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Find the *Chart / MVE 180LP* at our website: ***Click HERE***

Operator Instructions — Cryo-Cyl 120/180/230 LP

INITIAL INSPECTION

Upon receipt of the Cryo-Cyl LP remove the protective wrapping and inspect for the following:

1. Any shipping damage to the Cryo-Cyl LP including dents, cuts, and broken or bent plumbing components. Report damage to the shipping company immediately.
2. Warranty card, Operator Instructions Sheet, and Users Manual order card.
3. Read carefully and understand the "Operator Instructions Sheet" and the "Liquid Cylinder Users Manual" before operating this equipment.

GENERAL

The Cryo-Cyl LP model liquid cylinder is designed to transport, store and deliver liquid oxygen, nitrogen or argon as a cryogenic liquid. The common application for this liquid cylinder is to provide liquid at pressures around 20 psi (1.4 BAR). The Cryo-Cyl LP will build and maintain pressure from the normal boil off of the liquid. If the pressure exceeds 22 psi (1.5 BAR) the relief valve will vent off excess pressure. A continuous liquid flow can be provided from these cylinders.

CAUTION Only use replacement equipment which is compatible with liquid oxygen and has been cleaned for oxygen use. Do not use regulators, fittings, hoses, etc., which have been previously used in compressed air service. Similarly, do not use oxygen equipment for compressed air. Failure to comply with these instructions may result in serious damage to the liquid cylinder and personal injury.

CAUTION The Cryo-Cyl LP should be moved using an appropriate liquid cylinder cart or dolly. Do not roll liquid cylinders by handling rings. Cryo-Cyl LP liquid cylinders must be used and stored in a vertical position except for normal cart or dolly movement. Do not lay, store, or ship a liquid cylinder on its side. When necessary to transport a liquid cylinder by truck, use a power lift gate, crane, or inclined ramp to lower the liquid cylinder. If the truck bed and dolly are not at the same height, do not attempt to manually lift or slide a liquid cylinder on or off a truck bed. Failure to comply with these procedures may result in damage to the liquid cylinder and personal injury.

WARNING Excess accumulation of oxygen creates an oxygen enriched atmosphere (defined by the Compressed Gas Association as an oxygen concentration above 23 percent). In an oxygen enriched atmosphere, flammable items burn vigorously and could explode. Certain items considered non-combustible in air may burn rapidly in such an environment. Keep all organic materials and other flammable substances away from possible contact with oxygen; particularly oil, grease, kerosene, cloth, wood, paint, tar, coal dust, and dirt which may contain oil or grease. DO NOT permit smoking or open flames in any area where oxygen is stored, handled, or used. Failure to comply with this warning may result in serious personal injury.

WARNING Nitrogen and argon vapors in air may dilute the concentration of oxygen necessary to support or sustain life. Exposure to such an oxygen deficient atmosphere can lead to unconsciousness and serious injury, including death.

WARNING The Cryo-Cyl LP, with its patented support system is designed, manufactured, and tested to function normally for many years of service. MVE does not suggest or warrant that it is ever safe to drop a liquid cylinder or let it fall over in oxygen or any other cryogenic service. In the event a liquid cylinder is inadvertently dropped, tipped over, or abused, slowly raise it to its normal vertical position. Immediately open the vent valve to release any excess pressure in a safe manner. As soon as possible, remove the liquid product from the vessel in a safe manner. If the vessel has been used in oxygen service, purge it with an inert gas (nitrogen). If damage is evident or suspected, return to MVE prominently marked "LIQUID CYLINDER DROPPED, INSPECT FOR DAMAGE".

WARNING Before removing cylinder parts or loosening fittings, completely empty the liquid cylinder of liquid and release the entire vapor pressure in a safe manner. External valves and fittings can become extremely cold and may cause painful burns to personnel unless properly protected. Personnel must wear protective gloves and eye protection whenever removing parts or loosening fittings. Failure to do so may result in personal injury because of the extreme cold and pressure in the cylinder.

