

LSC Gate Adaptors provide a means for safe, simple, and quick removal of LSC In-line Refractometer Sensing Heads from active black liquor pipelines.

READ THIS ENTIRE PROCEDURE BEFORE ATTEMPTING TO INSTALL OR REMOVE THE HEAD

You will need the following tools:

- Large Wrench (Large 1" or 25mm) for closing the Gate Adaptor "isolation valve"
- Wrench, Small Adjustable (used to remove prism wash tubing if installed.)
- 3/16" Allen Wrench (used to remove Sensing Head) ▪ Small and Large Flat Head Screw Driver

The Gate Adaptor (2205 Duplex SST) employs a completely captivated slide plate that is mechanically sure and operated by an eccentric cam. Operation of the Gate Adaptor is accomplished by turning a 1 inch (25mm) hex cam just under a ½ turn. Double Teflon seals are provided against both sides of the slide plate. The Gate Adaptor provides for an external lock "fully open" or "fully closed" with positive visual and physical indication of "fully open" or "fully closed". If the lock port is not 100% open, then this is an indication that the valve is not properly closed. If you do not have a lock please, use a screwdriver or pin with a ¼" diameter shaft to verify that the valve is completely closed.

If you do not have a Gate Adaptor on your installation you will need to shut down the liquor process before you can proceed.



THESE TWO PICTURES SHOW THE GATE ADAPTOR ISOLATION VALVES IN THE CLOSED POSITION AND LOCKED

How to Safely Remove the LSC In-Line Sensing Head

Before maintenance can be done, the sensing head must first be safely removed. Most black liquor installations have the LSC Gate Adaptor Isolation Valve which allows for safe removal of the sensor.

Before closing the Gate Adaptor on a LSC Model 1022 Automatic Divert System, it is important to visually check the maintenance panel inside the 1022 to make sure neither refractometer is in a prism wash cycle, hold cycle or about to start a wash.

CLOSE ONLY ONE GATE ADAPTOR AT A TIME.

As one sensor is washing, the remaining "active" refractometer is given full divert capability. If you were to close the gate while the other head is washing, the system will divert the liquor.

