



# 2000-3000 Liter HP



# Operating Manual

Manual # - 14422722 Addendum



## TABLE OF CONTENTS

<b>1</b>	<b>Overview</b>	<b>3</b>
<b>2</b>	<b>Illustrations &amp; Parts Listings</b>	<b>7</b>
<b>3</b>	<b>Specifications</b>	<b>10</b>

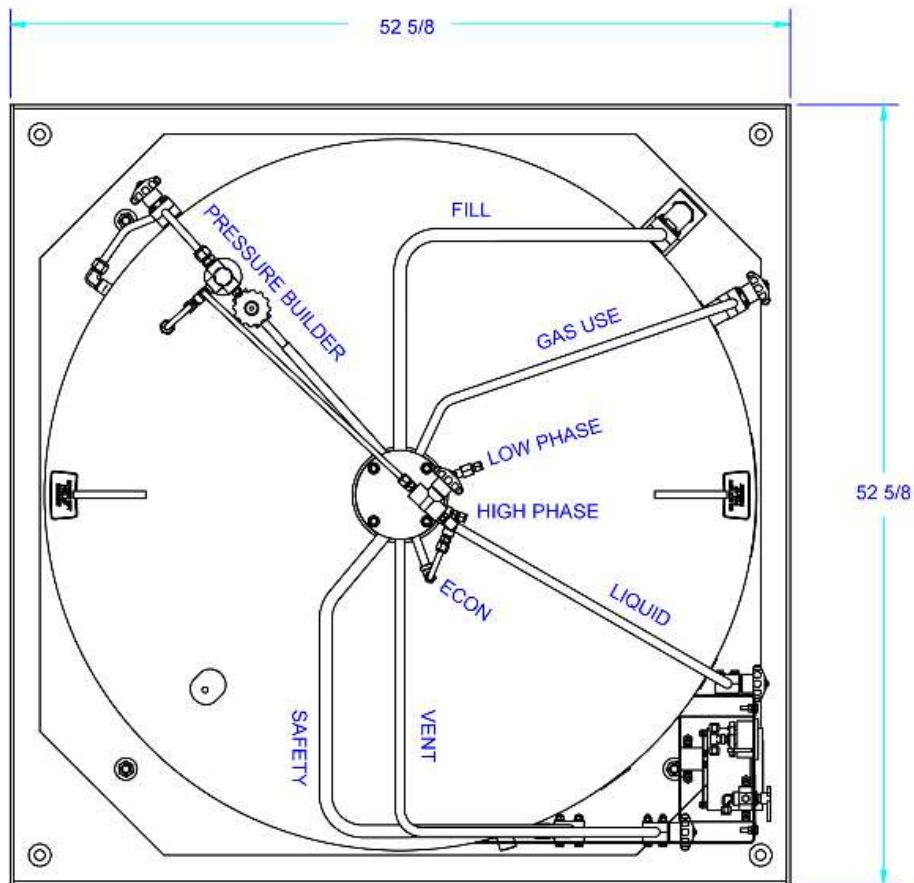
<b>Revision Log</b>	<b>Description</b>
Rev A (09/09)	Initial product release

The Perma-Cyl is an innovative design evolving from proven technology we have been using for years on our liquid cylinders. What makes the Perma-Cyl design revolutionary is the fast fill capability, no loss/low loss fill with automatic fill termination, extended hold time and telemetry compatibility. When filled by an Orca, the Perma-Cyl vessel is designed to have an actual fill-time of three minutes or less (smaller models) with zero losses under normal conditions. The vessel will allow liquid to be held for long periods without venting, limiting product losses during periods of nonuse. The new Cyl-Tel gauge features an accurate user-friendly display and is “telemetry ready” to connect to Chart’s multiple telemetry platforms.

