



Packaged Gases

Equipment for Cryogenic Service

PACKAGED GASES SOLUTIONS | SYSTEM DESIGN | MANUFACTURING | TRAINING | SERVICE



Packaged Gases
Product Catalog
www.chartindustries.com

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Innovative Design, Technology & Reliability

Across Chart, we pride ourselves on designing innovative products with advanced technology and high reliability to enhance customer value. Our understanding of our customer's business needs and end-use applications has helped us achieve a wide product portfolio of solutions. We provide the right product for the application – driving a competitive advantage for our customer and our company.



Innovative Design

Our packaged gases equipment designs are based on a system that incorporates patented and proven innovative technologies. Every component is designed, built and tested to create the safest and most reliable packaged gases equipment available today.



Quality Manufacturing

Our experiences and code compliant ISO 9001 and 14000 ensures our liquid cylinders are manufactured to high quality standards and on time.



Performance

The patented Dura-Cyl® design is the perfect blend of plumbing controls, rugged durability and thermal efficiency – giving you the highest performance liquid cylinder package on the market today.



Sales & Marketing Services

Our sales process doesn't stop with the equipment supply. We offer electronic sales tools, customized literature, marketing assistance and sales training to make our authorized partners positioned for growth in the liquid cylinder market.

When you choose Chart, you get single-source accountability from initial quality through after the sale service support.

Packaged Gases Applications

Metal Fabrication

Welding – GMAW/MIG, GTAW/TIG and Laser Beam Welding

Metal fabrication uses many different welding processes for the wide range of materials, thickness and product applications. Many of these unique and specialized welding processes use inert shielding gas or the combination of gases to obtain the maximum weld quality and optimized productivity. Liquid cylinders offer the flexibility to easily alter the gas supply to match the manufacturing process changes.



Cutting – Laser, Oxy Fuel and Plasma

All thermal cutting techniques utilize gases to assist in the cutting process. High-pressure nitrogen and oxygen are used as an assist gas to rapidly remove the molten metal from the cut zone or burn it away during the laser cutting process. To maintain maximum laser uptime and achieve the best cut quality, it is critical that the gas supply be uninterrupted and the required pressures and flows for the material and thickness being cut are maintained. Oxy Fuel and Plasma cutting processes have similar requirements. Laser-Cyl™ liquid cylinders manifolded together are an economical solution to providing an uninterrupted gas supply.



Analytical / Laboratory

ICP/ICP-MS – Inductively Coupled Plasma/Mass Spectrometry GC – Gas Chromatograph

A continuous flow of high purity argon gas is required for ICP/ICP-MS systems to repeatedly process material samples trouble-free. Dura-Cyl® liquid cylinders manifolded together meet this requirement. In addition, liquid cylinders are compact so they take up a minimal amount of valuable lab space.



Biological Storage and Research

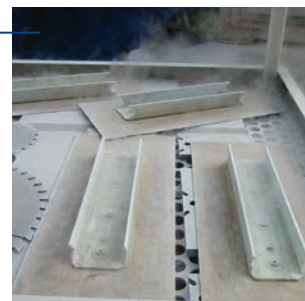
A sufficient supply of high-quality liquid nitrogen is needed to keep valuable biological samples stored indefinitely. Any interruption in supply can result in the loss of many years of research. With dedicated Dura-Cyl liquid cylinders connected to your equipment, you can be assured of your liquid supply to keep your samples safe. For applications that require the greatest amount of liquid in a tight space, the Dura-Cyl 265 with casters is an excellent choice.



Metal Processing

Heat Treating, Cryotempering, Thermal Spray Coating

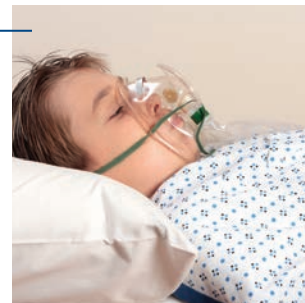
Heat treating and cryotempering processes are dependent on the quality of the nitrogen gas and liquid supply to maintain production at peak performance. With the Dura-Cyl liquid cylinder located at the point of use, the operator has complete control over their gas supply for optimum operation. In the thermal spray coating process, oxygen and argon are used at high pressure and at high flow rates. Manifolded Dura-Cyl tanks together is an economical solution for this application.



Medical

Oxygen Therapy and Cryotherapy

Medical applications have some of the most stringent gas requirements and the Dura-Cyl liquid cylinder meets these requirements with NF grade availability. Dura-Cyl tanks manifolded together for respiratory therapy assures a continuous gas supply and lowers distribution costs over high-pressure cylinders. An isolated hyperbaric chamber with intermittent use of oxygen is also a good application for Dura-Cyl tanks.



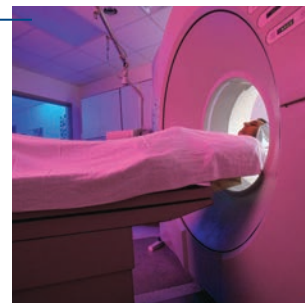
Cryotherapy

NF grade nitrogen can be supplied for gas applications to operate pneumatic surgical tools and supply liquid for medical uses such as cryotherapy. Working with the equipment manufacturers, we understand the stringent requirements for safe liquid supply. Our Dura-Cyl liquid cylinders can be ordered with the proper controls to ensure proper operation for this application.



MRI – Magnetic Resonance Imaging (Helium)

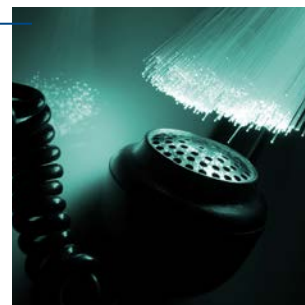
Superconducting magnets bathed in liquid helium are the most commonly used magnets in an MRI machine. The low temperature reduces the internal resistance to zero, which reduces the electrical requirement for the system dramatically and making it much more economical to operate. Chart's Ultra-Helium Dewar™ tanks are designed and built for reliable helium transport. They are thermally efficient, lightweight and maneuverable – making them the dewar of choice of lab personnel.



General Processing

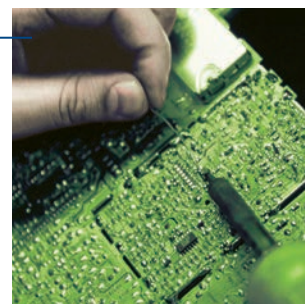
Purging and Blanketing

Inert purging and blanketing with nitrogen or argon gas is a common processing step in many manufacturing applications. These range from pharmaceutical to chemical to the wine industry, and they require a secure supply of gas for optimum processing results. Other unique applications like keeping fiber optic and telephone wire lines dry with nitrogen throughout the city make the Dura-Cyl tank an excellent choice of inert gas supply.



Electronic Manufacturing and Testing

Electronic grade manufacturing can use liquid or gaseous nitrogen or argon during the manufacturing process. Dura-Cyl liquid cylinders offer a compact package where the pressure and source is near the operation for convenience and customization of the gas supply. In a related business, printed circuit board testing performed in liquid nitrogen-powered environmental test chambers require quality liquid at the point of use. For intermittent uses or small chambers, the Dura-Cyl tank is an economical and convenient liquid supply.



Dura-Cyl® Premium Liquid Cylinders

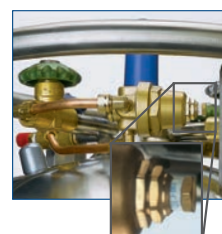
The Dura-Cyl® series is a premium transportable liquid cylinder for cryogenic service. The patented internal support system design and quality construction makes the Dura-Cyl series the most efficient yet rugged cylinder on the market today. Along with the patented Liquid Cylinder Control Manifold and our wide choice of caster base options, the Dura-Cyl Series is also the most user-friendly cylinder available. Adding our industry-leading 7-year vacuum warranty, the Dura-Cyl provides the lowest cost of ownership – making it the preferred choice in transportable liquid cylinders.



The Roto-Tel™ Liquid Level Gauge offers improved accuracy and expanded gauge ranges for better resolution.



