

## Induction Sealing Verification Variables

***An analysis of built-in and optional induction cap sealer detection packages available to ensure your Unifoiler™ waterless induction sealer promotes 100% verified induction sealed products.***

Sealing Unit Verification was coined by Pillar Technologies as a key factor for induction sealing reliability. The term SUV (sealing unit verification) refers to any feature or option Pillar extends on their Unifoiler™ waterless induction sealing systems that help ensure the system is sealing properly. The sealed product is verified by using the most technological systems available. Pillar's SUV package may be composed of a combination of built-in or standard features, coupled with extremely detailed detection packages for ultimate verification.

Standard "built-in" SUV features of the Unifoiler™ include:

1. Adjustable loss of seal alarm and conveyor shut down capabilities
2. Diagnostic indicating lights that include alarm fault
3. Impedance high or impedance low
4. High temperature
5. Current trip, under voltage trip, or over voltage trip
6. LED displayed operator controls that show power, alarm set, total bottle count, rejected bottles, and alarm set points.

Optional SUV packages available may include:

- A. Missing foil/loose cap detection and count display with reject delay and duration control
- B. Stalled bottle detection and count display with zero conveyor speed sealer shutdown
- C. Total bottle count display and run time display with conveyor speed reference display
- D. Reject device with kick-off tray and reject verification confirmation
- E. Deluxe stacked indicating light package to detect coil field active, visual loss of seal indicator or induction sealer in stopped position.
- F. In-feed bottle stop halting any unsealed bottles from entering the sealing frequency area when power drops, machine is turned off or stopped unexpectedly.

See below for more detailed information on components that comprise Pillar's induction sealing detection and integrity seal verification options.

*When you need to be absolutely secure in knowing that your induction sealer is working at it's utmost capability for accurately sealed products, the following detailed components may play a large factor on what induction sealing product is right for your application. Pillar can only provide instrumentation to notify the operator of a potential problem and help detect inaccurate seal verification by data accumulated by our equipment packages. Pillar is not responsible for a faulty product getting through the system on errors that may occur above and beyond our recommendations or capabilities.*



**STANDARD “BUILT-IN” SEALING DIAGNOSTIC INDICATORS OF THE UNIFOILER™ WATERLESS INDUCTION SEALER SERIES THAT HELP ENSURE A PERFECTLY SEALED BOTTLE:** (These are all security safeguards in the equipment only that may assist in promoting 100% induction sealed products.)

**Alarm Fault** - Lights when the coil output has dropped below the threshold set by the alarm set point on the panel. This is used to indicate that the inverter is not supplying the desired power to the coil. In such a case, proper sealing may not be accomplished.

**Impedance High** - If this light should illuminate when the inverter is in Stop mode, it does *not* indicate a problem. If it illuminates while the inverter is *running*, there may be a problem inside the inverter or coil.

**Impedance Low** - Indicates that an impedance mismatch has occurred. This condition occurs when the load on the inverter is higher than it can deliver.

**High Temp** - Indicates that the power transistors inside the inverter are not receiving sufficient cooling. The inverter will shut down to prevent the unit from overheating.

**Reject Fault** – Indicates that the reject verification sensor did not sense a bottle moving into the reject tray.

**Current Trip** - Indicates that a short circuit has occurred between the inverter and the coil.

**Under Voltage Trip** - Indicates that the supply voltage to the inverter has dropped (as in a brownout). The inverter will shut down to prevent the inverter from drawing excessive current.

**Over Voltage Trip** - Indicates that a voltage surge or other situation has caused an over-voltage condition within the inverter. The inverter will shut down to protect itself.

**Stalled Bottle Fault** - When this light is illuminated it is a warning that a Stalled Bottle condition was detected at the sealing coil. Also lights when rejected bottle button is pressed.

**Loose Cap Fault** - When this light is illuminated, it indicates that a cap was detected which is not fully seated on the container or is not threaded evenly causing a fault condition. Also lights when rejected bottle button is pressed.

