



PS-1 Series PHASE SEPARATOR

Installation Manual



Crane ChemPharma & Energy



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This document covers the installation of Technifab's PS-1 phase separator. Additional information for system operation and maintenance is included in the Owner's Manual, Technifab part number LT-36804.

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

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

Safety



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

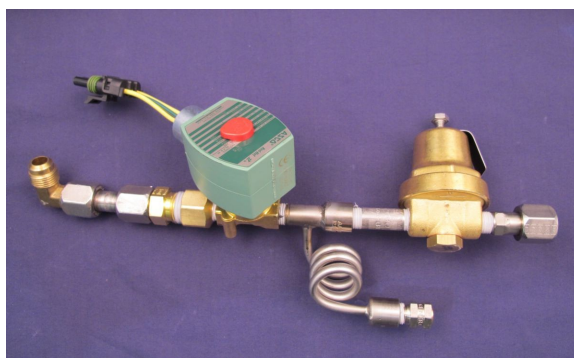
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Installation and Setup

Your PS-1 pressure reducing phase separator includes the following components:



PS-1 Reservoir



Tank Connection Assembly



Control Box & Liquid Level Sensor

NOTE: Technifab recommends that all cryogenic systems include an inline cryogenic filter if the cryogenic liquid is not clean. Some devices that the PS-1 may be connected to, including liquid nitrogen injectors such as the Techinjector, can be sensitive to debris and an inline filter could prevent device damage.

Installation and Setup (continued)

Mounting the Reservoir

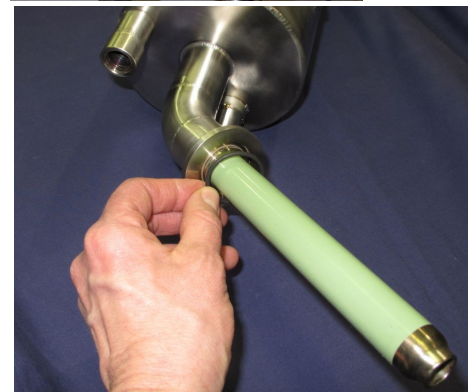
Begin by determining the best location to mount for your PS-1. The Reservoir should be mounted vertically using the bosses on the side of the reservoir tank.

If the PS-1 will need to use the same mounting system as the cryogenic device it is feeding (such as the Technifab Techninjector), you will first need to mount the Reservoir Bayonet to the device.

Lubricate the PS-1 bayonet o-ring with a standard vacuum silicone grease. Wipe off excess grease and put the o-ring over the bayonet and into the male bayonet flange. Take care not to contaminate the silicone grease and to keep it off the male bayonet.

Push the male and female bayonets together. Technifab uses a close fit bayonet design and therefore insertion will take some force to assemble the joint. Twisting the components up to a 15 degree angle while inserting the male bayonet can help the installation process. You should feel some resistance while making the connection.

Loosely assemble the clamp on the male and female flange. Do not tighten the clamp at this time, only latch it.

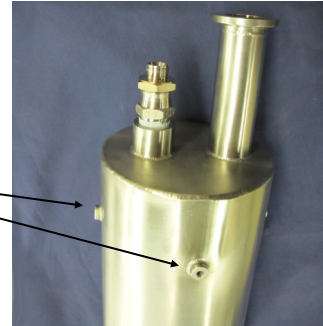


Installation and Setup (continued)

There are 8 lugs or bosses that can be used for mounting the vessel. You may use any combination of the bosses to mount the vessel securely, but at least one should be on the top and one on the bottom.

Mounting Bosses

The holes on the side of the vessel will accept 1/4"-20 screws and are threaded 3/8" deep. There must be at least 1/4" engagement of the threads.



When the unit is mounted securely you may tighten the v-band clamp on the bayonet.

Tank Connection Mounting

Mount the tank connection assembly to the liquid valve on the cryogenic supply tank. The cryogenic solenoid valve should point upward, so the solenoid angle is within 60 degrees of the tank vertical axis.

Follow the flow direction arrows on the solenoid and the back pressure regulator tank connection assembly.



Connect the cryogenic hose from the tank connection assembly to the inlet at the top of the PS-1 reservoir. The top of the PS-1 reservoir has a bayonet inlet, use the same assembly procedure described in the previous section for the reservoir outlet. Tighten the clamp when completed.

Control Box and Cable Mounting

Note: The control box must be installed in a environment where the ambient temperature does not exceed the minimum and maximum temperatures shown in the Specifications section.

The PS-1 control box can be mounted up to 25 feet from the control box and 25 feet from the supply tank. Contact Technifab if a longer cable is needed.

The control box must be mounted on a rigid mount using the holes in the enclosure. The mount should be free from vibration and excessive temperatures (refer to the Specifications section).

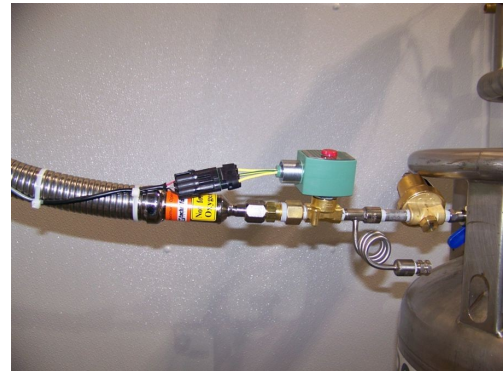
Installation and Setup (continued)

Mount the control box approximately eye level in height.

