



Trifecta® High-Pressure Systems

CONSULTING | SYSTEM DESIGN | INSTALLATION | COMMISSIONING | TRAINING



Trifecta Product Catalog
www.chartindustries.com

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Innovative Design, Technology & Reliability

Chart Inc. is the technology leader in Trifecta design, control systems, data acquisition, complete integrated system solutions, testing services and consulting. Experience from understanding our customer's specifications and the end-use applications has made Chart the industry standard in cryogenic solutions. When you want the best in high-pressure systems, our wide range of products are certain to satisfy your requirements while providing the lowest cost of ownership in the industry.

We offer the following comprehensive solutions to meet your needs:



Engineering Design

Our sales and engineering teams will document your system specifications and propose the most efficient and economical solution that meets the system's performance requirements.



Installation, Startup & Training

Certified technicians provide installation and training to assure long-term trouble-free operation.



Quality Manufacturing

Our experience and ISO 9001 certification ensure that your job is completed to high quality standards and on schedule.



Service & Support

Call us at 1-800-400-4683 with questions, or go to ChartParts.com for 24/7 parts ordering. We're ready to help!

When you choose Chart, you get single-source accountability.

What is a Trifecta® X-Series System?

The Trifecta X-Series is the preferred solution for reliable and continuous laser assist gases for delivery pressures up to 550 psig and flow rates up to 15,000 scfh. Drawing liquid from a standard bulk tank, the Trifecta system boosts the liquid pressure by alternately feeding two liquid cylinders equipped with innovative multi-function pressure building vaporizers. The Trifecta solution has no down-time and minimal losses when compared with other laser assist gas solutions. This convenient solution eliminates high-pressure pumps, compressors, cylinder cradles and surge tanks.



Laser Assist Nitrogen Gas Applications

Four Chart bulk tanks feeding eight Trifecta X15's supply laser assist nitrogen gas to 24 lasers at a combine plant. After our customer investigated every gas supply system on the market for their high-output factory, they ultimately chose Chart's Trifecta X-Series. The gas purity from liquid coupled with the latest technology made Trifecta the clear winner.



Product Highlights

- System utilizes standard low-pressure bulk tank to lower investment and use existing assets
- No downtime – system maintains pressure and flow when bulk tank is filled and eliminates excessive product losses associated with high-pressure bulk tanks
- Cylinders switch by pressure instead of level to further reduce product loss and protect against pressure decay
- Robust design features streamlined all stainless steel piping with only five control valves and one integrated electronic control system (PLC) for increased durability and reliability
- Computer-controlled design simplifies installation, start-up and continuous operation
- Frame assembly features a protective top cover in a compact footprint with an elevated base for improved ventilation
- Available for Oxygen (350 & 500 MAWP), or Nitrogen and Argon service (500 & 600 MAWP)
- Inconel and copper material used where required on high pressure oxygen unit



Visual Indication for Operation Modes



Integrated Bulk Tank Pressure Sensor



Dual Relief Valve Assembly



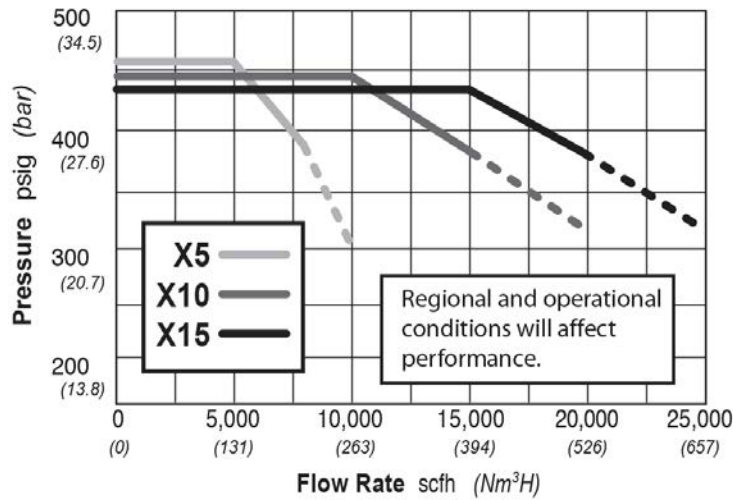
Two Main Connections Simplify Installation

