

INDUCTION CAP SEALER
SUPER SEAL™ JR.
ML0104-001-03

OWNERS REFERENCE MANUAL



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SECTION 1 – INTRODUCTION

WARNING!


Please read this manual carefully before installing, operating, or servicing.

DO NOT OPERATE THIS EQUIPMENT IN A HAZARDOUS ENVIRONMENT!

THIS EQUIPMENT PRODUCES A ELECTROMAGNETIC FIELD TO FACILITATE THE INDUCTION SEALING PROCESS. THE ELECTROMAGNETIC FIELD QUICKLY HEATS ANY METAL WITHIN THE FIELD AND MAY, UNDER CERTAIN CONDITIONS, IGNITE THE METAL OR SURROUNDING MATERIALS. PERSONNEL SHOULD REFRAIN FROM PLACING JEWELRY, SUCH AS RINGS AND WATCHES BENEATH OR WITHIN THE SEALING HEAD'S ELECTROMAGNETIC FIELD!

HIGH VOLTAGE is present within this equipment. As with any piece of **ELECTRICAL** equipment, one should become familiar with the manual before applying power. Proper connections and operation are required for safe use. **FOLLOW INSTRUCTIONS** for safety of personnel when operating or maintaining this equipment. **INSTALLATION** of this equipment must be done in accordance with this manual, Enercon installation drawings and local codes to ensure the safety of personnel in the area and in the building.

SAFETY AND WARNINGS

 Before placing this equipment into operation, we strongly recommend that you take the time to read this manual carefully in its entirety to ensure you understand all the safety and operational requirements for using this equipment.

The heating capability of this equipment and the presence of high voltage have the potential to cause severe personal injury or property damage. To avoid ignition of product liners from excessive heat, do not exceed your established output power level, or product dwell time, for a given application. **DO NOT** operate this equipment if any of the wiring or connections are exposed or damaged.

Before starting, operating, or making adjustments; identify the components of the Induction Cap Sealer, using this manual as a guide.

Personnel should use common sense and good working practices while operating and maintaining this equipment. All codes and operational guidelines should be followed and the starting and stopping sequence should be understood. Check all safety devices and follow the procedures contained in this manual.

Maintenance should only be performed by qualified personnel, adequately equipped with the proper tools. Follow the maintenance schedules as outlined in the manual to ensure problem-free operation after startup.

Safety instructions in this manual are called out in colored safety boxes with bold-faced text for emphasis. The signal words **CAUTION**, **WARNING**, and **DANGER** are used to indicate hazard seriousness levels as follows:

CAUTION!

CAUTION is used to indicate the presence of a potentially hazardous situation which, if not avoided may result in minor personal injury or property damage.

WARNING!

WARNING is used to indicate a potentially hazardous situation which, if not avoided, can result in serious injury or death.

DANGER!

DANGER is used to indicate an imminently hazardous situation which, if not avoided, will result in serious injury or death.

SAFETY PRECAUTIONS

DANGER!

The use of high voltage is necessarily employed in the operation of this equipment. Precautions have been taken in the design of this equipment to make it as safe as possible for both operator and service personnel. However, since no amount of interlocks and safety devices can be absolutely infallible, precautionary measures must always be taken when working on this equipment.

DO NOT Reach into the equipment, or any electrical enclosure, without first removing the power. Never apply power to this unit without all covers securely in place.

Capacitors Store Charge: Never trust a capacitor to be bled off completely. A meter or ground strap should be used to check each stud or lead before handling. Some capacitor studs, including those not tied to bus work (not used), may build up a considerable static charge. ***GROUND BEFORE HANDLING!***

DO NOT Stand In Water or On Grounded Surfaces or Touch Grounded Surfaces while Reaching in any System Enclosure. A piece of wood or other insulating material will act as an additional barrier to stand on.

WARNING!

DO NOT Operate this equipment in a hazardous environment! The presence of High Voltage within this equipment may result in explosion or fire when operated near flammable vapors, fuels, or other combustibles; including atmospheric product dust or particulates.

DO NOT Attempt to seal products with damaged or improperly applied liners, as they may overheat causing the liner and container contents to ignite.

DO NOT Exceed a 50% cycle duration with this equipment as this may cause the equipment to overheat and fail.

DO NOT Tamper With Safety Interlocks: Under no circumstances should any safety interlocks be defeated nor should any of the safety devices be relied upon for removal of voltage from the equipment.

Lockout: Use proper lockout and tag out procedures before removing any covers, panels, or cords provided for access. Ensure power cannot be

applied before entering. ***Use safety as the first step.***

CAUTION!

Familiarize Yourself Thoroughly with the Equipment.

Never attempt to work on this equipment unless you are completely familiar with it.

Never assume that a circuit is dead, **MAKE SURE!!!**

Always Wear Appropriate Protective clothing and Eyewear while working within the enclosure.

DO NOT Connect any external control or monitoring equipment, with the exception of appropriate test equipment, to the internal circuits of this equipment. Connecting external equipment in this manner may cause failure of this equipment and create a potential hazard to personnel.

CONTACT:

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24hr Customer Service is available.***

UNDERSTANDING INDUCTION SEALING

General

Induction Sealing is a process used to seal containers hermetically by using an electromagnetic field to heat a heat-sealable foil liner located within a closure. The Super Seal™ Jr. Induction Cap Sealer converts a line voltage (120/240 VAC – 50/60 Hz) to a high-frequency electromagnetic field in the sealing head. This electromagnetic field heats your liner by inducing currents into the metal of the foil liner located within the closures of your containers. High sealing speeds can be obtained using this process making it well suited for both production lines and laboratory applications.

Material Variations

Depending on the type of polymer used, an induction seal can meet FDA requirements for “tamper evident” packaging, or may simply provide leakage protection and shelf life extension, often referred to as a “freshness seal”. Many varieties of inner seal polymers have been developed and are available from a number of suppliers. Suppliers can assist you in the selection of the proper liner for the multitude of products and packaging methods used in the packaging industry.

Multiple Layer Liners

A multiple layer liner (**Figure 1**) typically consists of a *pulp board* layer (A), a *wax* layer (B), and a layer of *aluminum foil* (C) coated with a *polymer* (D).

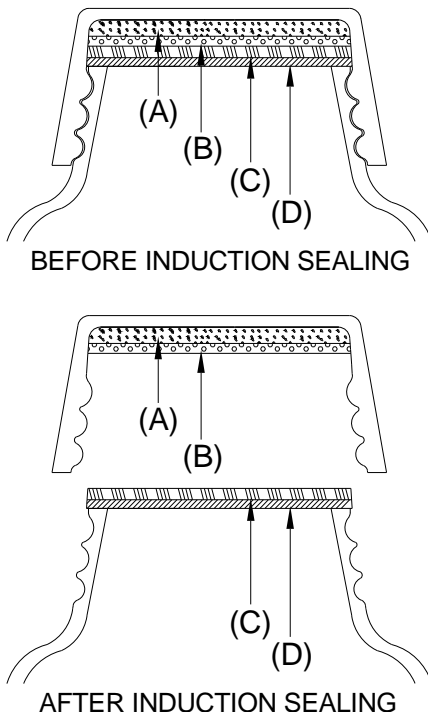


Figure 1

The polymer (D) must be compatible with your container material and capable of producing the seal strength and removal force required by your application.

Single Piece Liners

A single piece foil liner (**Figure 2**) typically consists of a layer of *aluminum foil* (A) coated with a *polymer* (B) inside a closure.

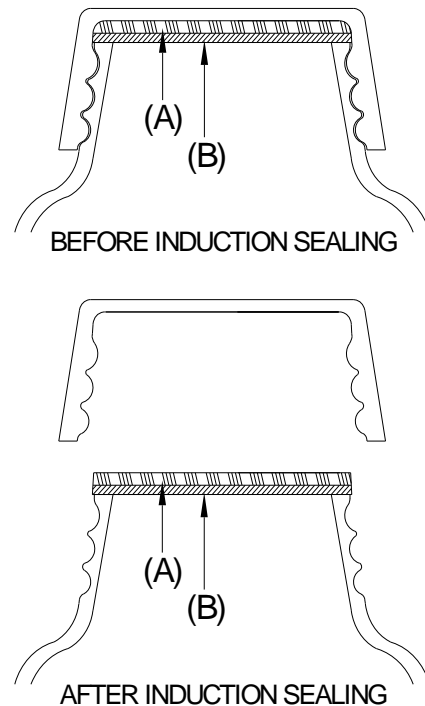


Figure 2

The polymer (B) must be compatible with your container material and capable of producing the seal strength and removal force required by your application.

! WARNING!