**Missing Foil Fault** - When this light is illuminated, it indicates that a container passed under the sealing coil that did not have a liner installed, and was not properly sealed.

**Zero Speed Fault** - When this light is illuminated it is a warning that a Zero Speed Condition was detected at the conveyor.

**Alarm Set** - Pressing this button allows the operator to view the Alarm Set Point on the display and change as required.

**Total Bottle** - Indicates the total number of containers that have passed through the sealing coil. (Not available without the optional detection system.)

**Rejected Bottle** - Indicates the total number of rejects due to a stalled bottle, loose cap, or missing foil fault. (Not available without the optional detection system.)

**Total Run Time** - Indicates the total number of operating hours on the system.

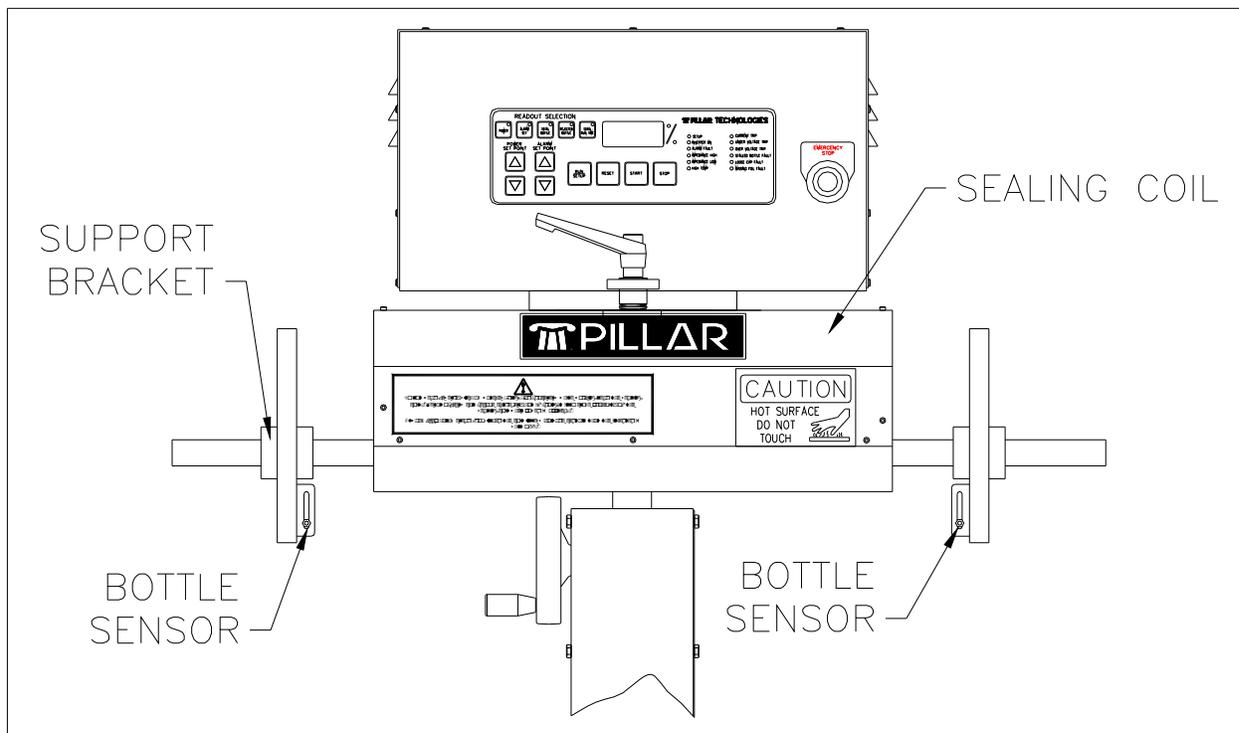
**Power Set Point** - Digital entry of the percentage of output power. This setting will control the amount of heating induced in the bottle caps.

