

HORIZONTAL CRYOGENIC STORAGE TANK

EFHA 24 BAR

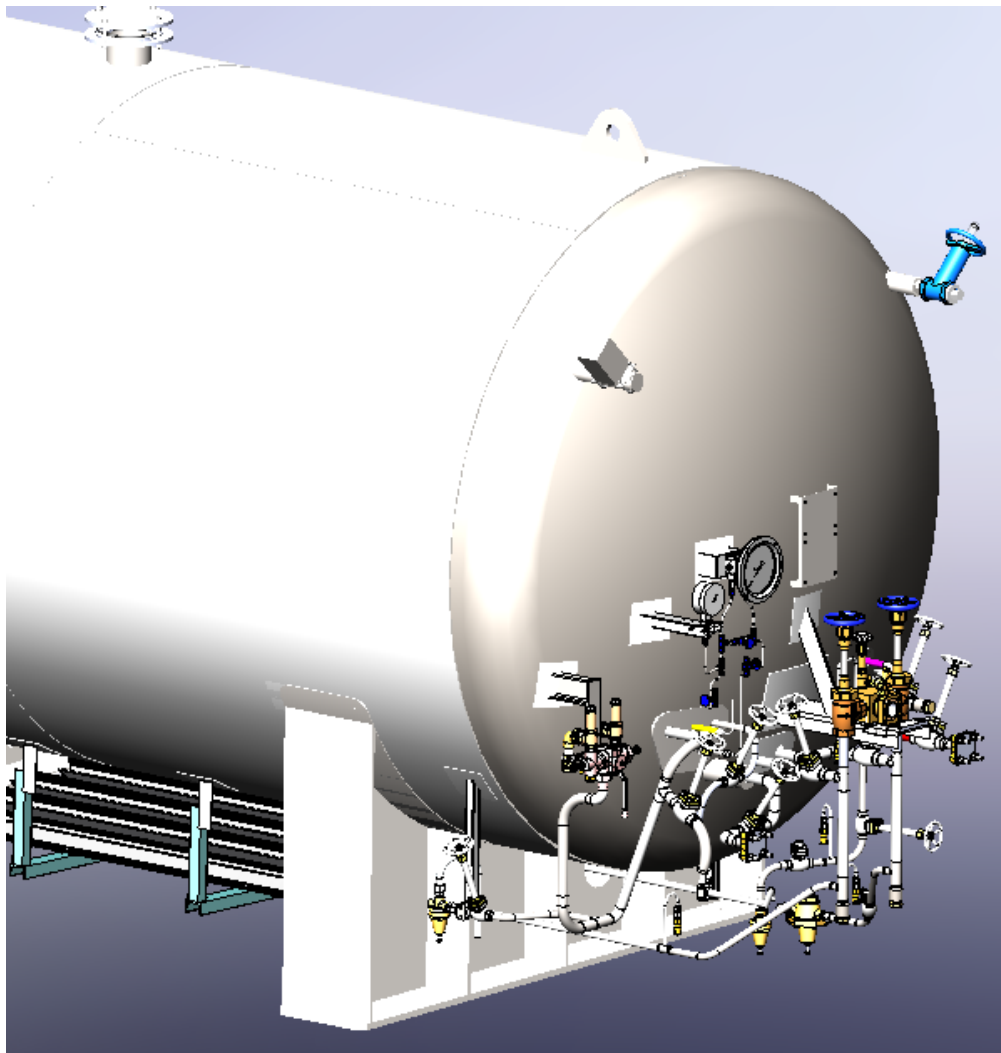


CRYOLOR ASIA PACIFIC introduces the latest generation vacuum insulated cryogenic tank, the **EFHA**, for Liquid Nitrogen, Oxygen or Argon service. Available in a range of sizes with a Maximum Allowable Working Pressure of **350 psig** (\approx 24 bar). **EFHA** is designed in accordance with **ASME Section VIII Division 1 + Mandatory appendix-44 (cold stretch)** with 'U' stamp.