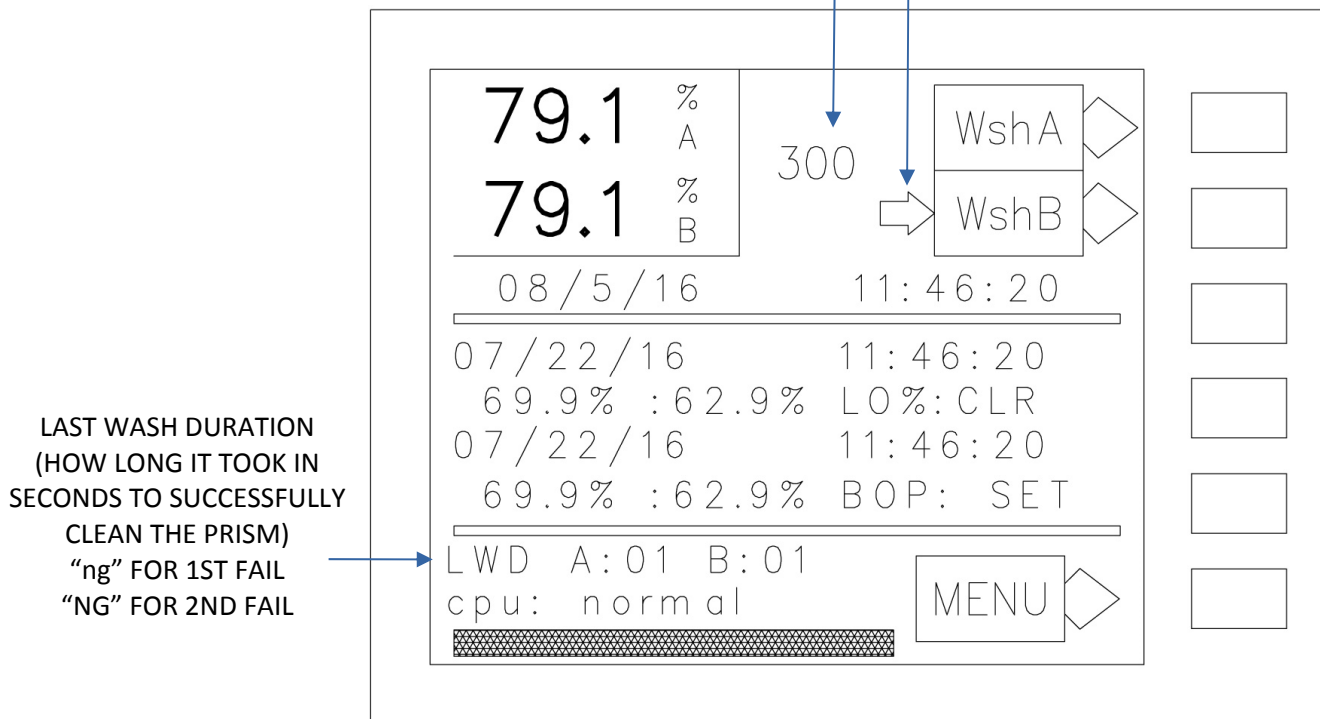


The other refractometer must remain active to allow for safe firing of liquor and uninterrupted operation. If both gates are closed at the same time, the divert system will trip the boiler. If the limit switches are working properly, the refractometer will be taken out of service as soon as the technician closes the Isolation Valve.

THE ARROW WILL POINT TO THE NEXT SENSING HEAD TO BE WASHED.

IN THIS EXAMPLE "B" WILL WASH NEXT

300 SECONDS UNTIL NEXT PRISM WASH



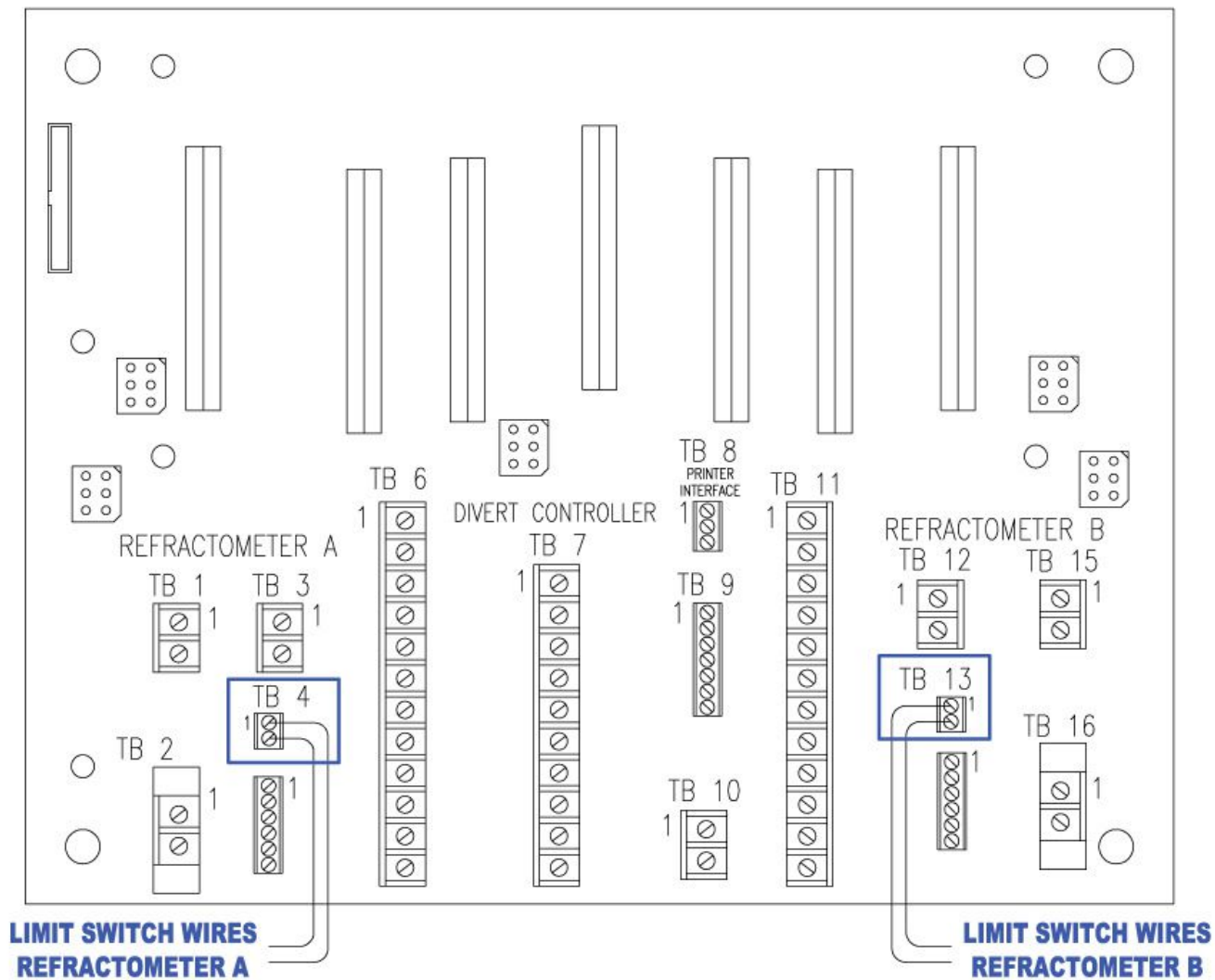
Note: NG – Meaning the 2nd Failed Wash, will take that sensing head out of service and transfer full divert capabilities to the remaining "active" head.