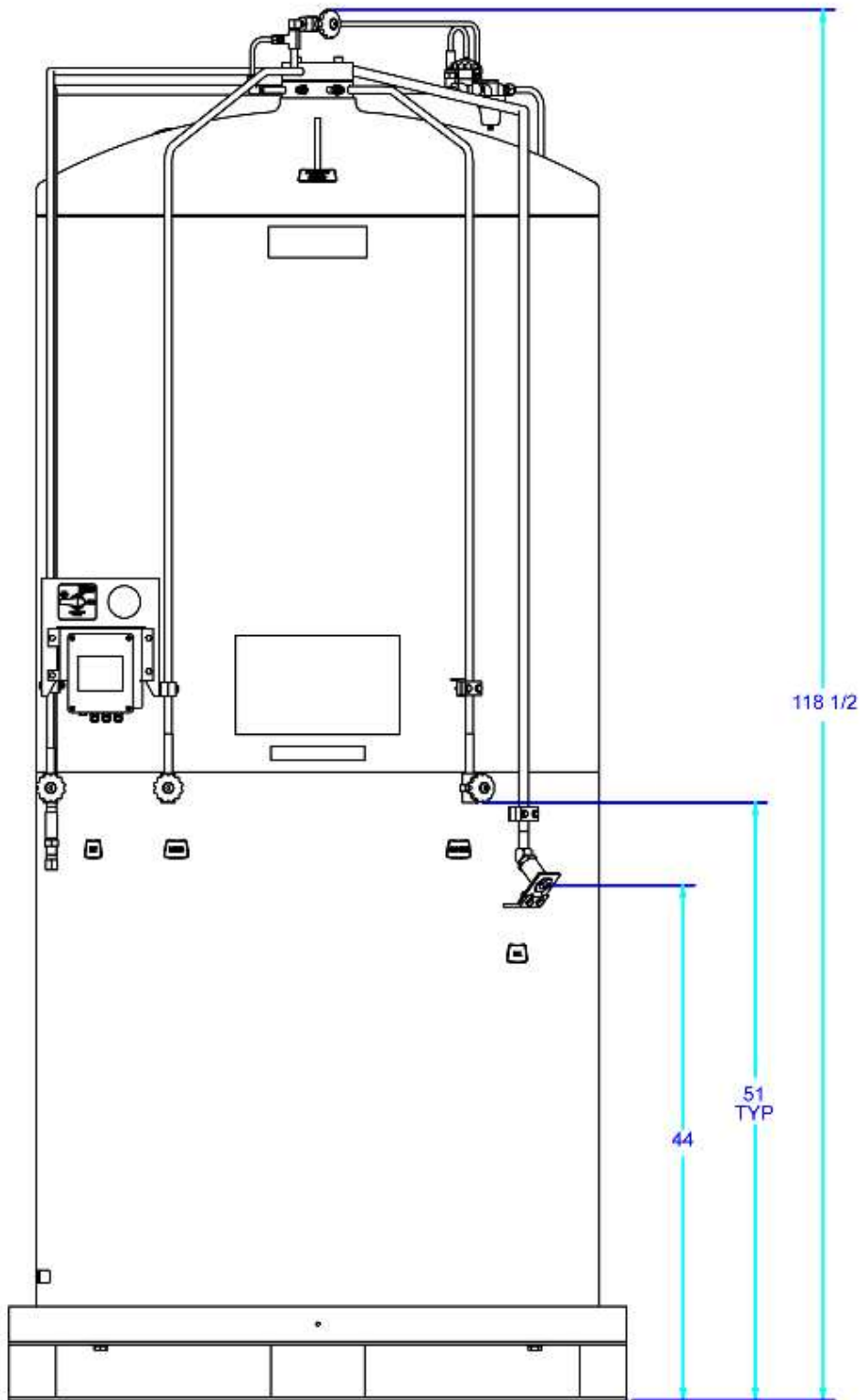
This manual is an addendum to include the new Perma-Cyl 2000HP and 3000HP models. For all filling, operating and safety instruction, please refer to the standard Perma-Cyl Operating Manual (PN 10961999).

These cylinders are designed for the volume MicroBulk user in mind. Below are the overall dimensions of the cylinders. Replacement parts and cylinder specifications are in the sections that follow.

