

# CMSH Series



Multishield Liquid Helium  
Container Specifications



**CRYOFAB**



# CMSH Series

## Multishield Liquid Helium Containers

### Model CMSH

The Cryofab CMSH helium dewar is designed for minimum loss storage, transportation and dispensing of liquid helium. The CMSH container employs state of the art vapor cooled multishield technology in conjunction with superinsulation to effect the lowest guaranteed loss rates in the industry on comparable units. The advanced insulation system results in quicker, more efficient cool down without the need of nitrogen pre-cooling. In addition the elimination of LN2 or helium gas circulation shielding means that the CMSH is virtually maintenance free.

These units have the same general areas of use as old-style, 4-wall helium containers but permit large storage capacities in small packages with lighter weight.

### Construction Features

The helium reservoir and outer jacket are welded 304 stainless steel.

Larger diameter necks accept standard helium transfer lines and eliminate thermal oscillations. This also allows for testing superconducting leads or other applications requiring dipping or immersion of components.

Standard equipment includes a removable halo ring providing protection for the manifold and components while allowing for easy access. Also a variety of handle configurations allow for easy pulling and securing.

The evacuation port is conveniently accessible for re-evacuation and serves as a vacuum space relief port.

All containers feature quick opening ball valves and quick couplings for easy insertion and pressure sealing of transfer lines with minimum loss of container pressure.

## Smaller and Larger Volumes Available

5 liters to 25 liters • 1500 liters to 7500 liters

CUSTOM CONFIGURATIONS  
ALSO AVAILABLE

All Vessels Available With:  
ASME • DOT • IATA • ADR

### Features include:

- No liquid nitrogen shielding or helium gas circulation required
- Lightweight but rugged construction stands up to trucking and everyday abuse
- Suitable for air transport
- All welded construction
- Lowest loss rates in the industry
- All units equipped with integral caster base
- Easily removable and interchangeable manifolds
- Suitable for neon and all other liquid gases<sup>1</sup>
- Applications include Distribution, Research and Liquefaction
- Two-year warranty on vacuum

|                                     |
|-------------------------------------|
| Net Capacity                        |
| Gross Capacity                      |
| Weight (Empty)                      |
| Material of Construction            |
| N.E.R.                              |
| Operating Pressure                  |
| Design Pressure <sup>2</sup>        |
| Neck ID                             |
| Depth (Flange to Bottom)            |
| Outside Overall Diameter            |
| Height                              |
| Maximum Transfer Line O.D.          |
| Minimum Transfer Line O.D.          |
| Transfer Line Length for Withdrawal |
| Minimum Fill Lance Length           |
| Caster Size                         |
| Vent Connection (MNPT)              |

1. Lab use only, not for transport



|                                     | CMSH 30   |             | CMSH 60   |             | CMSH 100   |      |
|-------------------------------------|-----------|-------------|-----------|-------------|------------|------|
| Net Capacity                        | 30 liters | 30 liters   | 60 liters | 60 liters   | 100 liters | 100  |
| Gross Capacity                      | 34 liters | 34 liters   | 65 liters | 65 liters   | 110 liters | 110  |
| Weight (Empty)                      | 59.3 kg   | 131 lbs     | 87 kg     | 192 lbs     | 95.5 kg    | 210  |
| Material of Construction            | 304 SS    | 304 SS      | 304 SS    | 304 SS      | 304 SS     | 304  |
| N.E.R.                              | 2.75 %    | 2.75 %      | 1.5 %     | 1.5 %       | 1 %        | 1    |
| Operating Pressure                  | 69 kPa    | 10 PSIG     | 69 kPa    | 10 PSIG     | 69 kPa     | 10   |
| Design Pressure <sup>2</sup>        | 206.9 kPa | 30 PSIG     | 310.3 kPa | 45 PSIG     | 310.3 kPa  | 45   |
| Neck ID                             | 37 mm     | 1.45 inches | 37 mm     | 1.45 inches | 37 mm      | 1.45 |
| Depth (Flange to Bottom)            | 865 mm    | 34 inches   | 941 mm    | 37 inches   | 1171 mm    | 46   |
| Outside Overall Diameter            | 509 mm    | 20 inches   | 611 mm    | 24 inches   | 611 mm     | 24   |
| Height                              | 1221 mm   | 48 inches   | 1298 mm   | 51 inches   | 1501 mm    | 59   |
| Maximum Transfer Line O.D.          | 12.7 mm   | 1/2 inch    | 12.7 mm   | 1/2 inch    | 12.7 mm    | 1/2  |
| Minimum Transfer Line O.D.          | 9.5 mm    | 3/8 inch    | 9.5 mm    | 3/8 inch    | 9.5 mm     | 3/8  |
| Transfer Line Length For Withdrawal | 1094 mm   | 43 inches   | 1170 mm   | 46 inches   | 1425 mm    | 56   |
| Minimum Fill Lance Length           | 764 mm    | 30 inches   | 764 mm    | 30 inches   | 764 mm     | 30   |
| Caster Size                         | 102 mm    | 4 inches    | 102 mm    | 4 inches    | 102 mm     | 4    |
| Vent Connection (MNPT)              |           | 1/2 inch    |           | 1/2 inch    |            | 1/2  |



