

**L4142 Rev. A 09/15**

## 1.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is not covered by warranty. If shipping damage is found, notify carrier at once. The carrier is responsible for all repair and replacement costs resulting from damage in shipment.

## 2.0 SAFETY

Read all instructions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and/or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance or incorrect operation. Do not remove warning labels, tags, or decals. In the event any questions or concerns arise, contact Enerpac or a local Enerpac distributor for clarification.

If you have never been trained on high-pressure hydraulic safety, consult your distributor or service center for a free Enerpac Hydraulic Safety Course.

This manual follows a system of safety alert symbols, signal words and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.



The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious personal injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are DANGER, WARNING, CAUTION and NOTICE.

### **DANGER**

Indicates a hazardous situation that, if not avoided, will result in death or serious personal injury.

### **WARNING**

Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.

### **CAUTION**

Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.

### **NOTICE**

Indicates information considered important, but not hazard related (e.g. messages relating to property damage). Please note that the Safety Alert Symbol will not be used with this signal word.



### **WARNING**

**Failure to observe the following precautions and instructions may result in death or serious personal injury:**

- Make no modifications to any SafeLink component. Any modifications to the product not expressly approved by Enerpac could void the user's authority to operate the product. Contact Enerpac factory for more information.
- SafeLink products must only be serviced by a qualified electronic technician. For factory authorized repair service, contact the ENERPAC Authorized Service Center in your area.
- Never use any component of the SafeLink system as a sensing device for personal protection. Doing so could lead to serious injury or death. The SafeLink system does NOT include the self-checking redundant circuitry necessary to allow its use in personal safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition.
- Some SafeLink components are powered by a 3.6 volt lithium battery. As with all batteries, there is a fire, explosion, and severe burn hazard risk. Do not burn or expose the battery to high temperatures. Do not recharge, crush, disassemble, or expose the contents to water.
- All live supply circuits must be disconnected before wiring the machine control.
- Be certain that all pressure is completely relieved (0 psi/bar) before loosening hydraulic fittings or disconnecting hydraulic lines.
- To avoid personal injury, keep hands and feet away from fixture cylinder(s) and workpiece during operation.

**NOTICE** All specifications published in this document are subject to change. Enerpac reserves the right to modify the specifications of products without notice. Enerpac reserves the right to update or change documentation at any time.

3.0 PRODUCT DATA

Table 1 - SafeLink SLE Series Specifications											
SafeLink Enclosure Model	Send Unit Model	Pressure Switch Model	Number of Pressure Switches (Hyd. Inputs)	Pressure Switch Setting Range*			Weight		Operating Temp Range		Enclosure Ratings
				psi	bar	MPa	lb	kg	°F	°C	
SLE-18	SLS-3	PSCK-8	1	1450-5000	100-345	10-35	6.0	2.7	-4 to +176	-20 to +80	NEMA14 partial submersion IEC 60529 (IP66)
SLE-19	SLS-3	PSCK-9	1	290-3045	20-210	2-21	6.0	2.7	-4 to +176	-20 to +80	
SLE-28	SLS-3	PSCK-8	2	1450-5000	100-345	10-35	6.5	2.9	-4 to +176	-20 to +80	
SLE-29	SLS-3	PSCK-9	2	290-3045	20-210	2-21	6.5	2.9	-4 to +176	-20 to +80	
SLE-38	SLS-3	PSCK-8	3	1450-5000	100-345	10-35	7.0	3.2	-4 to +176	-20 to +80	
SLE-39	SLS-3	PSCK-9	3	290-3045	20-210	2-21	7.0	3.2	-4 to +176	-20 to +80	
* Maximum input pressure is 5000 psi [345 bar].											