Due to the location of the sensing heads and / or concerns about the condition of your limit switches on the gate, it may be beneficial to lift 1 wire from the limit switch inside the Model 1022 enclosure (for A or B Sensing Head, depending on which one you are working on). But before you do make sure neither sensor is in the middle of a wash and / or hold cycle. If it is, please wait until the wash and hold cycle are completed

Lifting one wire opens the 5 VDC signal which simulates the gate being closed, taking that refractometer out of service and giving full divert capabilities to the remaining active refractometer. Now you have time to walk out to the sensing head and close the gate.

If you elect not to lift the limit switch wire, you will need to return to the 1022 after closing the gate adaptor to verify the 1022 shows that unit has been taken out of service. If you are looking at the Operator Panel it will display "Out"... if you are looking at the maintenance panel it should display "closed". **Failure to do so may cause a 'nuisance' divert.**

One benefit is that it will allow the customer to open the gate adaptor to see if the refractometer is functioning properly before reinstating the measurement as part of the divert logic. Please be sure to reconnect the limit switch wire after reinstalling the sensing head into service.



Now that you have checked the prism wash status, please proceed with the following instructions

1. Turn off the steam and air supply to the Prism Wash Valve that you intend to work on. Both "A" and "B" refractometers should have their own individual isolation valve for steam and air.
2. Stand directly in front of the sensing head when you are ready to take the sensing head off.

3. Rotate the 25mm hex cam counter clockwise to align the closed indication with the cam reference point. Insert the LSC lock (P/N # 670350) through the 1/4" hole located next to the open indication. (See illustrations) If our lock is not available a 2" x .250" dia. pin, or screwdriver may be used.

Note: The lock will go through *only* when the gate slide is 100% fully closed, or 100% fully open.

If the lock cannot be inserted, do not remove the sensor

4. Once you have visually and physically verified the Gate Adaptor is closed properly, crack the steam line connection between the prism wash valve and the sensing head check valve, and remove (free) one end of the line.