**Alarm / Time Set Point** - Digital entry of the alarm threshold. If the actual power output to the coil falls below this setting, the alarm circuitry will be activated. This is sometimes called the “loss of seal” condition.

**OPTIONAL DETECTION SYSTEMS OF THE UNIFOILER™ WATERLESS INDUCTION SEALER SERIES THAT HELP ENSURE A PERFECTLY SEALED BOTTLE:** (These are all “optional” packages that can be purchased with the induction sealer that may assist in promoting 100% induction sealed products.)

**Stalled Bottle Detector**

The purpose of the stalled bottle sensor assembly is to detect bottle movement on the conveyor line and activate an alarm if a bottle becomes stalled under the induction sealing coil. The stalled bottle option will also shut down the power supply when the fault occurs. If a container should stall beneath the coil, the foil liner may overheat, resulting in burning of the liner and the container, resulting in a potential safety hazard. The system senses containers entering the seal zone and also senses the containers leaving the seal zone. At the same time a third sensor monitors the conveyor speed and is used to record the proper amount of time for a container to pass between sensors. Even a slight delay from entrance to exit will cause an alarm to activate. A stalled bottle setup is shown below.



Stalled Bottle System

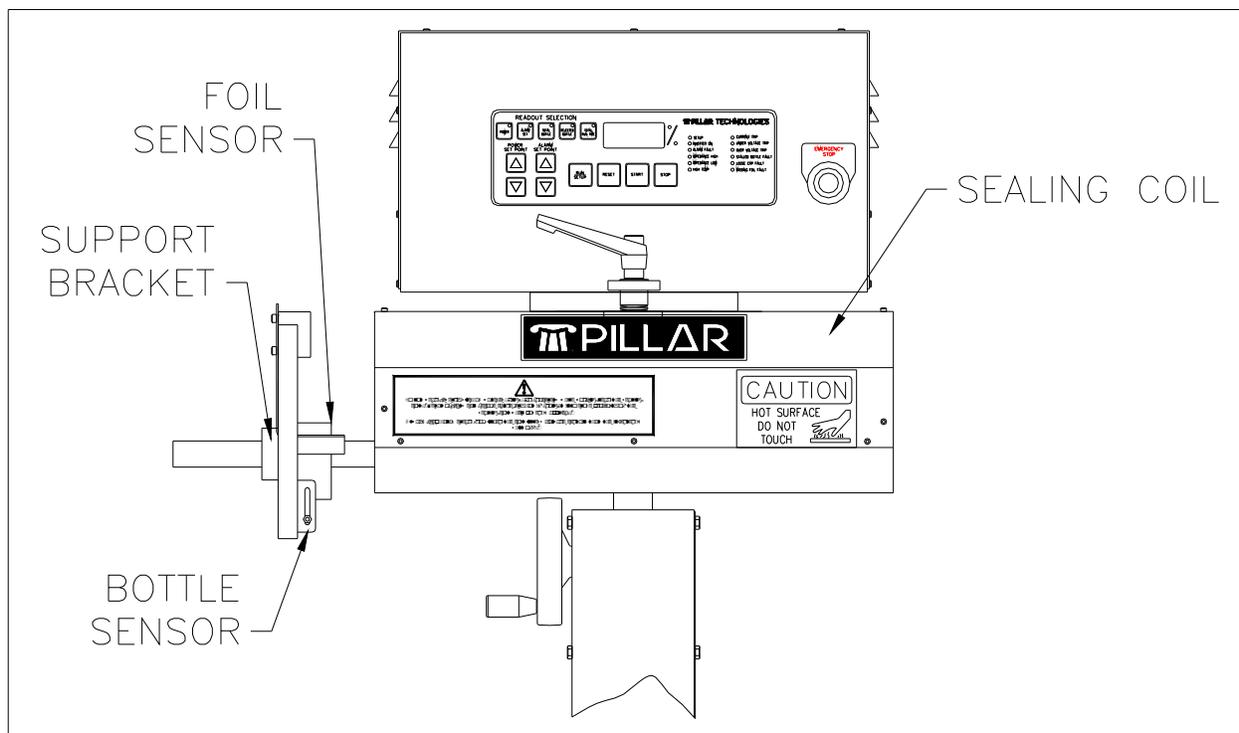
**Features of the Stalled Bottle System:**

