FINSEN RITTER
TOWARDS A SAFER TOMMOROW

CRYOGENIC VERTICAL TYPE LIQUID OXYGEN TANK

CLIENT: PADMINI CARE HOSPITAL, CUTTACK

Product: CRYOGENIC VERTICAL TYPE LIQUID OXYGEN TANK

MODEL: CRYOXY10

SCOPE: Design, Supply, Installation and Commissioning of Cryogenic Vertical Type Liquid Oxygen Tank

TABLE OF CONTENT

SCOPE

Description	Model No	Gross Capacity (Ltr)	Net Capacity (Ltr)	MAWP Kg/ Cm2 G
Vacuum+ Perlite Insulated Double walled Cryogenic 10KL Vertical type tank design to ASME SEC VIII, DIV 1 for Medical Oxygen Service	CRYOXY 10	10702	10167	17.00
Low Pressure Ambient vaporizer design to ASME SEC VIII, DIV 1 for 8 hrs Duty Cycle	CV600	600 NM3/HR FLOW RATE		38.00
PRS Skid: Complete Pressure Reducing Skid for 600 NM3/HR Flow rate from tank outlet to vaporizer downstream & upstream of vaporizer to regulator to Battery limited (Double Regulator Skid)				

INTRODUCTION

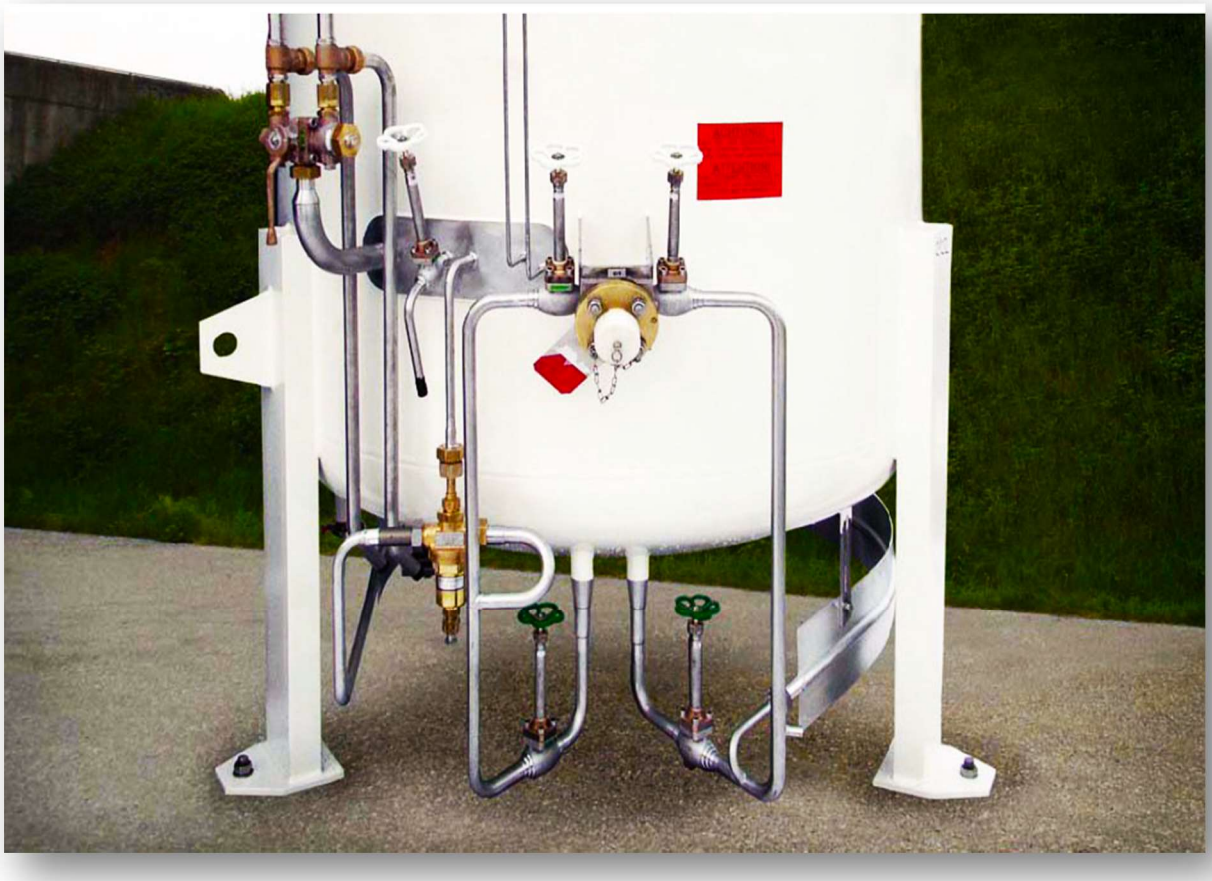
To an increasing extent, industrial gases such as oxygen, nitrogen and argon are delivered to customers in liquid form at cryogenic temperatures and stored by the customer in tanks before further use.The pressure ratings and sizes of these tanks have been standardised in accordance with the requirements of distribution logistics and economical series production.

