These instructions apply to Isolation Switch model SW-50-SSD that is to be installed on an in-service Dairyland model SSD decoupler in a Dairyland MTP-42 pedestal.

**WARNING:**
When Isolation Switches are used in ac voltage mitigation applications, if multiple or all decouplers are disconnected, the pipeline voltage may rise to an unsafe level (i.e., above the 15Vac that NACE standards consider safe). Therefore, safety precautions should be implemented by the user when decouplers are isolated from the pipeline, particularly at pipeline contact points. Dairyland will provide suggested procedures for installing and operating the Isolation Switch, but the user must be responsible for and approve the procedures to be used by its workers when initially installing the Isolation Switch in a field retrofit installation and when operating the Isolation Switch to disconnect or reconnect a decoupler because Dairyland cannot be familiar with each users safety guidelines.

**WARNING:**
Isolation Switches are not to be installed in a defined hazardous location, but rather in an “ordinary” location.

**CAUTION:**
When a SSD is being used to provide ac grounding for an item of electrical equipment, an Isolation Switch should not be installed because per electric codes such equipment must always be solidly AC grounded.

**INTRODUCTION**

The SSD is available with two different terminal configurations as illustrated below. The SSD version of the Isolation Switch can be installed on either model.

The SSD version of the Isolation Switch is illustrated below showing toggle switch and link positions when a decoupler is connected versus disconnected from the cathodically protected structure.
For worker safety during installation, it was recommended in Dairyland’s Isolation Switch ordering information that the user obtain certain equipment; namely a pair of electrically insulated gloves, a shorting cable with approximate 3 ft length with insulated clamps on each end, a multi-meter to measure ac voltage, and a clamp-on ac ammeter to measure ac current. (Of these items, Dairyland offers a suitable 3 ft long #2AWG shorting cable with insulated clamps, Model# “BCL-2”.) The following installation procedure assumes that these items are available. The use of the shorting jumper is illustrated for certain steps, but its use may not be necessary if the installer has measured and knows that the pipeline-to-earth voltage is at an acceptable touch voltage level for each step of the installation procedure, including when the conductor from the pipeline may be momentarily disconnected from the grounding conductor. However, it is suggested that the shorting jumper always be used as a safety precaution in the unlikely event of an electrical disturbance while the Isolation Switch is being installed. If the voltage one is working with is not known to be at a safe touch potential, then insulating gloves should be used.

SSD ISOLATION SWITCH INSTALLATION PROCEDURE

1. Prepare the Isolation Switch for installation as follows: (a) If the terminal configuration of the SSD to which the switch will be installed is as shown in the left view on page 1 (i.e., an SSD without an –R suffix in the model number, then remove the “L” bus (with one leg perpendicular to the switch base) as shown on the top end of the Isolation Switch in the above photo because it will not be used. If an SSD has a –R suffix in the model number, leave the “L” bus attached. (b) Remove and save the bolt, nut, and washers shown directly below the brass screw in lower left of the above photo because this is where the lead to the cathodically protected structure will be attached after the Isolation Switch is installed. If a second lead needs to be attached, the adjacent bolt to the left will be removed later after the first lead has been attached.

2. Before the Isolation Switch can be installed, it is first necessary replace the top carriage bolt in the C-channel bracket in the lower half of the pedestal with a longer 2.5” carriage bolt that is furnished with the Switch. [Exception: If the top bolt has a Red cap on the end, the pedestal already has a 2.5” long bolt installed. Go to Step 5.] Using a 9/16” wrench, remove the nuts on the two 3/8” carriage bolts that secure the C-channel bracket to the bottom half of the pedestal while leaving the leads connected to the SSD terminals. The nuts on both bolts have to be removed in order to change the top bolt. Then slide the C-channel off of these two bolts and hang the SSD on the edge of the bottom half of the pedestal off to the side.

3. Remove the two nuts that are remaining on the top carriage bolt that were behind the C channel bracket and drive out this bolt with a hammer.