Moreover, the support legs/saddles used in the EFHA range are calculated **to resist high winds and earthquakes according to IBC code Zone 0 to Zone 4.**

- **A maximum use of Stainless steel:** Only EFHA uses as much stainless in its construction to guarantee the lowest life cycle costs.
- **Components selected for their operational reliability** - mono-bloc pressure building economizer - regulator, safety system with dual relief valves and bursting discs as standard, aluminium star fin pressure building unit.
- **Reduced overall operational costs** - optimized pipe work layout with fewer connections minimize potential

leaks and facilitate operation & servicing, filling assembly isolation valves, proven painting techniques guarantee years of problem free operation.

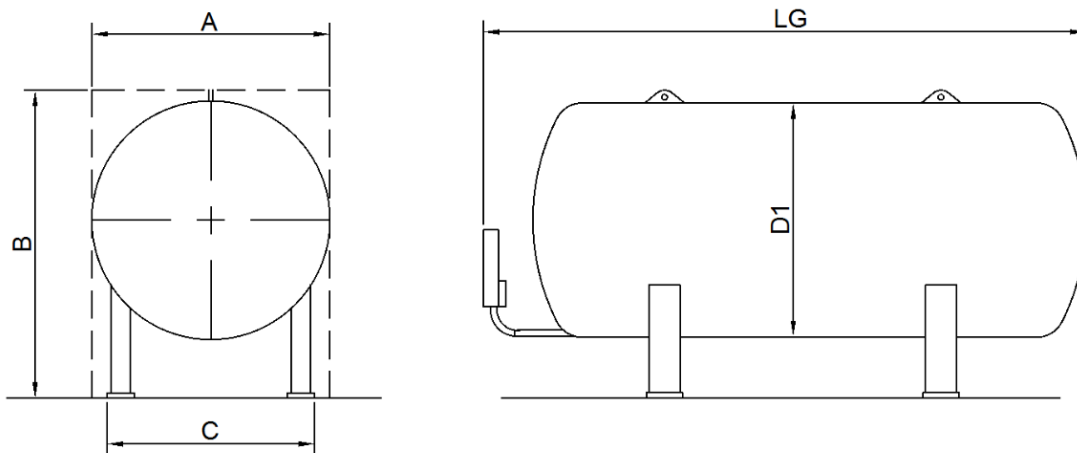
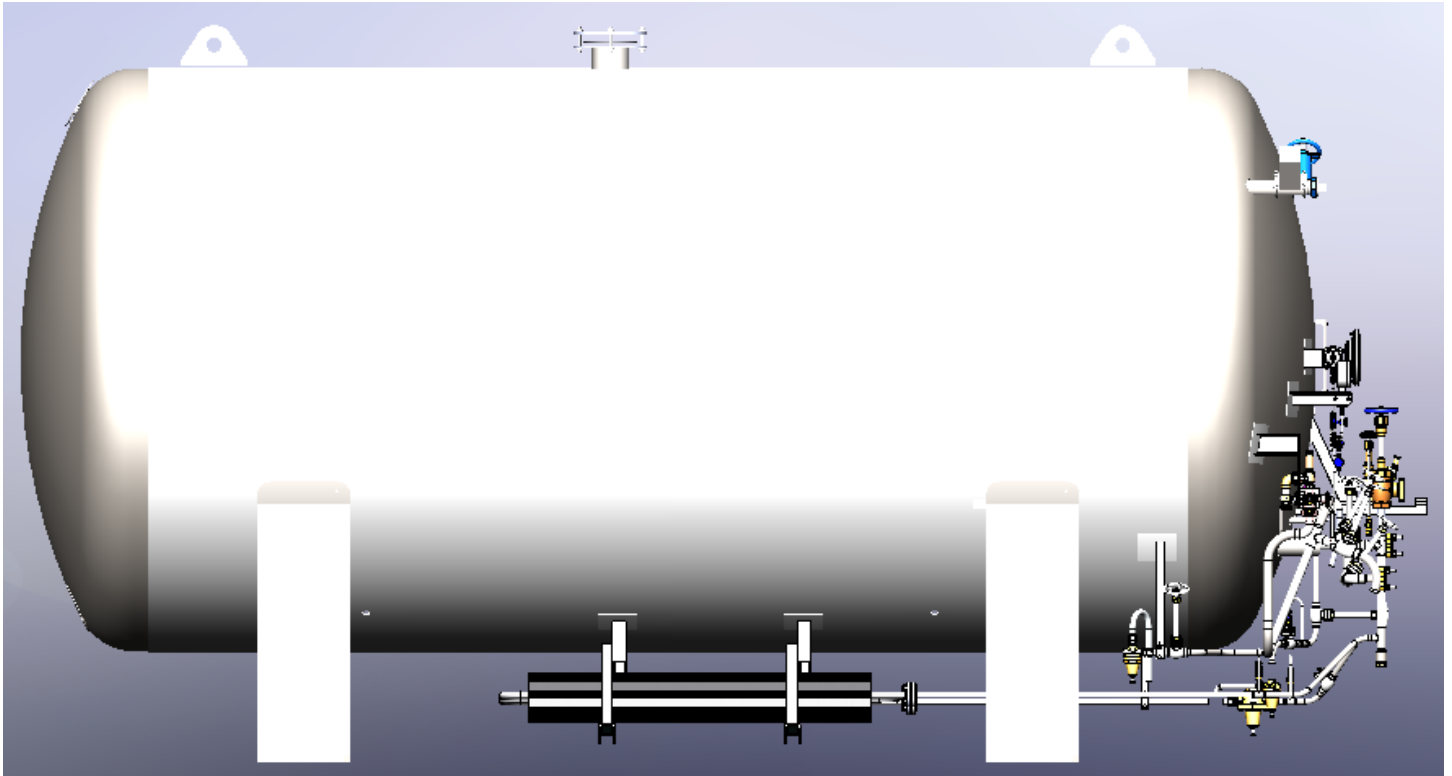


