# PERMA-MAX™

## FAST FILL MICROBULK STORAGE FOR $CO_2$ SERVICE

The Perma-Max™ 2200, 3300, 4400, 6000 and 12,000 HP MicroBulk Storage Systems are specifically designed for $CO_2$ service. One notable performance improvement is the fast fill feature – at least three times the fill rate over our standard Perma-Cyl Series from a typical beverage delivery truck. The upsizing and redesign of the top fill eductor circuit reduces the overall fill time, and it also reduces the amount of vent gas during delivery for a more efficient fill. Other new design features include all stainless steel ball valves, a larger internal pressure builder and vaporizer coils, allowing for faster pressure recovery and increased gas flow rates. Dedicated pressure builder and economizer regulators also contribute to this improved performance.

The Perma-Max tank comes with many of the standard features found on the Perma-Cyl Series for easy installation and fast start-up. The Perma-Cyl Series is well known for holding its liquefied gas contents for long periods of time without venting, limiting product loss during periods of little or no gas use.


Perma-Max 4400 HP

## PRODUCT HIGHLIGHTS

**The better alternative to full-for-empty cylinders**
- Replaces HP cylinders
- Extended hold time over liquid cylinders
- Easy low-cost installation – indoors or outdoors (local codes permitting)
- Safety devices pipe-away required for indoor installation

**Fast, efficient fills**
- Efficient fill circuit reduces fill times and vent losses
- Fill rates up to 170 lbs/min*

**High-performance vaporizer**
- Up to 51 lbs/hr**
- Available in 125 psig and 300 psig operating pressures
- Dedicated Pressure Builder (½") and economizer regulators

**Cyl-Tel® Liquid Level Gauge (Optional)**
- Digital and accurate
- Built-in user selectable scales
- Telemetry ready

**Ergonomic instruments and controls**
- Located at user height
- Isolation valves for regulators and level gauge

**Long life, low maintenance**
- Stainless Steel bottle and welded piping
- Heavy-duty galvanized pallet base

** Pressure transfer performance from 33% full at 125 psig to 90% full in 12 minutes with delivery vessel at 295 psig starting pressure without Perma-Cyl storage tank venting.*

*** Based on 12 hours per day of continuous duty at 68°F and 50% RH ambient conditions with internal vaporizer.*

CHART®

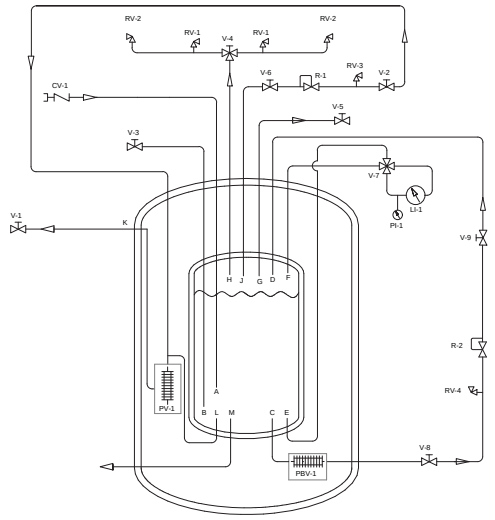
*Innovation. Experience. Performance.*

# PERMA-MAX™

## FAST FILL MICROBULK STORAGE FOR $CO_2$ SERVICE

| GENERAL SPECIFICATIONS | 2200 HP | 3300 HP | 4400 HP | 6000 HP | 12,000 HP |
|---|---|---|---|---|---|
| Relief Valve Setting / MAWP (psig/barg) | 350 / 24.1 | 350 / 24.1 | 350 / 24.1 | 350 / 24.1 | 350 / 24.1 |
| Overall Height (in/mm) | 82 / 2083 | 92 / 2337 | 116 / 2946 | 122 / 3099 | 119 / 3020 |
| Width with Pallet Base (in/mm) | 46.6 / 1184 | 53 / 1346 | 53 / 1346 | 60.5 / 1537 | 86 / 2180 |
| Length with Pallet Base (in/mm) | 50.6 / 1285 | 67 / 1702 | 67 / 1702 | 75.5 / 1918 | 102 / 2590 |
| Tank Diameter (in/mm) | 42 / 1067 | 48 / 1219 | 48 / 1219 | 58 / 1473 | 80 / 2030 |
| Tare Weight* (lbs/kg) | 1765 / 800 | 2200 / 998 | 2600 / 1179 | 3300 / 1497 | 9100 / 4128 |
| **CAPACITIES** | | | | | |
| Gross Volume (gal/liters) | 279 / 1056 | 410 / 1552 | 539.5 / 2042 | 769 / 2911 | 1435 / 5434 |
| Net Volume (gal/liters) | 251 / 950 | 384 / 1453 | 513.9 / 1945 | 715 / 2707 | 1350 / 5110 |
| Gaseous Volume** (scf/$Nm^3$) | 18,584 / 488 | 28,431 / 747 | 38,048 / 1000 | 52,954 / 1390 | 99,954 / 2627 |
| Weight Volume** (lbs/kg) | 2126 / 964 | 3252 / 1475 | 4353/ 1973 | 6057 / 2747 | 11,427 / 5183 |
| **PERFORMANCE** | | | | | |
| Normal Evaporation Rate (% per day)*** | .3% | | | | |
| Gas Supply Rate @ 150 psig (scfh/$Nm^3$H) | 320 / 8.4 | 450 / 11.8 | 500 / 14.2 | 500 / 14.2 | 1167 / 30 |
| (lbs/hr) / (kg/hr) | 36 / 16.3 | 51 / 23 | 51 / 23 | 51 / 23 | 130 / 59 |
| **CONSTRUCTION** | | | | | |
| Design & Manufacturing Code | ASME Sec. VIII Div. 1 | | | | |
| Outer Vessel | Type 304 SS | | | | Paint**** |
| Pallet Base | Galvanized Carbon Steel | | | | |