MVE

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Cryo-Cyl 120/180/230 LP Oper

FILLING WEIGHT TABLE			
MODEL*	NITROGEN	OXYGEN	ARGON
Cryo-Cyl 120LP	201 Lbs. (91 Kg.)	285 Lbs. (129 Kg.)	351 Lbs. (159 Kg.)
Cryo-Cyl 180LP	327 Lbs. (148 Kg.)	465 Lbs. (211 Kg.)	573 Lbs. (260 Kg.)
Cryo-Cyl 230LP	401 Lbs. (182 Kg.)	570 Lbs. (258 Kg.)	702 Lbs. (318 Kg.)

Note: Filling weights are shown as the maximum weight recommended by code. Their related volumes may vary with product density.
* Relief valve setting at 22 psig (1.5 BAR)

FILLING PROCEDURES

The Cryo-Cyl LP is equipped with a Liquid and Vent valve that are used for filling. Use a pressure transfer fill as the proper filling method for this style of cylinder. The delivery tank pressure should be as low as practical for the transfer to be efficient. Use the following procedure.

1. Sample the residual gas that is in the cylinder. Purge the cylinder if necessary to insure the proper purity.

2. Place the cylinder on the filling scale. Record the weight. Compare this weight to the registered tare weight on the data plate. The difference is the weight of the residual gas.

3. Connect the transfer hose to the fill valve (Item 1). Record the new weight. The difference between this weight and the initial weight is the weight of the transfer hose.

4. To determine the total filling weight add the tare weight of the cylinder, the hose weight and the proper filling weight from the table. The table indicates the product across the top and the liquid cylinder model down the side. Connect the two columns to find the proper weight. Example: The Cryo-Cyl 120 LP for oxygen at 22 psi (1.5 BAR) has a product weight of 285 pounds (129 Kg.).

5. Open the cylinders vent (Item 3) and liquid (Item 1) valves. Open the transfer line shut-off valve to begin the flow of product.

6. When the scale reads the calculated total filling weight, turn off the liquid valve (Item 1) on the cylinder. Close the vent valve (Item 3).

7. Close the transfer line shut-off valve and relieve the pressure in the transfer line. Remove the transfer line. Remove the cylinder from the scale.

OPERATING PRESSURE

The liquid cylinder will maintain a normal operating pressure of 22 psig (1.5 BAR). Normal liquid withdrawal operations are performed at lower pressure to reduce flash-off losses and splashing. Transfer of liquid at higher pressures can lead to excessive splashing of the cryogenic liquid which could result in burns to the operator and/or nearby personnel. All personnel should be fully instructed in the cautions associated with handling cryogenic fluids and the proper clothing and protective gear to be used.

PRESSURE BUILDING (OPTION)

The Cryo-Cyl LP is equipped with an internal pressure building coil and plumbing stubs for the optional PB valve and regulator. The following procedure should be used for maintaining pressure during liquid withdrawal if the pressure building option is part of the Cryo-Cyl LP cylinder.