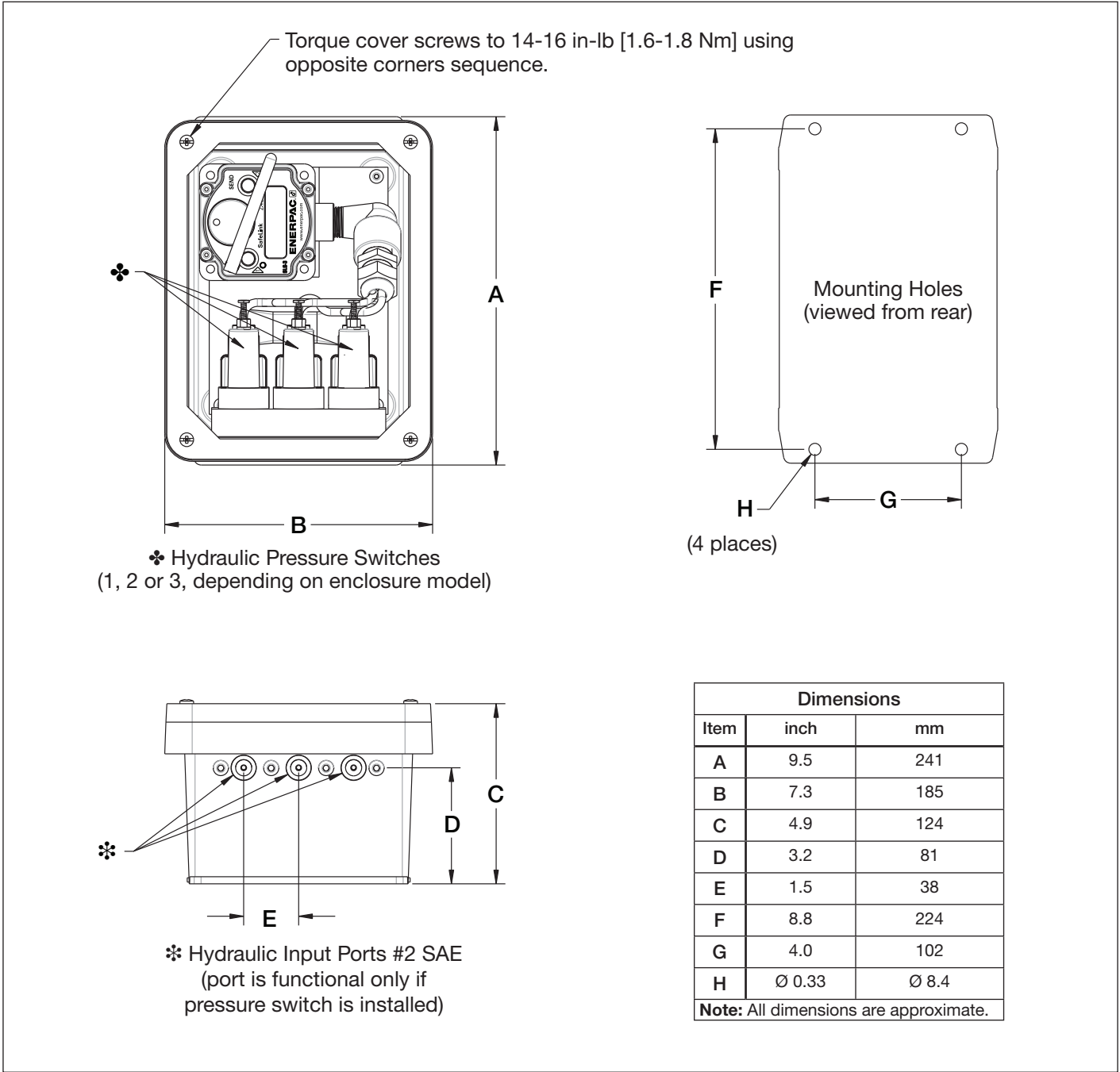


Figure 1, Mounting Dimensions

## 4.0 PRODUCT DESCRIPTION

The SafeLink SLE Series send unit with enclosure is designed to monitor fixture pressure and clamp position in real time, even when parts are being machined. The unit can also be used to verify that the operator has properly pressurized the fixture before it is sent inside the machining center.