| CMSH 250   |             | CMSH 350   |             | CMSH 500   |             | CMSH 1000   |      |
|------------|-------------|------------|-------------|------------|-------------|-------------|------|
| 250 liters | 250 liters  | 350 liters | 350 liters  | 500 liters | 500 liters  | 1000 liters | 1000 |
| 275 liters | 275 liters  | 370 liters | 370 liters  | 538 liters | 538 liters  | 1074 liters | 1074 |
| 154.5 kg   | 340 lbs     | 173 kg     | 380 lbs     | 255.5 kg   | 562 lbs     | 409 kg      | 900  |
| 304 SS     | 304 SS      | 304 SS     | 304 SS      | 304 SS     | 304 SS      | 304 SS      | 304  |
| 1 %        | 1 %         | 1.15 %     | 1.15 %      | .7 %       | .7 %        | .5 %        | .5   |
| 69 kPa     | 10 PSIG     | 69 kPa     | 10 PSIG     | 69 kPa     | 10 PSIG     | 69 kPa      | 10   |
| 206.9 kPa  | 30 PSIG     | 103.4 kPa  | 15 PSIG     | 172.5 kPa  | 25 PSIG     | 103.4 kPa   | 15   |
| 54 mm      | 2.12 inches | 54 mm      | 2.12 inches | 53.4 mm    | 2.10 inches | 53.4 mm     | 2.10 |
| 1348 mm    | 53 inches   | 1399 mm    | 55 inches   | 1399 mm    | 55 inches   | 1552 mm     | 61   |
| 814 mm     | 32 inches   | 814 mm     | 32 inches   | 1069 mm    | 42 inches   | 1374 mm     | 54   |
| 1781 mm    | 70 inches   | 1852 mm    | 73 inches   | 1857 mm    | 75 inches   | 1959 mm     | 77   |
| 19 mm      | 3/4 inch    | 19 mm      | 3/4 inch    | 19 mm      | 3/4 inch    | 19 mm       | 3/4  |
| 9.5 mm     | 3/8 inch    | 9.5 mm     | 3/8 inch    | 9.5 mm     | 3/8 inch    | 9.5 mm      | 3/8  |
| 1628 mm    | 64 inches   | 1679 mm    | 66 inches   | 1679 mm    | 66 inches   | 1832 mm     | 72   |
| 814 mm     | 32 inches   | 814 mm     | 32 inches   | 814 mm     | 32 inches   | 814 mm      | 32   |
| 127 mm     | 5 inches    | 127 mm     | 5 inches    | 127 mm     | 5 inches    | 153 mm      | 6    |
|            | 1/2 inch    |            | 1/2 inch    |            | 1/2 inch    |             | 1/2  |

2. Use of this equipment above Operating Pressure requires factory testing and certification. Please call 1.800.426.2186 for more information.