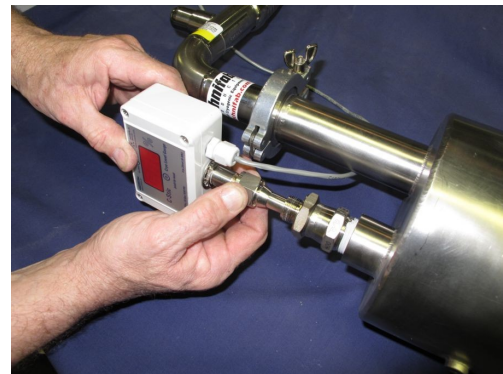


Route the cable to the supply tank and attach the plug for the solenoid valve.

Note: The liquid level sensor cable is hard wired to the control box. If you need to remove one end of the cable to route the wiring, refer to the next section for instructions on disconnecting and reconnecting the cable.



The cryogenic liquid level sensor, which is wired to the control box, can now be installed in the system. The probe's compression bushing was preset at the factory to the correct dimension. Insert the probe into the top of the reservoir and tighten the nut to lock it into place.



Double check all electrical connection and zip tie all wiring and cables neatly, keeping them out of the way of other equipment or personnel.

Liquid Level Sensor Cable Connection (optional)

In some installations you may need to disconnect the cable that connects the control box and the liquid level sensor.

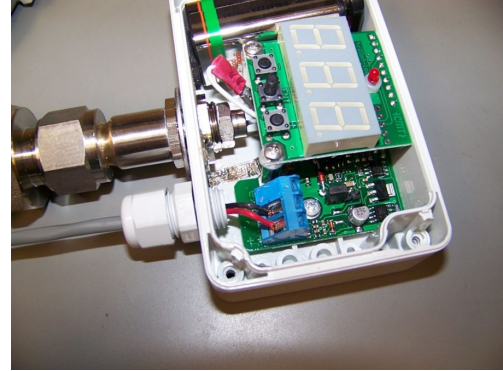
Remove the four screws on the cover of the liquid level sensor.

The cable from the control box has two insulated wires, red and black. To disconnect the cable use a small screw driver and remove the black and red wires.

Loosen the nut on the water tight connector and slide the cable out of the housing.

To reconnect the cable reverse the above procedure, taking care to make sure the red wire connects to the “+” on the sensor circuit board.

Note: The sensor internal battery is only used for the level display. Power for operation of the liquid level sensor is provided through the control box cable, thus the battery in the sensor itself is not required for operation.



Initial System Startup

Refer to LT-36804 PS-1 Phase Separator Owner’s Manual for an explanation of controls and more details on system operation.

1. Plug the control box into the power source.
2. Open the liquid cylinder valve slightly. Liquid nitrogen should begin to flow to the solenoid valve. If leaks are found, close the cylinder valve repair the leaks.
3. Press the On/Off button on the control box to turn on the solenoid valve and allow flow into the system. Again look for any leaks in the system. When the reservoir is full the solenoid valve will close.

NOTE: This unit has a 10 second delay before operation. This allows the system to come up to acceptable conditions before switching on the solenoid valve.

4. Open the liquid cylinder valve completely to allow full system flow. The unit is fully operational.

Troubleshooting

Problem	Test Procedure
System will not power up and the On/Off light does not illuminate.	• Verify there is power supplied to the control box. • Unplug/reset the power to the control box.
No Liquid coming out of the PS-1.	• Be sure liquid nitrogen supply tank is not empty. • Check the solenoid valve on the PS-1 hose for correct operation. • Check in-line cryogenic filter (if so equipped) to make sure it is not plugged. • Make sure the connected equipment is operating correctly.
Liquid coming out the exhaust vent on the cryogenic reservoir.	• Check for over-pressurization of the PS-1.
System has slow fill / no fill.	• Check liquid nitrogen supply to the PS-1 to assure there is line pressure. • If a filter has been installed in the line, drain system and carrier piping. Check all filters for restriction or blockage.

****Abide by all Lock out / Tag-out procedures when performing maintenance or troubleshooting the liquid nitrogen system.**

If the problem continues contact Crane Cryogenics for further assistance.

Product Specifications

Liquid (Working) Capacity	1 liter (.27 gallons)
Reservoir Tank Dimensions	32 cm x 91 cm x 20 cm (12" w x 36" h x 8" d)
Reservoir Tank Weight (empty)	6.6 kg (14.5 lbs)
Inlet Pressure	3.4 - 10 bar (50 - 150 psig)
Power Requirements	110 - 240 VAC, 50-60Hz
Power Usage	45 mA Nominal 1.7 A Maximum
Control Box Dimensions	29.2 cm wide x 34.3 cm high x 15.2 cm deep (11.5" x 13.5" x 6")
Control Box Temperature Range	0°C - 50°C(32°F - 120°F)
Control Box Mounting Distance (Max.)	75 meters (250 feet) maximum from vessel
Certifications	Nema 4X, IP65

Support Information

Crane Cryogenics 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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