Major components include:

- Protective enclosure with cover.
- Enerpac SafeLink SLS-3 send unit.
- Enerpac pressure switches, Model PSCK-8 or PSCK-9 (switch model and quantity of switches installed varies, depending on enclosure model). Pressure switches are factory installed and pre-wired to the SLS-3 send unit.
- Pressure switch manifold with input ports.
- Desiccant pack (for moisture protection).

See Section 3.0 of this manual for complete SLE Series product specifications and dimensions.

For detailed operating instructions and additional information regarding the SLS-3 send unit, refer to the *SafeLink Pallet Monitoring System Instruction Sheet* (Enerpac document L3080).

**NOTICE** To make a complete SafeLink system, one SafeLink SLR-2 receive unit is also required. The SLR-2 receive unit is not included and must be purchased separately.

## 5.0 ENCLOSURE INSTALLATION

**NOTICE** These instructions are intended only for use by experienced installation technicians with appropriate skills and training. If custom installation services are required, contact your Enerpac representative for additional information.

### 5.1 Installing the Send Unit Enclosure on a Fixture

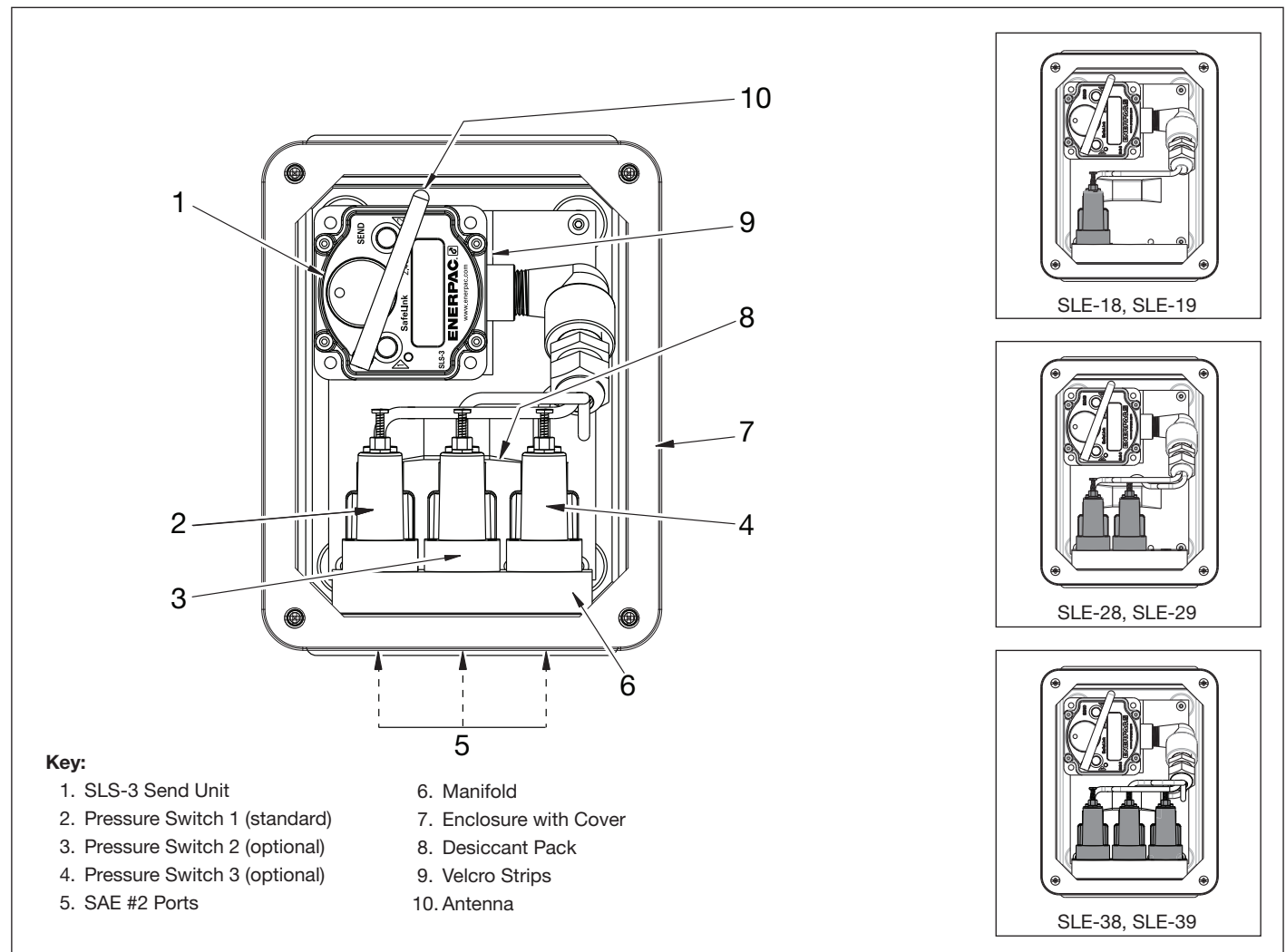
The send unit enclosure can be mounted anywhere on the fixture, including locations that are exposed to coolant flow or flying chips. The enclosure is IEC rated at IP66, protected from dust and strong jets of water or coolant. If necessary, the enclosure can be placed in direct contact with coolant streams.

