

# Technifab Vacuum Jacketed Tank Switcher Installation Manual



**We Know Cryo<sup>®</sup>**

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P R O D U C T S  
Manufacturers of Cryogenic Equipment

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This document covers the installation of Technifab’s Vacuum-Jacketed Tank Switcher. Additional information for initial startup and system operation is included in the Owner’s Manual, Technifab part number LT-33013.

## Symbols Used in this Manual



**Warning - indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**



**Caution - indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert**

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## Safety



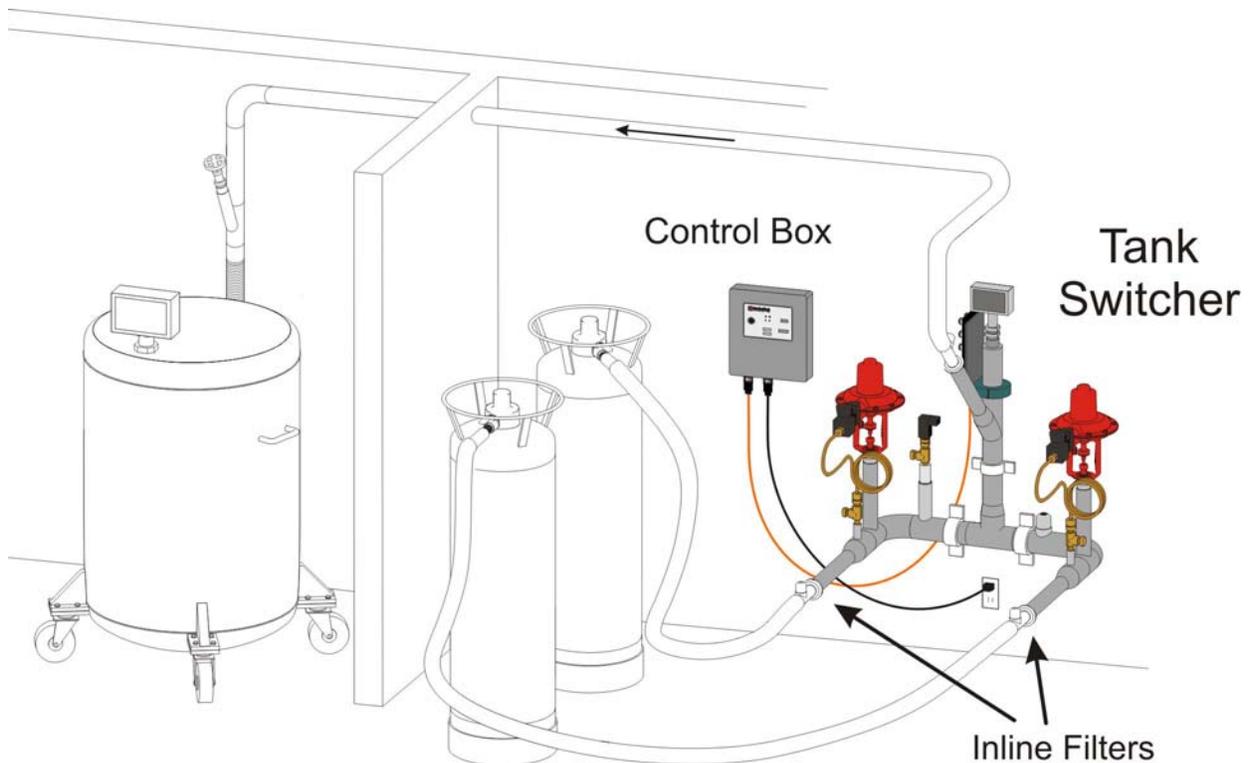
**Caution - Care should be taken around safety relief valves and gas vent line outlets in case cold cryogenic gas or liquid should ever be expelled.**



**Caution - Technifab Products Inc. recommends routing the discharge lines from pressure relief devices to a safe place of discharge. The outlet of the discharge line should not be in a location where it could injure people or damage anything should cold cryogenics be expelled.**

Consult the Cryogenic Equipment Safety and Handling Guide, Technifab part number LT-30084, for additional cautions and warnings of your cryogenic liquid system.

## Layout Diagram



# Components Included



**Tank Switcher Manifold Assembly with Junction Box**



**Liquid Level Sensor**



**Control Box**



**Control Cable**



**Bayonet Clamps**

**Note:** Most tank switchers include a cryogenic inlet filter installed inside the inlet female bayonets. You should use an orange colored bayonet clamp (two shown) to indicate inlet filters inside the bayonet connection. Please check your shipping document for a complete list of components included.

## Installation and Setup

A sketch or layout diagram of the system may help you when installing the components. The component locations will be determined by the tank inlet hoses, the tank switcher outlet connection, and the distance to the control box. The Tank Switcher Manifold Assembly also needs a mounting structure and a place to mount the control box.

1. For most systems the tank switcher manifold assembly should be mounted using channel steel and clamps around the vacuum jacketed pipe section. The tank switcher mounting needs to be capable of holding a minimum of 150 lbs (70 kg). 13/16" channel steel strut should be large enough to support the manifold.



The photo shows an example of a well mounted tank assembly. Be sure to mount the manifold in three places (shown with arrows on in the photo), one clamp on each of the three 'legs'.

2. The Control Box can be located up to 5 meters (16 feet) from the Tank Switcher Manifold with the standard cable. Other length cables are available from Technifab. Refer to the specifications section for the control box electrical and temperature requirements.