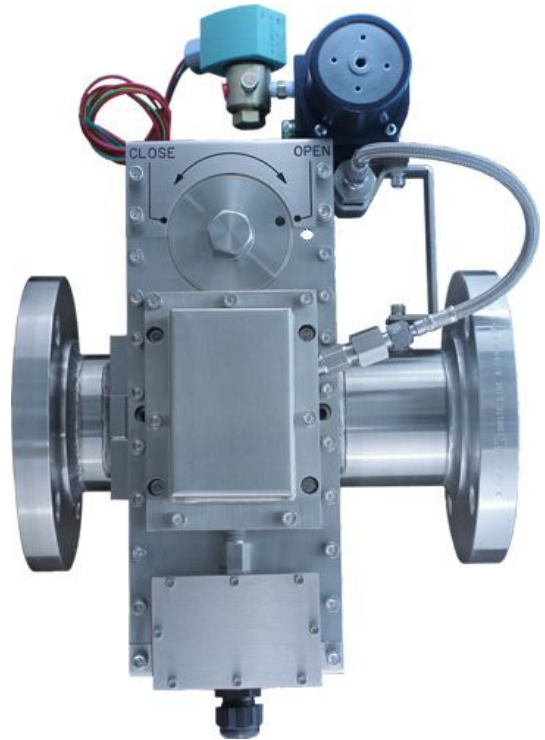
Note: Be cautious of steam pressure that may be trapped within this short piece of line and / or black liquor if your check valve has failed open.

Note: When closing the Gate Adaptor, some "Hot" Black Liquor will be trapped (or captivated) between the Sensing Head and the closed Gate Adaptor slide plate. This area is a 3/8 inch X 2 inch dia. and holds less than 1 ounce (29 ml) of black liquor.

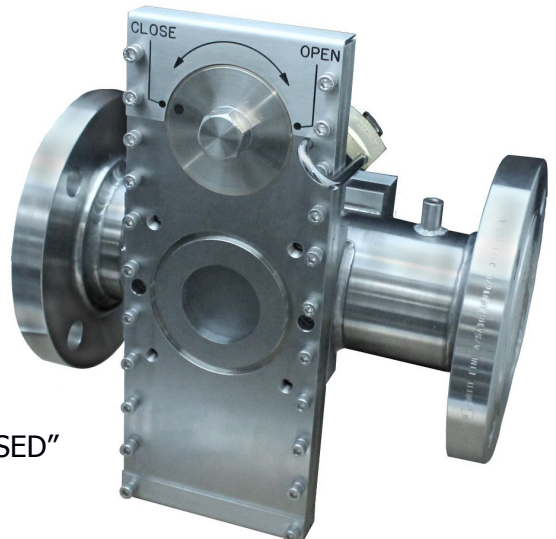
Due to the manner of our design, our sliding plate does not over pressurize the black liquor. Once the technician cracks the 4 mounting bolts and pulls back the T-Box, a small amount of black liquor will drip or ooze down the gate towards the floor, depending on the density of the liquor. It does not spray.

5. Use the 3/16" Allen Wrench to loosen the four (4) mounting bolts 1/4-20 x 7/8" socket head cap screw sequentially, and in small increments. Never remove one of the bolts completely at one time. Once you have cracked all 4 bolts, pull the T-Box out towards you. You will see a small amount of black liquor ooze down the gate. As indicated above, it is a small volume of liquor. Once this has stopped, move forward with loosening the four bolts to remove the sensing head. Always be fully prepared and be protected! (Hands, arms and face!)

