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PST 1000 (P/N 10478) Owners Manual



Overview and Concept

The PST 1000 is a combination pressure sensor and transceiver designed to work with the S/R Global 8 controllers. The PST 1000 is designed to provide analysis, evaluation and feedback on the performance of the ported automatic shutoff (or clutch) air torque tool to which it is attached.

The PST 1000 works with ported automatic shutoff and clutch-type air torque tools only. It uses the pressure from the port to determine the pattern of the air pressure from the port. This information on the air pressure is compared to a stored profile, and the result is communicated to the operator and the Global 8 controller.

The PST 1000 uses light emitting diodes to communicate with the operator and a 2.4 GHz radio to communicate with the Global 8.

Once the profile for what constitutes an acceptable (OK or Good) tightening has been determined, the PST converts the profile to specifications. It compares each tool use (rundown and tightening) to that specification group. The PST 1000 retains the specification group for one joint at a time. If the tool and PST 1000 are to be used on a different joint, the specifications for that joint must be put into the Global 8 and PST 1000 before use. If the joint is one that the PST 1000 and Global 8 has not been used on before, the specifications will have to be established and stored. If the specifications are already known and are available, they can be loaded in to the Global 8 and downloaded to the PST 1000.

See the Global 8 manual for the procedure to switch specification groups.

Safety

The PST 1000 is used with pneumatic power tools. The PST 1000 is a lithium-ion battery-powered electrical device. The safety precautions and procedures applicable to battery-operated devices and to the recharging of the batteries for such devices must be followed. All precautions used when working on or working with pneumatic power tools and with electrical devices must be applied and followed.

- Always wear personal safety equipment when working with the PST 1000.
- Always remove air pressure from the line before connecting or disconnecting the PST 1000 from a pneumatic tool.
- Always avoid water when using the battery charger or PST 1000.

Additional Safety Precautions Specific to the Battery and Charger

- **Caution: When working with lithium-ion battery cells, they are very sensitive to charging characteristics and may explode if mishandled.**
- User should be knowledgeable about the characteristics and safety requirements pertinent to the charging, discharging and assembly of lithium-ion batteries prior to use.
- Lithium-ion batteries should only be stored in a fireproof container.
- Do not put the batteries on a wood or fabric surface when charging.
- Never leave the batteries and charger unattended when charging.
- We are not responsible for damage caused by misuse or mishandling of these lithium-ion batteries.

Battery Charger and Battery Module

The supplied battery charger/power supply may be connected to a power outlet having from 100 VAC to 240 VAC. The prongs on the charger are United States-style. To use this charger with other power outlets requires the use of an adapter between the power outlet and the charger.

The battery charger connects to the battery port on the PST 1000 battery module. Charger output is 5 VDC. The battery may be charged before or after it is connected to the PST 1000 electronics module.

Spare batteries may be ordered for the PST 1000. Doing so permits the user to keep one battery charged and ready as an immediate replacement when the other becomes depleted of power.

The battery can be recharged 500 times or more, and will retain up to 90% of its capacity after 400 recharges.

The battery must be disposed of properly at the end of its' useful life. Consult the regulations pertinent to battery disposal for your locale.

Components

The following are shipped when a unit is ordered:

- This Owners Manual
- The PST 1000 unit with attached sensor tube as shown in the photograph on the prior page
- A box containing the battery charger
- A plastic envelope containing:
 1. Two (2) O-rings
 2. Three pair of hose clamps, each pair for a different hose diameter
 3. A double-ended sensor hose connector
 4. Four (4) Philips pan head SEMS screws, 6-32 x 1/4".



Installation

The installation location should be considered carefully prior to performing the installation. The distance from the port on the air tool to the PST 1000 is a factor in the accuracy and repeatability of the results. Changes in air pressure are best sensed when the PST 1000 is close to the tool. If the tool to which the PST 1000 is to be connected is a pulse tool, the PST 1000 should be positioned less than five feet (1.5m) of the tool. At greater distances the pulses in the pressure have diminished amplitude and are less detectable; the air pressure also dissipates slowly, resulting in a delay between cycle reports. At long distances it may be advisable to install a “quick dump” (fast pressure release) valve in the system to rapidly dissipate the air pressure after each fastening.

