If the OFF switch is not pressed, the unit will shut off automatically after about four minutes. The automatic shut off feature will not function when the unit is connected to the charger.
9. The unit can be used while recharging as long as the battery is not fully depleted. Readings taken while recharging a fully depleted battery may not be accurate.
10. The recharging time for a fully depleted battery is approximately four hours.

EXTERNAL TRANSDUCERS

1. Connect a specific external transducer to the EXTERNAL port on the analyzer. The unit will accept a standard six-pin male Bendix connector (see below). For external transducers that have a default set-up of 2 mV/V sensitivity and 350 ohms of bridge resistance and the exact same full scale lbf.in scale as the base: external maximum range of 100 lbf.in; PROCEED AS FOLLOWS (all others see #11).



2. With the MODE selection switch in TRACK, press ON to activate the unit. Always allow the analyzer to thermally stabilize (approx. four minutes) or it may display inconsistent readings.
3. Select EXTERNAL transducer.
4. To select the desired units of measurement, depress the ON button while pressing the RESET button. The LED lamps will indicate the scale selected.
5. Apply a preload to the external transducer between 80 - 85% of the range in the direction in which the analyzer will be used (clockwise or counter-clockwise).
6. Verify that the analyzer returns to zero after the preload step has been completed. If necessary, reset zero by pressing the ON switch with the mode selection in TRACK and no load applied to the transducer.
7. The analyzer may be operated in two modes, TRACK or HOLD. In the TRACK mode, the analyzer continuously measures input torque. In the HOLD mode, the analyzer retains the highest reading for at least 30 seconds after the load is removed. By pressing the RESET switch the unit will return to zero. (If the unit will not return to zero press the HOLD switch in the TRACK mode to RESET zero.)
8. When the Tester is not in use, press the OFF switch. If the OFF switch is not pressed, the unit will shut off automatically after about four minutes. The automatic shut off feature will not function when the unit is connected to the charger.
9. The unit can be used while recharging as long as the battery is not fully depleted. Readings taken while recharging a fully depleted battery may not be accurate.
10. The unit recharging time for a fully depleted battery is approximately four hours.
11. Do not use for external transducers that do not have a default set-up of 2 mV/V sensitivity and 350 ohms of bridge resistance and the exact same full scale lbf.in range as the internal transducer.

OPERATING INSTRUCTIONS

WARNING

READ ALL INSTRUCTIONS BELOW BEFORE PERFORMING TOOL TESTING AND/OR JOINT SIMULATION.

Tool Testing

1. Static tool – Place the torque tool with a 3/8” square drive adapter into the input drive and test using appropriate operating instructions.

CAUTION

When using the Rundown Adapter Spring Assembly (1), make sure its’ square base is properly seated in the square cavity of the input drive on the Torque Tester. (See Dwg. TPD1914.)

2. Dynamic tool – Place enclosed Rundown Adapter into the square cavity of the input drive and test as above. Do not exceed the maximum range of the internal transducer.