LCCM models have an integral mounted combination pressure control regulator, isolation valve and a calibrated dome control knob. (MP & HP models only)



MCR models have a combination pressure control regulator with our exclusive calibrated micrometer adjusting screw. (MP & HP models only)

Footring

MODEL		160 L	160 L	180 L	180 L	180 L	200L	200 L	200 L
	Pressure	MP	HP	LP	MP	HP	LP	MP	HP
LCCM	Part Number	10508748	10508756	—	10508764	10496433	—	10508772	10496417
MCR	Part Number	10783424	10783467	—	10783491	10783539	—	10783598	10783619
None ⁽¹⁾	Part Number	—	—	10648450	—	—	13277869	—	—
CAPACITY⁽²⁾⁽³⁾									
Liquid (Gross)	(liters)	176	176	196	196	196	209	209	209
Liquid (Net)	(liters)	165	165	185	185	185	196	196	196
Gas (N ₂)	ft ³ / Nm ³	3,685 / 97	3,464 / 91	—	4,099 / 108	3,864 / 102	—	4,375 / 115	4,072 / 108
Gas (O ₂)	ft ³ / Nm ³	4,577 / 120	4,348 / 114	—	5,096 / 134	4,843 / 127	—	5,435 / 143	5,048 / 133
Gas (Ar)	ft ³ / Nm ³	4,448 / 117	4,226 / 111	—	4,961 / 130	4,709 / 124	—	5,290 / 139	4,932 / 130
Gas (CO ₂)	ft ³ / Nm ³	—	3,382 / 89	—	—	3,766 / 99	—	—	4,011 / 105
Gas (N ₂ O)	ft ³ / Nm ³	—	3,207 / 84	—	—	3,574 / 94	—	—	3,810 / 100
PERFORMANCE									
NER (N ₂)	% per day	2.0	2.0	1.5	1.9	1.9	1.85	1.85	1.85
NER (O ₂ - Ar)	% per day	1.4	1.4	1.0	1.3	1.3	1.2	1.2	1.2
NER (CO ₂ - N ₂ O)	% per day	—	0.5	—	—	0.5	—	—	0.5
Gas Flow (N ₂ , O ₂ , Ar)	SCFH/Nm ³ /hr	350 / 9.2	350 / 9.2	—	350 / 9.2	350 / 9.2	—	400 / 10.5	400 / 10.5
Gas Flow (CO ₂ , N ₂ O)	SCFH/Nm ³ /hr	—	110 / 2.9	—	—	110 / 2.9	—	—	110 / 2.9
DIMENSIONS & PRESSURE RATINGS									
Relief Valve Setting	psig / barg	230 / 16	350 / 24	22 / 1.5	230 / 16	350 / 24	22 / 1.5	230 / 16	350 / 24
DOT/CTC Rating		4L200	4L292	4L100	4L200	4L292	4L100	4L200	4L292
Diameter	in / cm	20 / 50.8	20 / 50.8	20 / 50.8	20 / 50.8	20 / 50.8	20 / 50.8	20 / 50.8	20 / 50.8
Height ⁽⁴⁾	in / cm	59.8 / 151.9	59.8 / 151.9	64.3 / 163.3	64.3 / 163.3	64.3 / 163.3	66.6 / 169.2	66.6 / 169.2	66.6 / 169.2
Tare Weight	lb / kg	250 / 113.4	280 / 126.9	210 / 95.2	260 / 117.9	300 / 136.1	210 / 95.2	280 / 126.9	320 / 145.1
Full Weight (N ₂)	lb / kg	517 / 234	531 / 241	540 / 245	557 / 253	580 / 263	559 / 253.5	597 / 271	618 / 280
(O ₂)	lb / kg	629 / 285	640 / 290	676 / 307	682 / 309	701 / 318	706 / 320.2	730 / 331	747 / 339
(Ar)	lb / kg	710 / 322	717 / 325	778 / 354	773 / 351	787 / 357	821 / 372.4	827 / 375	839 / 380
(CO ₂)	lb / kg	—	667 / 303	—	—	731 / 331	—	—	779 / 353

(1) Pressure building regulator optional on LP models. (2) Gas capacities at DOT4L limits. See manual P/N 10642912 for details.

NER = Nominal Evaporation Rate

(3) Most of the Dura-Cyl models are available with permanently installed CGA fittings for medical applications. Contact Customer Service for details.

(4) All dimensions are measured from the floor to the top of the sight gauge protector.

Dura-Cyl® Advantages

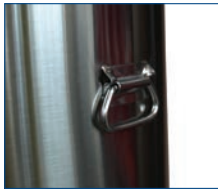
- Ideal for liquid nitrogen, oxygen, argon, CO₂ or nitrous oxide
- Different sizes, pressures, and features to meet your needs
- Stainless steel bottle construction
- Thick, dent-resistant outer shell
- Durable inner-vessel support system
- Heavy-duty footring and large diameter handling ring with four supports
- Optional Micrometer Controlled Regulator (MCR) or Liquid Cylinder Control Manifold (LCCM)
- Roto-Tel™ Liquid Level Gauge System
- 7-year vacuum warranty



Some models available with either round or square stainless steel caster bases for safe and easy mobility.



The Dura-Cyl LP models feature the "sight gauge" liquid level indicator and a liquid globe valve with an extended stem for less ice build-up on the handle for easier operation.

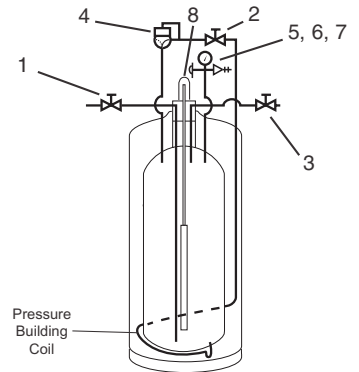


Two pull handles are standard on the round base design.

Nomenclature

1. Fill / Liquid Valve.
2. Pressure Control Valve.
3. Vent Valve.
4. Pressure Control Regulator (optional).
5. Pressure Gauge.
6. Pressure Relief Valve.
7. Rupture Disk.
8. Liquid Level Gauge.

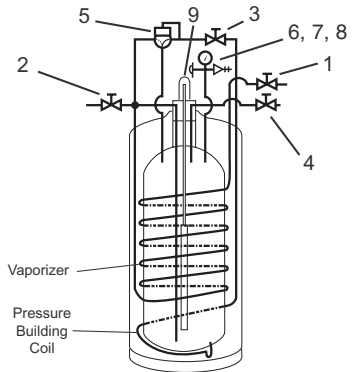
Model: LP



Nomenclature

1. Gas Use Valve.
2. Fill / Liquid Valve.
3. Pressure Control Valve.
4. Vent Valve.
5. Combination Pressure Control Regulator.
6. Pressure Gauge.
7. Pressure Relief Valve.
8. Rupture Disk.
9. Liquid Level Gauge.

Models: MP & HP



Caster Base

	120 L RB	230 L RB	230 L RB	230 L RB	230 L SB	230 L SB	230 L SB	265 L RB	265 L RB	265 L SB	265 L SB
	LP	LP	MP	HP	LP	MP	HP	MP	HP	MP	HP
	—	—	—	10616546	—	10496468	10496492	—	—	10510039	10512561
	—	—	10783635	10783651	—	10810779	10794027	10783678	10783694	—	—
	10648396	10648599	—	—	10648556	—	—	—	—	—	—
	120	240	240	240	240	240	240	276	276	276	276
	110	230	230	230	230	230	230	265	265	265	265
	—	—	5,024 / 132	4,734 / 124	—	5,024 / 132	4,734 / 124	5,769 / 152	5,438 / 143	5,769 / 152	5,438 / 143
	—	—	6,244 / 164	5,930 / 156	—	6,244 / 164	5,930 / 156	7,186 / 189	6,811 / 179	7,186 / 189	6,811 / 179
	—	—	6,073 / 160	5,763 / 151	—	6,073 / 160	5,763 / 151	6,982 / 183	6,634 / 174	6,982 / 183	6,634 / 174
	—	—	—	4,614 / 121	—	—	4,614 / 121	—	5,305 / 139	—	5,305 / 139
	—	—	—	4,378 / 115	—	—	4,378 / 115	—	5,034 / 132	—	5,034 / 132
	2.0	1.5	1.8	1.8	1.5	1.8	1.8	2	2	2	2
	1.4	1.0	1.2	1.2	1.0	1.2	1.2	1.4	1.4	1.4	1.4
	—	—	—	0.5	—	—	0.5	—	0.5	—	0.5
	—	—	400 / 10.5	400 / 10.5	—	400 / 10.5	400 / 10.5	400 / 10.5	400 / 10.5	400 / 10.5	400 / 10.5
	—	—	—	110 / 2.9	—	—	110 / 2.9	—	110 / 2.9	—	110 / 2.9
	22 / 1.5	22 / 1.5	230 / 16	350 / 24	22 / 1.5	230 / 16	350 / 24	230 / 16	350 / 24	230 / 16	350 / 24
	4L100 ⁽⁵⁾	4L100	4L200	4L292	4L100	4L200	4L292	4L200	4L292	4L200	4L292
	20 / 50.8	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0	26 / 66.0
	51 / 129.5	57.2 / 145.3	57.2 / 145.3	57.2 / 145.3	56.8 / 144.3	56.8 / 144.3	56.8 / 144.3	59.9 / 152.2	59.9 / 152.2	59.5 / 151.1	59.5 / 151.1
	177 / 80.3	296 / 134.3	311 / 141.1	367 / 166.5	325 / 147.4	340 / 154.2	395 / 179.2	330 / 149.7	390 / 176.9	360 / 163.3	418 / 189.6
	377 / 171	697 / 316.2	675 / 306.1	710 / 322	726 / 329.3	704 / 319.3	738 / 334.7	748 / 339.2	784 / 355.6	778 / 352.8	812 / 368.3
	462 / 209.5	866 / 392.8	828 / 375.5	858 / 389.1	895 / 406	857 / 388.7	886 / 401.8	925 / 419.5	954 / 432.7	955 / 433.1	982 / 445.4
	528 / 239.5	998 / 452.7	939 / 425.9	963 / 436.8	1,027 / 465.8	968 / 439	991 / 449.5	1,052 / 477.1	1,076 / 488	1,082 / 490.7	1,104 / 500.7
	—	—	—	895 / 405.9	—	—	923 / 418.6	—	997 / 452.2	—	1,025 / 464.9