**NOTICE** Be certain that the enclosure is mounted in a location where the send unit's antenna can transmit freely without interference. The enclosure must not be installed in a location on the fixture that is totally enclosed in metal.

The enclosure can be oriented in either the horizontal or vertical position. Use all four holes of the enclosure mounting flange to securely install the unit (fasteners are user-supplied).

**NOTICE** To prevent damage to the mounting flange holes, use appropriate size fasteners and do not over torque. Over torquing could crack the flange.

The SLS-3 send unit is secured to the enclosure back plate by Velcro strips. It should be positioned to allow the best view of the display and controls.



**Figure 2, Features and Components**

## 5.2 Hydraulic Connections

The hydraulic input ports are standard #2 SAE connections located on the bottom panel of the enclosure. Always use good engineering practices when making hydraulic connections. Maintain cleanliness to prevent contamination.

Oil system contamination can result in improper operation and accelerated wear of hydraulic components. To help prevent contamination, ensure that all external connections are properly made and leak tested. Be sure that plugs remain tightly installed in any unused ports.

**NOTICE** Maximum operating pressure is 5000 psi [345 bar]. To avoid possible damage to the enclosure mounted hydraulic components, be sure that hydraulic input pressure does not exceed 5000 psi [345 bar].

## 6.0 START-UP PROCEDURE

Before placing the send unit and enclosure into service:

1. Validate the setting of each pressure switch (one, two or three switches, depending on enclosure model) to ensure that the switch is set to the desired pressure. This process is described in Section 7 of this manual. Additional information about the pressure switches can be found in the *PSCK Pressure Switch Instruction Sheet* (Enerpac document L2391).
2. After checking the pressure switch settings, make the required hydraulic connections between the pressure switches and the fixture. After making connections, pressurize the input lines gradually to the machine working pressure setting. Verify that there are no oil leaks.
3. Before operation, the SLS-3 send unit must be properly “paired” with an SLR-2 receive unit. For complete instructions regarding the SafeLink start-up and pairing procedure, refer to the *SafeLink Pallet Monitoring System Instruction Sheet* (Enerpac document L3080).

## 7.0 PRESSURE SWITCH INFORMATION

### 7.1 Introduction

As a precaution, and to ensure proper operation, always validate the pressure setting of each pressure switch before placing the SLS-3 send unit into service.