If the PST 1000 is to be connected to a direct drive tool, then the unit may be mounted up to twenty feet (20', 6m) from the tool.

The PST 1000 has two modules, the electronics module and the battery module. The modules each wrap around half of the air supply hose for the ported air tool that the PST will monitor. The generic procedure shown here uses a polyurethane air hose with a 1/4" inside diameter. The procedure, and exceptions to the procedure, apply to the installation regardless of air hose material or diameter.

NOTE: The PST 1000 is designed to be used with air hoses having an outside diameter between 1/2" and 5/8" (12.5 mm to 15.8mm).

1. Invert the PST 1000 so the battery module is facing you. There are four (4) 6-32 x 1 1/4" Philips pan head screws attaching the battery module to the electronics module. Use a screwdriver with a #2 Philips head to remove all four screws.



2. Once all four screws have been removed, lift the battery module straight off of the electronics module. Do not twist either module; doing so may damage the electrical connectors between the modules.



3. There are two options available for attaching the PST 1000 to the air hose that will supply the tool to be monitored. The best option for your operation depends upon how the PST 1000 will be used.

The basic approach used to secure the unit is to clamp the electronics module to the air hose via a pair of clamps from among the three pair supplied. The battery module is then attached to the electronics module through one of two methods. The battery module may be attached using the four screws removed in Step 1 of this procedure, or it may be attached by using the supplied O-rings. This method is a little more convenient when it is necessary to replace a discharged battery, but at a slight cost in security of the battery module.

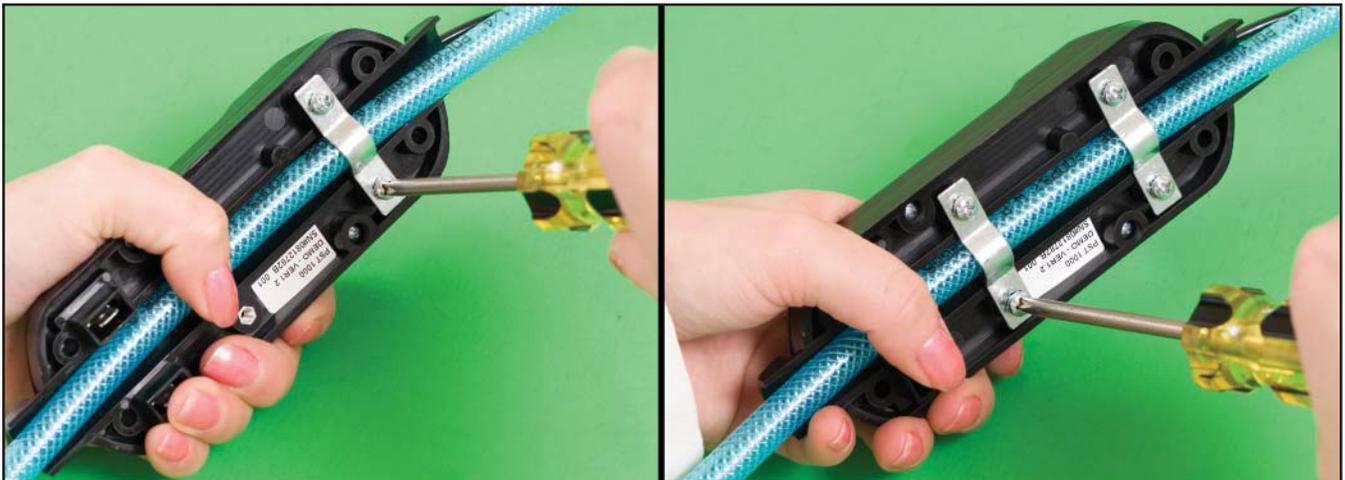
If the O-rings are to be used, whether as the sole means of holding the modules together or to supplement the screws, they should be slid onto the hose at this point. Once the electronics module is attached, it may not be possible to place one of the O-rings behind the module.

4. Measure and locate the position on the hose where the PST 1000 will be mounted. Lay the hose in the channel in the electronics module. Check the supplied hose clamps against the hose at the hose clamp mounting nuts in the unit to see which pair will clamp the electronics module against the line most securely but without crushing it.