1. Open the PB isolation valve (Item 3) prior to liquid withdrawal.

2. Allow the pressure to rise in the cylinder until the regulator shuts off the PB circuit.

3. Transfer liquid as described in this operational sheet.

4. Close the PB valve when liquid transfer is complete.

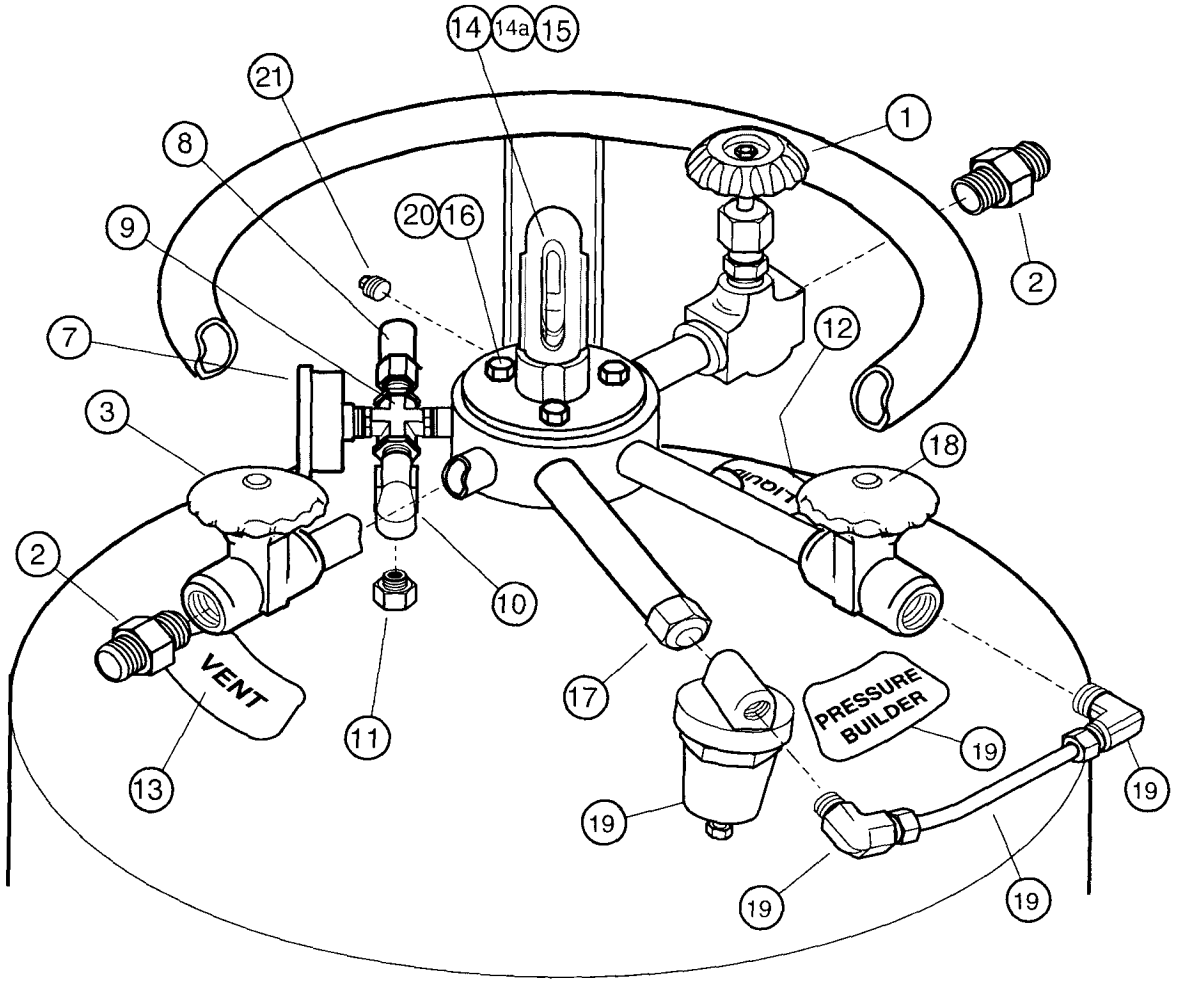
LIQUID WITHDRAWAL

Cryogenic liquid can be pressure transferred from the liquid cylinder to other cryogenic equipment that operates at a lower pressure than the liquid cylinder. To make a liquid transfer follow this procedure:

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tion and Components



Item	Part No.	Qty.	Description
1	10552618	1	Globe Valve – 3/8" FPT (Liquid)
2	11-1007-2	2	Male Connector – 1/2" ODT x 3/8" MPT Ar or N_2
2	11-1011-2	2	Male Connector – 5/8" ODT x 3/8" MPT (O_2)
3	17-1001-2	1	Globe Valve – 3/8" FPT (Vent)
4	39-1066-6	1	Dust Cap (Vacuum Rupture Disc)
5	38-1494-5	1	Warranty Seal
6	39-1069-6	1	Pumpout Cap
7	20-1516-9	1	Pressure Gauge (0-100 psi)
8	18-1001-2	1	Relief Valve (22 psi)
9	12-1292-2	1	Cross – 1/4 FPT