- ◆ Indicator Lamp - Light located on display panel lights when a stalled bottle fault occurs.
- ◆ Reset Button - Allows the operator to silence the alarm during a stalled bottle fault.
- ◆ Fail Safe Operation - The system will also monitor the conveyor speed, and will give a stalled bottle fault if the conveyor speed drops below 7 ft/min.
- ◆ Reject Counter - A display that shows the number of rejects caused by stalled bottle faults.

## Missing Foil Detector

The purpose of the missing foil detection system is to provide a warning to the operator in the event that a container passes under the sealing coil that did not have a liner installed. If a container passes under the inductive sensor that does not have a foil present, the inductive sensor will send a signal to the microprocessor, the processor will then provide a signal to alert the operator. This option does not shut down the inverter, but can be used with a reject mechanism to remove defective containers from the conveyor line. A typical missing foil system is shown below.

The missing foil system consists of an optical sensor that detects the presence of a container at the same time that the inductive sensor is looking for a foil under it. The outputs from both of these sensors are connected to the sensor panel inside the inverter cabinet. In addition, an optical encoder is also provided, which requires mounting onto the conveyor shaft at a convenient location. The output of this encoder is connected back to the sensor panel at the rear of the inverter.



Missing Foil System

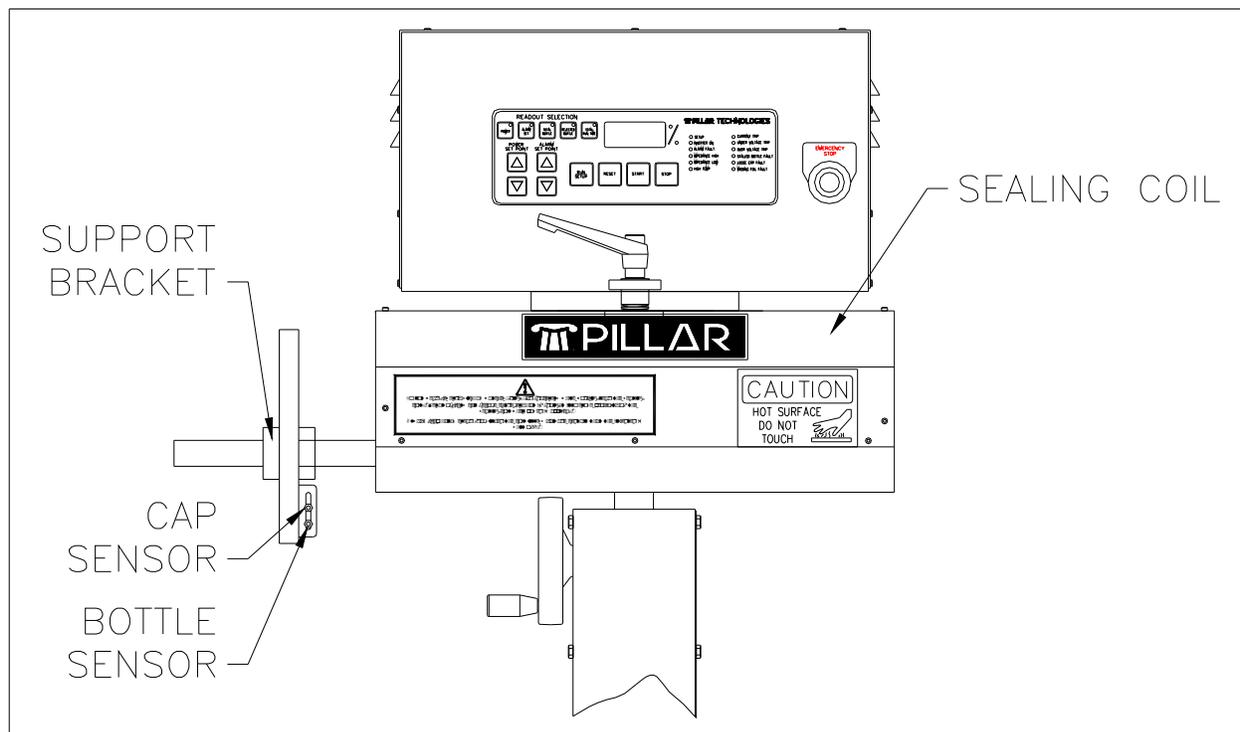
### Features of the Missing Foil Detector

