

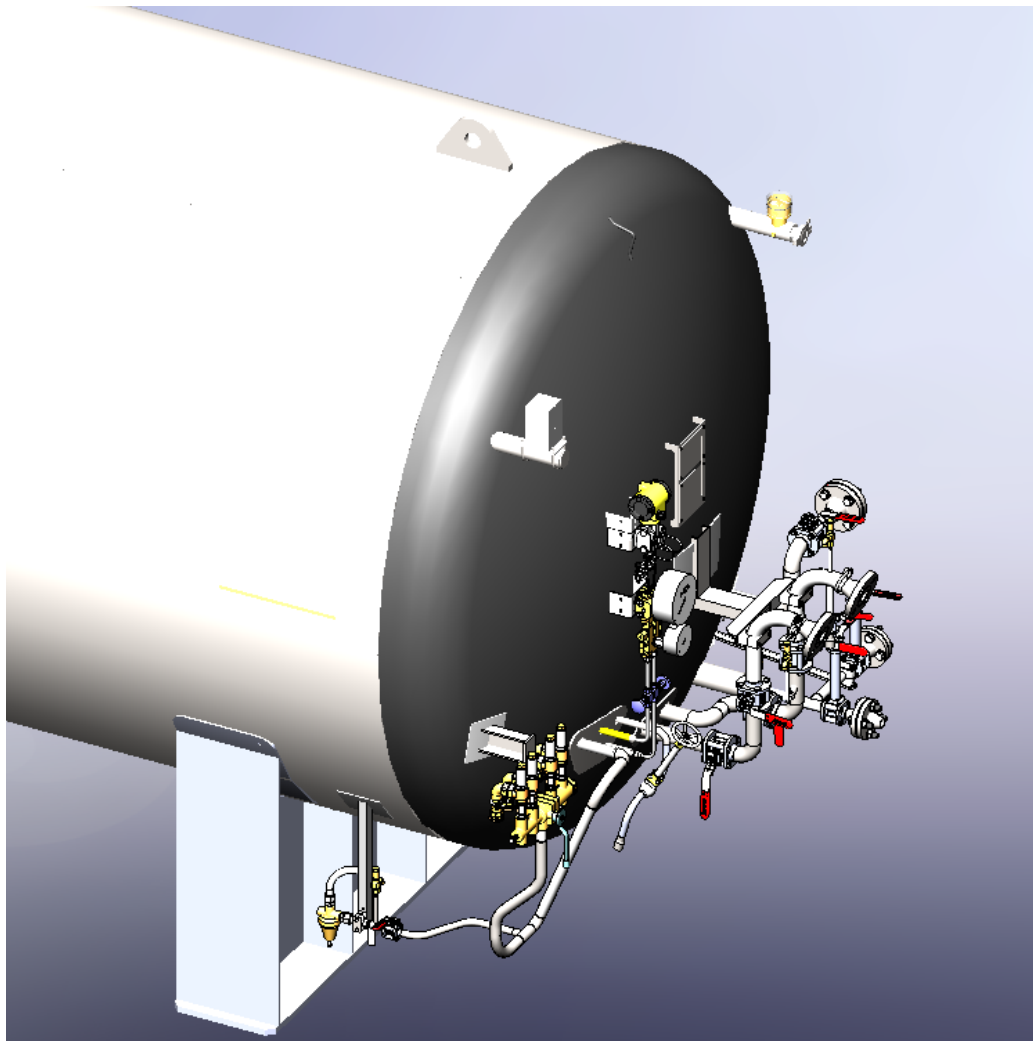
HORIZONTAL CRYOGENIC STORAGE TANK

EFHA 24 BAR - CO₂, N₂O

CRYOLOR ASIA PACIFIC introduces the latest generation vacuum insulated cryogenic tank, the **EFHA** series, for Liquid Carbon dioxide service with **Stainless steel** inner vessel. Available in a range of sizes with a Maximum Allowable Working Pressure of **350 psig** (≈ 24 bar), **EFHA** series is designed in accordance with **ASME Section VIII Division 1 + Mandatory appendix-44 (cold stretch)** with 'U' stamp.

Moreover, the 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** - uses as much stainless steel in its construction to guarantee the lowest life cycle costs - valves, interconnecting piping and all welded connections are stainless steel.
- **Components selected for their operational reliability** - safety system with dual relief valves and back pressure regulator as standard, stainless steel valves.
- **Reduced overall operational costs** - optimized pipework layout with fewer connections minimize potential leaks and facilitate operation & servicing, filling assembly isolation valves as standard, proven painting techniques guarantee years of care-free operation.

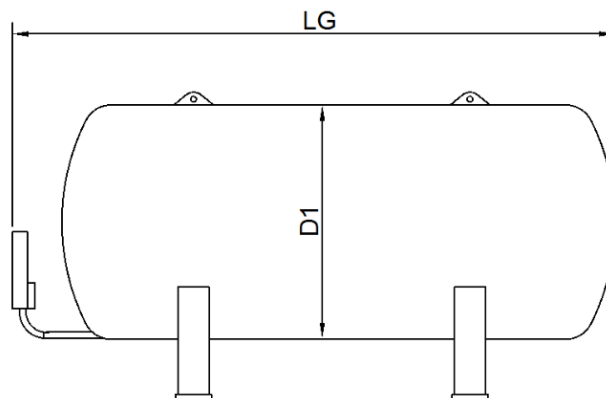
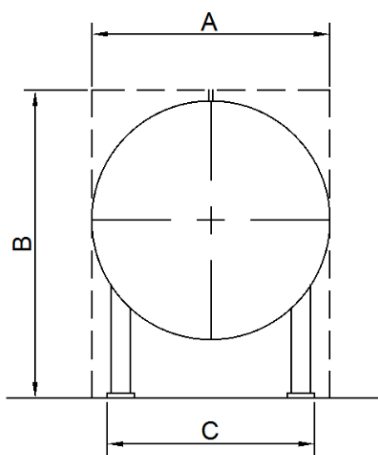


Disclaimer: The image shown above is just a representation of the tank, The actual product may vary on its appearance and size.