GATE CLEARLY INDICATES "OPEN"
LOCK PORT IS 100% OPEN



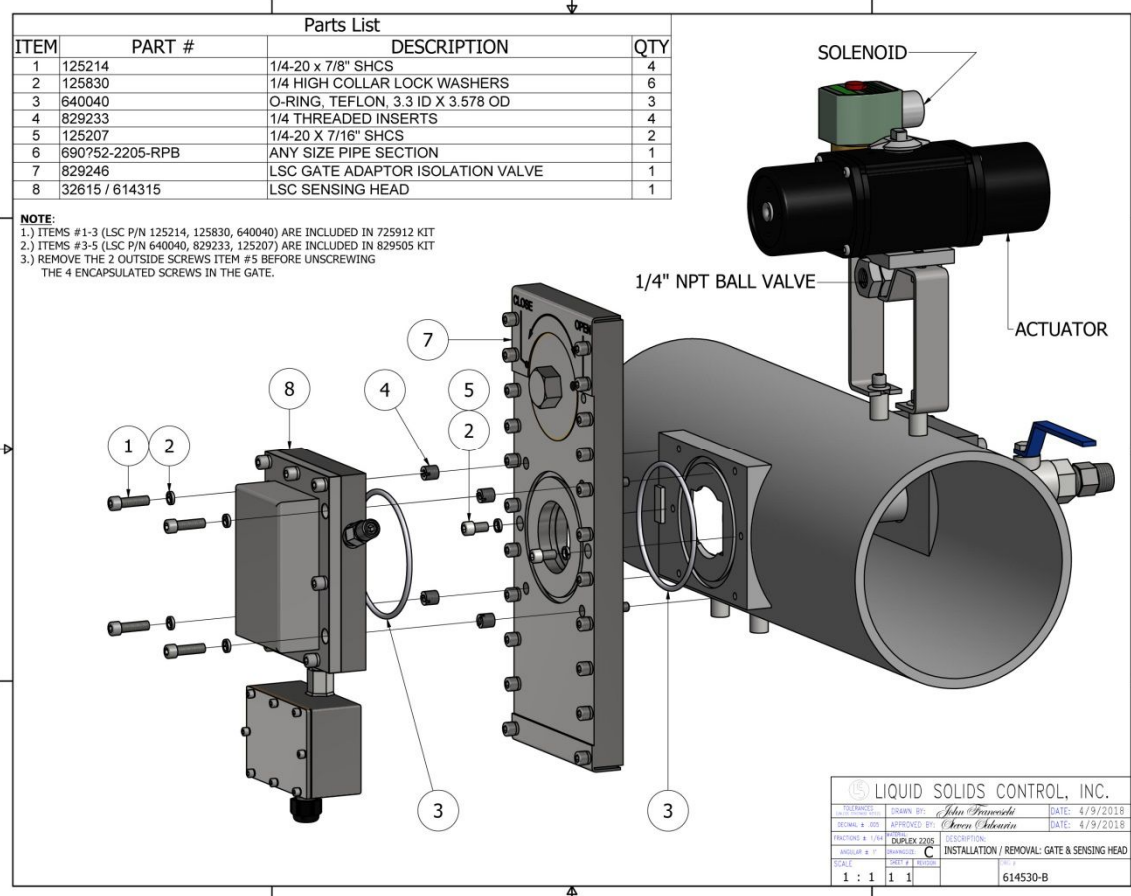
GATE CLEARLY INDICATES "CLOSED"
WITH PAD LOCK IN PLACE



Now that you have safely removed the sensing head, you can proceed with verifying the calibration, repair the head and / or replace it. If you are replacing the check valve as a preventative maintenance program, please make sure to use Teflon tape on the threads and install the check valve in the right direction. This will allow steam to flow to the prism during the prism wash cycle.

If the check valve is damaged or sticking, please inspect the wash port and wash nozzle and verify they are not plugged up. If they are, please rinse clean with warm / hot water.