DO NOT attempt to Induction seal damaged or improperly applied liners as they may overheat causing the liner and container contents to ignite.

The Sealing Process

When the closure is placed onto the container and placed within the electromagnetic field produced by the sealing head, several things occur.

1. An electrical current, called an eddy current, is induced into the aluminum foil, resulting in a resistance-type heating effect.

2. The polymer coating melts and flows around the lip of the container.
3. In Multiple Layer Liners the wax bond holding the foil liner to the backing material is melted and the wax is absorbed into the backing material.

When the electromagnetic field is shut off the polymer cools and hardens, bonding the foil to the container lip. When the closure is removed from the container the metal foil will remain bonded to the lip of the container and any backing materials (Multiple layer liners only) will remain inside the closure.

NOTE:

A fundamental requirement for induction cap sealing is to have the proper amount of torque on the cap, which exerts a downward force when sealing. Consult your cap supplier for the recommended torque of your cap. A rule of thumb is to equate half the liner's millimeter size (diameter) to inch-pounds of torque. For example, a 53mm liner would require 27 inch-pounds of torque. Also refer to the Torque Requirement Table on **Page 18** of this manual.

UNPACKING AND INSPECTION

IMPORTANT: The carrier accepted responsibility for this shipment when the carrier signed the Bill of Lading at the origin of shipment. If external damage to the packaging was detected, it should have been noted on the freight bill before signing it to acknowledge receipt. If you give the carrier a clear receipt for goods that have been damaged or lost in transit, you do so at your own risk and expense. If concealed loss or damage is discovered after delivery, notify your carrier at once and request an inspection. This is absolutely necessary for the carrier to consider your claim. The carrier agent should make an inspection and issue a loss or damage report.

Your *Super Seal™ Jr. Induction Cap Sealer* will typically ship in a single container but to ensure all items that shipped were received, compare the items you received with the packing slip. All packages and crating should be carefully opened and all items thoroughly inspected for damage.

NOTE:

Be extra careful if using a sharp instrument when removing the protective wrapping from the equipment. File a claim with the freight carrier for any damage incurred during shipping. Enercon Industries should also be contacted as soon as possible to expedite the shipment of replacement parts.

CONTACT:

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Fax Number: +1 (262) 255-2462
E-Mail Address: service@enerconmail.com
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24hr Customer Service is available.

Enercon Parts Department
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E-Mail Address: parts@enerconmail.com

DOCUMENTATION

A system folder containing printed drawings and CD-ROM was also provided.

HANDLING

The *Enercon Super Seal™ Jr. Induction Cap Sealer* was completely tested and inspected before being ready for shipment. The portable unit is packaged in a convenient case with a handle for carrying. Like any piece of electronic equipment, it should not be dropped or given harsh treatment. It should not be checked through as luggage on commercial transportation, without special packaging, rather it should be hand-carried in its protective bag. The case should not be struck or be allowed come in contact with abrasive surfaces. Many long hours of service can be expected when following and observing procedures outlined in this manual.

INTRODUCTION TO THE SUPER SEAL™ JR.



Figure 3

GENERAL

The *Super Seal™ Jr.* is compact, but powerful enough to handle virtually all your induction cap sealing needs. With its advanced electronics and specially engineered sealing heads, this portable system can seal everything from the smallest closures to 120mm wide-mouth containers.

This unit requires no water cooling, or special power so it can be used virtually anywhere. The *Super Seal™ Jr.* is extremely simple to use. Ease of operation and changeover make this the perfect answer to your induction sealing needs.

SPECIFICATIONS

- ◆ Designed to operate in a maximum ambient air temperature of 104° F (40° C) @ 80% relative humidity, non-condensing.
- ◆ High-efficiency sealing heads create a consistent heat pattern for dependable sealing performance.
- ◆ No water required for cooling.
- ◆ Front Panel displays “**TIMER**” setting from .00 to 9.99 seconds and “**SEALING POWER %**” setting from 0 to 100% for precise output selection.
- ◆ Front Panel displays “**BATCH COUNT**” and “**FOIL COUNT**” of 0-999 for production accountability.
- ◆ Front Panel includes “**SEALING**” and “**MISSING FOIL**” LED Indicators.
- ◆ Front Panel UP/DOWN arrows for adjusting **TIMER** and **SEALING POWER %** settings.
- ◆ Dimensions: 3” H x 8 ¼” W x 10 ½” D (7cm H x 21cm W x 26cm D).
- ◆ Input Power: 120 VAC ± 10%, 50/60 Hz, 10 Amps, (240 VAC ± 10%, 50/60 Hz, 5 Amps is also available).
- ◆ Output Power: 1000 Watts.

INFORMATION AND SAFETY LABELS

This page contains representative examples of the typical placement of the labels that appear on your *Super Seal™ Jr. Induction Cap Sealing System*. These labels are designed to provide technical, functional, and safety information required for operation of this equipment. If for any reason a label is removed, defaced, painted over or underlying parts are replaced, we recommend you obtain a replacement label from Enercon and re-apply them in the locations shown.

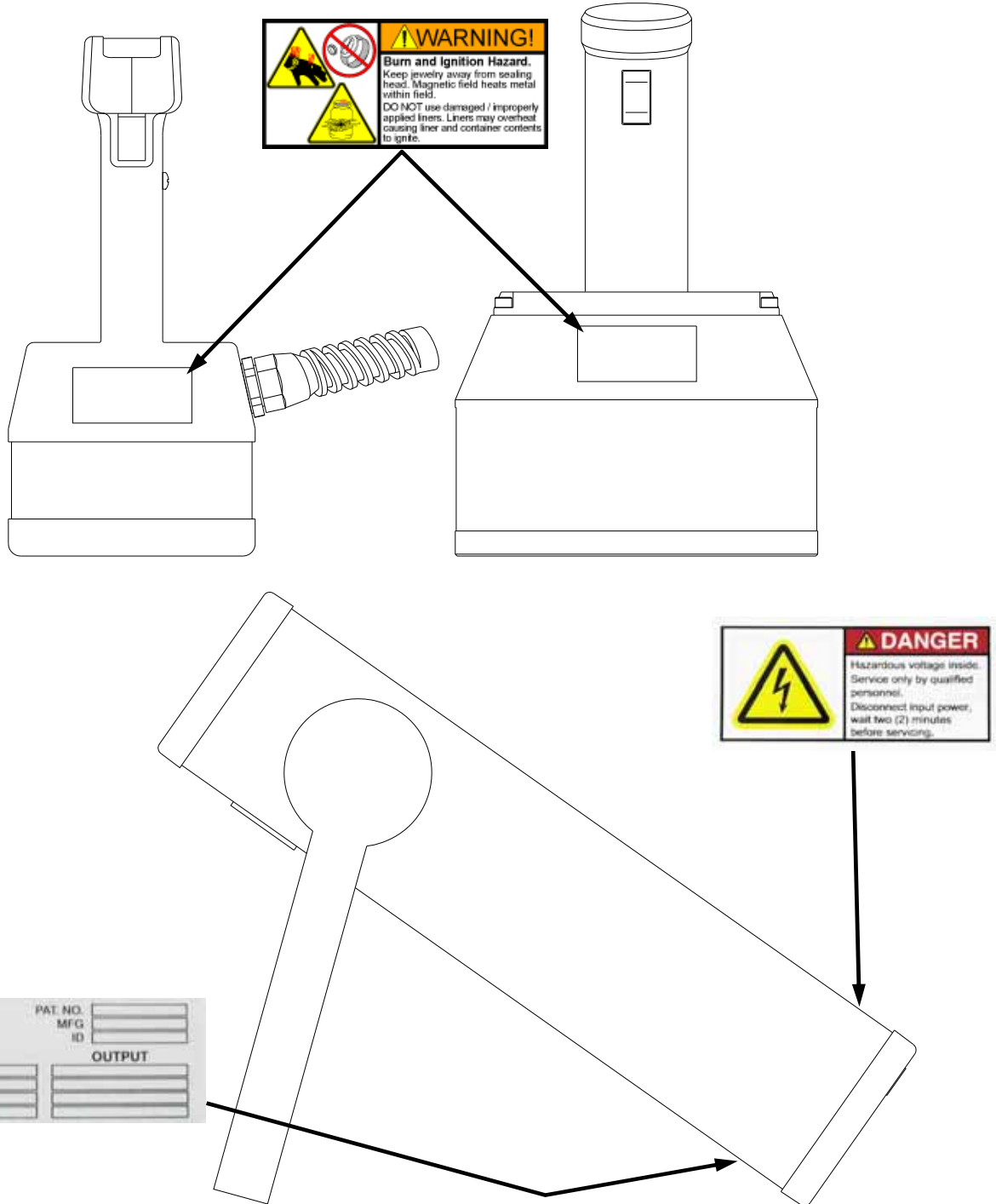


Figure 4

SECTION 2 – INSTALLATION

INSTALLATION AND CONNECTIONS

Ensure that Handle (1) is rotated into a position that will support the power supply and allow the display to be accessed easily (Figure 5). Place the unit on a clean even surface close to your capping process.