RB = Round Base SB = Square Base Note: All caster base models are available with stainless steel casters.

(5) Dura-Cyl 120LP is not TC approved.

Laser-Cyl™ High Pressure Liquid Cylinders

Laser-Cyl is designed specifically for laser applications, as a high performance option to expensive high pressure cylinder tanks. The Laser-Cyl delivers optimal pressure up to 500 psig (34.5 bar) and continuous flow rates up to 575 SCFH (15.1 Nm³/hr).

Product Advantages

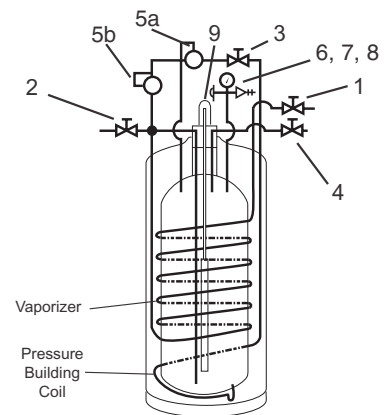
- Durable inner vessel support system (200 VHP only)
- Built-in vaporizer coils supply constant pressure gas at continuous flow rates up to 575 SCFH (15.1 Nm³/hr)
- Piping controls located on top for easy operation and maintenance
- Differential pressure liquid level gauge accurately displays product level (450 only)
- Insulation system provides low NER for longer holding time
- Available in 200 and 450 liter sizes with an optional pallet frame
- 7-year vacuum warranty

Specifications			
MODEL		200	450
	Pressure	VHP	VHP
	Part Number	10619771	10619659
CAPACITY⁽¹⁾			
Liquid (Gross)	(liters)	200	450
Liquid (Net)	(liters)	196	428
Gas (N ₂)	ft ³ / Nm ³	3,521 / 93	7,922 / 208
Gas (O ₂)	ft ³ / Nm ³	4,674 / 123	10,519 / 276
Gas (Ar)	ft ³ / Nm ³	4,552 / 120	10,241 / 269
Gas (CO ₂)	ft ³ / Nm ³	3,537 / 93	7,960 / 209
Gas (N ₂ O)	ft ³ / Nm ³	3,333 / 88	7,516 / 197
PERFORMANCE			
NER (N)	% per day	2.0	2.0
NER (O ₂ - Ar)	% per day	1.4	1.4
NER (CO ₂ - N ₂ O)	% per day	0.5	0.5
Gas Flow (N ₂ , O ₂ , Ar)	SCFH/Nm ³ /hr	350 / 9.2	575 / 15.1
Gas Flow (CO ₂ , N ₂ O)	SCFH/Nm ³ /hr	110 / 2.9	180 / 4.7
DIMENSIONS & PRESSURE RATINGS			
Relief Valve Setting	psig / barg	500 / 34.5	500 / 34.5
DOT/CTC Rating		4L412	4L412
Diameter (cylinder)	in / cm	20 / 50.8	30 / 76.2
Height (cylinder) ⁽²⁾	in / cm	65.8 / 167.1	61.3 / 155.7
Base Width (frame)	in / cm	—	34 / 86.4
Base Depth (frame)	in / cm	—	34 / 86.4
Base Height (frame)	in / cm	—	73.8 / 187.5
Tare Weight ⁽³⁾	lb / kg	375 / 170	1,265 / 574
Full Weight (N ₂)	lb / kg	630 / 286	1,839 / 836
(O ₂)	lb / kg	762 / 346	2,136 / 971
(Ar)	lb / kg	846 / 384	2,324 / 1,056
(CO ₂)	lb / kg	791 / 360	2,202 / 1,001

(1) Net gas capacities at DOT 4L limits.

(2) All dimensions are measured from the floor to the top of the sight gauge protector.

(3) Weights are approximate and vary with pallet design.



Nomenclature

1. Gas Use Valve.
2. Fill / Liquid Valve.
3. Pressure Control Valve.
4. Vent Valve.
- 5a. Pressure Control Regulator.
- 5b. Economizer Regulator
6. Pressure Gauge.
7. Pressure Relief Valve.
8. Rupture Disk.
9. Liquid Level Gauge.

Model: 200

VGL™ Vertical Gas Liquid Cylinders

The VGL™ Series is back. Since its first introduction by Minnesota Valley Engineering (MVE) in 1970, the VGL liquid cylinder built its reputation on reliability and innovation. It was the first liquid cylinder to offer a stainless steel outer jacket, an all-metal shock absorbing footing, and color-coded valve handles. Now, the VGL Series is available with updated components and the latest in field-proven vacuum insulation technology. The most popular models have been streamlined – making them the preferred choice in economical transportable liquid cylinders.

Product Advantages

- Ideal for liquid nitrogen, oxygen, argon, CO₂ or nitrous oxide
- Stainless steel inner and outer cylinder construction
- Thick, dent-resistant outer shell
- Four handling ring supports with large one-inch pipe size ring
- 4" galvanized casters on 230 models
- Integrated pull handle on 230 square base model
- Color-coded valve handles and name tags for easy identification of the plumbing functions
- Roto-Tel™ Liquid Level Gauge System
- 5-year vacuum warranty



Specifications		Footring		Caster Base	
MODEL		180	200	230 RB	230 SB
PBER	Pressure	HP	HP	HP	HP
	Part Number	14880547	14880555	14880563	14880571
CAPACITY ^{(1) (2)}					
Liquid (Gross)	(liters)	196	209	240	240
Liquid (Net)	(liters)	185	196	230	230
Gas (N ₂)	ft ³ / Nm ³	3,864/102	4,072/108	4,734/124	4,734/124
Gas (O ₂)	ft ³ / Nm ³	4,843/127	5,048/133	5,930/156	5,930/156
Gas (Ar)	ft ³ / Nm ³	4,709/124	4,932/130	5,763/151	5,763/151
Gas (CO ₂)	ft ³ / Nm ³	3,766/99	4,011/105	4,614/121	4,614/121
Gas (N ₂ O)	ft ³ / Nm ³	3,574/94	3,810/100	4,378/115	4,378/115
PERFORMANCE ⁽³⁾					
NER (N ₂)	% per day	1.9	1.85	1.8	1.8
NER (O ₂ - Ar)	% per day	1.3	1.2	1.2	1.2
NER (CO ₂ - N ₂ O)	% per day	0.5	0.5	0.5	0.5
Gas Flow (N ₂ , O ₂ , Ar)	SCFH/Nm ³ /hr	350/9.2	400/10.5	400/10.5	400/10.5
Gas Flow (CO ₂)	SCFH/Nm ³ /hr	110/2.9	110/2.9	110/2.9	110/2.9
DIMENSIONS & PRESSURE RATINGS					
Relief Valve Setting	psig / barg	350 / 24	350 / 24	350 / 24	350 / 24
DOT Rating		4L292	4L292	4L292	4L292
Diameter	in / cm	20 / 50.8	20 / 50.8	26 / 66.0	26 / 66.0
Height ⁽⁴⁾	in / cm	64.3/163.3	66.6/169.2	57.2/145.3	56.8/144.3
Tare Weight	lb / kg	288/130	305/138	360/163	393/178
Full Weight (N ₂)	lb / kg	568/257	603/273	703/318	736/333
(O ₂)	lb / kg	689/312	732/332	851/386	884/400
(Ar)	lb / kg	775/351	824/373	956/433	989/448
(CO ₂)	lb / kg	719/326	764/346	888/402	921/417