Disclaimer: The image shown above is just a representation of the tank, The actual product may vary on its appearance and size.

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TANK VIEW



Note: The above picture is not an actual view, the tanks will be built with saddles for larger vessels.

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TYPE	EFHAA06 (1.5 KUSG)		EFHA11 (3 KUSG)		EFHA14 (4 KUSG)		EFHA19 (5 KUSG)		EFHA21 (6 KUSG)	
	Gross capacity (liters / USG) *	6150	1625	10540	2784	14910	3939	19290	5096	23660
Net capacity (liters / USG) *	5535	1462	9486	2506	13419	3545	17361	4586	21294	5625
Boil off Rate O2 (%)	0.80		0.46		0.40		0.34		0.32	
Empty weight (kg / lbs)	5200	11464	6800	14991	8400	18519	10000	22046	11700	25794
Weight full Nitrogen (kg / lbs) - LIN	9672	21324	14465	31889	19243	42423	24028	52972	28906	63726
Weight full Oxygen (kg / lbs) - LOX	11515	25387	17624	38853	23711	52274	29809	65717	35996	79359
Weight full Argon (kg / lbs) - LAR	12910	28462	20014	44123	27093	59729	34184	75363	41363	91189
Continuous flow rate For 8 Hours at 16bar (Nm3/hr)	400									
Ø Diameter (mm / feet)	2200 / 7.2									
LG (mm / feet)	4300	14.1	5500	18.0	7100	23.3	8600	28.2	10235	33.6
A (mm / feet)	2300 / 7.5									
B (mm / feet)	2850 / 9.3									
C (mm / feet)	2000 / 6.5									

TYPE	EFHA27 (7.5 KUSG)		EFHA33 (9 KUSG)		EFHA41 (11 KUSG)		EFHA47 (13 KUSG)		EFHA53 (15 KUSG)	
	Gross capacity (liters / USG) *	28040	7407	34340	9072	41300	10910	47530	12556	56270
Net capacity (liters / USG) *	25236	6667	30906	8165	37170	9819	42777	11300	50643	13378
Boil off Rate O2 (%)	0.30		0.27		0.25		0.24		0.24	
Empty weight (kg / lbs)	13200	29101	16500	36376	19000	41888	21100	46518	23700	52250
Weight full Nitrogen (kg / lbs) - LIN	33591	74055	41472	91430	49033	108100	55664	122718	64620	142462
Weight full Oxygen (kg / lbs) - LOX	41994	92582	51764	114120	61411	135388	69909	154122	81484	179641
Weight full Argon (kg / lbs) - LAR	48354	106602	59552	131290	70778	156038	80688	177887	94246	207776
Continuous flow rate For 8 Hours at 16bar (Nm3/hr)	400									
Ø Diameter (mm / feet)	2200 / 7.2		2840 / 9.3							
LG (mm / feet)	10235	33.6	8900	29.2	10400	34.1	11700	38.4	13400	44.0
A (mm / feet)	2300 / 7.5		2840 / 9.3							
B (mm / feet)	2850 / 9.3		3100 / 10.2							
C (mm / feet)	2000 / 6.5		2600 / 8.5							