4. Replace the top bolt with the 3/8”x 2.5” long carriage bolt provided. Reinstall the two nuts and washers on this bolt that will be behind the C channel bracket and tighten. Then reinstall the C-channel bracket over the two carriage bolts and replace the washer and nut on each carriage bolt and tighten. In addition, screw the 3/8” jam nut that was provided with the switch on the top carriage bolt in addition to the nut just added and tighten. This added jam nut is required to space the Isolation Switch the correct distance from the SSD mounting bracket when installed. It is important that this jam nut be installed or the switch parts may be shorted through contact with the metal C channel bracket.
5. It is important to know the voltage and current associated with the leads to be handled during the installation process. It is recommended that the installer first measure the ac current flowing through the decoupler with a clamp-on ammeter and measure the ac voltage from the negative SSD terminal to a metal probe (e.g., a long shank screwdriver) pushed into the earth where the worker will be standing to install the switch as this will represent the worker touch potential. If NACE guidelines were followed, the voltage measured should, but may not be, less than the 15 Vac that NACE considers safe, which is the reason for recommending this measurement.

6. Regardless of the voltage measured in Step 5, as a precaution connect the black jumper clamp to the positive terminal of the SSD and connect the red clamp to the connector (not the SSD terminal pad) on one of the conductors attached to the negative SSD terminal (if there is more than one). The reason for this step is that the voltage on this conductor may be higher when it is removed from the SSD terminal if not grounded. The following photos represent the shorting jumper for the two different SSD terminal configurations.

7. If the voltage measured in Step 5 is not considered safe by your company’s safety guidelines, which is not expected to be the case, then use insulated gloves when removing the lead from the negative SSD terminal. The use of insulated gloves is not shown in the following steps because their use is not expected to be required in most installations. Their use, if required, will make the installation more difficult, but should be used whenever the touch potential is above your company’s safety guidelines.

8. This step involves removing the pipeline lead from the SSD negative terminal. In most cases, it is expected that the voltage on this lead to earth will be at a safe touch potential, so if the touch voltage measured was safe with the lead connected, it will remain safe after it is removed provided the lead remains shorted to ground with the jumper cable. Use two 1/2” wrenches to disconnect the lead from the SSD negative terminal and save the nut, bolt, and washers for Step 10. Then holding this lead with the insulating clamp, move it down inside of the pedestal off to the side so it will be out of the way for the remaining steps. This step is the same for either SSD terminal configuration.

Note, in some applications there may be several leads from the negative SSD terminal to the cathodically protected structure. Attaching the red clamp to just one of these leads will ground all of the leads if they are bonded to a common structure, but confirm that this is the case.

9. If the SSD to which the Isolation Switch is being installed is the –R model (i.e., the terminal configuration shown in the above left photo of Step 8, which is most common) continue, otherwise go to Step 12. The “L” bus described in Step 1 should have been left intact for the –R SSD version as described in Step 1. First, loosen the nuts on the bolts that secure each end of the SSD mounting bracket to the C channel bracket as this will allow the SSD be adjusted vertically about ½” which is required for the next step.

10. Have the bolt, nut, and washers from the Step 8 and hold the SSD Isolation Switch so “L” bus is on the right side of the SSD negative terminal (the left terminal) with the hole in the “L” bus aligned with the hole in the SSD terminal. Insert the 5/16” bolt through the “L” bus and SSD terminal and place a split lock washer, flat washer, and nut on this bolt and finger tighten the nut. The SSD with the Switch attached may need to be raised vertically so the threaded end of the 3/8”x2.5”
carriage bolt in the C channel bracket bolt also fits through the hole in the phenolic base located just below the toggle switch (See photo below on right). Place a flat washer and nut on the 3/8" stud projecting through the phenolic base and firmly tighten. Then firmly tighten the 5/16" bolt in the “L” bus and tighten the two 5/16" bolts securing the SSD bracket to the C channel bracket. These steps are illustrated in the following four photos.