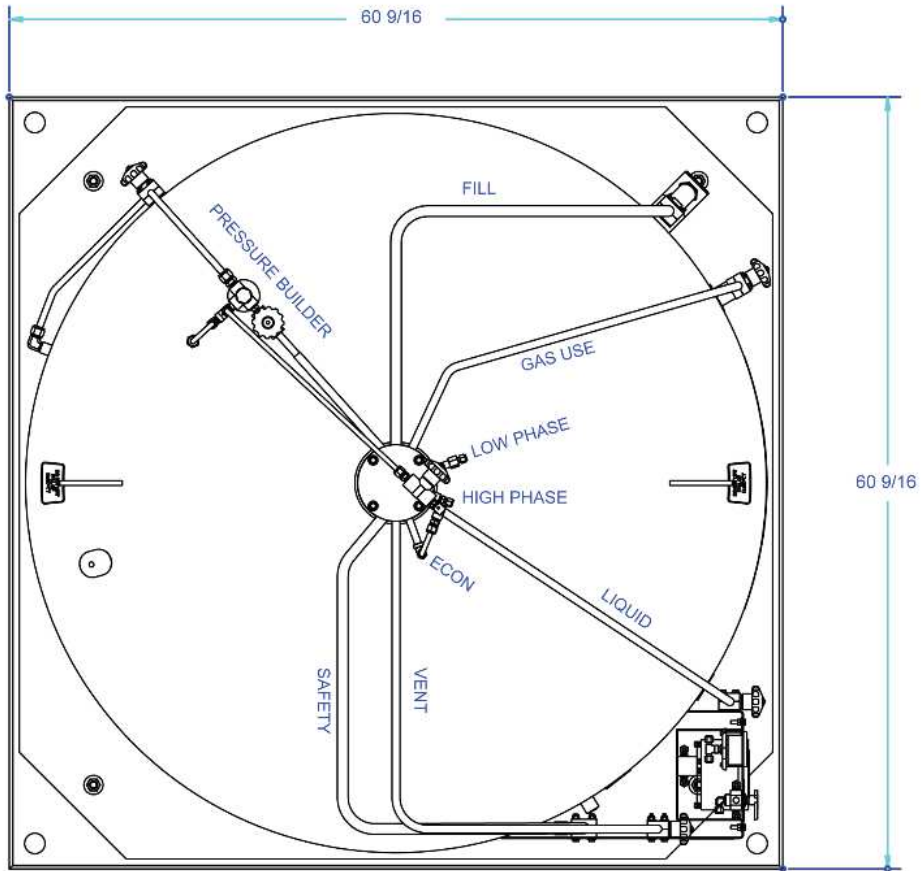
## Perma-Cyl 2000HP



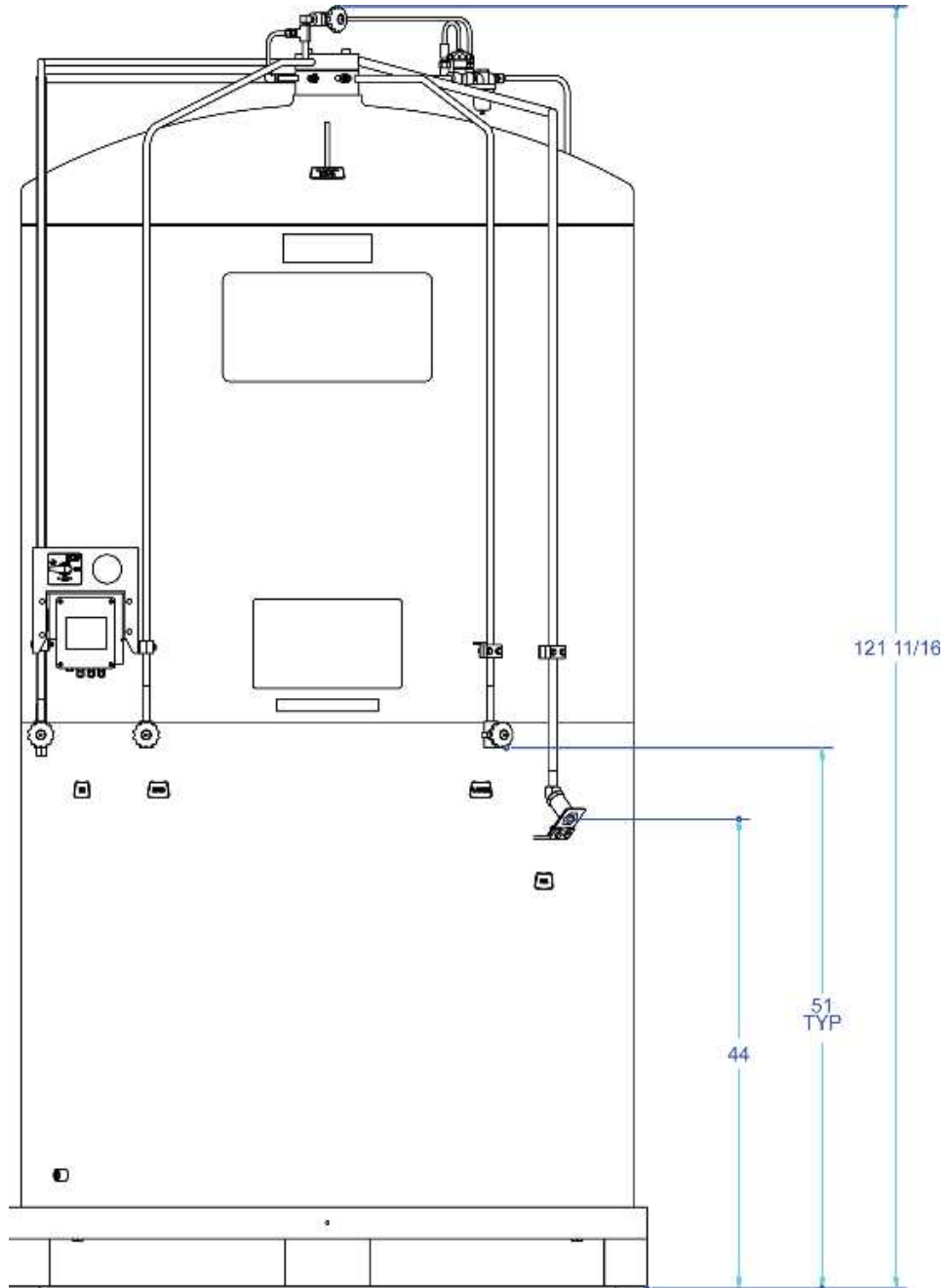
## Perma-Cyl 2000HP



## Perma-Cyl 3000HP

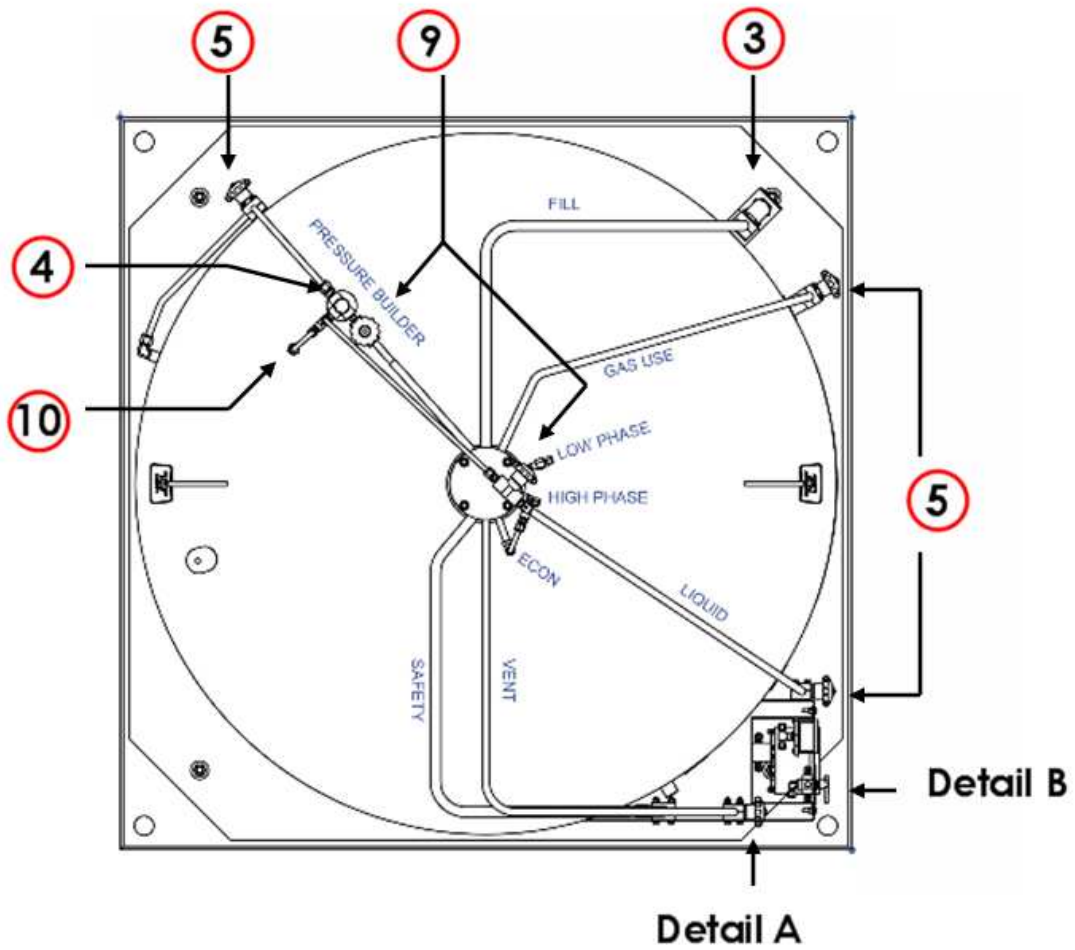


## Perma-Cyl 3000HP

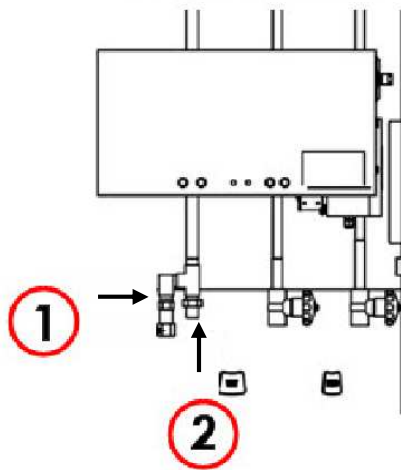