Inert Service

Trifecta X-Series 500 MAWP

Service	MAWP (psig)	MAOP (psig)*	Model		
			X5	X10	X15
LIN	500	450	x	x	x
LAR	500	450	x	x	x

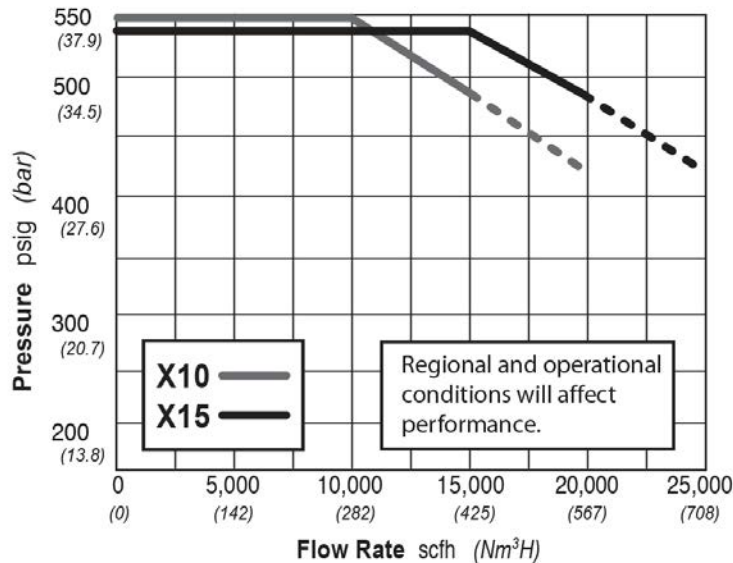
*Maximum Allowable Operating Pressure



Trifecta X-Series 600 MAWP

Service	MAWP (psig)	MAOP (psig)*	Model	
			X10	X15
LIN	600	550	x	x
LAR	600	550	x	x

*Maximum Allowable Operating Pressure



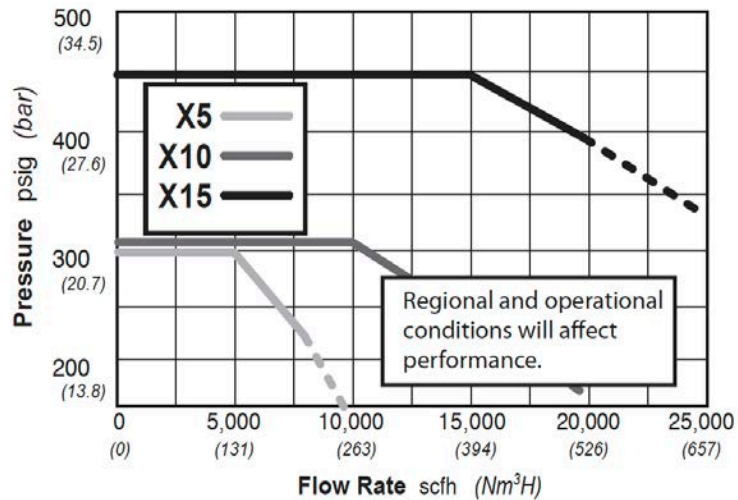
Oxygen Service

Trifecta X-Series 350 & 500 MAWP



Service	MAWP (psig)	MAOP (psig)*	Model		
			X5	X10	X15
LOX	350	300	x	x	x
LOX	500	450			x