Item	Part No.	Qty.	Description
10	12-1046-2	1	Street Elbow – 1/4 MPT
11	19-1162-2	1	Rupture Disc (200 psi)
12	38-3059-9	1	Decal (Liquid/Fill)
13	38-3061-9	1	Decal (Vent)
14	54-1108-6	1	Level Gauge
14A	23-0009-4	1	O-ring (silicon)
15	54-1048-6	1	Level Gauge Protector (Yellow)
16	29-1050-1	3	Bolt – 1/4-20 5/8 Lg. (S.S.)
17	12-1075-2	1	Cap, Brass – 1/4" FPT
18	55-7601-9	1	Valve – 3/8" FPT (PB)
19	10658826		Pressure Building Regulator Kit
20	29-10604-1	3	Lockwasher – 1/4" (SS)
21	12-1081-2	1	Plug, Brass — 1/4" MPT

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CAUTION: Before making a liquid transfer be sure that protective eyeglasses and gloves are being worn. If the transfer is being made to an open top vessel, the transfer pressure should be as low as possible and a phase separator should be used to eliminate splashing and hose whip.

1. Connect the transfer hose to the liquid valve (Item 1) of the cylinder.
2. Connect or place the other end of the hose onto the inlet of the cryogenic equipment that will receive liquid. Atmospheric dewars are filled with a phase separator mounted to the open end of the hose.
3. Refer to the receiving equipment manual for procedures to open the fill valve and vent valve of the receiving equipment.
4. Open the liquid valve (Item 1) on the liquid cylinder. This valve can be adjusted to obtain the proper liquid flow rate.
5. When the transfer is complete, close the receiving equipment's valve. Close the liquid valve (Item 1) on the cylinder and relieve pressure from the hose.
6. Disconnect or remove the hose from the receiving equipment.

For additional information regarding the Cryo-Cyl LP, order the Liquid Cylinder Users Manual, form # 2407 from MVE.

CRYO-CYL 120/180/230 LP SPECIFICATIONS

	Cryo-Cyl 120LP	Cryo-Cyl 180LP	Cryo-Cyl 230LP
Physical Characteristics			
Diameter (inches)	20	20	26
(cm)	(50.8)	(50.8)	(66.0)
Height (inches)	51.0	63.5	54.8
(cm)	(129.5)	(161.3)	(139.2)
Empty Weight*** (lbs.)	165	210	290
(kg)	(74.8)	(95.2)	(131.5)
Fill Weight (see fill chart)			
Design Specification U.S.	DOT 4L	DOT 4L	DOT 4L
Canada	–	TC4LM	TC4LM
DOT Service Pressure (psig)	100	100	100
(BAR)	6.9	6.9	6.9
Relief Valve Setting (psig)	22	22	22
(BAR)	1.5	1.5	1.5
Operating Pressure (psig)	10-100	10-100	10-100
(BAR)	0.7-6.9	0.7-6.9	0.7-6.9
Normal Evaporation Rate			
• Nitrogen / day	2.0%	1.5%	1.5%
• Oxygen or Argon / day	1.4%	1.0%	1.0%
Gross Capacity (liters)	(120)	(196)	(240)
Storage Capacity			
Liquid (liters)	(110)	(185)	(230)
Storage Capacity, Gas			
• Nitrogen	–	–	–
• Oxygen	–	–	–
• Argon	–	–	–
Gas Delivery Rate (scfh)			
• Nitrogen, Oxygen, Argon	–	–	–
Liquid Level Gauge	Float	Float	Float
Construction Material	Stainless	Stainless	Stainless
PB Regulator (option)			
Range psig	0-25	0-25	0-25
(BAR)	(0-1.7)	(0-1.7)	(0-1.7)
Finish	Stainless	Stainless	Stainless
Base Construction	Caster*	Footring	Caster **

* Round base

** Round or square base

*** Tare weights are approximate. Exact tare weight is shown on the cylinders data plate.

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