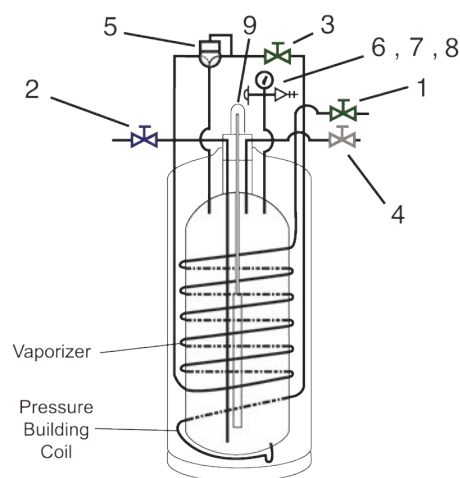
(1) Gas capacities at DOT4L limits. See manual for details.

(2) All VGL models are available with permanently installed CGA fittings for medical applications. Contact Customer Service for details.

(3) Ambient conditions: 68°F/20°C and 50% relative humidity

(4) Dimensions are measured from the floor to the top of the sight gauge protector.

Note: All caster base models are available with galvanized casters. RB = Round Base SB = Square Base
NER=Nominal Evaporation Rate



Nomenclature

1. Gas Use Valve
2. Fill / Liquid Valve
3. Pressure Building Valve
4. Vent Valve
5. Combination Pressure Building Regulator
6. Pressure Gauge
7. Pressure Relief Valve
8. Rupture Disk
9. Liquid Level Gauge

Cryo-Cyl™ Liquid Cylinders

Like the Dura-Cyl models, the Cryo-Cyl™ 80HP liquid cylinder model is designed and built to meet the rugged demands of the liquid cylinder market. However, in contrast, this model is designed specifically for liquid and low to medium gas flow applications. By specifically targeting these applications, we are able to offer this model at an economical value over our premium Dura-Cyl Series.

Product Advantages

- Ideal for liquid nitrogen, oxygen, argon, CO₂ or nitrous oxide
- Stainless steel construction
- Thick, dent-resistant outer shell
- Durable, inner-vessel support system
- Heavy-duty footing and large diameter handling ring with two supports
- Roto-Tel™ Liquid Level Gauge System
- 7-year vacuum warranty



Standard on all of our liquid cylinders are color-coded model labels, protectors and two safety devices.

Protector Color	Pressure
Yellow	LP
Blue	MP
Orange	HP
Red	VHP

Specifications		
MODEL		80 L
	Pressure	HP
	Part Number	10648610
CAPACITY⁽¹⁾⁽²⁾		
Liquid (Gross)	(liters)	85
Liquid (Net)	(liters)	80
Gas (N ₂)	ft ³ / Nm ³	1,680 / 44
Gas (O ₂)	ft ³ / Nm ³	2,108 / 55
Gas (Ar)	ft ³ / Nm ³	2,049 / 54
Gas (CO ₂)	ft ³ / Nm ³	1,640 / 43
Gas (N ₂ O)	ft ³ / Nm ³	1,555 / 41
PERFORMANCE		
NER (N ₂)	% per day	3.0
NER (O ₂ - Ar)	% per day	2.0
NER (CO ₂ - N ₂ O)	% per day	0.8
Gas Flow (N ₂ , O ₂ , Ar) ⁽³⁾	SCFH/Nm ³ /hr	100 / 2.6
Gas Flow (CO ₂ , N ₂ O)	SCFH/Nm ³ /hr	35 / 0.9
DIMENSIONS & PRESSURE RATINGS		
Relief Valve Setting	psig / barg	350 / 24
Operating Pressure ⁽⁴⁾	psig / barg	125 / 8.6
DOT/CTC Rating		4L292
Diameter	in / cm	20 / 50.8
Height ⁽⁵⁾	in / cm	39.5 / 100.3
Tare Weight	lb / kg	165 / 74.8
Full Weight (N ₂)	lb / kg	287 / 130
(O ₂)	lb / kg	340 / 155
(Ar)	lb / kg	377 / 171
(CO ₂)	lb / kg	353 / 161

(1) Net gas capacities at DOT 4L limits.

(2) The Cryo-Cyl model is available with permanently installed CGA fittings for medical applications. Contact Customer Service for details.

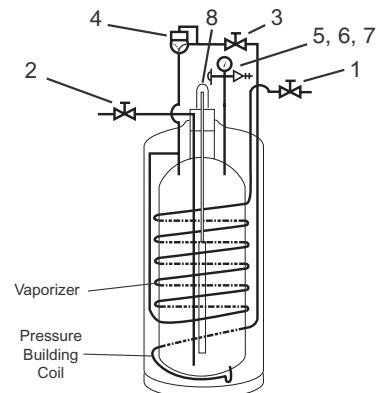
(3) Gas flows of twice the continuous flow rate can be achieved for one hr. over an eight hr. period.

(4) Pressure building regulator range (50-175 psi).

(5) Height dimensions are measured from the floor to the top of the sight gauge protector.

Nomenclature

1. Gas Use/Vent Valve.
2. Fill / Liquid Valve.
3. Pressure Control Valve.
4. Pressure Control Regulator.
5. Pressure Gauge.
6. Pressure Relief Valve.
7. Rupture Disk.
8. Liquid Level Gauge.



Mega-Cyl™ Palletized Liquid Cylinders

The Mega-Cyl series is Chart's line of palletized cylinders designed for easy transport with capacities from 450 to 1000 liters. Engineered with the volume user in mind, it's ideal for construction sites, remote purging operations and back-up systems. Mega-Cyl cylinders are available in all services at 350 psig (24 barg) and are specifically designed to optimize distribution costs.

Product Advantages

- Tough, durable stainless steel construction
- High-performance Super Insulation
- Easily accessible valves and gauges
- Spray header for pump filling on vent tube
- Accurate differential pressure contents gauge (non-electric)
- Galvanized steel pallet frames available for all models
- 7-year vacuum warranty

Mechanical differential pressure gauge standard for contents indication.