*Maximum Allowable Operating Pressure



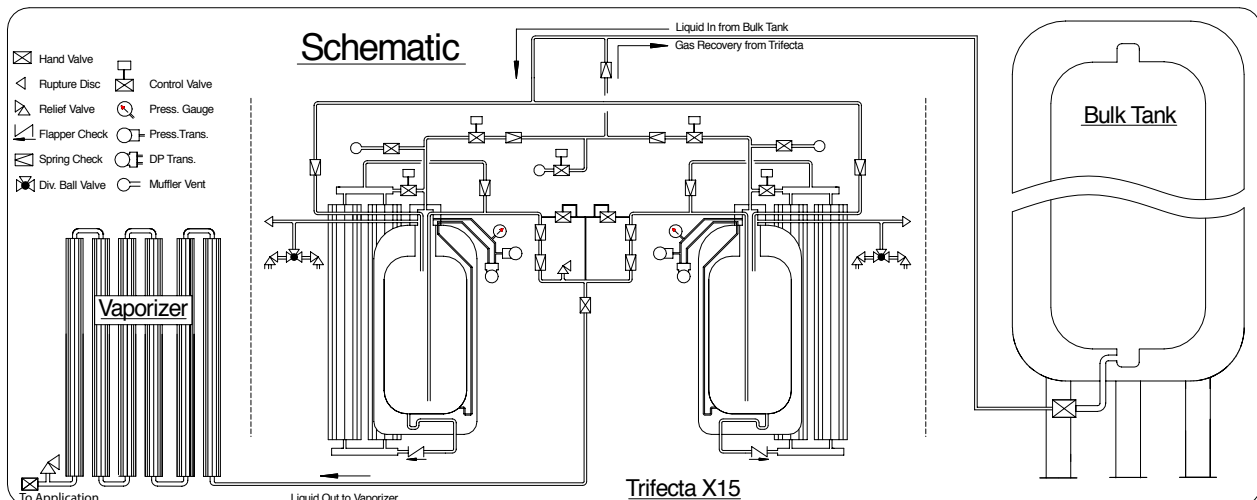
All Models

Dimensions

Length	53"	1347 mm
Width	55"	1400 mm
Height	96"	2440 mm
Weight X5	1700 lbs	770 kg
Weight X10	1750 lbs	795 kg
Weight X15	1800 lbs	815 kg

System Requirements

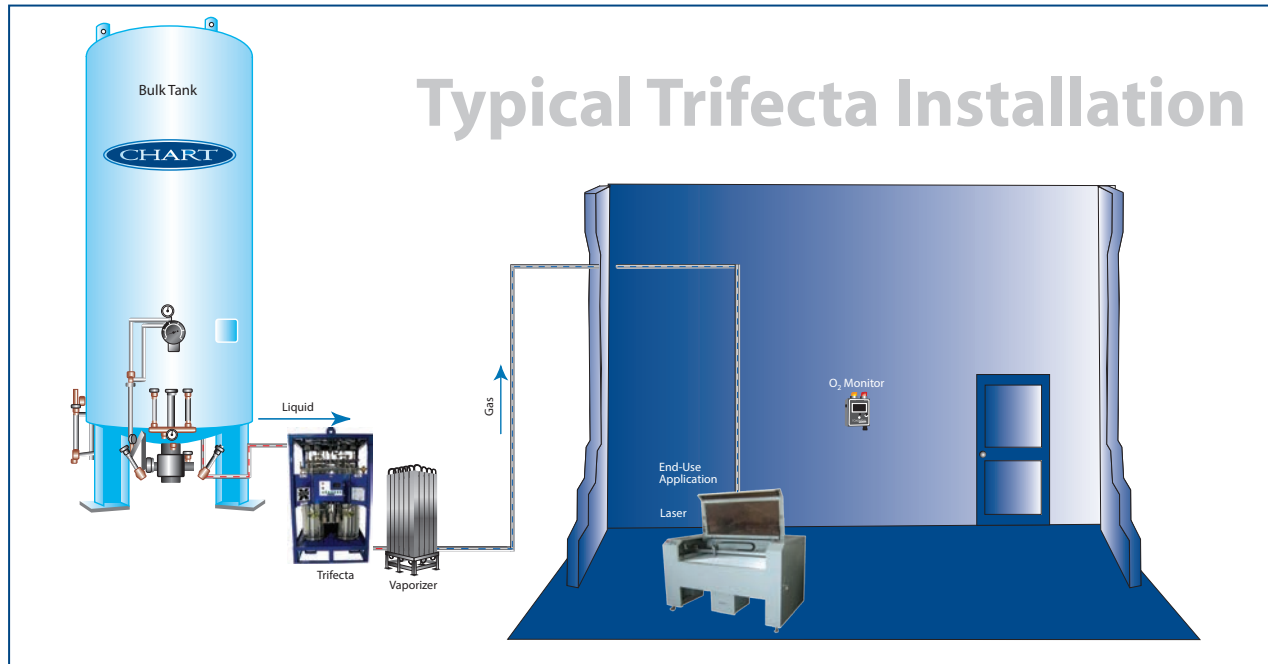
- 15 amp, 110 VAC power, dedicated circuit (230 VAC panel also available)
- Bulk storage tank with 100 psig minimum pressure
- External vaporizer, minimum 600 psig working pressure (700 psig for 600 MAWP), sized for maximum flow rate
- Two piping connections to bulk storage tank (liquid withdrawal)
- High-flow pressure regulation
- Gaseous nitrogen source for pneumatic actuators (600 psig)