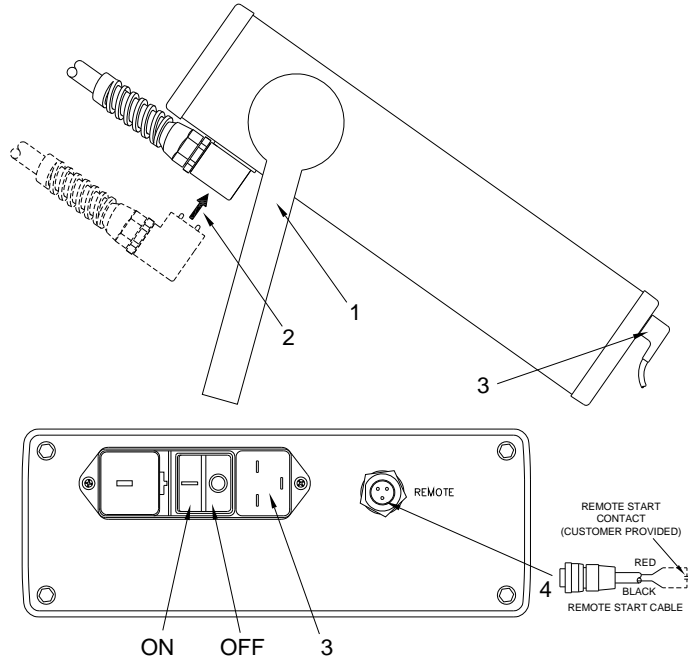


Figure 5

Attach the sealing head to the power supply by inserting the sealing head's plug into the connector on the bottom of the power supply (2).

NOTE:

The sealing head must be securely connected to complete the system interlock circuit. If the sealing head is not connected properly, the front panel will remain blank when power is applied.

Connect the power cord to the power entry module on the rear of the power supply (3), and connect the other end into an appropriate outlet (See the power supply rating plate for voltage requirements).

WARNING!

The power supply should not be operated without the grounded line cord connected to a grounded receptacle.

DO NOT bypass the ground terminal.

To start the unit from a remote location, refer to SECTION 3 – PRINCIPLES OF OPERATION; REMOTE OPERATIONS, the Remote Start Cable should be plugged into the REMOTE connector (Figure 5) on the rear of the unit (4). Insert the cable

connector into the power supply connector and rotate the locking ring on the cable connector ensuring it locks securely in place. This will function as the start switch when connected to the unit, but does not disable the trigger switch on the sealing head.

SEALING HEAD SELECTION

The Sealing Head provided with your Super Seal™ Jr. will have been sized from the product samples, or dimensions, that you provided to Enercon. If you seal multiple products, with a varying range of cap and liner sizes, it is possible that more than one sealing head will have been provided for your production needs (Figure 6).

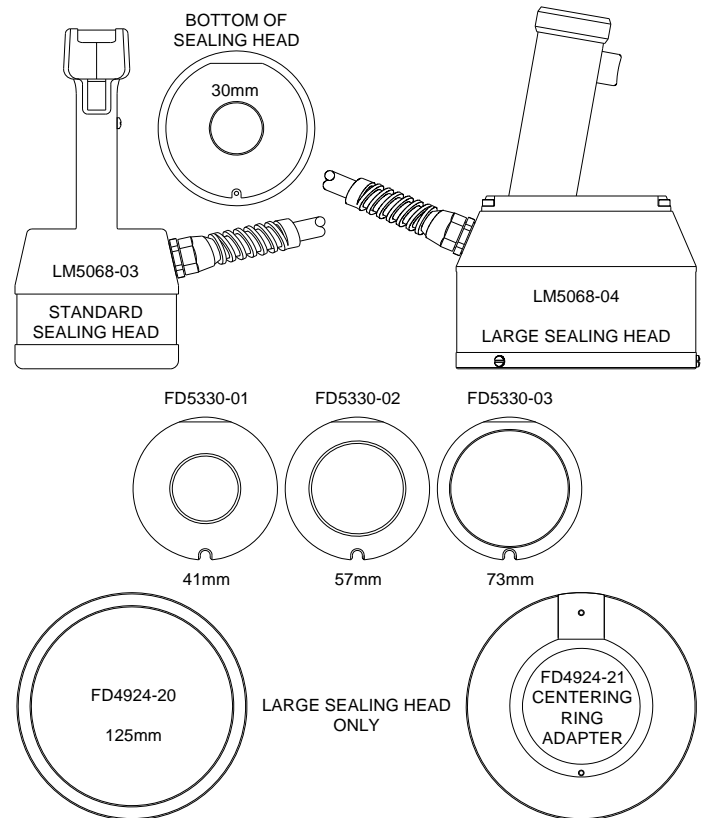


Figure 6

Regardless of which sealing head was provided, you will need to ensure that the sealing head is configured properly for the product to be sealed. This will include the selection of the proper centering ring, the removal/installation of the centering rings, or the removal/installation of the standard sealing head's insert.

Each sealing head is supplied with 3 standard size centering rings to aid in properly aligning the closure under the sealing head. The large sealing head also

includes an adapter ring for mounting the standard size centering rings, and an additional centering ring for caps with an O.D. up to 125mm. The standard sealing head has an additional insert that can be removed resulting in an opening that can be used for standard or deep caps with an O.D. of 30mm or smaller (**Figure 8**).

CENTERING RING REMOVAL/INSERTION

Standard Sealing Head

The removable centering rings are secured to the Standard Sealing Head using a nylon screw and cutouts in the head (**Figure 7**). The rings are removed by removing the nylon screw and gently pulling the ring down and out. The centering rings are installed by inserting the ring's notch into the cutout on the bottom of the head and reinstalling the nylon screw.

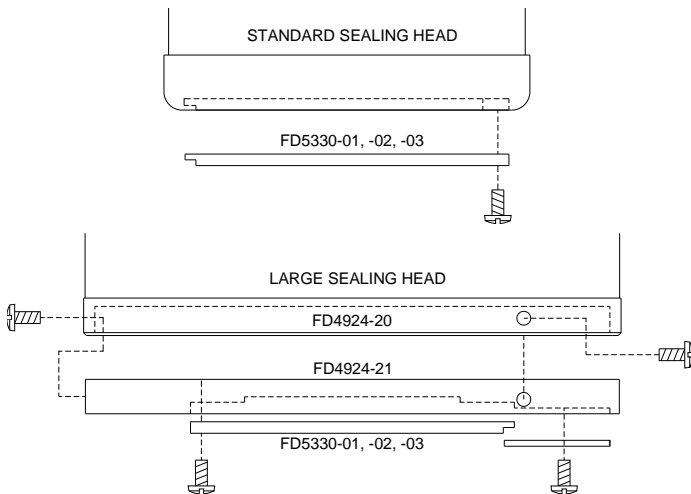


Figure 7

Large Sealing Head

The removable centering rings are secured to the large sealing head using the Centering Ring Adapter (**Figure 7**). The Centering Ring Adapter is installed using the 3 nylon screws around the bottom of the sealing head. Remove the nylon screws and remove the 125mm centering ring. Place the adapter ring into the opening and reinstall the 3 nylon screws. Once the adapter ring is installed, loosen or remove the screw securing the holding plate to the adapter ring. Insert the centering ring into the adapter and tighten, or reinstall the holding plate and install the second nylon screw. The centering ring and adapter can be removed as a single piece in the reverse order of the installation steps described. The 125mm centering ring is reinstalled in the same manner as the ring adapter. See the table below for sizes, part numbers and usage of the centering rings and sealing heads.

SEALING HEADS				
Part #	Description	Range		
LM5068-03	Standard Sealing Head	To 89mm		
LM5068-04	Large Sealing Head	38-125mm		
CENTERING RING INFORMATION				
Part #	Size	LM5068-03	LM5068-04	Included
N/A *	30mm	Yes	No	*
FD5330-01	41mm	Yes	Yes	Yes
FD5330-02	67mm	Yes	Yes	Yes
FD5330-03	73mm	Yes	Yes	Yes
FD4924-20	125mm	No	Yes	Yes
FD4924-21	N/A	No	Yes	Yes

*This is the opening built into the bottom of the Standard Sealing Head for the insert (**Figure 8**).