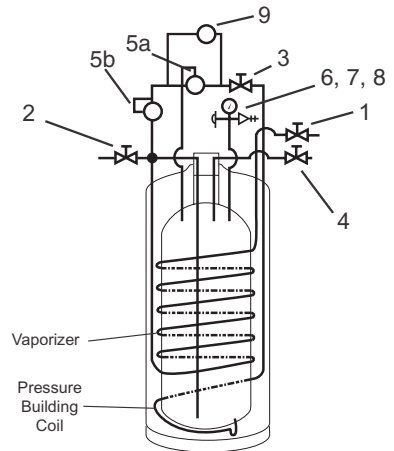


Specifications				
MODEL		450	800	1000
	Pressure	HP	HP	HP
	Part Number	10588979	10671262	10752281
CAPACITY				
Liquid (Gross)	(liters)	450	880	1056
Liquid (Net) ⁽¹⁾	(liters)	428	800	950
Gas (N ₂)	ft ³ / Nm ³	8,875 / 233.2	19,672 / 517	23,363 / 614
Gas (O ₂)	ft ³ / Nm ³	11,111 / 292	24,320 / 639.1	28,843 / 758
Gas (Ar)	ft ³ / Nm ³	10,812 / 284.1	23,767 / 624.6	28,234 / 742
Gas (CO ₂)	ft ³ / Nm ³	8,652 / 227.4	16,255 / 427.2	18,580 / 488.3
PERFORMANCE				
NER (N ₂)	% per day	2.1	1.8	1.3
NER (O ₂ - Ar)	% per day	1.4	1.2	0.9
NER (CO ₂ - N ₂ O)	% per day	0.6	0.5	0.3
Gas Flow (N ₂ , O ₂ , Ar)	SCFH/Nm ³ /hr	575 / 15.1	880 / 23.1	960 / 25.2
Gas Flow (CO ₂)	SCFH/Nm ³ /hr	195 / 5.1	280 / 7.4	300 / 7.9
DIMENSIONS & PRESSURE RATINGS				
Relief Valve Setting	psig / barg	350 / 24	350 / 24	350 / 24
DOT/CTC/ASME Rating		4L292	ASME Sec 8/Div1	ASME Sec 8/Div1
Diameter (cylinder)	in / cm	30 / 76.2	42 / 106.7	42 / 106.7
Height (cylinder)	in / cm	62 / 158	67 / 171	76 / 191
Base Width (frame) ⁽²⁾	in / cm	34 / 86.4	45 / 114	45 / 114
Base Depth (frame) ⁽²⁾	in / cm	34 / 86.4	45 / 114	45 / 114
Height (frame) ⁽²⁾	in / cm	74 / 188	95 / 241	95 / 241
Tare Wt. (cyl + frame) ⁽³⁾	lb / kg	1,275 / 580	2,500 / 1,136	2,650 / 1,205
Full Weight (N ₂)	lb / kg	1,918 / 872	3,926 / 1,784	4,343 / 1,974
(O ₂)	lb / kg	2,195 / 998	4,514 / 2,052	5,038 / 2,290
(Ar)	lb / kg	2,393 / 1,088	4,958 / 2,253	5,569 / 2,532
(CO ₂)	lb / kg	2,265 / 1,029	4,666 / 2,120	5,218 / 2,372

(1) CO₂ values and 450 liter models based on DOT4L fill density. N₂, O₂ and Ar values based on net volume at 0 psig.

(2) Customized pallets are available upon request.

(3) Weights are approximate and vary with pallet design.



Nomenclature

1. Gas Use Valve.
2. Fill / Liquid Valve.
3. Pressure Control Valve.
4. Vent Valve.
- 5a. Pressure Control Regulator.
- 5b. Economizer Regulator
6. Pressure Gauge.
7. Pressure Relief Valve.
8. Rupture Disk.
9. Liquid Level Gauge.

Ultra-Helium Dewar™ Helium Transport

The Ultra-Helium Dewar™ Cryogenic Tanks are designed and built for reliable transport. They are light, maneuverable and durable, while providing superior thermal performance. The unique neck tube design provides proven support during transportation. The outboard caster base provides maximum stability in a compact design.

Available in sizes ranging from 60 to 500 liters. The Ultra Helium Dewars are suitable for air transport (IATA conforming) with the optional absolute pressure relief valve. All models are 100% non-magnetic for Magnetic Resonance Imagery (MRI) service.

Product Advantages

- Maximum durability and lightweight
- Outstanding thermal performance
- Large ball valves for up to 3/4" (19 mm) transfer lines



Specifications					
MODEL		60	100	250	500
	Part Number	10533409	10533417	9923629	11202581
CAPACITY ⁽¹⁾					
Liquid (Gross)	(liters)	66	110	275	550
Liquid (Net)	(liters)	60	100	250	500
PERFORMANCE					
NER ⁽²⁾	% per day	1.75	1.25	1.0	1.0
MAWP	psig / barg	10.0 / 0.7	10.0 / 0.7	10.0 / 0.7	10.0 / 0.7
DIMENSIONS & PRESSURE RATINGS					
Relief Valve Setting	psig / barg	10.0 / 0.7	10.0 / 0.7	10.0 / 0.7	10.0 / 0.7
Secondary Relief Valve	psig / barg	12.0 / 0.8	12.0 / 0.8	12.0 / 0.8	12.0 / 0.8
Diameter	in / cm	26 / 66	26 / 66	32.0 / 81.3	42.0 / 106.7
Height	in / cm	49.5 / 125.7	56.5 / 143.5	67.4 / 171.1	67.25 / 170.8
Dip Tube Length ⁽¹⁾	in / cm	32.5 / 82.6	39.5 / 100.3	54.4 / 138.2	51.5 / 98.1
Tare Weight	lb / kg	184 / 83	212 / 96	348 / 158	470 / 213.2

(1) The dip tube length is measured from the tank flange to the bottom of the inner vessel.

(2) Based on gross capacity.

Contact Customer Service for details.

How We Build the Best Liquid Cylinder

Simply stated, innovation is the foundation of Chart's legendary performance, lowest lifecycle cost, safety, and user-friendliness. Each of Chart's world-leading liquid cylinders has been developed with a commitment to quality, precision engineering and technical excellence.

Dura-Cyl®

Handling Ring

Large diameter heavy-gauge stainless steel rolled ring supported with four brackets for additional strength. Plumbing, gauges and control valves are well protected when exposed to rough handling.

Neck Tube

Our rugged neck tube is a key component to our patented Dura-Series support system design. It is a perfect balance of low heat loss and durability in event of a tip-over.

Outer Shell

Our high-strength high-polish stainless steel outer shell is a full 12-gauge thickness for maximum dent resistance for a longer life quality appearance.

Bottom Support

Another key component to our patented Dura-Series support system. The bottom support not only supports the inner vessel in the event of a tip-over, but this unique design prevents the outer top head from caving if the cylinder is dropped vertically.

Footring

Our footring is made of thick 7-gauge stainless steel and welded 100% to the bottom head. This all metal, boltless design helps absorb vertical shock, promotes cylinder stability and eliminates maintenance over the cylinder's life.

LCCM

The patented Liquid Cylinder Control Manifold (LCCM) reduces plumbing connections by combining the Economizer and Pressure Builder (PB) regulator along with the PB isolation valve. The set pressure can easily be adjusted by hand with the calibrated dome control knob.

Load Ring

The load ring is another key component to our patented Dura-Series support system design. In the event of a tip-over, the shock is distributed from the outer shell to the inner vessel through the load ring. This helps prevent failure of the neck tube and gives protection in all directions.

Vacuum & Insulation

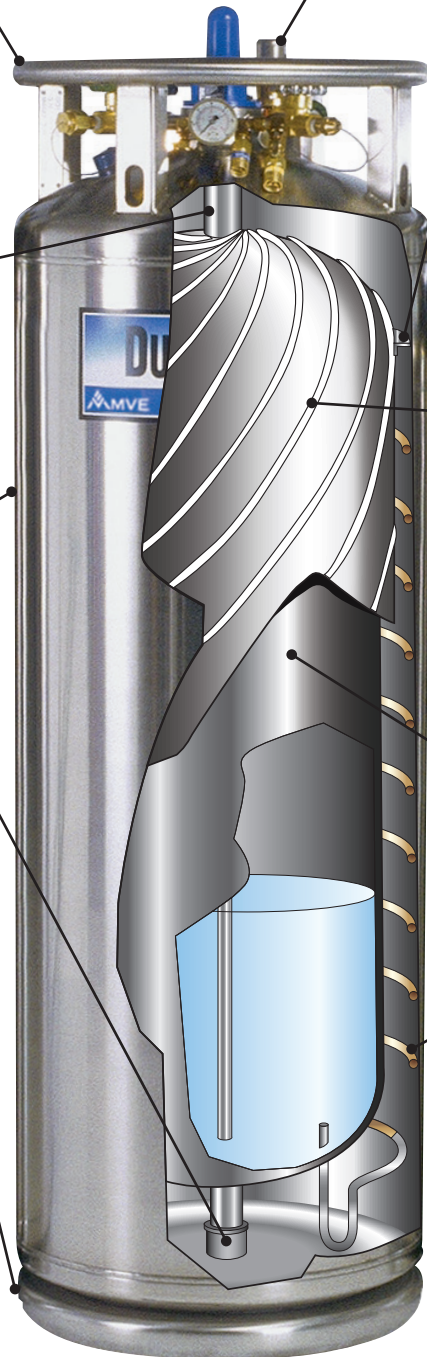
Reducing heat transfer from the inner vessel has always been our top priority. That's why we integrate a proprietary spiral wrap super insulation system with our vacuum maintenance system. This durable proven package will give you years of trouble-free service for maximum NER performance.

Inner Vessel

Every step in design, engineering, fabrication and inspection is directed toward meeting DOT 4L, TC4LM and other pressure vessel codes and specifications.