Engineered for Efficiency— Built to Last

A Turnkey Approach

Chart works closely with our customers to ensure the total system is designed properly, making the Trifecta system as effective as possible. Our turnkey approach ensures consistent, quality liquid to keep your system operating at peak efficiency. Built for long-term integrity and industry leading design, these systems give customers the highest performance at the lowest operating cost – all while providing a single point of contact for efficient project management.



VS-01 Series Bulk Tank Specifications

Model	Gross Capacity		Nominal Capacity		MAWP*		Diameter		Height		Weight**		NER %/day in O ₂	Flow Capacity***	
	Gal	Liters	Gal	Liters	psig	bar	in	mm	in	mm	lbs.	Kg		SCFH	nm ³ /hr
VS 1500SC	1,640	6,208	1,580	5,981	250	17.2	66	1,676	196	4,978	6,200	2,818	.35	9,000	237
VS 3000SC	3,150	11,924	3,030	11,470	175 250	12.1 17.2	86	2,184	228	5,791	11,100 12,800	4,990 5,806	.25	18,000	473
VS 6000SC	6,010	22,750	5,770	21,842	175 250	12.1 17.2	86	2,184	383	9,728	19,900 21,500	9,026 9,752	.15	18,000	473
VS 9000SC	9,360	35,431	8,990	34,031	175 250	12.1 17.2	114	2,896	348	8,840	29,400 32,300	13,364 14,682	.10	42,000	1,104

* MAWP - Maximum Allowable Working Pressure. 400, 500 psig tanks are available upon request ** Weights are for ASME designs

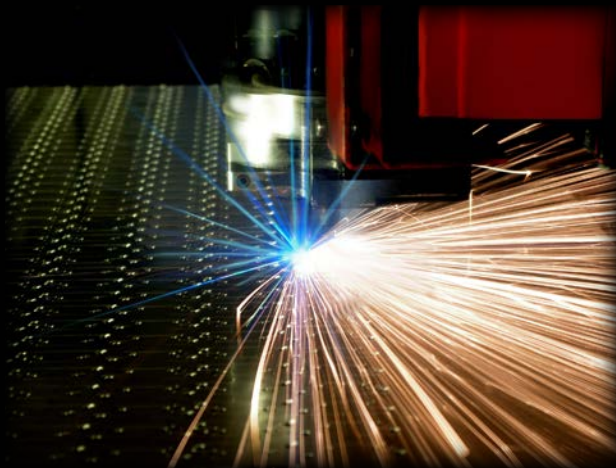
*** Flow capacity rating down to a 20% contents level with a maximum fall of in tank operating pressure of 15 psig (bar). (NER) = Nominal Evaporation Rate

Vaporizer Specifications

Part Number	Trifecta Model	Flow Rate* 8 hours, SCFH, Nitrogen	Vaporizer Manufacturer and Model Number	MAWP (psig)
13132416	Trifecta 5K	7,800	Cryoquip 6030021-1PAU 802FC4.5	600
11939574	Trifecta 10K	11,500	Cryoquip 6030021-1PAU 803FC4.5	600
12991956	Trifecta 15K	19,500	Cryoquip 6030021-1PAU 804FC4.5	600
20753195	Trifecta 15K	19,500	Thermax SG180HF	700**

* For models to meet special requirements including other models for extended operating periods, low pressure drop requirements, etc. – consult Chart. The performance of ambient air vaporizers is subject to many factors. These include flow, duty cycle, ambient temperature, relative humidity, freeze period, altitude, wind, solar radiation, operating pressure and proximity to adjacent structures. Ratings are based on mean ambient conditions of 70°F (21°C) and 70% relative humidity. Special conditions may vary considerably for a particular application, thereby affecting performance.

** Required for 600 MAWP model.



Innovation. Experience. Performance.®

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