**PERMA-CYL 2000 - 3000HP PLUMBING COMPONENTS**

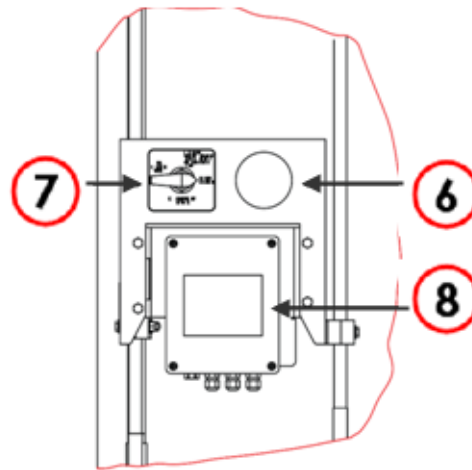
TOP VIEW



SIDE VIEW DETAIL A



SIDE VIEW DETAIL B



# ILLUSTRATIONS AND PARTS LISTING

ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	11488591	Line Relief Valve (350PSI) 	10	1812702	Relief Valve (550PSI) 
2	11526569	Rupture Disk (525PSI) 			
3	11051090	Check Valve 1/2" FPT x 1/2" FPT 			
4	11081328	MCR Regulator (300 PSI) 			
5	10502848	Shut-off valve 1/2FPT 			
6	13909811	Pressure Gauge (0-600 PSI) 			
7	11939013	5-Way Valve 			
8	13141662	Cyl-Tel Gauge 			
9	11905999	Shut-off valve 1/4FPT 			