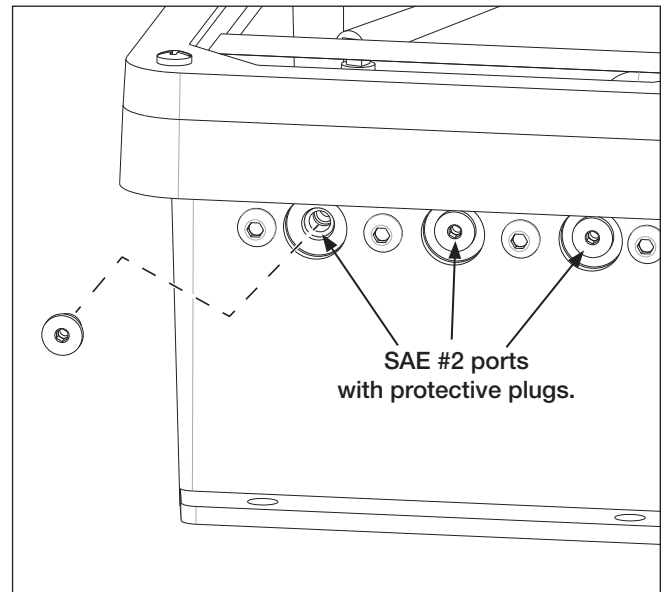
### 7.2 Adjusting and Validating the Pressure Switch Setting

All SafeLink SLE Series enclosures include at least one factory pre-installed pressure switch. Up to two additional pressure switches can be ordered as optional equipment.

Adjust and validate the setting of each pressure switch as described in the following steps:

1. Remove plug from hydraulic input port. Use a 1/8 inch Allen wrench. See Figure 3.
2. Connect a hand pump and 0-5000 psi [0-345 bar] pressure gauge to the hydraulic input port (SAE #2 connection).

**NOTICE** If desired, the machining center hydraulic system can be used in place of a hand pump. To allow verification of hydraulic pressures in the following steps, the hydraulic system must be equipped with a pressure gauge.

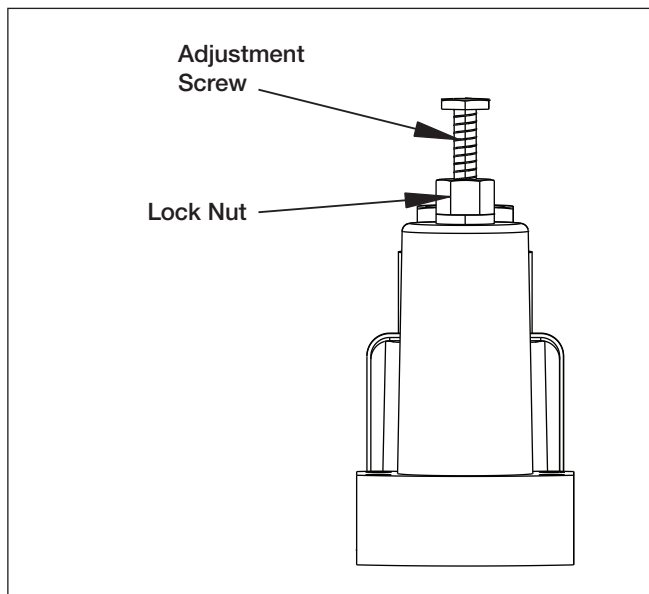


**Figure 3, Hydraulic Input Ports**  
(viewed from bottom of enclosure)



**Figure 4, SLS-3 Send Unit Controls**

3. To gain access to the SLS-3 send unit controls, remove the four screws securing the enclosure cover. Remove the cover from the enclosure.
  4. Press and hold *Button #1* on the SLS-3 send unit for about 3 seconds. See Figure 4.
    - The display window will scroll through the status of each possible I/O. LED #2 will flash red.
    - The send unit will then scroll through multiple screens (NODE 1, I/O 1, OFF. . .).
- NOTICE** The following instructions assume that the pressure setting is being adjusted for the pressure switch connected to I/O 1 (first pressure switch). However, the procedure is similar for I/O 2 (second pressure switch) and I/O 3 (third pressure switch).
5. Be certain that the hydraulic input line (from the pump) is connected to the pressure switch, but not pressurized. Pressure gauge should indicate 0 psi/bar.