Air hoses from differing manufacturers and of different materials will have different outside diameters, even when the nominal inside diameter size of the hose is the same. If the hose clamp is not quite small enough to clamp the hose securely, or if the hose material is very slippery, electrical tape can be wound around the hose to create a slightly larger diameter where the clamp will engage the hose. This simple expedient can compensate for minor differences in outside diameter.



5. Install the first hose clamp using the 6-32 x 1/4" Phillips pan head SEMS screws. Use a #2 Phillips screwdriver to tighten the screws. Tighten snugly, do not overtorque, and do not bend the clamps. Finish this step by installing the second hose clamp of the same size at the second hose clamp position.



Check the security of the unit by tugging gently on the hose while holding the electronics module. If the hose slips, then either a smaller hose clamp should be used or electric tape applied to the hose to increase the outside diameter under the clamps.

6. Install the battery module onto the electronics module. Orient the battery module so that the electric receptacles are at the same end of the unit as the electric prongs on the electronics module. Align the two modules with each other, then gently press the two together. Once the initial engagement is made, squeeze the modules together to seat them completely.



7. Secure the battery module in place against the electronics module using either or both of the two types of securement provided.

If the battery module is to be secured using the O-rings, slide the O-ring over the tapered section at the end of the modules and into the groove behind the tapered section. Repeat this action at the other end of the unit.

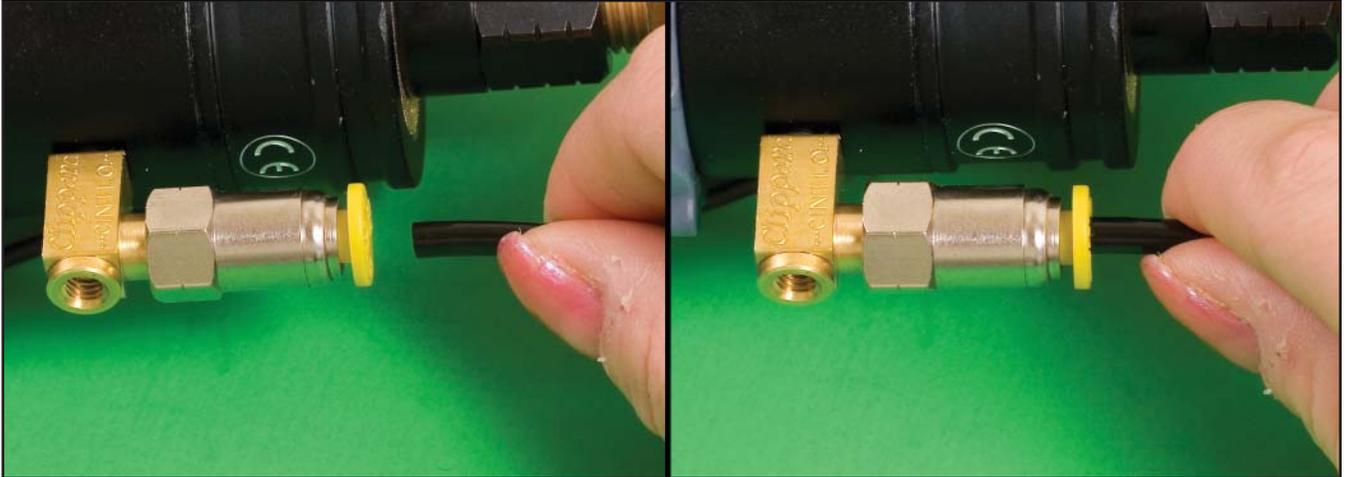
If the screws are to be used to secure the battery module to the electronics module, install the screws at each end and tighten them snugly.

The screws and the O-ring can both be used if desired.



8. Connect the PST 1000 sensor tube to the port of the air tool.

If your tool has a connector for the tube already installed, then simply complete the connection. A spring-loaded push-type connector is shown below. If your connector is of this type, simply insert the hose until the connector grasps it firmly.



If your tool has a connector and sensor tube already installed, use the double-ended connector supplied with the PST 1000 to connect the two hoses.

