REDI CONTROLS

Operation & Maintenance Manual

Portable Service Purger

for

Low Pressure Chillers

Model: PSP-LP-1B

For Refrigerants
R-11, R-113, R-114 & R-123
&
Other Similar Refrigerants

File Literature Number 1100-05

OPERATING INSTRUCTIONS

WARNING: DO NOT attempt to pump liquid with service purger. Pumping liquid can damage compressor valves.

Set-Up Procedure

Liquid Trap (smaller of the two cylinders, gray and yellow color) and Non-Condensable Tank (larger of the two cylinders, Blue color) preparation

Always begin with empty cylinders. Both the Liquid Trap and Non-Condensable Tank cylinders must be empty. The Liquid Trap is automatically evacuated during the normal purging process. The Non-condensable Tank of course will be full of non-condensables throughout the purging process.

1. Place Service Purger, Liquid Trap Cylinder and the Non-condensable Tank as near to the chiller purge pick-up point as possible. Both cylinders **MUST be upright.**
2. Remove CAPS from Service Purge Compressor PORTS "A" (IN) and "B" (OUT).

CAUTION: DO NOT start Service Purge compressor until caps have been removed from Ports "A" (inlet) and "B" (outlet). Operating the Service Purge Compressor with discharge Port "B") capped-off can damage purge compressor.

3. Connect yellow **Cable-A** to the liquid level switch connector on the **Liquid Trap Cylinder**
4. Connect yellow **Cable-B** to the liquid level switch connector on the **Non-Condensable Tank.**
5. Plug Service Purger power cord into appropriate 120 volt receptacle.
6. To verify proper liquid switch operation of both cylinders do the following test with the Service Purger compressor running:

   First, test the "Liquid Trap" liquid level switch by slowly turning the Liquid Trap cylinder upside down. If properly connected and functioning properly the purge compressor should stop and the OVERFILL FAULT LIGHT will energize. Return cylinder to upright position and reset.

   Reset by momentarily unplugging the Service Purger power cord.

   Next, with the compressor running, test the "Non-Condensable Tank" liquid level switch by slowly turning the cylinder upside down. If connected and operating properly BOTH the 80% CUT-OFF and OVERFILL FAULT lights will energize and the compressor will stop.

   Return the cylinder to the upright position. The 80% CUT-OFF light should de-energize and the OVERFILL FAULT light should remain energized.

   Again, reset by momentarily unplugging the Service Purger power cord.

The OVERFILL FAULT light should now be de-energized. If so, the Service Purger is functioning properly and ready for service.

WARNING: If the Service Purger fails the above functional test STOP! DO NOT continue until the problem has been corrected. An improperly functioning unit can lead to substantial LOSS OF REFRIGERANT.

Hose Hook-Up

1) Using the two 3 foot hoses (provided) complete Service Purger set-up **as shown in the Hook-up illustration**.
2) Connect the SIGHT GLASS end of the 10 foot ¼" hose (provided) to the foul gas inlet port of the Liquid Trap Cylinder and the opposite end of hose to the chiller's foul gas purging pick-up point.

WARNING: Although the Portable Service Purger compressor utilizes "Poppet" type valve which are tolerant to small intermittent amounts of liquid they are not intended to pump liquid. *Excessive liquid intake will damage the compressor valves.* Liquid intake can result from refrigerant vapor condensing in the foul gas pick-up hose before the compressor suction intake. Therefore, as a means of providing maximum protection against potential liquid slugging of the compressor valves, a Liquid Trap (cylinder) is provided to trap any liquid before it can reach the compressor. **Failure to utilize the Liquid Trap can result in compressor valve failure.**

Purger Operation

CAUTION: The Service Purger should never be left operating unattended! Operation should be monitored at all times.

1) Check to make sure the dip-tube valve on the Non-condensable Tank is CLOSED.
2) Open foul gas pick-up valve on chiller.
3) Open valves on both cylinders, except the dip-tube valve on the Non-Condensable Tank. The dip-tube valve must remain closed during purging.
4) Select desired operating mode, **TIMED** or **HOLD** mode.