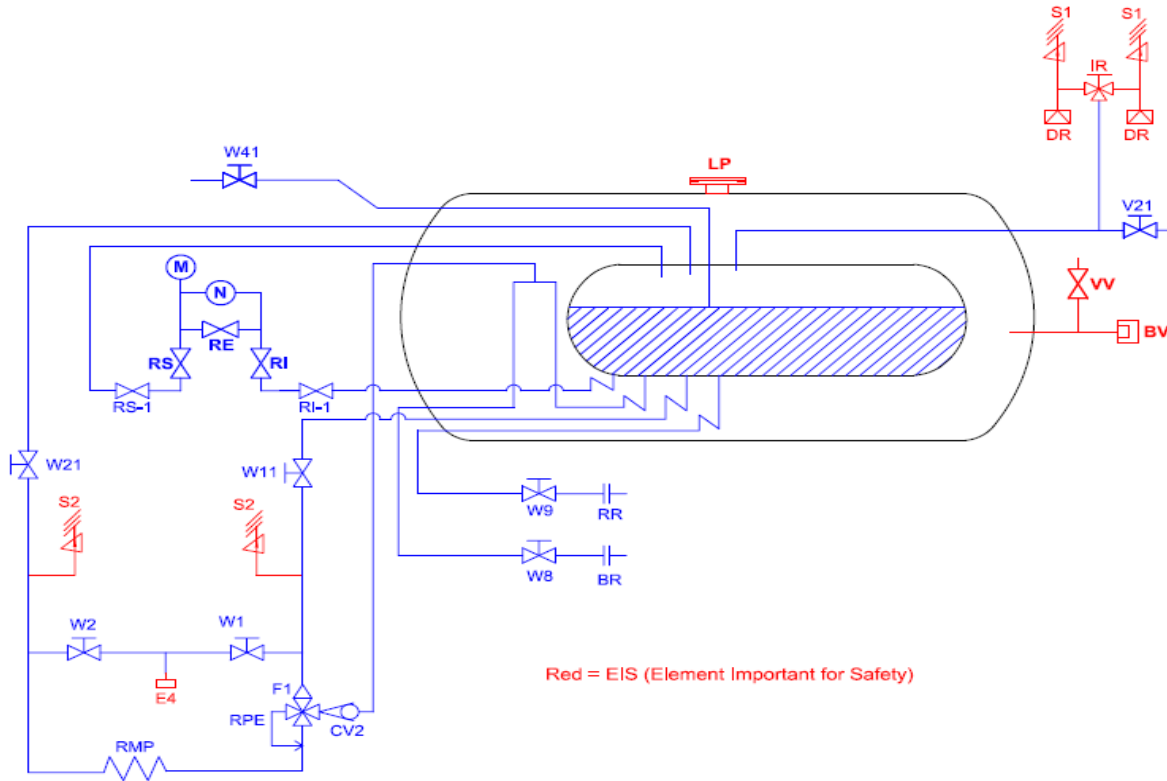
* Manufacturing tolerance : ± 4%

Note: Trycock level is 90%.