- ◆ Indicator Light - Light that is located on the display panel, which indicates when a missing foil fault has occurred.
- ◆ Adjustable Fault Contact – A timed contact used to activate a bottle reject.
- ◆ Dependable Operation - The sensing of the container and the foil at the same time allow for fail-safe operation and dependable detection of foils.
- ◆ Reject Counter - A display that shows the number of rejects caused by missing foil faults.

## Loose Cap Detector

The loose cap detection system is used to detect the presence of a cap that is not fully seated, or a crooked cap, or even a container which is not setting flat on the conveyor. The result of any of these conditions will cause an output signal to an external relay which can be used to activate an alarm device, or provide the signal to a reject mechanism on the conveyor. A typical loose cap detection system is shown below.

The loose cap system consists of two optical sensors that are mounted at the exit of the sealing coil. The lower sensor senses the presence of a container exiting the sealing coil area. The upper sensor is looking for a cap that is not at the correct height on the conveyor. The outputs from both of these sensors are connected back to the sensor panel. In addition, an optical encoder is also provided, which requires mounting onto the conveyor shaft at a convenient location.



Loose Cap Detection System

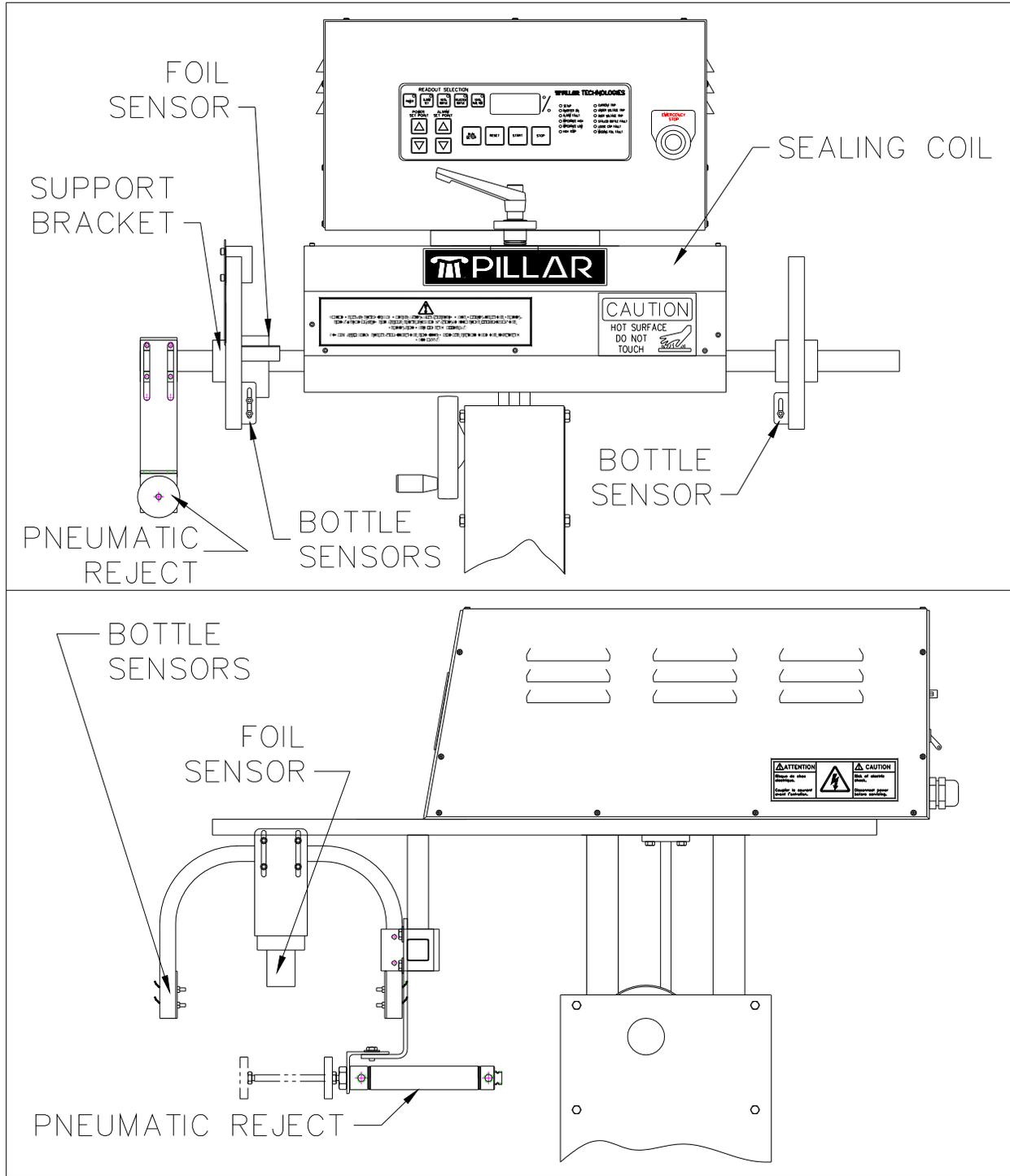
### Features of Loose Cap Detection System

- ◆ Indicator Light - Light that is located on the display panel indicates when a loose cap fault has occurred.
- ◆ Adjustable Fault Contact – A timed contact used to activate a bottle reject.