Vaporizer

We optimize our vaporizer designs with the available area of the outer shell to yield the highest gas withdrawal rates attainable. During the manufacturing process, we solder the copper coils to the inside of the outer shell with custom robotic machines to maximize the solder content and control the bonding strength to achieve our high performance specifications.



Lo-Loss™ Liquid Cylinder Filling System

Lo-Loss™ is an automated filling system that dramatically reduces depressurization (flash) losses during liquid cylinder filling. By maintaining an optimal pressure difference between the bulk tank and liquid cylinder, losses are kept at a minimum without increasing fill times.

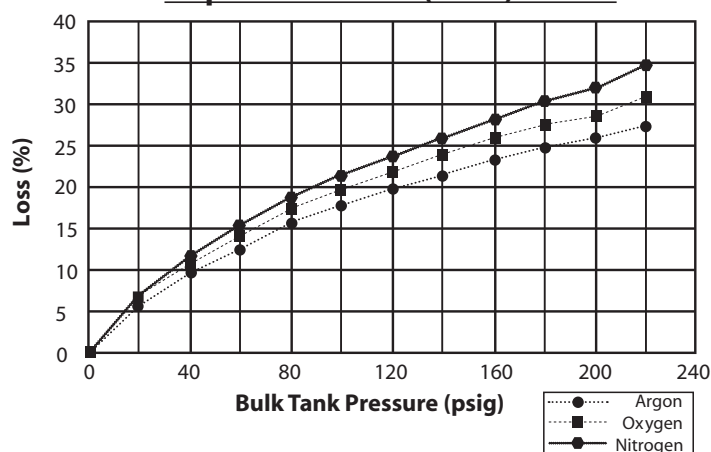
Product Advantages

- Designed for pressure transfer filling in argon, oxygen and nitrogen* service
- Automatic liquid cylinder pressure regulation throughout the fill cycle
- Modular design allows integration into existing systems
- Automatic shutoff improves labor utilization by allowing unattended filling
- Promotes DOT-compliant filling and eliminates wasted product associated with vent filling

* Each product requires a separate pressure control unit



Depressurization (flash) Losses



The Lo-Loss System reduces flash losses during liquid cylinder filling to 3-5% without compromising fill times. For example, flash losses of up to 23%* (1,217 SCF) will occur when filling a 200 liter liquid cylinder in argon service from a bulk tank at 150 psig (see graph). By maintaining the liquid cylinder vent pressure at 30 psig lower than the bulk tank pressure, Lo-Loss reduces flash losses in this example to 3%* (160 SCF).

* An additional 2-4% of product based on gross volume will be lost due to transfer and cool-down losses.

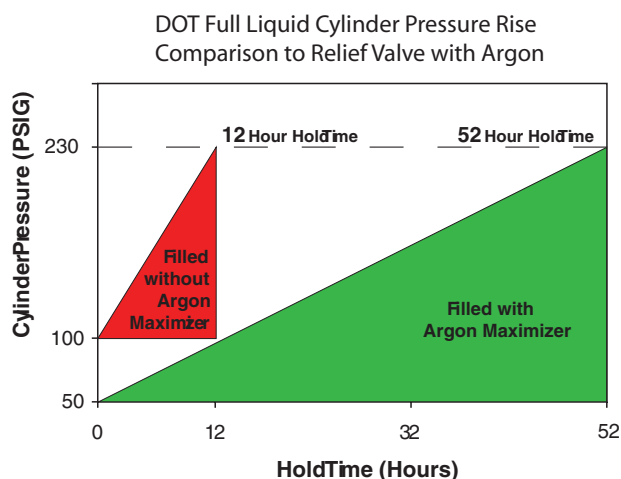
Argon Maximizer™ Liquid Cylinder Automated Filling System

The Argon Maximizer™ is an efficient cryogenic heat exchanger designed to reduce filling losses in argon liquid cylinders. It operates with a simple heat transfer principle that consumes inexpensive liquid nitrogen to subcool the argon during the liquid cylinder filling process. The results are lower liquid cylinder filling losses and colder liquid for longer holding times — giving you better handling logistics at your fill plant and at your customer's site. The Argon Maximizer can also be used with Lo-Loss to further optimize the filling process.

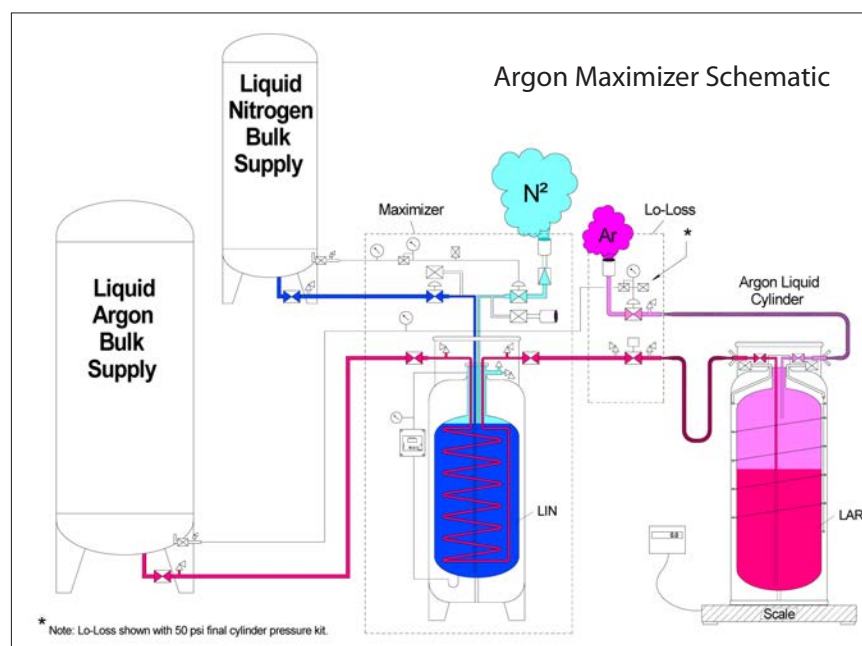
Product Advantages

- Reduce argon liquid cylinder filling costs by as much as 75%*
- Increase customer satisfaction with longer hold times (40 hours on average)
- Reduce liquid cylinder fill time labor by 25%*
- Eliminate just-in-time liquid cylinder filling

* See case study #7, P/N 14661205.



Note: Argon bulk tank saturated at 130 psig, and cylinders filled with the Lo-Loss system.



Pro V8™ Manifold Programmable Liquid Cylinder Manifold System

The Pro V8™ Manifold is a high-performance liquid cylinder solution for a consistent gas supply in permanent or temporary applications requiring delivery pressures up to 450 psig and flow rates up to 2200 SCFH. What makes the Pro V8 manifold unique from other manifolds is that it draws liquid from up to a total of 8 liquid cylinders into an on-board vaporizer for minimum pressure drop in high flow gas applications, like laser assist gas.

The Pro V8 manifold provides a constant gas flow by switching between the reserve and primary bank of liquid cylinders until the main supply is finally exhausted. This design minimizes residual losses as it alternates between the reserve and primary banks until the primary bank can no longer supply the required minimum pressure to the application. This patented feature is driven by a PLC with pressure transducer inputs for high reliability and user-friendliness. The Pro V8 allows for empty cylinders to be switched out with no gas supply downtime and at the user's convenience. Built using a painted steel chassis on large pneumatic casters, the Pro V8 is easily transported and can go anywhere a gas supply is needed – indoors or outdoors. Works with all pressure ranges of liquid cylinders in gas service, providing they are of all the same service pressure.



Product Advantages

- Performance Gas Flow*
 - 1000 SCFH w/3 Liquid Cylinders
 - 2200 SCFH w/3 Liquid Cylinders + 1 Pusher Liquid Cylinder
 - Pressure Drop: 5 psi @ 1000 SCFH, 10 psi @ 2200 SCFH**
- Capacity
 - 6 Liquid Cylinders + 2 Pusher LCs (4 per bank)
 - Compatibility Models: MP, HP or Laser-Cyl™
- Integrated high-performance vaporizer with drip pan keeps a majority of the water off the floor and allows for drainage pipe-away
- Control Panel for easy set up, cylinder type selection (all must be same type) & operator switchover
- PLC and pressure monitoring drives switching between banks, ensuring maximum product usage
- Standard final line regulator with valve manifold
- Optional manually open override solenoid valves
- Optional flex hose kits for vent and liquid cylinder connections include 90 degree style for easy cylinder connection (available for all services)
- Rugged steel compact frame design for easy delivery and set up for temporary applications
- Fits through standard 34" door, straps down easily in standard pickup truck and includes lifting lug for overhead crane
- Large 6" diameter casters for outdoor installations

* Measured at 70°F and 50% relative humidity with nitrogen.