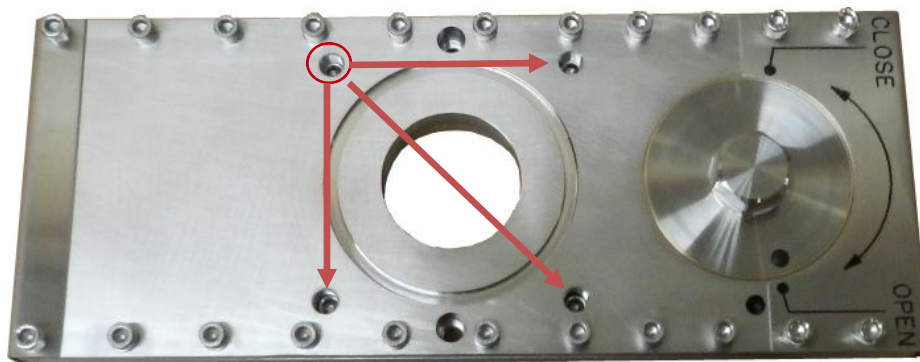
How to Safely Reinstall the LSC In-Line Sensing Head



Note: If you have removed the wash nozzle or check valve, please reconnect them before mounting the sensing head to the Gate Adaptor valve.

1. Before reinstalling the Sensing Head to the Gate Adaptor, make sure all surfaces are clean and free of black liquor (sensing head base plate, prism and gate surface). If the sensing head is hot, be sure to use hot water when cleaning the head as you do not want to thermally shock / crack the prism with cold water. Remember to remove the old O-ring and clean the O-ring groove with a wet rag and small screw driver. A Scotch Bright scrub pad also works well.

2. WITH A LARGE FLAT HEAD SCREW DRIVER, BE SURE THE FOUR THREADED INSERTS (SHOWN ON NEXT PAGE) ARE SCREWED BELOW THE SURFACE OF THE TOP GATE PLATE, BOTTOMED AND SNUG.



3. Seat a new White Teflon O-Ring (P/N 640040) into the groove on the gate; if the O-ring won't stay use a little grease to hold it in place. Now you can install the Sensing Head using a 3/16" Allen Wrench. The Sensing Head is mounted to the Gate Adaptor with four 1/4 - 20 x 7/8" socket head cap screws, with 1/4" high collar lock washers.

4. Tighten the four (4) mounting bolts sequentially, and in small increments. Make sure each bolt only has one high collar lock washer. The head should seat, metal to metal with no visible gap between the head and gate.

5. Now reconnect the prism wash line (usually SST flex line) to the 1/4" NPT Check Valve located on the sensing head and the 1/4" Prism Wash Valve. Use adjustable wrenches to tighten these connections so that they do not leak.

6. Before you can open the Gate Adaptor you need to visually check the maintenance panel inside the 1022 to make sure neither refractometer is in a prism wash mode, hold cycle or close to starting a wash. If you fail to do this, you could potentially cause the boiler to trip off of liquor.

If you elected to lift the limit switch wire inside the 1022 enclosure, you do not need to verify the prism wash status as the 1022 considers the refractometer you are working on as "out of service".

7. Now rotate the 25mm hex cam clockwise to align the Open indication with the cam reference point. Insert the LSC lock (P/N # 670350) through the 1/4" hole located next to the open indication. If our lock is not available, a 2" x 0.250" dia. pin, pen or screwdriver may be used. Your Gate Adaptor is now open and liquor is flowing across the sensing head.

8. Turn on the steam and air supply to the prism wash system.

9. Now walk back to the 1022 enclosure. The operator panel will still read "Out" but you can see how the refractometer is doing from the maintenance display. Once you are happy with its operation, verify that neither refractometer is in a wash/hold and reconnect the limit switch wire you had lifted. Now the 1022 will reinstate that refractometer into operation. The 1022 will also automatically switch back to requiring both refractometers to see low solids before it diverts.

Note: Checking the status of the prism wash is only required for automatic divert systems as you do not want to accidentally cause the divert system to trip the recovery boiler. If you are working on a single point measurement (single refractometer – Model 326, 614, 725 & 829) you can close the gate without having to check.

If your questions are not answered by the information contained in this contact one of our LSC locations listed below.

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