To operate in the **TIMED** mode turn the PURGE CYCLE TIMER dial clockwise to the desired purge time in minutes. The minimum time setting is 10 minutes and the maximum time is 60 minutes.

When operating in the timed mode the service purger will automatically cycle OFF at the conclusion of the preset timed period. Should further purging be required, reset timer as required.

Although 60 minutes is generally sufficient time to complete most purging jobs in some instances more time is required. In these instances it may be desirable to operate the purger in the HOLD mode.

To operate in the HOLD mode turn the cycle timer dial counterclockwise until the dial pointer is aligned with the area designated as HOLD. In the HOLD mode purger operation is continuous until operation is **manually stopped.**

To terminate the HOLD mode, manually turn the timer dial to the OFF position.

> **NOTE:** Actuation of the LIQUID LEVEL SENSOR of either purging cylinder overrides all timing functions and terminates purge operation.

How to determine when purging is complete

As non-condensables are compressed into the Non-Condensable Tank the refrigerant vapor component condenses to liquid and accumulates in the tank. Simultaneously, the non-condensable component becomes pressurized until reaching 100 psi. If and when the pressure reaches 100 psi the tank's pressure relief valve will begin exhausting excess non-condensable pressure to the atmosphere.

If after 30 minutes of continuous purging there is no discernable pressure increase on the pressure gauge and or no non-condensables being exhausted by the relief valve it can be assumed purging is complete.

What to do when the 80% Level Light Energizes

In most instances purging will be have been completed before Non-Condensable Tank becomes filled with liquid refrigerant. However, when the tank does become 80% full purge operation is halted and the 80% FULL LIGHT is energized. When this occurs the Non-Condensable Tank MUST BE EMPTIED before purging can resume. To empty tank proceed as follows;

1) Connect a separate hose to the DIP-TUBE VALVE on the Non-Condensable Tank. (See Hook-Up Schematic)
2) Connect opposite end of hose to chiller at an appropriate point, i.e. the chiller charging valve.
3) Open the DIP-TUBE VALVE and allow pressure in the cylinder to push the liquid refrigerant from the cylinder back to the chiller. Monitor carefully as not to allow non-condensables to re-enter the chiller once the cylinder is emptied of liquid.
4) Close DIP-TUBE VALVE. Leave hose connected to chiller until purging is complete.
5) To resume purging reset Cycle Timer to desired setting.

What to do if the OVERFILL FAULT Light Energizes

Both cylinders are protected by an OVERFILL SAFETY SWITCH. If the switch in either cylinder is activated by high liquid level purger operation is terminated and the OVERFILL FAULT LIGHT energizes. Should this event occur it will be necessary to determine which cylinder is overfilled according to the following Steps;

Step 1) Feel the weight of both cylinders. The heavier cylinder is probably the one that caused the Overfill Light to energize. If it is the LIQUID TRAP cylinder that is full then empty the cylinder back to chiller, reset, and continue purging operation.

Step 2) If it is determined that the NON-CONDENSABLE tank is full and caused the OVERFILL FAULT LIGHT to energize then STOP NOW there is a problem with the Liquid Level Sensor. The defective Liquid Level Sensor MUST BE REPLACED BEFORE RESUMING PURGE ACTIVITY.

WARNING: Operating the Service Purger with a malfunctioning Non-Condensable Tank Liquid Level Sensor is both DANGEROUS and likely to result in substantial LOSS OF REFRIGERANT.

After Purging is Complete

1) Close chiller purge pick-up valve.
2) Empty liquid contents of both cylinders back to chiller.
3) Close valves on both cylinders and remove hoses.
4) Disconnect yellow sensor cables.
5) Take the Non-Condensable Tank outdoors and vent non-condensables.

Troubleshooting the Service Purger

1. Unit is plugged into receptacle but nothing runs when timer is set, nor does either indicator light energize when Purge Cylinder is turned up side down.

   a. Unit not plugged in or receptacle is dead. Check circuit breaker.
   b. F1 fuse blown (located inside Service Purge enclosure). Replace fuse.