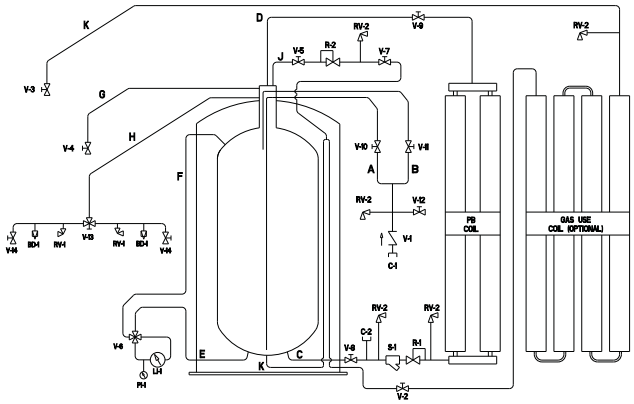
**Footnotes:** Specifications subject to change without prior notice. *Weights include lab base. (Does not come standard on the Model 2200.) **Gas measured at 1 atm and 70°F, Liquid measured at 0°F and saturated pressure. ***Values are based on gross volume. ****Model 12,000 is built with stainless steel outer top and bottom heads.




| NOMENCLATURE | |
|---|---|
| CV-1 | TANK FILL CHECK VALVE |
| LI-1 | TANK LIQUID LEVEL GAUGE |
| PBV-1 | TANK PRESSURE BUILDING VAPORIZER COIL |
| PI-1 | TANK PRESSURE GAUGE 0-400 PSI |
| PV-1 | TANK PROCESS VAPORIZER COIL |
| R-1 | TANK ECONOMIZER REGULATOR |
| R-2 | TANK PB REGULATOR |
| RV-2 | TANK SECONDARY RELIEF VALVE |
| RV-1 | TANK PRIMARY RELIEF VALVE |
| RV-3 | TANK ECON INLET RELIEF VALVE |
| RV-4 | TANK PB OUTLET RELIEF VALVE |
| V-1 | TANK GAS USE VALVE |
| V-2 | TANK ECONOMIZER INLET ISO VALVE |
| V-3 | TANK LIQUID WITHDRAWAL VALVE |
| V-4 | TANK SAFETY 3-WAY DIVERTER VALVE |
| V-5 | TANK FULL TRYCOCK / VENT VALVE |
| V-6 | TANK ECONOMIZER VALVE |
| V-7 | TANK GAUGE ISOLATION VALVE |
| V-8 | TANK PRESSURE BUILD OUTLET ISO VALVE |
| V-9 | TANK PRESSURE BUILD INLET ISO VALVE |

| PIPING | |
|---|---|
| A | FILL EDUCTOR |
| B | TANK LIQUID WITHDRAWAL |
| C | TANK PB INLET |
| D | TANK PB OUTLET |
| E | TANK LIQUID PHASE |
| F | TANK VAPOR PHASE |
| G | TANK FULL TRYCOCK / VENT VALVE |
| H | TANK DUAL RELIEF |
| J | TANK ECONOMIZER |
| K | TANK GAS USE OUT |
| L | TANK GAS USE IN |
| M | BOTTOM LIQUID WITHDRAWAL |

**Perma-Max Models 2200 - 6000 HP**




| NOMENCLATURE | |
|---|---|
| C-1 | FILL CONNECTION |
| C-2 | LIQUID WITHDRAWAL CONNECTION |
| V-1 | FILL CHECK VALVE |
| V-2 | GAS USE ISO VALVE |
| V-3 | GAS USE VALVE |
| V-4 | VENT VALVE |
| V-5 | ECONOMIZER ISO VALVE |
| V-6 | GAUGE ISO VALVE |
| V-7 | ECON REGULATOR ISO VALVE |
| V-8 | PB INLET ISO VALVE |
| V-9 | PB REGULATOR ISO VALVE |
| V-10 | BOTTOM FILL VALVE |
| V-11 | TOP FILL VALVE |
| V-12 | FILL HOSE DRAIN VALVE |
| V-13 | SAFETY 3-WAY DIVERTER VALVE |
| V-14 | SAFETY LINE PURGE VALVE |
| R-1 | PB REGULATOR |
| R-2 | ECON REGULATOR |
| RV-1 | PRIMARY RELIEF VALVE |
| RV-2 | PIPING RELIEF VALVE |
| S-1 | PB STRAINER |
| PI-1 | PRESSURE INDICATOR |
| LI-1 | LIQUID LEVEL INDICATOR |
| BD-1 | DEVICE BURST DISC |

| PIPING | |
|---|---|
| A | BOTTOM FILL |
| B | TOP FILL |
| C | PRESSURE BUILD INLET |
| D | PRESSURE BUILD OUTLET |
| E | LIQUID PHASE |
| F | VAPOR PHASE |
| G | VENT |
| H | DUAL SAFETY RELIEF |
| J | ECONOMIZER |
| K | GAS USE |

**Perma-Max Model 12,000 HP**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