11. Install the label provided to the side of the SSD as illustrated.

12. This step applies when installing the Isolation Switch to a Non-R SSD model with the terminal configuration illustrated in the left view on page 1. For this installation, the “L” bus should already have been removed in Step 1, but if not, remove it and save the bolt and washers. First, loosen the nuts on the bolts that secure each end of the SSD mounting bracket to the C channel bracket as was illustrated in Step 9 as this will allow the SSD be adjusted vertically about ½” as required for the next step.

13. Have the 5/16” bolt and washers that were securing the “L” bus and hold the Isolation Switch up and behind the negative SSD terminal and partially thread the 5/16” bolt with washers through the negative SSD terminal pad into the captivated nut in the Switch base. It may first be necessary to push up on the SSD so the threaded end of the 3/8” stud in the C channel bracket is aligned and fits through the hole in the phenolic base just below the toggle switch before the 5/16 bolt can be threaded into the captivated nut on the switch. Finger tighten the 5/16” bolt into the captivated nut securing the switch to the SSD terminal, place a flat washer and nut on the 3/8” stud projecting through the phenolic base and tighten (same as illustrated in lower right photo of Step 10). Then tighten the 5/16” bolt into the captivated nut securing the switch to the SSD terminal (photo below on right) and re-tighten the two 5/16” bolts securing the SSD bracket to the C channel bracket.

14. The next step involves reconnecting the lead from the pipeline to the SSD terminal through the isolation Switch, a step that would be much easier to do if insulated gloves and the shorting cable jumper could be removed due to the confined working space in the SSD pedestal. It is expected that in most field retrofit installations, where the voltage has already been mitigated, that the pipeline voltage with one decoupler disconnected at a time may remain at an acceptable touch potential so work could be done by hand. To determine if the touch potential of the pipeline lead is at an acceptable touch potential when not grounded, connect a multimeter between the connector on the pipeline lead and a metal probe pushed into the earth (e.g., a long shank screwdriver) where the worker will be standing to connect the lead. Hold the lead by its insulation and momentarily remove the cable clamp so it is not grounded and read the ac voltage on the meter. If the voltage measured represents a safe touch potential per your company safety guidelines, the pipeline lead can be installed by hand without the clamps in the way or having to use insulated gloves. If the measured potential of the ungrounded lead is not considered safe, then either insulated gloves must be used or the lead must remain grounded during the lead connection process which will make this step somewhat difficult. Once the lead is connected to the switch, it will be again be grounded through the decoupler.

15. This lead connection step may be done by hand only if the touch potential of the ungrounded lead was safe, otherwise use insulated gloves. Keeping the lead grounded during the connection should keep the voltage on this lead at a safe value, but there is the possibility that the clamp could be accidentally disconnected in the process of attaching the lead, so care must be taken whenever insulated gloves are not used and the lead potential is above a safe value. Attach the connector on the lead from the pipeline by threading the 5/16”x1” long hex bolt, lock washer, flat washer, and lock washer furnished through the hole in the cable lead connector into a captivated nut behind the bottom hole of the bus below the brass screw and tighten securely. The recommended torque level is 10–12 ft-lbs (13.5–16 Nm). Do not over-tighten. The following shows the pipeline lead grounded in the process of making the connection to the Switch.
16. If a second lead from the cathodically protected structure is to be attached, remove the bolt to the left of the lead just connected in and similarly attach that lead.

17. Remove the cable clamps if they were still attached. If the SSD is to remain connected to the pipeline, confirm that the toggle switch is UP in the OPEN position and the link CLOSED with both link bolts torqued 10-12 ft-lbs (13.5-16Nm).

18. Apply the Caution/Switch Operation label provided to the side of the SSD enclosure so it is readable when operating the Isolation Switch.

19. Last, install the label provided on the outside of the pedestal next to the pedestal lock as shown. Confirm that the label message has been adhered to. Then install the pedestal cover and lock.