2. Unit is plugged in but nothing runs when timer is actuated. However, indicator lights do energize when the Purge Cylinder is turned up side down.

   a. Purge Cycle Timer defective.
   b. Either one or both RLY-1 and RLY-2 relay defective.

3. Cooling Fan is running but Compressor isn't.

   a. Compressor Start Relay and/or Start Capacitor defective.
   b. Compressor OFF on internal over-load.
   c. Compressor defective.

4. Service Purger fails to shut-off and neither indicator light energizes when the Non-Condensable Tank or Liquid Trap Cylinder is inverted.

   a. Yellow cable loose or improperly connected.

b. Yellow cable defective.
c. T1 Transformer defective
d. Either or both RLY-1 and RLY-2 relays defective
e. Defective tank Liquid Level Switch

5. Service Purger shuts off when either cylinder is inverted but on or both indicator lights fail to energize.

a. One or both indicator lights defective.
b. One or both RLY-1 and RLY-2 relays are defective.

6. Purge stops and the OVERFILL LIGHT comes ON.

a. The LIQUID TRAP cylinder is full. Empty contents to chiller, reset and resume purge operation.
b. If not (a) above then the 80% level sensor or RLY-1 Relay has failed and the NON-CONDENSABLE TANK is full of liquid. Determine which component is at fault and replace.

Mechanical problems

Potential cause of trouble given in the order most likely to occur….

1. Compressor runs but Cooling Fan doesn't.
a Cooling Fan power connector unplugged from Fan terminals.
b Fan motor defective.

2. Compressor and Cooing Fan running but does not build-up pressure in the Non-Condensable Tank.
a Chiller's non-condensable pick-up port clogged.
b No non-condensables in chiller.
c Dip-tube valve in Non-Condensable Tank open.
d Hoses improperly connected.
e Loose hose connection.
f Non-Condensable Tank pressure relief valve leaking.
g Tank building pressure but pressure gauge is defective.
h Defective purge compressor valves.