**PERMA-CYL 2000 - 3000 HP STANDARD PRODUCT  
CONNECTIONS:**

PART NO.	DESCRIPTION
4010022	Outlet 3/8" MPT (INERT) 
4010012	Outlet 3/8" MPT (OXY) 
10873809	Quick Connect Fill Fitting (ARG) 
10873796	Quick Connect Fill Fitting (OXY) 
10873817	Quick Connect Fill Fitting (NIT) 
10582833	Quick Connect Fill Fitting (CO2) 
1110122	Connection 1/2" ODT x 1/2" (45° Flare-Inert) 
1110912	Connection 5/8" ODT x 1/2" (45° Flare-OXY) 
10873809	Quick Connect Fill Fitting (ARG) 

# PERMA-CYL® 2000 HP

HIGH PRESSURE

<b>GENERAL SPECIFICATIONS</b>		
Relief Valve Setting / MAWP	350 psi	24.1 bar
Overall Height	117 in	2970 mm
Width with Piping	52 5/8	1337 mm
Tank Diameter	48 in	1219 mm
Tare Weight	3860 lbs	1751 kg
<b>Capacities</b>		
Gross Volume	539.5 gal	2042 liters
Net Volume	513.9 gal	1945 liters
Gaseous Volume (@ 1 Atm & 70° F / 0° C)*		
Oxygen	59,089 scf	1553 Nm <sup>3</sup>
Nitrogen	47,847 scf	1257 Nm <sup>3</sup>
Argon	57,786 scf	1519 Nm <sup>3</sup>
<b>PERFORMANCE</b>		
Normal Evaporation Rate (% per day)**		
Nitrogen	1%	1%
Oxygen & Argon	0.62%	0.62%
Gas Supply Rate	1350 scfh	52.4 Nm <sup>3</sup> H
<b>CONSTRUCTION</b>		
Design & Manufacturing Code	ASME Sec. VIII Div. 1	
Outer Vessel	Type 304 SS	

**Footnotes:** Specifications subject to change without prior notice.

Covered by existing and pending patents.

\*Values are based on net capacity at 0 psig (0 bar).

\*\*Values are based on gross volume.

# PERMA-CYL® 3000 HP

HIGH PRESSURE - HIGH FLOW

<b>GENERAL SPECIFICATIONS</b>		
Relief Valve Setting / MAWP	350 psi	24.1 bar
Overall Height w/ Piping	121 11/16 in	3091 mm
Width w/ Lab Base	61 in	1549 mm
Tank Diameter	58 in	1473 mm
Tare Weight	4500 lbs	2045 kg
<b>CAPACITIES</b>		
Gross Volume	770 gal	2911 liters
Net Volume	715 gal	2707 liters
Gas Storage Capacity (@ 1 Atm & 68° F / 20° C)*		
Oxygen	82,239 scf	2161 Nm <sup>3</sup>
Nitrogen	66,592 scf	1750 Nm <sup>3</sup>
Argon	80,425 scf	2115 Nm <sup>3</sup>
Carbon Dioxide	52,954 scf	1390 Nm <sup>3</sup>
<b>PERFORMANCE</b>		
Normal Evaporation Rate (% per day)**		
Nitrogen	1%	1%
Oxygen & Argon	0.62%	0.62%
Gas Supply Rate	1350 scfh	35.4 Nm <sup>3</sup> H
High-Flow Option (side mount)	2000 scfh	52.4 Nm <sup>3</sup> H
<b>CONSTRUCTION</b>		
Design & Manufacturing Code	ASME Sec. VIII Div. 1	
Outer Vessel	Type 304 SS	

**Footnotes:** Specifications subject to change without prior notice.

Patents: 5,787,942 • 5,954,101 • 6,799,429.

\*Values are based on net capacity at 0 psig (0 barg). See page 15 of Chart's MicroBulk Systems Product Catalog (P/N 11926802) for conversion densities.

\*\*Values are based on gross volume.