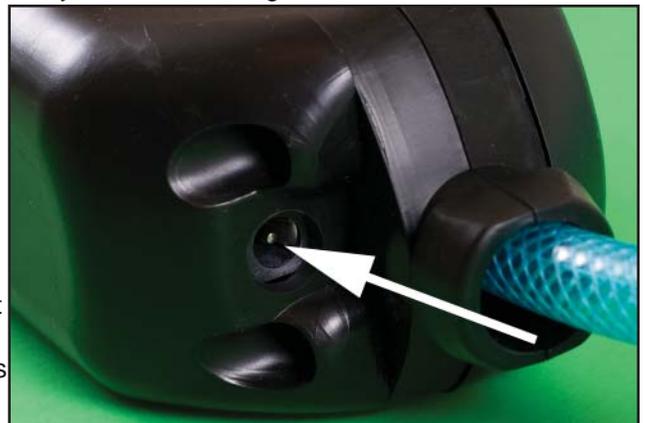


9. Charge the battery. Insert the connector from the battery charger into the battery module at the location shown in the photograph below. Plug the charger into a power outlet within the ratings given in the section of this document on the battery charger. Use an adapter of the correct type and rating if needed.

The PST 1000 uses a 5200 mAh rechargeable lithium ion battery. The initial charge will take about four hours, and the time for a recharge will depend upon the degree to which the battery is discharged.

The PST 1000 operates in three modes when the battery module is connected to the electronics module: "sleep", "monitor" and "transmit".

The sleep mode uses about 15 mA. During a fastening, the unit uses about 100 mA, and when transmitting to the Global 8 the unit uses about 150mA. The length of time that the battery will last in use is a function of how long the unit is monitoring each fastening and the number of fastenings performed each day.



When the battery charge is low and recharging is required, both the RX/TX Status and Tightening Status LED's will flash red when the tool is running but the torque is above Threshold 1 (See Global 8 Manual).

Establishing Communications with the Global 8

The first step in operating the PST 1000 is to associate it with one of the eight groups of specifications on the Global 8 with which it will be used.

Follow the instructions provided with the Global 8 to learn how to select a group for use with the unit. Once the group is ready for the PST 1000 to be associated with it:

1. Take a small hex wrench and insert it into the hole just above and to the left of the "P" in "PST". See photo to the right.
2. Gently press the button at the bottom of the hole, and hold the button down until the "RX/TX Status" LED emits alternating red and green light.
3. Remove the hex key from the hole.

The Global 8 and PST 1000 have now established radio communications, and the tool is associated with the specification group active when the association was made.

Operating With the PST 1000

Once the PST 1000 has been associated with one or more groups on the Global 8 it is to work with, operation is automatic.

When the unit is first turned on (power supplied), the startup routine will cause both LED's to flash a green signal briefly.

When the group associated with the PST 1000 unit is active, simply operate the tool in the manner designed. Once the tightening is complete, the tightening status will be displayed via the "Tightening Status" LED on the unit.

If the LED emits green light, the tightening met specifications. If the LED emits red light, the tightening did not meet specifications and the torque on the fastener should be corrected.

The PST 1000 will communicate the information it acquired during the tightening to the Global 8 with which it is working. The PST 1000 will make up to five attempts to communicate with the Global 8. For the RX/TX Status LED, the following are the indicators:

- Red: The PST 1000 is transmitting to the Global 8
- Green: The PST 1000 and the Global 8 have communicated

The Tightening Status informs the operator of the acceptability of the tool use just completed.

- Solid Green: The fastening met specifications
- Flashing Green: A batch has been completed
- Solid Red: The tightening did not meet specifications

Should the data on the memory chip be compromised for any reason, both LED's will flash red. This will occur at any time, not just when the tool is in use and above Threshold 1. Send the unit out for repair if this occurs.

Maintenance

The PST 1000 should be cleaned periodically with a clean damp cloth. Never pour liquid of any type onto the unit or immerse it in liquid.



Do not crimp the sensor tube. Inspect for leaks. Should the hose become damaged or develop a leak, replace with a standard 5/32" tube. If the damage is located where the sensor tube enters the PST 1000 unit, the unit should be sent to your S/R distributor for repair.

Questions

If you have any questions about the PST 1000 or the Global 8, please go to our website or contact us using the information provided on the first page of these instructions.

Contains FCC ID: OUR-XBEE/OUR-XBEE PRO

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i.) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.