STANDARD HEAD INSERT REMOVAL

For tall closures, with a maximum O.D. of 30mm, the insert on the sealing head can be removed to allow placing the closure within the opening (**Figure 8**). Use a retaining ring removal tool or mini needle nose pliers to turn the insert. Once loose, finish unscrewing the insert by hand.

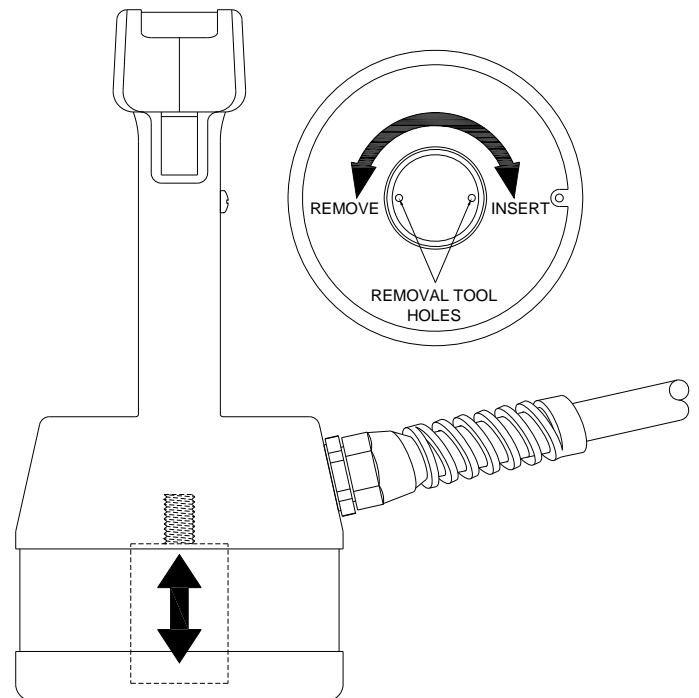


Figure 8

SECTION 3 – PRINCIPLES OF OPERATION



Figure 9

GENERAL

⚠ Before operating this equipment, we recommend reading this section in its entirety to ensure you understand all the safety and operational requirements for using this equipment. Also, please refer to **SECTION 1 – INTRODUCTION / HANDLING, Pages 1 and 2**, to become familiar with all safety requirements and precautions.

⚠ WARNING!

DO NOT operate this equipment in a hazardous environment.

Operating this equipment near flammable vapors, fuels, or combustibles; including atmospheric product dust or particulates, may result in explosion or fire, causing serious injury or death.

DISPLAY FUNCTIONS

The *Super Seal™ Jr. Induction Cap Sealer* utilizes an intuitive multi-function control/display front panel that allows monitoring of the “**TIMER**”, “**SEALING POWER %**”, “**BATCH COUNT**” and “**FOIL COUNT**” functions (**Figure 9**). The LED beside each of these functions will be lit when that function is selected and its information will be displayed on the front panel. The “**SEALING**” LED indicates the run status of the power supply, and the “**MISSING FOIL**” LED will be lit to indicate that the container presently under the sealing head is missing its foil liner. The “**DISPLAY/RESET**” button allows you to toggle between the available functions, and it is used to reset the “**BATCH COUNT**” and “**FOIL COUNT**” to zero when pressed and held. The “**Up/Down**” arrows allow adjustment of the **TIMER** and **SEALING POWER %** set points when they are selected.

NOTE:

The information on the Front Panel Display will vary depending upon which Display Function you have selected.

TIMER – The number displayed here indicates the duration the *Super Seal™ Jr.* will run when the trigger switch is pressed on the sealing head. The display will show the selected cycle time, which ranges from .00 - 9.99, and will count down from the selected number to .00 when the unit is running. The display will reset to the selected value when the cycle is complete.

⚠ WARNING!

Never allow the sealing head or liners to reach temperatures sufficient to ignite the liner or container contents.

Ensure the sealing cycle duration is correct to prevent excessive heating of the liner, and ensure that equal on/off time (50% duty cycle) is observed to prevent excess heating of the sealing head.

Failure to observe these requirements may lead to fire or explosion.

SEALING POWER % – The number displayed here represents a percentage (0-100%) of the total output power the *Super Seal™ Jr.* is capable of producing. The number displayed will flash while this mode is selected.

BATCH COUNT – The number displayed here indicates the number of containers that have been processed since the last count reset. When the trigger switch has been pressed the batch count will increase by 1 once the sealing cycle is complete.

FOIL COUNT – The number displayed here indicates the number of containers that you have sealed with a foil liner present since the last count reset. When the trigger switch has been pressed the foil count will increase by 1 only if a foil liner was detected within the electromagnetic field of the sealing head.

SEALING – This LED is lit when the *Super Seal™ Jr.* is generating the electromagnetic field for sealing containers.

MISSING FOIL – This LED is lit when the *Super Seal™ Jr.* is running, but is not detecting a foil liner within the electromagnetic field of the sealing head.

INITIAL SETUP

Once the correct sealing head and required cords/cables are attached, apply power to the unit by toggling the power switch to the **ON** position (**Figure 10**).

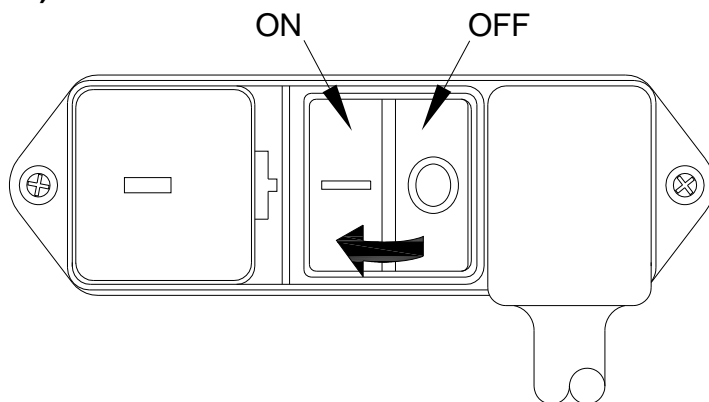




Figure 10

WARNING!

The power supply should not be operated without the grounded line cord connected to a grounded receptacle.




DO NOT bypass the ground terminal.

When power is applied to the unit, the front panel display will flash **8.8.8** and all front panel LEDs will illuminate briefly. Once the startup cycle is complete, the front panel display and LEDs will default to the **TIMER** mode and the display will show the last settings displayed before the unit was shut down.

If the cycle time displayed is not correct, you can adjust the time by pressing the UP  / DOWN  arrows until the cycle time is set to the desired duration.

NOTE:

The timer can be set for a maximum 9.99 seconds and this is typically more than enough time for most applications. For the initial setup, a timer setting of 1.00 seconds is typically a good starting point.

Press the Display/Reset  button and the **SEALING POWER %** LED should be lit and the output percentage should be flashing. Press the UP  / DOWN  arrows to select the desired output level.

NOTE:

100% is the recommended output level for all sealing operations and should only be adjusted if your liners continue to overheat even when sealed using the shortest available cycle durations.

WARNING!

Never allow the sealing head or liners to reach temperatures sufficient to ignite the liner or container contents.

Ensure the sealing cycle duration is correct to prevent excessive heating of the liner, and ensure that equal on/off time (50% duty cycle) is observed to prevent excess heating of the sealing head.

Failure to observe these requirements may lead to fire or explosion.

WARNING!

The sealing head produces an electromagnetic field that quickly heats any metal within the field.

DO NOT pass metal objects, other than appropriate liner materials, beneath the sealing head.

Personnel should keep jewelry, such as rings and watches, from placement beneath or within the sealing head's electromagnetic field.

CAUTION!

When the sealing head is energized, **DO NOT** place it on or near metal surfaces, such as metal tables, as they can be heated by the electromagnetic field.

Hidden metal parts in wood-topped tables are susceptible to induction heating, as the electromagnetic field will travel through the wood and induct into the metal parts.

NOTE:

Before attempting to seal any closures, you should understand some basics of the induction sealing process. Please see **SECTION 1 – INTRODUCTION / HANDLING, Pages 3 & 4** for a brief overview of the induction sealing process.

NOTE:

Running the *Super Seal™ Jr.* without a liner present will not damage the equipment, and it is recommended that the initial startup be performed without a liner present.

INITIAL STARTUP

The *Super Seal™ Jr.* will only start and run when **TIMER** mode is selected, ensure that the **TIMER** LED is lit. With a short cycle time selected, press and release the Trigger Switch in the sealing head (Figure 11).