**Figure 5, Pressure Switch Setting Adjustment**

**NOTICE** Two 10 mm wrenches are required to complete the pressure setting adjustment described in steps 6 thorough 12.

6. Loosen the pressure switch lock nut by turning it counter-clockwise. See Figure 5.
7. Turn the adjustment screw counter-clockwise until the screw is backed-out completely. This will ensure that the pressure setting is at its lowest level.

**NOTICE** Starting from the lowest possible setting will result in a more accurate setting for the desired pressure.

8. Before pressurizing the hydraulic input line, view the SLS-3 send unit display and verify that I/O 1 is "OFF". (I/O 2 for second pressure switch, I/O 3 for third pressure switch).
9. Pressurize the hydraulic input line gradually to the machining center's minimum working pressure setting. In most cases, this will be the operating pressure minus a user-determined acceptable pressure drop.
10. View the SLS-3 send unit display and verify that I/O 1 has changed from "OFF" to "ON" (I/O 2 for second pressure switch, I/O 3 for third pressure switch).
11. While viewing the SLS-3 send unit display, slowly turn the adjustment screw clockwise until I/O 1 changes from "ON" to "OFF". This will simulate a hydraulic pressure release at the desired setting (I/O 2 for second pressure switch, I/O 3 for third pressure switch).
12. While holding the adjustment screw with a wrench (so that it does not turn), use a second wrench to tighten the lock nut clockwise to 3 ft-lb [4 Nm].
13. If the send unit enclosure contains additional pressure switches, repeat steps 1 though 12 for each remaining pressure switch.
14. Reinstall the enclosure cover after all pressure adjustments have been completed. Torque the cover screws to approximately 14-16 in-lb [1.6 to 1.8 Nm].

## 8.0 MAINTENANCE

### 8.1 Enclosure

The enclosure protects the SLS-3 send unit, pressure switches and manifold against coolant spray and other harsh conditions which may occur in the manufacturing environment. It is maintenance free and corrosion resistant.

### 8.2 Removing and Installing the Enclosure Cover

To ensure that the components inside the enclosure remain protected, always reinstall the enclosure cover and use all 4 cover screws (supplied with unit). Torque the cover screws to 14-16 in-lb [1.6 to 1.8 Nm].

**NOTICE** To prevent damage to components inside the enclosure, always be sure that the cover is fully secured with all four screws tightened to the proper torque. Never allow machining center operation while the cover is loose or removed.

### 8.3 Desiccant Pack Replacement

The inside of the enclosure must remain condensation free. Condensation could damage the SLS-3 send unit and the other components inside the enclosure.

The use of a desiccant packet is recommended to absorb any condensation which may form inside the enclosure. The desiccant packet is a consumable and should be replaced immediately if condensation is found inside the enclosure.

Frequency of desiccant packet replacement will vary, depending on the operating environment.

Check the enclosure for condensation at initial start-up and periodically during the following months to determine the proper replacement interval for the desiccant pack. Desiccant packs are readily available from many industrial supply sources and are not offered by Enerpac.

### 8.4 Send Unit Battery Replacement

The SLS-3 send unit battery has a 2 to 3 year expected life. Battery replacement procedures can be found in the *SafeLink Pallet Monitoring System Instruction Sheet* (Enerpac document L3080).

The SLS-3 send unit attaches to the enclosure back plate using Velcro strips. This Velcro mounting allows the SLS-3 send unit to be easily detached and re-attached to the enclosure back plate, simplifying the battery replacement procedure.

## 9.0 PRODUCT WARRANTY

SafeLink products are warranted by Enerpac to be free from defects in material and workmanship for 2 years following the date of shipment. Enerpac will repair or replace, free of charge, any SafeLink product which, at the time it is returned to the factory, is found to have been defective during the warranty.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Enerpac, replacement. IN NO EVENT SHALL ENERPAC BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.

Enerpac reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Enerpac.

NOTES:

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NOTES:

[illegible]



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