|        | CMSH 150   |             | CMSH 200   |             |                                     |
|--------|------------|-------------|------------|-------------|-------------------------------------|
| liters | 150 liters | 150 liters  | 200 liters | 200 liters  | Net Capacity                        |
| liters | 171 liters | 171 liters  | 220 liters | 220 liters  | Gross Capacity                      |
| lbs    | 125 kg     | 275 lbs     | 156 kg     | 343 lbs     | Weight (Empty)                      |
| SS     | 304 SS     | 304 SS      | 304 SS     | 304 SS      | Material of Construction            |
| %      | 1.2 %      | 1.2 %       | 1.15 %     | 1.15 %      | N.E.R.                              |
| PSIG   | 69 kPa     | 10 PSIG     | 69 kPa     | 10 PSIG     | Operating Pressure                  |
| PSIG   | 206.9 kPa  | 30 PSIG     | 206.9 kPa  | 30 PSIG     | Design Pressure <sup>2</sup>        |
| inches | 55.5 mm    | 2.18 inches | 54 mm      | 2.12 inches | Neck ID                             |
| inches | 1196 mm    | 47 inches   | 1221 mm    | 48 inches   | Depth (Flange to Bottom)            |
| inches | 713 mm     | 28 inches   | 814 mm     | 32 inches   | Outside Overall Diameter            |
| inches | 1527 mm    | 60 inches   | 1654 mm    | 65 inches   | Height                              |
| inch   | 12.7 mm    | 1/2 inch    | 19 mm      | 3/4 inch    | Maximum Transfer Line O.D.          |
| inch   | 9.5 mm     | 3/8 inch    | 9.5 mm     | 3/8 inch    | Minimum Transfer Line O.D.          |
| inches | 1374 mm    | 54 inches   | 1450 mm    | 57 inches   | Transfer Line Length For Withdrawal |
| inches | 764 mm     | 30 inches   | 814 mm     | 32 inches   | Minimum Fill Lance Length           |
| inches | 102 mm     | 4 inches    | 127 mm     | 5 inches    | Caster Size                         |
| inch   |            | 1/2 inch    |            | 1/2 inch    | Vent Connection (MNPT)              |

Commercial Air Transport Vessels

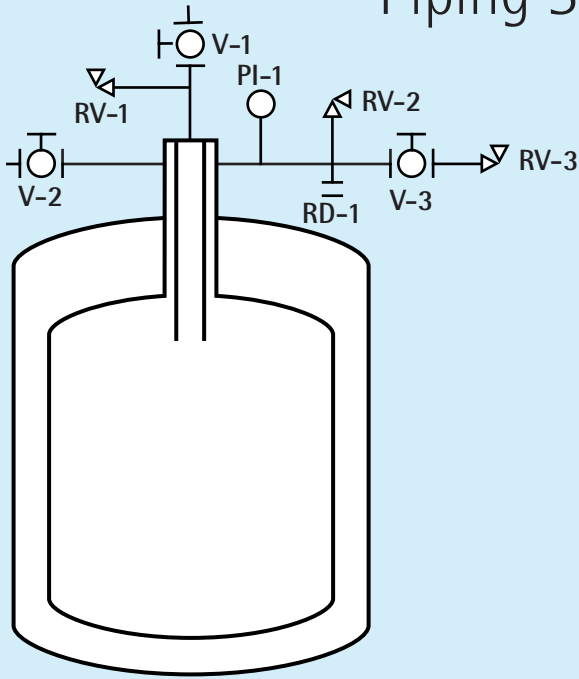


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|        | CMSH 250-S |                        | CMSH 400-S |                        |                                     |
|--------|------------|------------------------|------------|------------------------|-------------------------------------|
| liters | 250 liters | 250 liters             | 400 liters | 400 liters             | Net Capacity                        |
| liters | 275 liters | 275 liters             | 440 liters | 440 liters             | Gross Capacity                      |
| lbs    | 150 kg     | 330 lbs                | 232 kg     | 510 lbs                | Weight (Empty)                      |
| SS     | 304 SS     | 304 SS                 | 304 SS     | 304 SS                 | Material of Construction            |
| %      | 1.25 %     | 1.25 %                 | 1 %        | 1 %                    | N.E.R.                              |
| PSIG   | 69 kPa     | 10 PSIG                | 69 kPa     | 10 PSIG                | Operating Pressure                  |
| PSIG   | 206.9 kPa  | 30 PSIG                | 172.5 kPa  | 25 PSIG                | Design Pressure <sup>2</sup>        |
| inches | 54.7 mm    | 2.15 inches            | 53.4 mm    | 2.10 inches            | Neck ID                             |
| inches | 1196 mm    | 47 inches              | 1196 mm    | 47 inches              | Depth (Flange to Bottom)            |
| inches | 814 mm     | 32 inches              | 1069 mm    | 42 inches              | Outside Overall Diameter            |
| inches | 1524 mm    | 60 inches <sup>3</sup> | 1577 mm    | 62 inches <sup>3</sup> | Height                              |
| inches | 19 mm      | 3/4 inch               | 19 mm      | 3/4 inch               | Maximum Transfer Line O.D.          |
| inch   | 9.5 mm     | 3/8 inch               | 9.5 mm     | 3/8 inch               | Minimum Transfer Line O.D.          |
| inches | 1374 mm    | 54 inches              | 1425 mm    | 56 inches              | Transfer Line Length for Withdrawal |
| inches | 814 mm     | 32 inches              | 814 mm     | 32 inches              | Minimum Fill Lance Length           |
| inches | 127 mm     | 5 inches               | 127 mm     | 5 inches               | Caster Size                         |
| inch   |            | 1/2 inch               |            | 1/2 inch               | Vent Connection (MNPT)              |