**Measured between liquid cylinder top head and ambient vaporizer output.

ADF105™ Automatic Dewar Filling Station

ADF105 is a manual start, automatic shut off liquid nitrogen dewar filling station for standard (160 – 240 liter) dewars (liquid cylinders). The ADF105 station uses cryogenic sensors to detect a "full" condition. Once full, dual cryogenic valves shut off the fill cycle maintaining the fill pressure inside the liquid cylinder. The liquid cylinder is ready for immediate use.

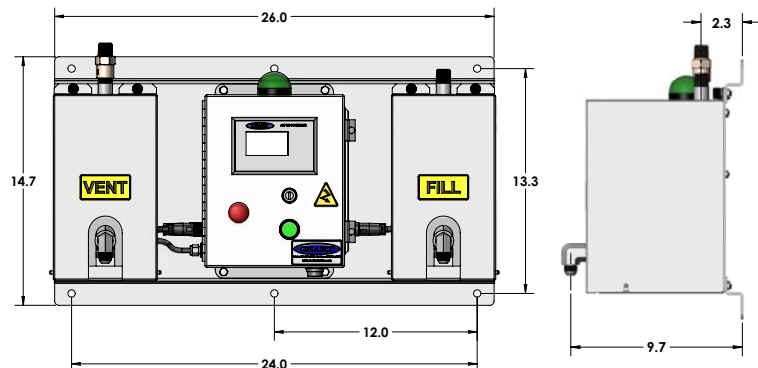
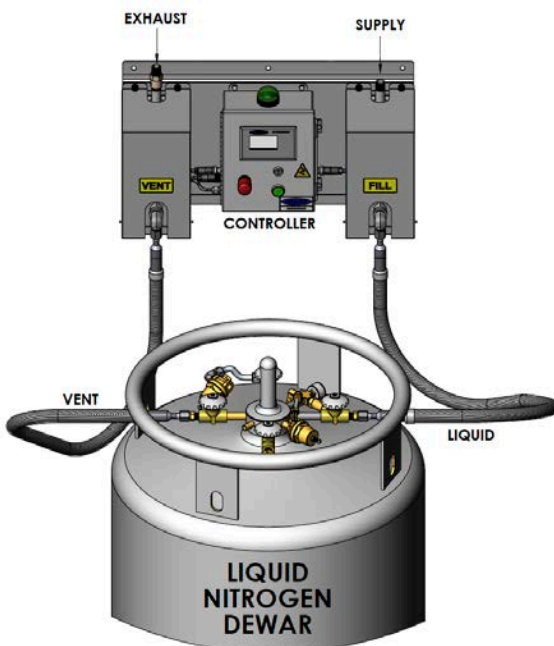
The ADF105 system is suitable for indoor or outdoor installations. It is designed to fill portable low pressure (max 25 psig) liquid nitrogen cylinders from a piping system or bulk tank.

Liquid cylinders transported at less than 25 psig are exempt from filling by weight per the DOT4L code.

Product Advantages

- Eliminate Waste – no more overfilling or loss of product with other filling methods
- Increase Employee Safety – create a safer work environment with max fill shut off timer, vent safety interlock, and security key switch features
- Create Labor Efficiencies – unattended filling eliminates wasted labor and downtime
- Exponential Cost Savings – control your costs with onsite facility resources
- Ideal for customers who want to fill their own liquid cylinder in LN₂ service

Fabrication	Exterior Case: Stainless Steel Electrical Enclosure: Weather Tight
Utilities	Electrical: Single phase 115v/3 amps, Optional 220v/1.5 amps
Certifications	NEMA 4X, CE
Specifications	Weight: 54 lbs (24.49 kg) Dimensions: 26" L x 15" H x 10" D (660.4 x 381 x 254 mm) Min/Max operating pressure: 22-150 psi (1.5-10.3 bar)
Additional Components	Two 4' non-vacuum insulated flex hoses



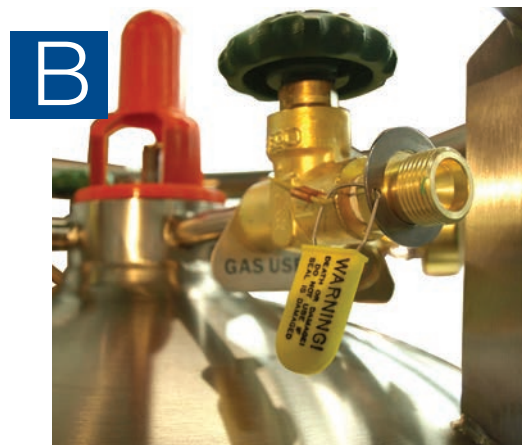
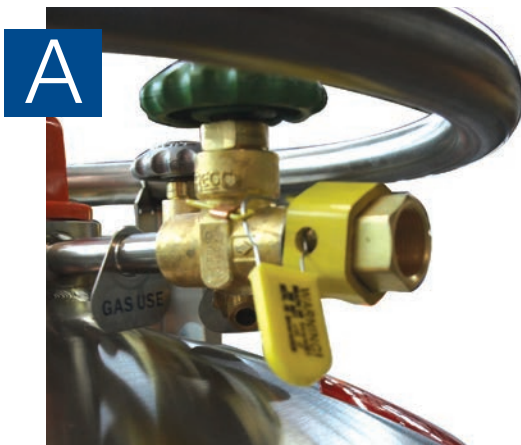
CGA Fitting Restraints For Liquid Cylinders

Maintaining control of product service is of the utmost importance when using liquid cylinders. Chart offers CGA Fitting Restraints that provide a clear visual indication before any attempt is made to remove or change use-fittings. Installing and inspecting these restraints ensures that cylinders are filled with the correct product each and every time. Designs comply with CGA bulletin #SB-26.

WARNING!

DO NOT REMOVE ANY FITTINGS UNLESS CYLINDER IS BEING SERVICED BY AUTHORIZED PERSONNEL. DO NOT USE CYLINDER IF WIRE SEAL IS MISSING, DAMAGED OR HAS BEEN TAMPERED WITH OR IF THERE IS ANY DOUBT AS TO THE CONTENTS CONTAINED IN THIS CYLINDER. FAILURE TO FOLLOW ANY OF THESE INSTRUCTIONS MAY RESULT IN DEATH, SEVERE PERSONAL INJURY AND/OR PROPERTY DAMAGE.

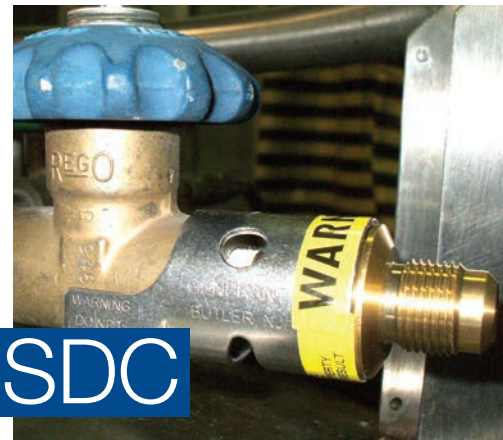
Warning Label (4½" x 3½")
P/N 10998521



Type A & B restraints are standard on all DOT cylinders.



Brazed CGA fitting into valve body



SDC (Single Direction Clutch, GENERANT). Also available with internal check valve.

Options and Accessories engineered to enhance system installations in any application.



The M45 manifold is a convenient, automatic way of increasing the gas delivery rate to any application. The unique change-over valve allows easy manual selection of the primary bank of cylinders. An indicator light shows when the system automatically switches to the reserve bank so replacement cylinders can be ordered.



A variety of handling carts and accessories are available to make the transportation of liquid cylinders safe and easy. They optimize fast and safe deliveries by decreasing back injuries, along with lowering Worker's Compensation costs.



The four-wheeled carriage cart permanently attaches to the lower section of any 20 inch (508 mm) diameter liquid cylinder. The front pull handle is attached to the dual swivel wheels for easy mobility. Rear wheels are stationary so the carriage cart with liquid cylinder can be backed into a tight location. Ideal for lab users with dedicated liquid cylinders.