STANDARD VACUUM INSULATED TANKS

The vacuum-insulated double wall tanks consist of two concentric vessels, an austenitic steel inner tank and an outer jacket in carbon steel with an anti-corrosion primer and a special environmentally friendly top coat. The interspace between inner and outer tank is evacuated and filled with insulating powder (perlite). An adsorbent is also added to maintain the vacuum in the insulation interspace.
The standard tanks come in gross nominal water capacities from 3,160 litre to 61,620 litre. The maximum allowable working pressure for the inner vessels is 18, 22 or 36 bar gauge for design temperatures ranking from -196°C up to 20°C. All standard tanks have vertical configuration, requiring little space for installation.

The operating pressure may be set up to 90 % of the maximum allowable working pressure and is automatically maintained constant by the regulator and pressure building coil fitted to the tank.

Each tank can also be equipped with a tank mounted (clip-on) air-heated vaporiser to supply product in gaseous form at ambient temperatures and flow rates up to 120 Nm3/h. Standard tank features are various fittings for transportation and installation. Vaporisers up to 1,000 Nm3/h are installed separately.



Finsen Ritter Cryogenic Tank Structure

FEATURES

Highly Effective Operation

Two service valves provide an exchange possibility for the filling valves even if the tank is filled. Integrated pressure building coil for standard discharge capacities (service valves see flow diagrams: valve 2 pressure building and valve
13 gas shut-off). The tank also has an optimized design to reduce ice formation.

Safety

In case that the safety valves will release product, the medium will be blown off to a safe place.

Easy operation

All valves required for operation are set in one line.

Ergonomical position of controls and instruments

The tank controls and instruments are set
in two lines.
– Operation line:
Operation controls and instruments
– Service line:
Service controls and instruments
– Weather protection for instruments

The operation controls and instruments can be operated by the user. A white handwheel is fixed on top of this instruments and will be used for filling or extraction.
The service controls and instruments will be used by trained employees of the gas supplier only. These valves are marked with a green handwheel.

Non-corroding transport and lifting devices

Stainless steel transport legs

High Quality Industrial Grade Valves & Pressure Gauges

TECHNICAL DATA SHEET

Tank technical specification -Non-Thermosiphon (Liquid Medical Oxygen)

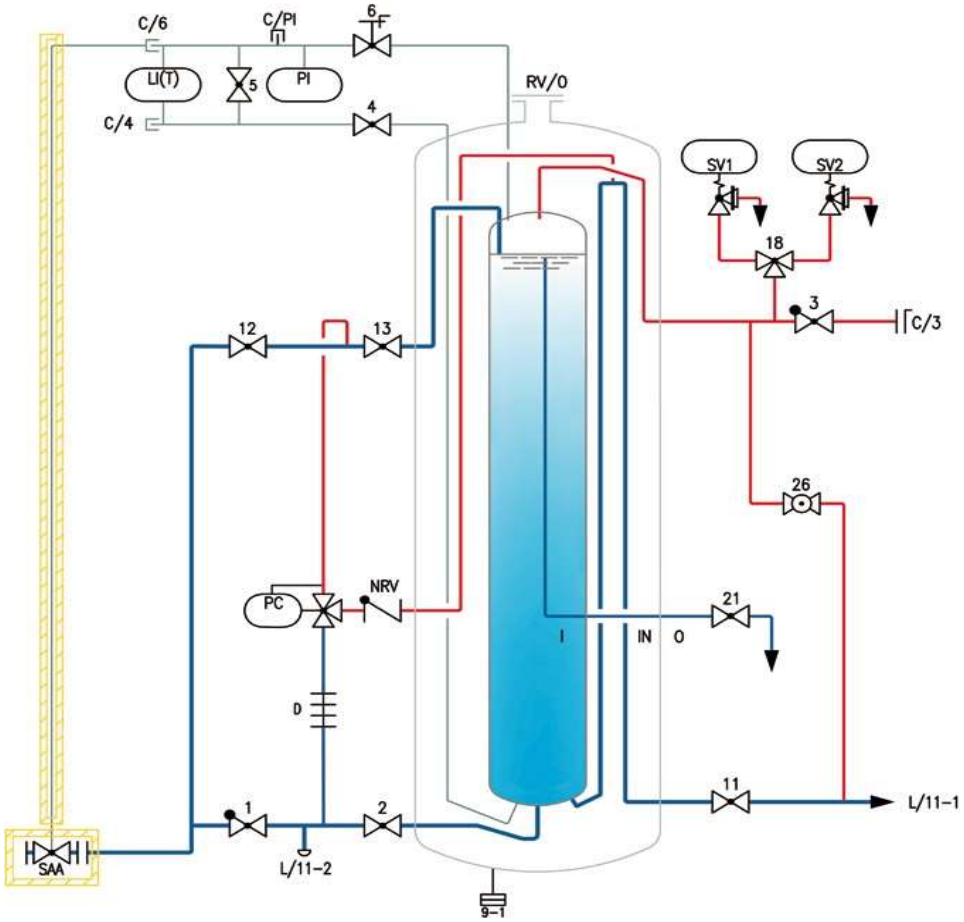
Description	Unit	Model Numbers
Model		CRYOXY10
Gross Liquid Storage Capacity	Liters	10702
Net Liquid Storage Capacity	Liters	10167
INNER VESSEL		
Design Code		ASME SEC VIII DIV 1
Maximum Allowable Working Pressure (MAWP)	Bar	17 Bar
Design Pressure	Bar	19 Bar
Design Temperature	Deg C	19 Bar
Type of Insulation	-	Perlite + Vacuum
Fluid Approved For	-	LIN / LOX / LAR
Material of Tank	-	SA 240 TP 304
Material of Piping	-	SA 312 TP 304 or Equivalent
Inspection By	-	Quality Engineer
OUTER VESSEL		
Design Code	-	ASME SEC VIII DIV 1
Inspection By	-	NF
Material of construction	-	Carbon Steel
SURFACE TREATMENT		
Inner Vessel		Degreased
Outer Vessel		
WEIGHT		
Empty Tank Weight (Approximate) (Kgs) (storage / thermosyphon)	Kgs	5083 / 5408
Product Weight (Approximate) (kgs)		
LIN	kgs	8235
LOX	kgs	11488
LAR	kgs	14132
VALVES	-	Globe Valves - Bestobell / Mack / Rego
		Safety Valve - Herose / Rego / Bestobell
		Level / Pressure Gauge - Hilekar / Wika / Baumer(Waree)