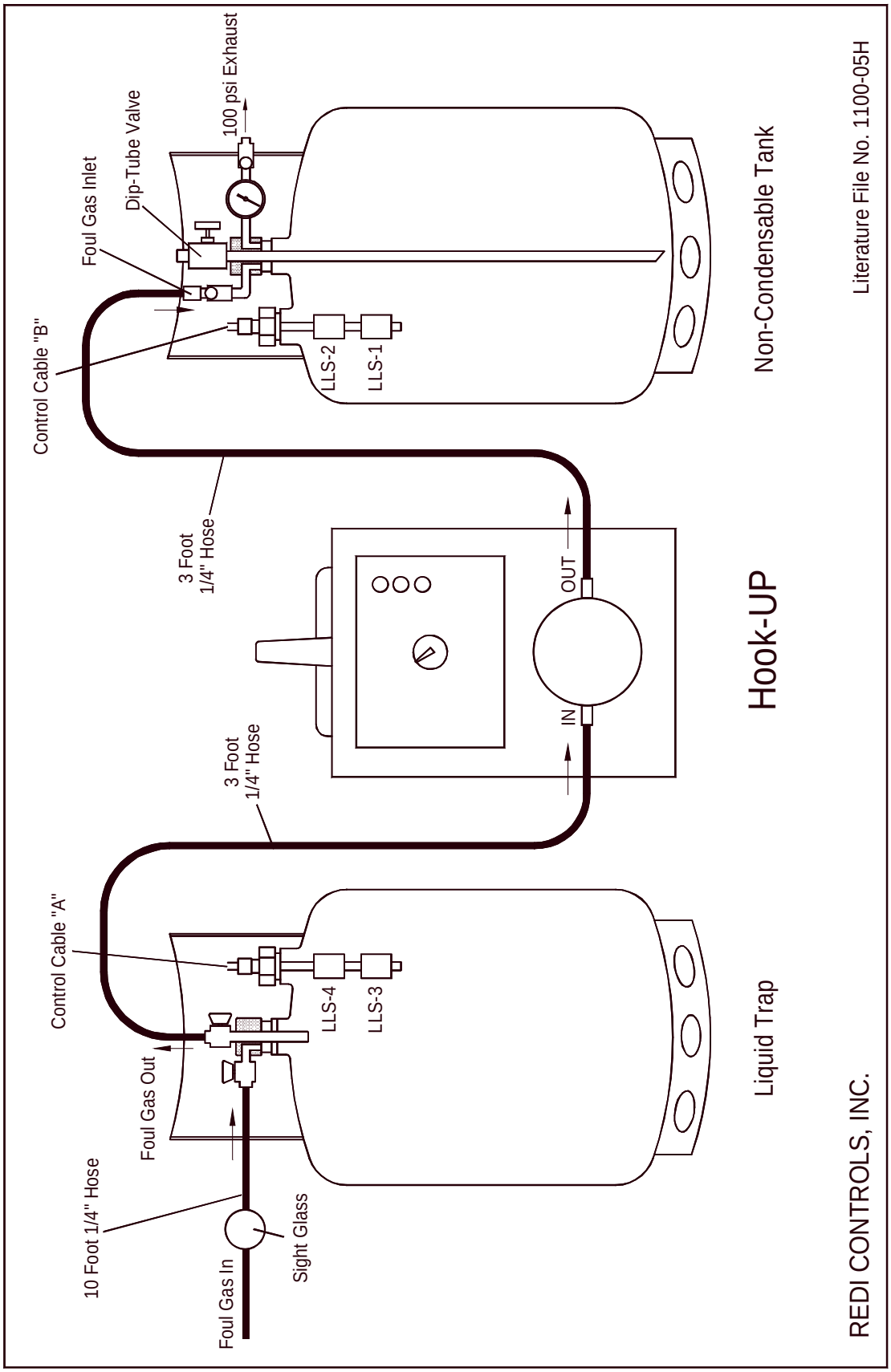
MAINTENANCE

The Service Purge unit does not require scheduled maintenance beyond normal care and cleaning.

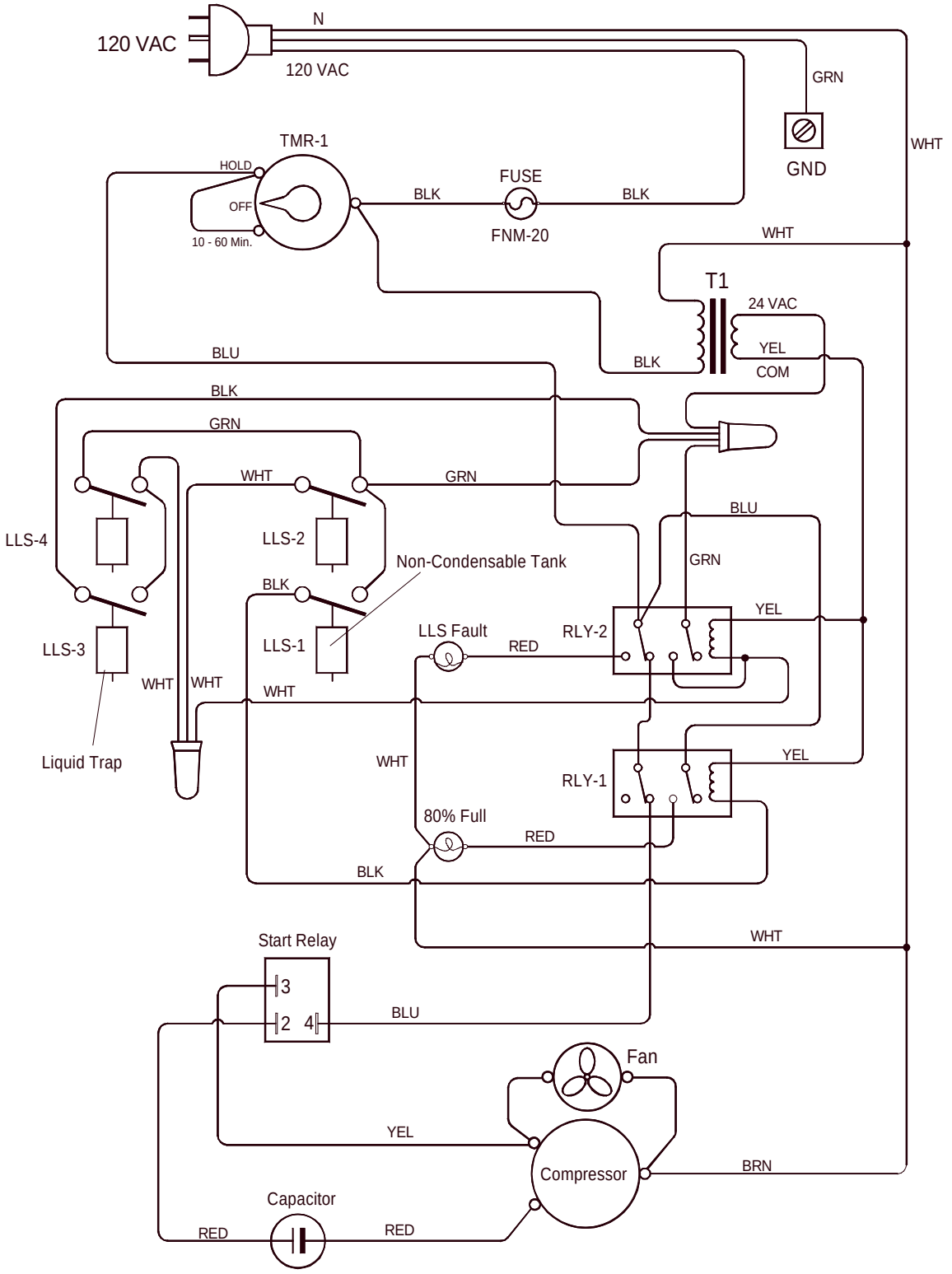
However, the Service Purge Cylinder should be regularly inspected for corrosion, rust, deterioration, leaks, etc.

