

# Cryogenic Subcooler

## Vertical



An advanced liquid nitrogen subcooler, engineered to deliver a guaranteed **77 K (-196 °C)**, zero-vapor liquid quality to your process, regardless of your storage tank's level, pressure and insulation conditions. By transforming standard LN<sub>2</sub> into a subcooled state with extremely low enthalpy, we eliminate flash-off, ensure maximum thermal transfer efficiency and precise temperature control with flow rates of up to **3,500 kg/hr**.

### Typical Applications

- **Food Industry** - Tunnel freezers and meat mixing
- **Pharmaceutical Manufacturing** - For Spray Freeze Drying (lyophilization) of drug solutions (vaccines, APIs, biotech products) and precise cryogenic reactor cooling for sensitive synthesis
- **Electronics Manufacturing** - Process cooling
- **Semiconductor Testing** - For chip testing and qualification under extreme temperatures
- **Aerospace** - For supercooled liquids in rocket tank filling and thermal testing in space simulation chambers
- **Oil & Gas / LNG** - Gas purification and cryogenic distillation
- **Metal Processing** - For cryogenic deburring of metal or plastic parts

### Ergonomic Features and Benefits

- **Lowest Coolant Losses** – Super vacuum insulation with lowest heat leak
- **High Efficiency Subcooling** – Maintains constant liquid density for stable, high-quality performance
- **User-defined Pressure** - Keeps outlet pressure equal to inlet pressure (up to 10 bar) for reliable and consistent operation
- **Corrosion Resistant** – Built from stainless steel 300 series for durability and long service life
- **High Mass Flow Rate** – Handles capacities from 500 - 3500 kg/hr to fit wide range of operational needs
- **Lowest Maintenance** – Designed for hassle-free operation with minimal service requirements
- **Ease of Installation** – Plug-and-play setup for quick, skill-free installation
- **Applications Flexibility** – Suitable for LN<sub>2</sub>, LO<sub>2</sub>, LAr, and LNG, covering diverse cryogenic applications
- **5 Years Vacuum Warranty** – Lowest cost of ownership

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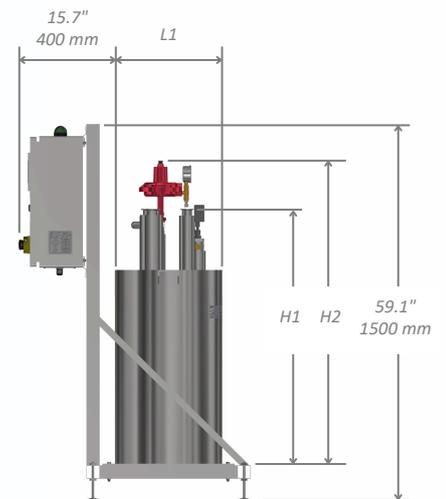
## Specifications

| Models                       | CSV.500   | CSV.1500     | CSV.3500     |
|------------------------------|---|--------------|--------------|
| Subcooling Rate              | 500 kg/hr   | 1500 kg/hr   | 3500 kg/hr   |
| Max. Process Inlet Pressure  | 150 psi (10 bar)  |              |              |
| Bath Pressure                | Atmospheric   |              |              |
| Bath Level Control           | Automatic (Pneumatic)   |              |              |
| Weight - Empty               | 80 kg (lbs)   | 120 kg (lbs) | 250 kg (lbs) |
| Weight - Full Process & Bath | 120 kg (lbs)  | 200 kg (lbs) | 450 kg (lbs) |
| Vacuum Insulation            | Static  |              |              |
| Material                     | Stainless Steel 300 series*   |              |              |
| Bath Level Control           | Cryo-Stic Level Sensor  |              |              |
| Certifications               | NEMA 4X, CE   |              |              |
| Standard Testing             | Dimensional Check<br>He Leak Check at $1 \times 10^{-9}$ cc/s   |              |              |
| Optional Services            | Vacuum Retention Testing, LN2 Cold Shock, Pre-material Certification, X-ray, ASME B31.3 Certification, CFOS Cleaning for O2 Application |              |              |
| Utilities                    | Liquid Nitrogen LN <sub>2</sub> : ≤ 150 psi (10 bar)<br>Gaseous Nitrogen GN <sub>2</sub> : 87 psi (6 bar)<br>Electrical: 80-240 VAC     |              |              |

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## Dimensions

| Models  | L1                | H1                 | H2                 |
|---------|-------------------|--------------------|--------------------|
| CS.500  | 16.0"<br>(406 mm) | 29.3"<br>(744 mm)  | 39.6"<br>(1005 mm) |
| CS.1500 | 19.7"<br>(500 mm) | 34.6"<br>(880 mm)  | 45.7"<br>(1160 mm) |
| CS.3500 | 23.6"<br>(600 mm) | 57.1"<br>(1450 mm) | 66.9"<br>(1700 mm) |



All dimensions provided are for indication purposes only and may not accurately represent the actual product dimensions. Please contact us for updated and actual measurements.