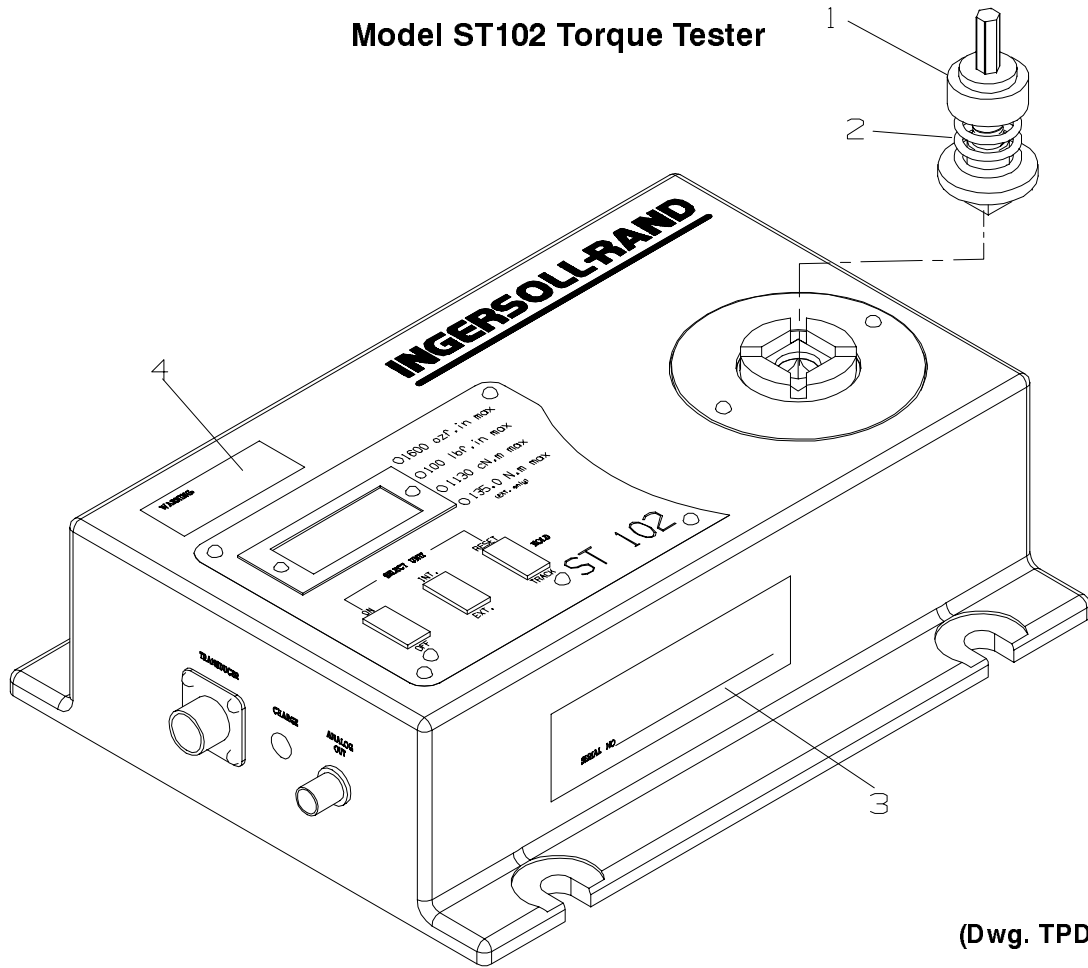
Joint Simulation

1. The tester is supplied with a rundown adapter which should be used as a joint simulator with dynamic (power) tools. When testing most power tools, it is important to simulate a joint, thus allowing a tool to reach full RPM. Always begin a test with the rundown spring in the retracted position. Compress the spring during rundown and then reverse the adapter so that the spring is in the retracted position prior to next test.
2. Select a spring which produces the best repeatable or most closely simulates the actual joint for which the tool is used.
3. Since the tester cannot always duplicate the actual joint characteristics, the torque readings displayed on the torque tester may vary from the actual torque that the tool will apply to the joint. A rundown adapter that simulates a variety of different joint characteristics is provided with the torque testers. When critical assemblies are involved, the torque output of the power tool being used should be verified on the actual assembly.

Care

1. DO NOT store the analyzer in humidity exceeding 85% or temperatures below 50°F for any extended period of time.
2. Always keep the exterior of the unit clean and dry.
3. DO NOT drop the unit. If dropped, the unit may be damaged and a calibration inspection is recommended.
4. Verification of the accuracy of the unit using a dead weight test set is recommended at six month intervals, or sooner if usage is high or any damage is suspected.

Model ST102 Torque Tester



(Dwg. TPD1914)

PART NUMBER FOR ORDERING

1	Rundown Adapter Spring Assembly (includes Hard and Soft Draw Simulator Springs)	ST100-800
2	Spring	
	Hard Draw	ST100-801
	Soft Draw	ST100-802
3	Serial Number Label	ST102-301
4	Warning Label	WARNING-10-99
*	Carrying Case	ST102-804
*	Battery Charger (120V)	ST102-803
*	Battery Charger Label	ST102-302
EQUIPMENT AVAILABLE AT EXTRA COST		
*	Transducer Connector Cable	ST100-89
*	Replacement Battery Pack	ST100-805
*	Battery Charger (240V)	ST102-808
*	Battery Charger Label	ST102-302
*	Rotary Transducer	
	1/4" square drive (0-100 in-lb. or 0-11.3 NM)	ERT250S
	1/4" hex drive (0-100 in-lb. or 0-11.3 NM)	ERT250H
	1/2" square drive (0-100 ft-lb. or 0-1.35 NM)	ERT500S

* Not illustrated.

For calibration or service of the Torque Tester contact:

**Ingersoll-Rand Company
510 Hester Drive
White House, TN 37188**