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FLOW DIAGRAM



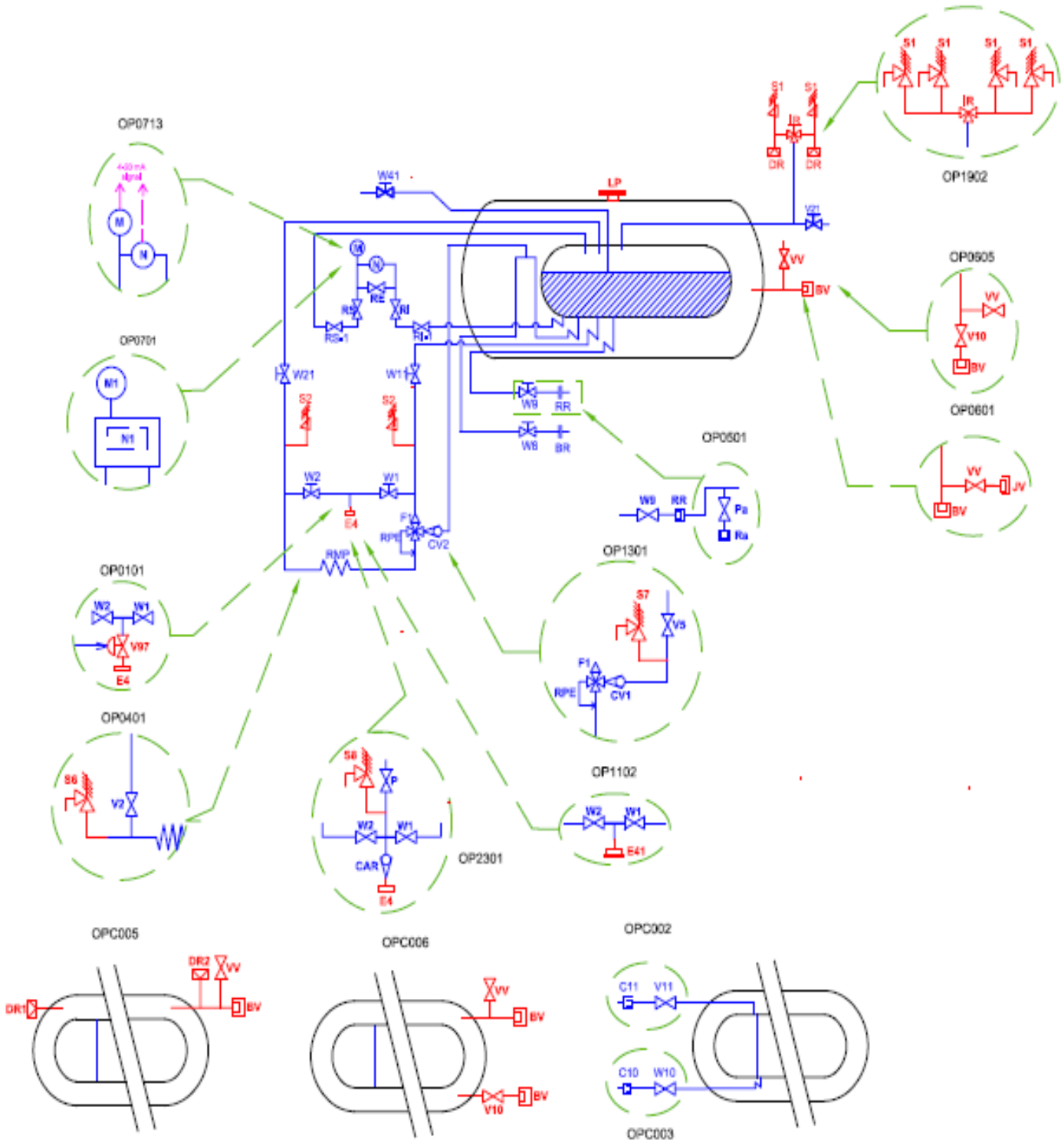
REFERENCE	NOMENCLATURE	SIZE
W1, W11	Bottom Filling Valves	DN 25 < 21 kl Tanks
W2, W21	Top Filling Valves	DN 40 ≥ 21 kl Tanks
S3-S4	Line Safety Valve	1/4"
E4	Filling Connection	DN 40
S1	Inner Vessel Safety Valve	1/2"
DR	Inner Vessel Protection Device	1/2"
IR	3-Way Valve	DN 20
M	Pressure Indicator	-
N	Level Indicator	
RI	Level Gauge Manifold, Liquid	
RE	Level Gauge Manifold, Equalizer	
RS	Level Gauge Manifold, Gas	
W41	Full trycock Valve	DN 15
LP	Lift Plate	As per Cryolor design
BV	Vacuum Connection	-
W8 + BR	Withdrawal Valve - Gas + Connection	DN 25 < 21 kl Tanks
W9 + RR	Withdrawal Valve - Liquid + Connection	DN 40 ≥ 21 kl Tanks
RPE & F	Pressure Regulator / Economizer with Filter	-
CV1	Check Valve	
RMP	Pressure Building Coil	
V21	Vent Valve	DN 25
VV	Vacuum probe isolation valve	-

Note : All operating valves are “Bestobell” make as per standard.