- ◆ Dependable Operation - The sensing of the container and the cap at the same time allow for fail-safe operation and dependable detection of loose or crooked caps.
- ◆ Reject Counter - A display that shows the number of rejects caused by loose cap faults.

## **Pneumatic Reject**

A pneumatic reject is available to work in conjunction with the missing foil and/or loose cap detection system. The reject is activated whenever these faults occur. The reject cylinder is simply mounted to the existing sensor brackets. The reject signal is determined by the sensor system described above. A source of clean, dry compressed air of at least 80 psi is required to operate the cylinder. Please see the reject setup instructions above to adjust the operation of the pneumatic reject.

The reject verification system is used to verify that a container has been removed from the conveyor once the system has decided to reject it. This system consists of a sensor placed at the entrance of the reject tray. If a reject verification has not been detected after a reject, the power supply will turn off, the Reject Fault LED on the front panel will illuminate and the reject fault relay will be energized. To reset this fault and restart the power supply, the RESET or STOP button must be pressed. The system will wait approximately 600ms after the reject relay is de-energized or until the next reject (whichever is shorter) to detect the container exiting the conveyor before issuing a fault. A Reject Fault may also occur if the reject verify sensor is blocked.



Pneumatic Reject

**For more information on sealing verification systems, please contact Pillar Technologies direct at: 1-888-PILLAR-6 (888-745-5276) or e-mail: [capsealers@pillartech.com](mailto:capsealers@pillartech.com)**