<sup>3</sup> Height to 3/4" quick coupling

# Piping Schematic



## Symbol Description

| Symbol | Description                                 |
|--------|---|
| V-1    | Liquid Valve                                |
| V-2    | Vent Valve                                  |
| V-3    | Isolation Valve                             |
| RD-1   | Rupture Disk*                               |
| RV-1   | Relief Valve, 15 PSIG                       |
| RV-2   | Relief Valve, 10 PSIG                       |
| RV-3   | Pressure Control Valve, .5 PSIG             |
| PI-1   | Compound Pressure Gauge<br>30" Hg-0-15 PSIG |

\*Only on capacities 200 Liters and greater.

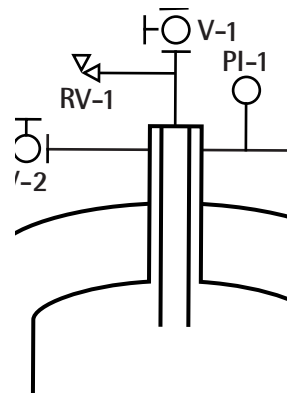
## Standard Access Ports



Sizes 150 liters and less  
1/2" to 3/8" access



Sizes 200 liters and up  
3/4" to 1/2" access



Liquefaction  
1/2" to 3/8", 5/8" to 1/2"  
side by side

**Custom Configurations**  
also available





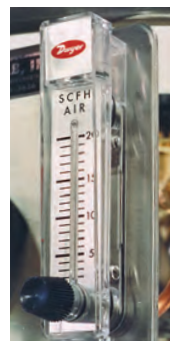
# Optional Equipment



Differential Pressure  
Liquid Level Gauges



Super Conducting  
Liquid Level Systems



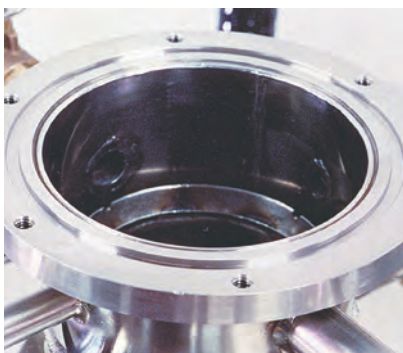
Flow Meters



Built-in Vacuum Jacketed  
Withdrawal Valve



Absolute Relief Valve  
For Air Transport



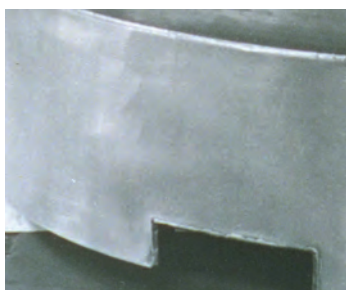
Larger Neck  
Openings



Electric Pressure  
Building Systems



Pull Handles  
Available on Sizes  
100 It thru 1000 It



Fork Lift Provisions  
Available on Sizes 500 It and up



Removable Dollies  
Sizes 30 It to 100 It



Outboard Wheel Configuration  
Sizes 30 It to 150 It

Locking Casters



Wing Lock



Pedal Lock



## CRYOFAB

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