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FLOW DIAGRAM (with options)



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REFERENCE	NOMENCLATURE (OPTIONS)	SIZE
OP0101	Over pressurization protection (To avoid over pressure filling & Ensure vessel safety while filling)	
V97	Over pressurization protection valve	DN 40
C6	MG 97 valve connection	
OP0401	Pressure Building Coil Isolation valve	
S6	Line Safety Valve	1/4"
V2	Pressure Building Coil Isolating Valve	DN 15
OP0501	Liquid Analysis Connection	
Pa	Liquid Analysis Valve	DN 15
Ra	Quick Connection	
OP0601	Annular space vacuum detection / Vacuum sensor / Vacuum measuring probe	
VV	Vacuum Isolation Valve	1/8"
JV	Vacuum Thermocouple Connection	1/8"
OP0605	Vacuum Isolation valve	
V10	Vacuum isolation valve -Edwards Vacuum valve Type SP10K & SP25K	
OP0701	Teleflo Diva	
M1 & N1	Digital Level indicator & Analog Pressure indicator	
OP0713	Wika with Telemetry (4-20mA) option 4-20 mA Telemetry provision with wika gauge	
OP1102	ISO filling connection / Optional adaptor 1 1/2" 300 lbs	
E41	ISO Flange connection for Filling	DN 40
OP1301	Economizer Isolation valve	
V5	Globe Valve With Check	DN 15
S7	Line Safety Valve	1/4"
OP1902	Additional safety relief valves 4 Number of safety relief valves without bursting disc	
OP2301	Filling assembly with Check valve, Check valve & Purge valve	
S8	Line Safety Valve	1/4"
P	Purge Valve	
CAR	Check Valve	
OP5301	Footprint template Footprint drawing available before tank shipment (For foundation work at customer site)	
OPC001	10% Trycock Net capacity of tank with 10% gas phase	
OPC002	Additional Top filling / Gas withdrawal line	
V11	Top filling / Gas withdrawal valve	DN 25 < 21 kl Tanks
C11	Top filling / Gas withdrawal connection	DN 40 ≥ 21 kl Tanks
OPC003	Additional Liquid withdrawal line	
W10	Liquid withdrawal valve	DN 25 < 21 kl Tanks
C10	Liquid withdrawal connection	DN 40 ≥ 21 kl Tanks
OPC005	Rupture disc for Outer vessel safety relief	
DR1 & DR2	Vacuum bursting disc (Instead of lift plate)	
OPC006	Additional vacuum pumping line for vacuum valve	
BV	Vacuum pump down connection	
V10	Vacuum isolation valve -Edwards Vacuum valve Type SP10K & SP25K	

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REFERENCE	NOMENCLATURE (OPTIONS)	SIZE
OPC007	ANSI flange connection on withdrawals	
	ANSI flange connection on withdrawals (Instead of 3 part coupling)	
OPC008	Metal P&ID	
	Metal P&ID instead of Laminated sheet P&ID	
OPC009	Upsizing liquid withdrawal valve (W9) to DN 50 / 2"	
	Liquid withdrawal valve size increased to DN50 / 2" (Valve size DN50, Pipe size DN25/DN40)	
OPC010	Liquid withdrawal line (W9) to DN 50 / 2"	
	Liquid withdrawal line size DN50 / 2" (Both Pipe & Valve)	
OPC012	LAR-CGA connection on Filling cluster	
	CGA-Filling connection for Liquid Argon	
OPC013	LOX-CGA connection on Filling cluster	
	CGA-Filling connection for Liquid Oxygen	
OPC014	LIN-CGA connection on Filling cluster	
	CGA-Filling connection for Liquid Nitrogen	
OPC015	MOM Certificate	
	MOM certificate available	
OPC016	Herose valves (Instead of Bestobell valves)	
	Operating valves are Herose make, instead of Bestobell make	
OPC017	Customer LOGO	
	Customer requirement LOGO fixed on tank.	

Note (*):

- This technical specification is purely an indication, It can't be considered as a contractual document.
- This technical specification is subject to change without prior intimation.