With dual relief valves one cylinder can be used for both liquid (low pressure) or gas (medium pressure) accounts, which maximizes the flexibility of your liquid cylinders.



Stainless-steel transfer hoses that remain flexible during liquid transfer can be coupled with a bronze phase separator. Ideal for safe discharge of LN_2 into open dewars.



The vent muffler can be attached to the vent connection of the liquid cylinder to reduce the venting noise during the fill. Plastic for inert service and brass for oxygen service.

Liquid Cylinder Repair World Class Facilities

Chart's aftermarket support is world-class, offering installation, repair and OEM replacement parts for every product we manufacture and more. Our repair facilities are integrated with our manufacturing sites so the latest updates in equipment design and manufacturing processes are always built into your repairs. Liquid cylinder repair locations in Ball Ground, GA and McCarran, NV.

Benefits

- Complete cosmetic, revac and rebuild services
- No hassle shipping with pick-up and delivery at your door
- Free freight available
- Cylinder inspection with estimate prior to work
- Component replacement with stock OEM parts
- DOT/TC and ASME coded facility
- Three/Five year vacuum warranty
- Lowest life-cycle cost
- Service on all makes and models
- Guaranteed 100% satisfaction
- Quickest turn-around time in the industry



Eastern Repair Facility – Ball Ground, GA

Beverage, Liquid Cylinder, MicroBulk & Trifecta Repair

Quality service and 100% satisfaction is what you'll get when you have your beverage and liquid cylinders repaired by Chart, the same team that builds them. Our staff is dedicated to repairing your cylinders to the same reliable standards on which they were built.



Western Repair Facility – McCarran, NV

Bulk, Mobiles, Beverage, Liquid Cylinder, MicroBulk & Trifecta Repair

This repair location strategically services our Western region accounts on over 15 acres with 43,000 square feet ready to service all your equipment. This is our newest state-of-the-art facility.



Chart Online Marketing Services

As Chart Inc. continues to provide distributors and customers with the best products and services in the industry, we would like to introduce you to an innovative marketing support tool designed to assist you in growing your business faster! Chart Online Marketing Services is like having your very own 24/7 marketing department providing you the marketing materials needed to drive customers to you. But this is much more than just a site to download product photos, you now have the ability to truly customize brochures, spec sheets and posters with your local contact information and company logo.

3 Easy Steps To Getting Onto Our Website To Order Marketing Materials!



1. Go to <http://literature.chart-ind.com>.
2. Enter your User ID and Password. Click Log In, or click on Sign Up to create an account.
3. Choose a category that you are interested in.



Chart Parts Website

It's Easy to Use! Check out the Benefits

- Personalized account information
- Order history & shipment tracking
- Shopping cart stores your parts before you buy
- Parts available for all makes and models
- 24/7 ordering and order tracking
- Same-day shipment on all stock parts

For All Your Parts Needs...www.chartparts.com

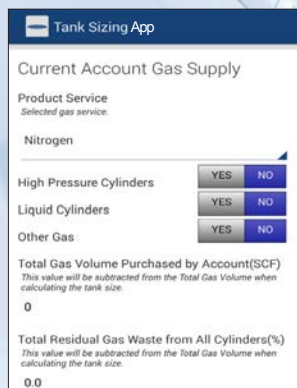


Chart Tank Sizing App

Correctly sizing your cryogenic equipment supply is easy when you know how – or know who to ask. For decades, Chart has helped gas distributors select the optimal cryogenic storage products for their customers. But now, Chart has developed a new **Tank Sizing App** that can advance your mode-change sales process faster and more accurately. No matter the challenge, Chart will provide the tools you need to succeed.

Download the app today for free at your app store and start learning from our experience.

Notes

SCF of GAS / Liter of LIQUID

Pressure psig	Argon	Nitrogen	Oxygen	CO ₂	Pressure psig	Argon	Nitrogen	Oxygen	CO ₂
0	29.69	24.60	30.36		225	23.58	18.35	24.24	20.34
25	28.24	23.17	28.89		250	23.17	17.89	23.83	20.07
50	27.32	22.26	27.97		275	22.77	17.43	23.43	19.82
75	26.60	21.53	27.25	22.40	300	22.37	16.96	23.03	19.58
100	25.98	20.89	26.63	21.96	325	21.98	16.47	22.64	19.34
125	25.43	20.33	26.09	21.57	350	21.43	15.96	22.25	19.11
150	24.93	19.80	25.59	21.23	375	21.19	15.42	21.86	18.88
175	24.46	19.30	25.12	20.91	400	20.79	14.80	21.47	18.66
200	24.01	18.82	24.67	20.61	425	20.39	14.07	21.08	18.44

Gas Densities at Liquid Pressures

ARGON	Weight		Gas		Liquid	
	Pounds (Lb)	Kilograms (Kg)	Cubic Feet (SCF)	Cubic Meters (Nm ³)	Gallons (Gal)	Liters (L)
1 Pound	1.0	0.4536	9.671	0.2543	0.08600	0.3255
1 Kilogram	2.205	1.0	21.32	0.5605	0.18957	0.7176
1 SCF Gas	0.1034	0.04690	1.0	0.02628	0.008893	0.03366
1 Nm ³ Gas	3.933	1.7840	38.04	1.0	0.3382	1.2802
1 Gal Liquid	11.630	5.276	112.5	2.957	1.0	3.785
1 L Liquid	3.072	1.3936	29.71	0.7812	0.2642	1.0

NITROGEN	Pounds (Lb)	Kilograms (Kg)	Cubic Feet (SCF)	Cubic Meters (Nm ³)	Gallons (Gal)	Liters (L)
1 Pound	1.0	0.4536	13.803	0.3627	0.1481	0.5606
1 Kilogram	2.205	1.0	30.42	0.7996	0.3262	1.2349
1 SCF Gas	0.07245	0.03286	1.0	0.02628	0.01074	0.04065
1 Nm ³ Gas	2.757	1.2506	38.04	1.0	0.4080	1.5443
1 Gal Liquid	6.745	3.060	93.11	2.447	1.0	3.785

OXYGEN	Pounds (Lb)	Kilograms (Kg)	Cubic Feet (SCF)	Cubic Meters (Nm ³)	Gallons (Gal)	Liters (L)
1 Pound	1.0	0.4536	12.076	0.3174	0.1050	0.3977
1 Kilogram	2.205	1.0	26.62	0.6998	0.2316	0.8767
1 SCF Gas	0.08281	0.03756	1.0	0.02628	0.008691	0.0329
1 Nm ³ Gas	3.151	1.4291	38.04	1.0	0.3310	1.2528
1 Gal Liquid	9.527	4.322	115.1	3.025	1.0	3.785
1 L Liquid	2.517	1.1417	30.38	0.7983	0.2642	1.0

SCF (Standard Cubic Foot) gas measured at 1 atmosphere and 70°F.

Liquid measured at 1 atmosphere and boiling temperature.

CARBON DIOXIDE	Weight			Gas		Liquid		Solid
	Pounds (Lb)	Tons (T)	Kilograms (Kg)	Cubic Feet (SCF)	Cubic Meters (Nm ³)	Gallons (Gal)	Liters (L)	Cubic Feet (Cu Ft)
1 Pound	1.0	0.0005	0.4536	8.741	0.2294	0.11806	0.4469	0.010246
1 Ton	2000.0	1.0	907.2	17,483.0	458.8	236.1	893.9	20.49
1 Kilogram	2.205	0.0011023	1.0	19.253	0.5058	0.2603	0.9860	0.2260
1 SCF Gas	0.1144	—	0.05189	1.0	0.02628	0.013506	0.05113	0.0011723
1 Nm ³ Gas	4.359	0.002180	1.9772	38.04	1.0	0.5146	1.9480	0.04468
1 Gal Liquid	8.470	0.004235	3.842	74.04	1.9431	1.0	3.785	0.08678
1 L Liquid	2.238	0.0011185	1.0151	19.562	0.5134	0.2642	1.0	0.02293
1 Cu Ft Solid	97.56	0.04880	44.25	852.8	22.38	11.518	43.60	1.0

SCF (Standard Cubic Foot) gas measured at 1 atmosphere and 70°F.
Liquid measured at 21.42 atmospheres and 1.7°F.Nm³ (normal cubic meter) gas measured at 1 atmosphere and 0°C.
All values rounded to nearest 4/5 significant numbers.

Conversion Data



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