3. Mount the control box using the holes, four total, at the top and bottom of the control box. Connect the control cable to the bottom of the control box and to the junction box on the manifold assembly, using proper cable routing/mounting as needed. The control box comes with a standard NEMA 5-15R male power connector at the end of the cable. Do not plug the unit in at this time.



## Installation and Setup (continued)

3. The liquid level sensor height is set to the proper level at the factory using the compression bushing. If the liquid level sensor is not already installed, put it into the manifold assembly and tighten the compression fitting.



5. Connect the cables to the manifold junction box. Inlet valve solenoid cables are marked on the left side and may continue to the top right for a 6 tank switcher. The liquid level probe and the pressure transducer cables are connected on the right side from the bottom up.



6. Hookup the inlet and outlet piping to the manifold. If the tank switcher inlets have inline cryogenic filters, be sure to use the supplied orange clamps to identify the inline filter inside the bayonets. The standard bayonet on the tank switcher uses a wing-nut clamp; hand tighten the wingnut until the clamp is firmly mounted.



**Note:** If the outlet is being connected to a Techniguard vacuum jacketed pipe system you may want to refer to LT-30121, the Techniguard System Installation Manual for B-Series and R-Series VJP, which covers bayonet and vacuum-jacketed pipe installation in more detail.

The tank switcher utilizes air-actuated valves that will use either shop air or process air. Many tank switchers use process air, which is preconfigured at the factory. For shop air the *Pneumatic Actuated Valve Guidelines*, Technifab part number literature LT-35569, has a more complete description of the differences and shop air requirements. From LT-35569 the shop air requirements are:

- Maximum pressure 250 psig (17 Bar).
- Minimum pressure 50 psig (3.4 Bar).
- 5 SCFM (2.4 nl/s) minimum flow rate at the delivery point.

Perform a final check to ensure that all electrical connections are correct and that the fittings and the bayonet connections are tight. The unit can then be plugged in and the valves turned on to look for any leaks.

At this point you should refer to the Tank Switcher Owner's Manual, LT-33013, for more information on operating the unit.

**Note:** Test the system from a warm fill situation to make sure an alarm situation does not occur, especially if being used with biological freezers.

## **Alarm Output**

The Tank Switcher can trigger an external device such as an auto dialer or alarm. This connector (far right in the photo) requires a 2-pole plug available from Technifab. The Tank Switcher sends a 24 volt DC signal when all tanks have been depleted.



24Vdc Pos. (+)

The pin closest to the notch in the connector is the ground and the positive terminal is furthest away (see photo). Refer to the specifications section for electrical signal specifications.



24Vdc Neg. (-)

# Troubleshooting

Problem	Action
System will not power up or screen is dark	<ul style="list-style-type: none"> <li>• Check electrical supply to make sure there is power to the unit.</li> <li>• Unplug/ reset the Control Box by unplugging the unit.</li> </ul>
Unit switches to next tank before active tank is empty.	<ul style="list-style-type: none"> <li>• Check to make sure all cables to inlet valves are connected. A small LED in the solenoid connector indicates the valve should be on.</li> <li>• If the pipe system is at room temperature, It takes longer to deliver liquid nitrogen. Press the onscreen Run/Stop button, press the onscreen reset button, and press the Run/Stop button again. A longer Switcher Timer SP setting may be necessary.</li> </ul>
Error message on screen	<ul style="list-style-type: none"> <li>• Check all wires and connectors.</li> <li>• On Initial Setup an error may display “RGEF130: Input Data error”. This is caused either by wires not attached correctly or the value is too low to read by the PLC. Press “X” and continue to monitor system closely.</li> </ul>
Slow fill	<ul style="list-style-type: none"> <li>• Check supply dewars for liquid and pressure.</li> <li>• Check the screen to make sure the “Active” light is on for a tank that has liquid nitrogen and the tank valve is open.</li> <li>• Make sure the tank switcher inlet filter (if equipped) is not plugged or clogged.<sup>1</sup></li> </ul>
No fill	<ul style="list-style-type: none"> <li>• Check to make sure the active tank has liquid nitrogen and is turned on.</li> <li>• Make sure the tank switcher inlet filter (if equipped) is not plugged.<sup>1</sup></li> </ul>

<sup>1</sup>Refer to LT– 38213, Inline Cryogenic Filter Instructions, for cleaning or replacement.

**If the problem continues contact Technifab Products, Inc for further assistance.**

# Product Specifications

## *Technifab Cryogenic Tank Switcher*

Maximum Pressure	30 psig (2.0 Bar)
Manifold Dimensions (2 Tank Version)	29.5" wide x 29" high x 23" deep (75 cm x 74 cm x 59 cm)
Control Box Dimensions	11.5" wide x 13.5" high x 6" deep (29.2 cm x 34.3 cm x 15 cm)
Control Box Operating Temperature	32°F - 122°F (0°C - 50°C)
Enclosure and Penetrations Rating	NEMA 4X, IP65
Power Requirements	110-240 VAC, 50-60 Hz
Power Usage	200 watts @ 110 VAC nominal 1.7 amp maximum
Alarm Output	24 VDC 0.2 amp max current

## Support Information

Technifab continuously seeks to improve its products. Customer feedback is an essential element of this process. Should any issue arise regarding this product's performance, please immediately notify:

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