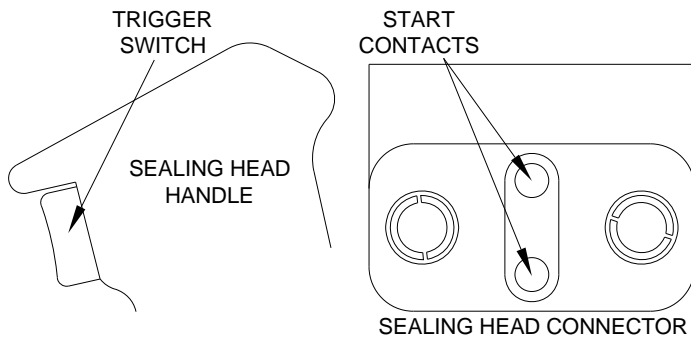


Figure 11

The **SEALING** LED should illuminate and the **TIMER** value will count down to .00. Once the cycle is complete, the **SEALING** LED will extinguish and the unit will emit a beep to confirm a completed cycle. The **TIMER** value will reset once the cycle is complete. If the unit started and ran properly the unit is now ready for testing on each of the products you intend to seal with this unit. If the unit did not start and run, double check the selected Functional Mode, or proceed to the troubleshooting section of this manual.

DETERMINING THE CORRECT TIMER AND SEALING POWER % SETTINGS

Once it has been determined that the unit is functioning properly, and that your product is packaged properly, testing will be required to determine the correct **TIMER** and **SEALING POWER %** settings for each of your products.

The *Super Seal™ Jr.* is an air-cooled design intended for both demonstration and production purposes. It can operate at full output for sufficient lengths of time to seal large quantities of containers by hand. A 50% duty cycle will allow for substantial

periods of operation (example; 2 seconds on and 2 seconds off). Typically the higher the **SEALING POWER %** setting, the shorter the **TIMER** setting requirement will be. But regardless of the **SEALING POWER %** setting you choose, it is recommended that you use this setting for all products to accommodate ease of change-over.






! WARNING!

Never allow the sealing head or liners to reach temperatures sufficient to ignite the liner or container contents.

Ensure the sealing cycle duration is correct to prevent excessive heating of the liner, and ensure that equal on/off time (50% duty cycle) is observed to prevent excess heating of the sealing head.

Failure to observe these requirements may lead to fire or explosion.

Use the following procedure to determine the sealing requirements of any untested product packages, or to troubleshoot sealing issues.

1. Attach the appropriate Sealing Head to the power supply and apply power by toggling the power switch to the **ON** position.
2. Once the initial power on sequence is complete, the **TIMER** mode is enabled and the display should show the last selected time setting.
3. Press the UP  or DOWN  arrow on the front panel to select a starting point for the **TIMER** setting. A 0.50 second cycle time is a good starting point.
4. Press the Display / Reset  button and the **SEALING POWER %** LED should be illuminated. The number displayed on the front panel display should be flashing.
5. Press the UP  or DOWN  arrow on the front panel to select a starting point for the **SEALING POWER %** level.

NOTE:

It is recommended that the Initial **SEALING POWER %** setting is 100%, to ensure the shortest sealing cycle possible.

6. Using a container with an appropriately applied liner and closure, place the sealing head on the closure to be sealed and press the trigger switch. Ensure the timer counts down to .00 and remove the sealing head.

7. Test the container to see if the liner bonded completely to the lip of the container.
8. If the liner did not bond, or only partially bonded, to the lip of the container, increase the **TIMER** setting by 0.10 - 0.20 seconds.
9. Continue making small adjustments to the **TIMER** setting and repeat steps 6 – 8 until the desired seal is achieved.

NOTE:

If the liner shows no signs of adhesion you may wish to make the initial adjustments larger, but do not exceed 0.50 second increments. If a liner shows signs of partially bonding, **DO NOT** reuse that container.






10. If the liner is sealed but shows signs of overheating you will need to lower the timer setting. A 0.10 - 0.20 second adjustment is a good starting point.
11. If the liner still overheats at 0.25 seconds, or lower, the SEALING POWER % may need to be lowered to a level that will allow good seals in an acceptable cycle time.

NOTE:

Regardless of the cycle time and sealing power % settings, ensure the 50% max duty cycle is observed to prevent damage to the sealing head.


SEQUENCE OF OPERATION

Once the initial Setup is complete and the TIMER and SEALING POWER % settings have been determined, the unit is ready for production. The sequence of operation for the unit is as follows:

1. Plug the unit into an appropriate outlet and apply power to the unit by toggling the switch located on the rear of the unit to the **ON** position.
2. Once the startup cycle is complete, the front panel display and LEDs will default to the **TIMER** mode and the time value that was displayed when the unit was shut down. If this is not the correct cycle time for the product you will be sealing press the UP  or DOWN  arrows to adjust the setting to the proper time.
3. Press the Display/Reset  button to verifying the correct setting for SEALING POWER %.
4. Press the UP  or DOWN  arrows to adjust this setting as needed.

NOTE:

It is recommended that **TIMER** mode be selected while running to ensure the correct cycle time is

selected. Press the Display/Reset  button until the **TIMER LED** is lit before proceeding.

5. Place the sealing head onto the container to be sealed and ensure it is centered properly over the closure.
6. Press and release the Trigger Switch and the **SEALING LED** should illuminate while the **TIMER** counts down to .00. The unit will beep at the end of the sealing cycle if the audible indicator function is turned on.
7. Remove the closure to check the seal if desired.
8. Repeat Steps 5 and 6 until the production or sample run is complete.
9. To shut down the *Super Seal™ Jr.* toggle the power switch to the OFF position. If the unit is stored for extended periods, disconnect the power cord from the receptacle and power supply and disconnect the sealing head from the power supply. Store the system in its protective bag until needed.

REMOTE OPERATIONS

The **REMOTE** function allows starting the unit from a remote location using a Normally Open (N.O.) contact that is momentarily closed (**See Figure 5 on Page 7**). The remote start cable connects to the **REMOTE** connector on the back of the unit and the other end must be attached to a customer supplied N.O. contact. When the cable is attached to the unit, momentarily closing the N.O. contact will start the unit. The contact closure must be momentary to allow the remote start function to be repeatable.




NOTE:

The N.O. remote start contact functions as the start switch when connected to the unit, but does not disable the trigger switch on the sealing head.

The sequence of operation for remote operations is the same as the standard sequence of operation, but using the Remote Start contact instead of the trigger switch.





MISSING FOIL CALIBRATION

The Missing Foil circuit will require calibration upon initial use of the unit, when the sealing head is changed/replaced, or when the SEALING POWER % setting is changed. Calibration of the Missing Foil Circuit should also be performed if a container has a foil liner present and the **MISSING FOIL LED** illuminates, or if the LED does not illuminate when the foil liner is missing. Use the following steps to calibrate the Missing Foil Circuit.

1. Once power is applied, ensure the Cycle Time is set to a minimum duration of 3.00 seconds (See SEQUENCE OF OPERATION on this page).
2. Press the Display / Reset  button until the **SEALING POWER %** LED is illuminated.
3. Next press and hold the Display / Reset  button until the **SEALING POWER %** LED flashes and release the button.
4. Hold the sealing head away from any metal objects, then press and hold the trigger switch until the **MISSING FOIL** LED illuminates and release the trigger switch.
5. Press and hold the Display / Reset  button until the **SEALING POWER %** LED stops flashing. The Missing Foil Circuit is now set.
6. If the Cycle Time was adjusted, reset the duration to your production set point.


RESETTING COUNTS

The **BATCH COUNT** and **FOIL COUNT** displays continually update with each sealing cycle and displays counts up to 999. These counts can be used to give an exact count of the containers that have been processed through a specific production cycle and an exact count of how many containers had a foil liner present in the closure. When these counts need to be reset follow the steps below to perform the reset.

1. Press the Display / Reset  button repeatedly until the **BATCH COUNT** LED is illuminated.
2. To reset the displayed number to 0, press and hold the Display / Reset  button until the number resets.
3. Press the Display / Reset  button repeatedly until the **FOIL COUNT** LED is illuminated.
4. To reset the displayed number to 0 press and hold the Display / Reset  button until the number resets.


TURNING THE AUDIBLE INDICATOR ON / OFF

The *Super Seal™ Jr.* is typically shipped with the audible indicator (beep) turned on. This indicator can be turned off or on, as desired, by using the following steps:

1. Ensure that the **TIMER** mode LED is illuminated.
2. Press and hold the Display / Reset  button until the front panel displays either ON or OFF. This will be the current status of the Indicator.