FINSEN RITTER
TOWARDS A SAFER TOMMOROW

Low Pressure Atmospheric Vapouriser Technical Specifications

Sr no.	DESCRIPTION	UNIT	VALUE
1	Model No.	----	CV100
2	Dutty (Normal) *	hrs	8
3	Inlet/Design Temperature	Deg C	-196 TO 65
4	Outlet Temperature	----	10 Deg C Below Ambient Temperature
5	Heating Medium	----	Ambient Air
6	Maximum Operating Pressure	kg/cm^2 (g)	38
7	Design Pressure	kg/cm^2 (g)	40
8	Hydrostatic Test Pressure	kg/cm^2 (g)	44
9	Radiography	----	N/A
10	Cleaning Duty	----	OXYGEN
11	Design & Manufacturing Code	----	ASME SEC.VIII, DIV.1
12	Fin Tube Material	----	SB221A96063T5
13	Overall Dimension (L X W H)	----	1086 X 380 X 2175
14	Inlet Flange Size (DRILLED TO ASME B16.5)	DN	25
15	Outlet Flange Size (DRILLED TO ASME B16.5)	DN	25
16	Empty Weight	kg	105

FLOW DIAGRAM



Instrumentation and equipment, standard

C/1	Fill coupling
C/4, C/6	Connection add. transmitter
C/PI	Test connection pressure indicator
D	Pressure building coil
I	Inner vessel
IN	Insulation
LI	Level indicator
L/11-1	Pipeline discharge
L/11-2	Pipeline discharge (plugged)
L/11-3	Pipeline discharge (plugged)
NRV	Non return valve
O	Outer vessel
PC	Pressure controller
PI	Pressure indicator
RV/O	Relief valve-outer vessel
SV1, SV2	Safety valve

(1) only T ... V110 - T ... V800
(2) only T18 V200 - T18 V800

Valves, standard

1	Filling
2	Pressure building valve
3	Vent valve
4	Bottom gauge (+)
5	Gauge bypass
6	Top gauge (-)
9-1	Evacuation connection
11	Discharge
12	Top filling
13	Gas shut-off
18	Change over
21	Trycock

Options

SAA	Safety shut-off valve, control line for SAA
LI(T)	Level indicator Samson Media 6 incl. instrument panel and standard programming, extra programming of Samson Media 6 acc. to customer requirements
LI(T)	Level indicator WIKA with transmitter output 4 - 20 mA

SPECIAL VAPOURISER DESIGN

The vaporisers are suitable for a design overpressure = max. allowable working pressure (PS) of 40 bar and an allowable operating temperature range (TS) of -269°C/+50°C.
The Finsen Ritter finned tubes and connecting flanges are made of aluminium alloy. Clip-on standard design means the vaporiser without frame. Upon customer request, a mounting kit for installation on a cryo-tank is available.

Vaporiser Type: l 40-8F 2.5

Explanation of type designation:
L = air heated
40 = max. permissible working overpressure: 40 bar
8 F = number of Finned tubes: 8
2.5 = length of single finned tube: 2.5 m

COMPANY PROFILE

We at Finsen Ritter develop and deliver state of the art PSA Oxygen Generation Equipment. We have a team of exemplary people from IITs, IIMs and NITs to deliver the products and services. Our company or products are certified by CE, ISO 9001: 2015, ISO 13485:2016, and ISO 15858:2016. We are working with Grasim industries, Avantha Power, Bangalore international airport limited, Bharat Oman refinery Ltd, Chartered buses, Ramada group of hotels and so on.

Existing Corporate Clients for our other products and services