CAUTION: Never use a purge cylinder in questionable condition.

NOTE: The Purge Cylinder MUST be re-qualified within 5 years from date of manufacture. Follow the requirements of the U.S. Department of Transportation (49 CFR 173.34) or Transport Canada (B-339). An easier and less costly alternative to cylinder re-qualification is to replace the purge cylinder every (5) five years.



HOOK-UP Portable Service Purger Model: PSP-LP-1B



WIRING DIAGRAM

Model PSP-LP-1B

REDI CONTROLS, INC. Literature File No. 1100-05W

REDI CONTROLS, INC.
Equipment Warranty

Subject to the terms below, REDI CONTROLS will, within one year after date of purchase, repair any REDI CONTROLS' product being used by the original purchaser, which is defective due to faulty materials or workmanship. REDI CONTROLS has the right to repair or replace a defective part or replace the entire product.

To file a Warranty claim on any system or component, return the defective unit to the address below, or other location as REDI CONTROLS directs, freight prepaid.

This Warranty does not apply to or cover:

Damages beyond REDI CONTROLS' control.

Malfunctions that result from failure to properly install, operate or maintain a product in accordance with instructions provided by REDI CONTROLS.

Failures of equipment due to abuse, accident or negligence.

Damages from, or part failures due to equipment not being installed per REDI CONTROLS' instructions, per applicable codes or ordinances, or in accordance with good trade practices.

Labor or other charges incurred in removing or reinstalling any REDI CONTROLS product or part.

Damages resulting from use of a REDI CONTROLS product for any purpose other than for which it was designed and manufactured.

Any implied warranty of merchantability or fitness for any particular purpose, occurring after the Warranty Period.

Loss of use, loss of time, inconvenience, rental for substitute products, loss of business, loss of income, or any other consequential damages resulting from use or failure of any REDI CONTROLS product.

Inquiries to: REDI CONTROLS at 755 E. Main Street,
Greenwood, Indiana, 46143

REDI CONTROLS, INC.
(317) 865-4130
e-mail us at: redi@redicontrols.com

Check our Web Site at: www.RediControls.com