SECTION 4 – MAINTENANCE / TROUBLESHOOTING

GENERAL

 Before performing maintenance or troubleshooting on this equipment, please read this section completely. Also, please refer to **SECTION 1 – INTRODUCTION / HANDLING, Pages 1 and 2**, to become familiar with all safety requirements and precautions for this equipment.

The Enercon *Super Seal™ Jr.* Induction Cap Sealer is designed to require minimal maintenance. However, to ensure long-term reliability, it is a good practice to have a planned maintenance program. This section will include recommended preventive and corrective maintenance procedures.

ROUTINE INSPECTION AND SERVICING

Enercon's Induction Cap Sealing Power Supplies are designed to survive the rugged use that may be imposed upon them by your production environment. However, a preventive maintenance program will play an important role in the durability and long life of the equipment if implemented and followed.

DANGER!

Ensure all power is disconnected and locked out from the power supply before removing the cover for any maintenance or troubleshooting procedures.

VISUAL INSPECTION

A weekly visual inspection is a good practice that will often identify issues before they affect the equipment. One should check for dust and corrosive buildup on the system and its hardware. Some equipment may be located in corrosive environments that make a daily inspection necessary.

EXTERNAL CONNECTIONS

Inspect any cables or connectors attached to the back of your system for damage or deterioration. Even if the Remote connector is not in use, it should be inspected ensure the cover is still intact and that the connector is free of any corrosion or build up.

Compressed air can be used in most instances for removing contaminants that may have accumulated on the system. If using compressed air is not an option, or fails to remove the contamination, then wiping or washing the exterior of the system should be performed instead.

NOTE:

The *Super Seal™ Jr.* enclosure is rated Nema 1 (IP32). This rating prevents the intrusion of dust and dirt, but will not prevent moisture intrusion in a wash down environment.

DO NOT expose the *Super Seal™ Jr.* to any type of wash down!

SEALING HEAD AND CONNECTOR

It is good practice to inspect the condition of the sealing head and its cable and connector before beginning a production run. Ensure the housing and bottom of the sealing head are not cracked from improper handling, or discolored from overheating. The sealing head cable must be free of kinks, cracks, burns, or discoloration along its entire length and the connector should seat properly in the power supply connector with no signs of burning or overheating. Avoid dropping the sealing head as both external and internal damage may occur.

INTERNAL CONNECTIONS

To inspect internal connections the Front or Back End Plate must be removed from the power supply and the Top Cover removed.

Power and control connections should remain tight. Loose connections may often be recognized by discoloration of the wire or connection. **DO NOT** over-torque connections.

MAINTENANCE RECORD

A table is provided for the logging of maintenance for this equipment in **SECTION 6 - MISCELLANEOUS**. Regularly record the maintenance performed on this equipment in this table, including any issues found and their resolution.

SUPER SEAL™ JR. TROUBLESHOOTING TABLE

Symptom	Item	Check/Inspect	Resolution
Front panel is blank when switch is turned on	Sealing Head Installation	1. Is sealing head properly plugged in?	1. Properly plug sealing head into unit.
	Power Cord	1. Plugged into unit/ wall receptacle? 2. Cord damaged?	1. Plug into unit/wall. 2. Replace power cord.
	Fuses	1. Check fuses 2. Fuse holder	1. Secure fuse holder. 2. Replace bad fuse.
	Feed Voltage	1. Proper voltage at wall receptacle?	1. Reset / turn on breaker for wall receptacle.
Front panel is lit properly but nothing happens when trigger is depressed	Sealing Head	1. Inspect start contacts for damage. 2. Ohm check trigger switch start contacts on the sealing head connector (figure 11).	1. Contact Enercon customer service for replacement sealing head. 2. Replace trigger switch or sealing head as required.
	Trigger Switch	1. Try to remote start from back panel connector	1. Replace trigger switch or sealing head as required.
Timer cycles as soon as power switch is turned on	Trigger Switch	1. Ohm check trigger switch at start contacts on the sealing head connector (figure 11).	1. Replace trigger switch or sealing head as required.
	Remote Start Contact	1. Attempt starting unit from trigger switch. 2. Inspect remote start cable.	1. Repair/Replace remote start contact. 2. Repair/Replace remote start cable.
Timer counts down properly but sealing led is not lit	Container is sealed.	1. Possible bad control board.	1. Repair/Replace control board.
	Container is not sealed	1. Possible bad control board. 2. Inspect power board. 3. Ohm check power MOSFETS. 4. Inspect sealing head connector.	1. Repair/Replace control board. 2. Repair/Replace power board. 3. Replace failed MOSFETS. 4. Repair/Replace sealing head.
Timer counts down, LEDs are properly lit but indicator does not beep.	Audible Indicator Status.	1. Audible indicator off. 2. Possible bad control board.	1. Refer to page 13 to turn indicator on. 2. Repair/Replace control board.
Foil indicator LED is always on	Missing Foil Circuit	1. Calibrate missing foil for level of operation. 2. Possible bad control board.	1. Perform Missing Foil Calibration on Page 13. 2. Repair/Replace Control Board.
F01 appears when trigger is pressed	Minimum Frequency Trip	1. Does this occur every time?	1. Call Enercon for corrective action.
F02 appears when the trigger is pressed	Output Current Trip	1. Does unit run at a lower sealing power %, or does it trip at all setpoints?	1. Call Enercon for corrective action.
F03 appears when the trigger is pressed	Minimum Frequency Trip and Output Current Trip	1. Does this occur every time?	1. Call Enercon for corrective action
F04 appears when the trigger is pressed	Under Resonance Trip	1. Possible bad sealing head.	1. Call Enercon for corrective action
F05 appears when the trigger is pressed	Under Resonance and Low Frequency Trip	1. Possible bad sealing head.	1. Call Enercon for corrective action
F06 appears when the trigger is pressed	Under Resonance and Over Current Trip	1. Possible bad unit or sealing head.	1. Call Enercon For Corrective Action
F07 appears when the trigger is pressed	All Types Of Trips Detected	1. Possible bad unit or sealing head.	1. Call Enercon For Corrective Action
F10 appears when the trigger is pressed	Under Voltage Trip	1. Low input voltage.	1. Verify that your input voltage is within $\pm 10\%$ of the required input voltage.

Enercon Customer Service Department
Phone Number: +1 (262) 255-6070
Fax Number: +1 (262) 255-2462
E-Mail Address: service@enerconmail.com
Website: www.enerconind.com
24hr Customer Service is available.

APPLICATION TROUBLESHOOTING

Helpful Induction Sealing Information

1. **Pressure** - Even, uniform pressure on the induction liner over the entire land area of the container is required for a good seal. Important contributors to the establishment of the appropriate amount of pressure include the amount of on-torque pressure, thread design, and closure design.
2. **Heat** - Heat is the active ingredient in the induction sealing process. Too much heat can be as counterproductive as too little. Trial and error will lead you to the appropriate power settings for your various applications. In addition to your power settings, selection of the proper sealing head design, proper setup and head alignment are also very important.
3. **Time** - The induction liner must spend a sufficient amount of time within the sealing head's electromagnetic field to properly heat the foil and melt the bonding polymer properly. As a general rule, the faster your process speed, or the shorter your sealing cycle, the higher your power setting will need to be in order to reach the proper melt temperature to create a good seal.
4. **Closures** - Closures must be designed to accommodate the type of induction liner you intend to use. The thread style and pattern on the closure must be compatible with those on the container. The closure must create an even, uniform pressure on the induction liner over the entire land area of the container. The closure should be properly sized to fit the container neck and robust enough in its construction to avoid distortion when it is applied.
5. **Containers** - The thread style and pattern on the container must be compatible with those on the closure you choose. The land area of the container must be flat and smooth. Ridges or saddles on the land area will lead to weak seals. The best seals are achieved when the land area is 85 mils (2mm) wide or wider. The neck area and the land area of the container should never be chemically treated or flame treated. Such treatment will inhibit the bonding of the liner to the container.
6. **Induction Liner** - Induction liners have been developed for almost every possible application. They have a wide range of characteristics and capabilities. Always remember that the sealing polymer on the liner must be compatible with the

material your containers are made of and capable of creating the type of seal you wish to achieve. The O.D. of the liner must be appropriate for the closure and the container you are using. The liner should be free of wrinkles or impurities and should be centered in the closure.

7. **Sealing Head** - As is true for induction liners, induction sealing heads have been developed for almost every possible application. The designs can be as simple as small hand-held sealing heads to the sophisticated, integrally mounted, high-speed production sealing heads. The function of the sealing head is to create an electromagnetic field which induces an electrical current, called an eddy current, into the foil portion of the induction liner. The eddy current heats the metal of the liner making the sealing process possible. Choosing the appropriate sealing head for your application requirements is very important.

Understanding The Results Of Induction Sealing

Easy-Peel Liners

Easy-peel liners seal tightly to the lip of the container, but allow for a clean peel from the container.



Tamper-Evident Liners

Tamper-evident liners seal tightly to the lip of the container, but leave part of the liner on the lip when opened. This is used to show evidence that the container has indeed been opened.



Good Seal

A good seal will have good adhesion for the entire circumference of the container opening and will stand up well to pressure tests. Wrinkling of the liner will be at a minimum, and the inside of the closure will show no signs of overheating. On 2-piece liners, the liner and closure will show no signs of swirling or twisting from poor wax melt or absorption.



These conditions can range from a seal that lets go under light pressure to a pinhole leak that exists along the lip of the container. On 2-piece liners you may also see signs of swirling or twisting due to poor wax melt or absorption.



No Seal

A No Seal result on a container is when the container is run through a sealing cycle and the liner shows no signs of adhesion to the lip of the container.



Possible Causes

- ❖ Insufficient cycle time.
- ❖ Insufficient Induction field - low power.
- ❖ Incorrect induction liner - incompatibility.
- ❖ Chemical or flame treatment of the container neck or the land area.
- ❖ Insufficient on-torque.
- ❖ Improper sealing head placement on cap – not centered or level to the closure.
- ❖ Deformations on the land area.
- ❖ Thin or weak land area – too narrow.

Solutions

- ❖ Increase the TIMER setting on the sealer.
- ❖ Increase the POWER OUTPUT % on the sealer.
- ❖ Check cap/liner specifications to ensure the correct liner is being used.
- ❖ Check container specifications.
- ❖ Verify the torque requirement of your container and closure.
- ❖ Verify the proper alignment of the sealing head and your container during the sealing process.
- ❖ Inspect your containers.

Possible Causes

- ❖ Insufficient cycle time.
- ❖ Insufficient Induction field - low power.
- ❖ Incorrect induction liner - incompatibility.
- ❖ Chemical or flame treatment of the container neck or the land area.
- ❖ Sealer not running.

Solutions

- ❖ Increase the TIMER setting on the sealer.
- ❖ Increase the POWER OUTPUT % on the sealer.
- ❖ Check cap/liner specifications to ensure the correct liner is being used.
- ❖ Check container specifications.
- ❖ Turn On / Troubleshoot Sealer.

Partial or Weak Seal

A Partial Seal result on a container is when the liner only shows signs of adhesion to a portion of the lip of the container when the closure is removed.

A Weak Seal result on a container is when the liner shows signs of full adhesion to a portion of the lip of the container, but fails under pressure tests.

Overheated or Burned Seal

An Overheated or Burned Seal result on a container is when the liner shows signs of discoloration, deterioration, and/or wrinkling. The inside of the closure may show signs of melting, and on a 2-piece liner the backing material may be discolored or burned, depending upon the severity of the overheating.



A burned smell often accompanies overheating and may possibly affect the smell or taste of your product and may be the only indication of overheating.

NOTE:

When overheating of the liner occurs, ignition of the liner and/or container contents is possible.

Possible Causes

- ❖ Excessive cycle time.
- ❖ Excessive Induction field – high power.
- ❖ Insufficient on-torque.
- ❖ Improper sealing head placement on cap – not centered or level to the closure.
- ❖ Deformations on the land area.
- ❖ Thin or weak land area – too narrow.

Solutions

- ❖ Decrease the TIMER setting on the sealer.
- ❖ Decrease the POWER OUTPUT % on the sealer.
- ❖ Verify the torque requirement of your container and closure.
- ❖ Verify the proper alignment of the sealing head and your container during the sealing process.
- ❖ Inspect your containers.

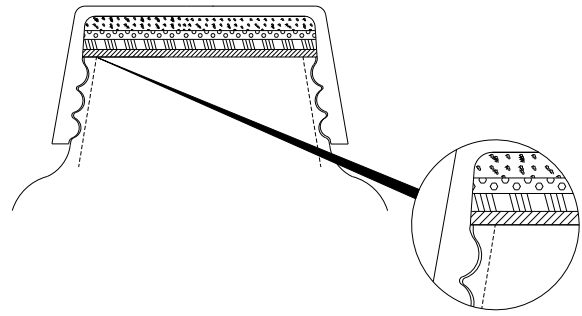
Additional Application Troubleshooting Tips

1. Excessive removal torque on a one-piece liner.
 - ❖ Excessive cycle time.
 - ❖ Excessive Induction field
 - ❖ Excessive on-torque.
 - ❖ Closure and container threads not compatible.
 - ❖ Liner too large - overhang wedged in threads.
2. Excessive removal torque on a two-piece liner.
 - ❖ Poor wax melt from insufficient cycle time.
 - ❖ Poor wax melt from insufficient Induction field.
 - ❖ Poor wax melt from heat sinking – product in contact with liner during sealing process.
 - ❖ Liner melted into container and closure from to overheating.
 - ❖ Excessive on-torque.
 - ❖ Liner undersized - pulp backing bonded to container.
3. Very low removal torque
 - ❖ Insufficient on-torque.
 - ❖ Excessive on-torque – threads stripped.

Cap & Container Issues

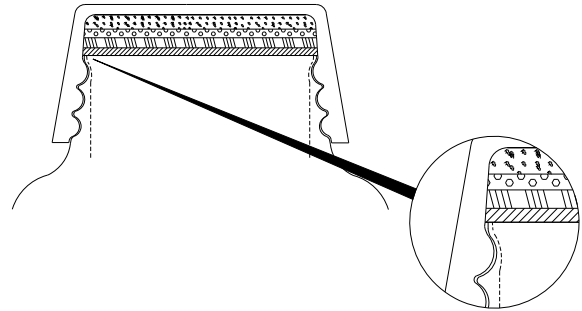
Good Container Lip/Liner Contact

Good contact between the liner material and the container lip is very important. This goes hand in hand with the amount of torque applied, but can be a problem even when the torque levels are good. The land area of the container should be wide enough and rigid enough to support the pressures and heating required for a good seal.



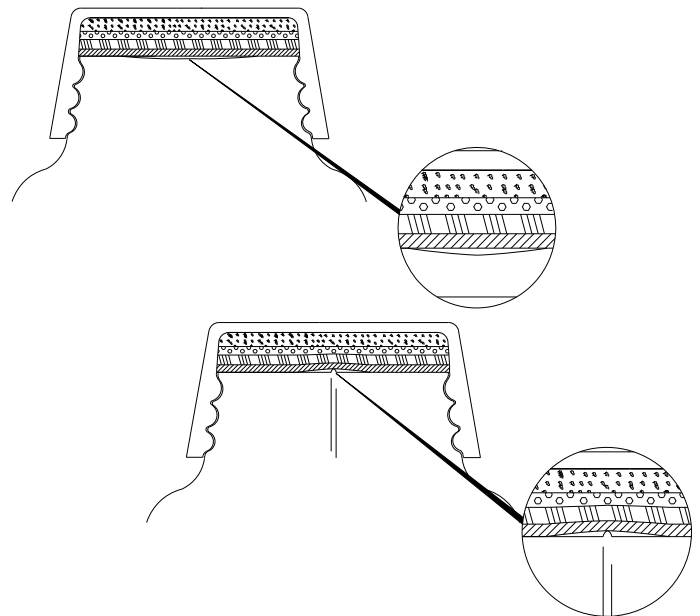
Poor Container Lip/Liner Contact

A thin or weak land area can cause poor contact between the liner material and the container lip. When the land area is too thin there may not be enough rigidity in the land area to support the pressures and heat required for a good seal.



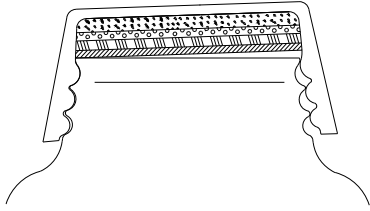
Container Lip Deformations

Gaps between the land area and liner material can be the result of any number of problems, from mold imperfections to container material issues. Regardless of the cause, any gap between the liner and container land area may cause overheating and failure of the seal. A gap caused by saddles on the land area and a gap caused by a protrusion are shown. These defects can be detected on the container land area before the container is capped.



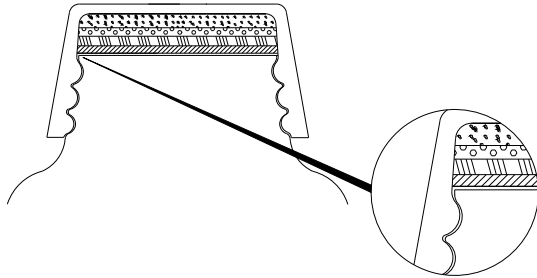
Cocked Cap

A cocked cap is usually due to a problem with the capping process or a cap or container problem. The gap created can cause overheating and the cap itself may actually jam the container under the sealing heads causing the liner to overheat severely.



Torque Issues

One of the most common causes of poor or inconsistent sealing is an improperly torqued cap. Whether the torque is too low or too high, the end result is usually an air gap between the lip of the container and the liner material. This air gap will usually cause overheating of the liner, but at the very least will create a gap too large for the polymer to fill. The following table is provided as a general rule of thumb for determining the torque required for your cap size. For exact torque requirements, contact your cap manufacturer.



Torque Requirement Table

Cap Size	Torque
15mm	6-9 in./lbs (.68-1nm)
18mm	7-10 in./lbs (.79-1.13nm)
20mm	8-12 in./lbs (.9-1.35nm)
22mm	9-14 in./lbs (1-1.58nm)
24mm	10-16 in./lbs (1.13-1.8nm)
28mm	12-18 in./lbs (1.35-2.03nm)
33mm	15-25 in./lbs (1.69-2.82nm)
38mm	17-26 in./lbs (1.92-2.93nm)
43mm	18-27 in./lbs (2.03-3.05nm)
48mm	19-30 in./lbs (2.14-3.38nm)
53mm	21-36 in./lbs (2.37-4.06nm)
58mm	23-40 in./lbs (2.59-4.51nm)
63mm	25-43 in./lbs (2.82-4.85nm)
70mm	28-50 in./lbs (3.16-5.65nm)
83mm	40-60 in./lbs (4.51-6.78nm)
89mm	45-65 in./lbs (5.08-7.34nm)
100mm	50-70 in./lbs (5.65-7.90nm)
110mm	52-73 in./lbs (5.87-8.25nm)
120mm	55 -75 in./lbs (6.21-8.47nm)

Note: The listed torque levels are a general guideline only, check with your cap / liner manufacturer for specific requirements of your package.

SECTION 5 – PARTS LIST

GENERAL

This Section of your manual contains illustrated part breakdowns of the various components that make up the *Super Seal™ Jr. Induction Cap Sealer*. If standard options are offered with your system they will be represented with parts breakdown illustrations as well, but special order options typically will not.

The illustrations, and their associated part tables, are primarily provided for replacement part identification, but can also be useful in locating items that are identified as being required for operation, or requiring maintenance or adjustment.

HOW TO USE THE PART LISTS

1. Refer to the illustrated part breakdowns to identify the desired illustration.
2. Visually locate the desired part in the illustration and identify the part's **Item #**.
3. Refer to the part table and find the **Item #** to identify the Enercon **Part #**, **Description**, and **Quantity**.

HOW TO ORDER PARTS

Due to possible changes in the part numbers and quantities in your system, we request that you have all of the following information available when placing an order. We do understand that some information may be unavailable, but be aware that this may cause delays in shipping your order.

1. Locate the **Model Number** and **Serial Number** of your unit on the system **Rating Plate**; see **Figure 4** on **page 6** of this manual.
2. The **Part Number** and **Date** of this manual; both are located on front cover of this manual. The **Part Number** is also located in the footers on each page of the manual.
3. The **Part Number** of the desired part, the page number it was found on, and the parts **Description**.

NOTE:

All of the replacement parts provided are manufactured with the same precision as the parts supplied with the original equipment.

4. To place a part order contact:

Enercon Parts Department
Phone Number: +1 (262) 255-6070
Fax Number: +1 (262) 255-2462
E-Mail Address: parts@enerconmail.com

SHIPPING INSTRUCTIONS FOR RETURNS

Enercon has 2 facilities that perform repairs and process credits. Before shipping parts or equipment back, contact Enercon's Customer Service Department for a **Return Material Authorization (RMA)** number, the proper shipping address, and any special shipping instructions.

If possible, use the original packaging material the parts or equipment were shipped with. If that is not available, use a fiberboard box and adequate packing materials to support the item's weight and prevent movement during shipping.

Ensure both the shipper and receiver addresses are clearly printed on top of package along with the **RMA** number.

Parts must be sent **Prepaid**.

SUPER SEAL™ JR. PARTS BREAKDOWN

Item #	Part #	Description	Qty.
1A	LM5061-01	Control Board – 120 VAC System	1
1B	LM5061-02	Control Board – 240 VAC System	1
2	LM5060-01	Power Board	1
3	TR0060	Power Mosfets	2
4	BR0060	Bridge Rectifier	1
5	CP2637	Output Capacitor	1
6	LM5109-01	Power Disconnect	1
7A	CN0013	Power Entry Module	1
7B	CN0094	2-Pole Fuse Drawer	1
7C	FU0125	250 VAC 10 Amp Fuse	2
7D	CN0089	4 Position Voltage Selector	1
8	CN0156	Remote Start Connector	1
9	FD6253-02	End Cap - Front	1
10	FD6253-03	End Cap – Back	1
11A	LM5068-03	Standard Sealing Head SS Jr. (Not Shown)	As Req.
11B	LM5068-04	Large Sealing Head SS Jr. (Not Shown)	As Req.
12	LM4074-25	Remote Start Cable (Not Shown)	1

When contacting customer service have serial # of your unit available to ensure the proper parts are supplied.

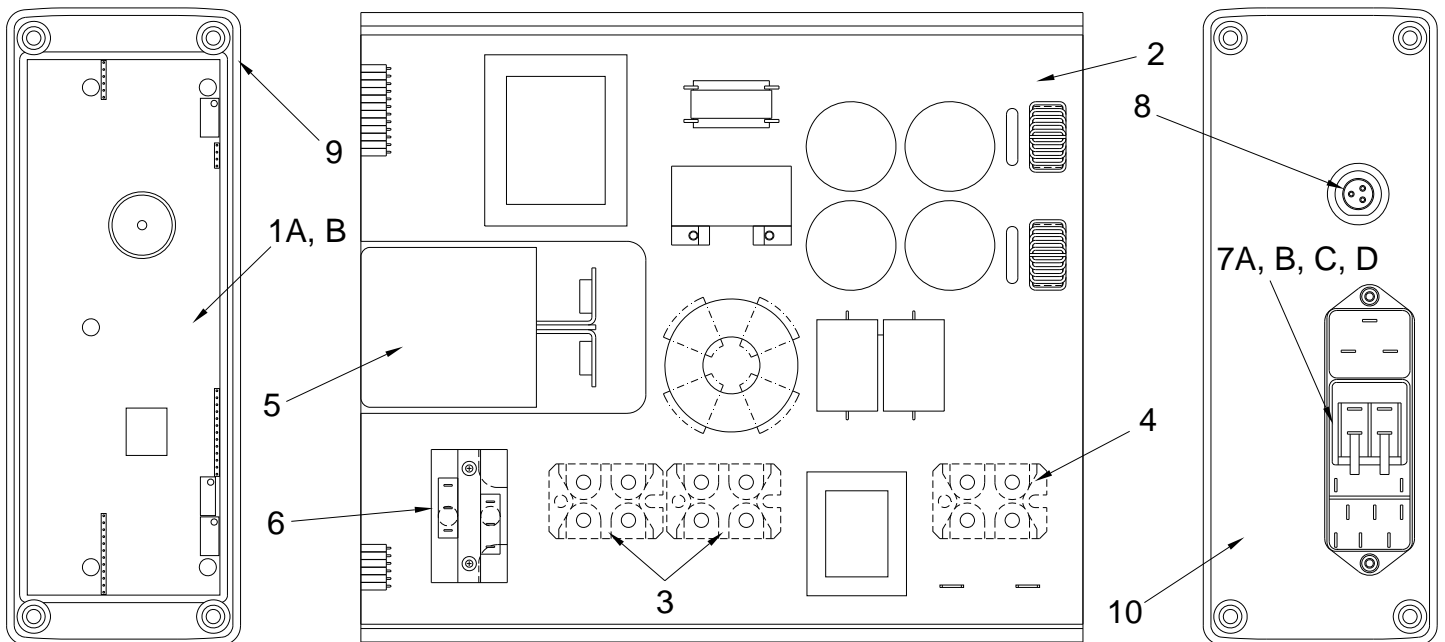


Figure 12

SECTION 6 – MISCELLANEOUS

MAINTENANCE RECORD				
Date	Check Performed	Issues Found	Corrective Action	Verified By

PRODUCTION INFORMATION

Product	Liner	Container	Sealing Power %	Min/Max Cycle Time	Production Cycle Time