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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	EFHA06 (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	6250
Net capacity (liters / USG) *	5658	1495	9697	2562	13717	3624	17747	4688	21767	5750
Boil off Rate CO ₂ (%)	0.2		0.19		0.18		0.17		0.16	
Empty weight (kg / lbs)	5200	11464	6800	14991	8400	18519	10000	22046	11700	25794
Weight full (kg / lbs) - LCO ₂	11882	26196	18252	40239	24600	54234	30959	68253	37407	82468
Weight full (kg / lbs) - LN ₂ O	12312	27144	18989	41863	25643	56532	32308	71226	39061	86116
Continuous flow rate For 8 Hours at 16 bar (Nm ³ /hr)	400									
∅ 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									

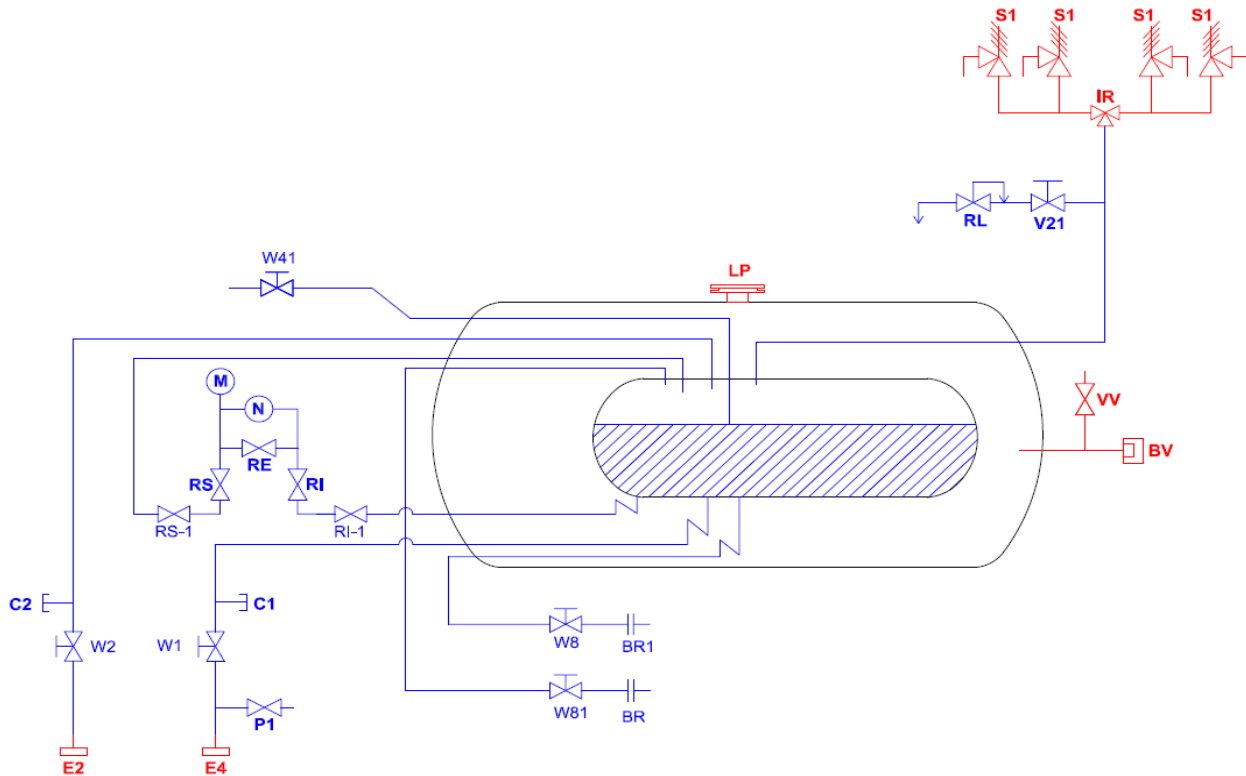
TYPE	EFHA27 (7.5 KUSG)		EFHA33 (9 KUSG)		EFHA41 (11 KUSG)		EFHA47 (13 KUSG)		EFHA53 (15 KUSG)	
Gross capacity (liters / USG) *	28040	7407	34340	9072	41300	10910	47530	12556	56270	14865
Net capacity (liters / USG) *	25797	6815	31593	8346	37996	10037	43728	11552	51768	13676
Boil off Rate CO ₂ (%)	0.15		0.14		0.125		0.1		0.1	
Empty weight (kg / lbs)	13200	29101	16500	36376	19000	41888	21100	46518	23700	52250
Weight full (kg / lbs) - LCO ₂	43666	96267	53811	118633	63873	140816	72742	160369	84838	187037
Weight full (kg / lbs) - LN ₂ O	45627	100589	56212	123927	66761	147183	76066	167696	88773	195711
Continuous flow rate For 8 Hours at 16 bar (Nm ³ /hr)	400									
∅ 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 92%.

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EFHA 24 BAR - CO2, N2O

FLOW DIAGRAM



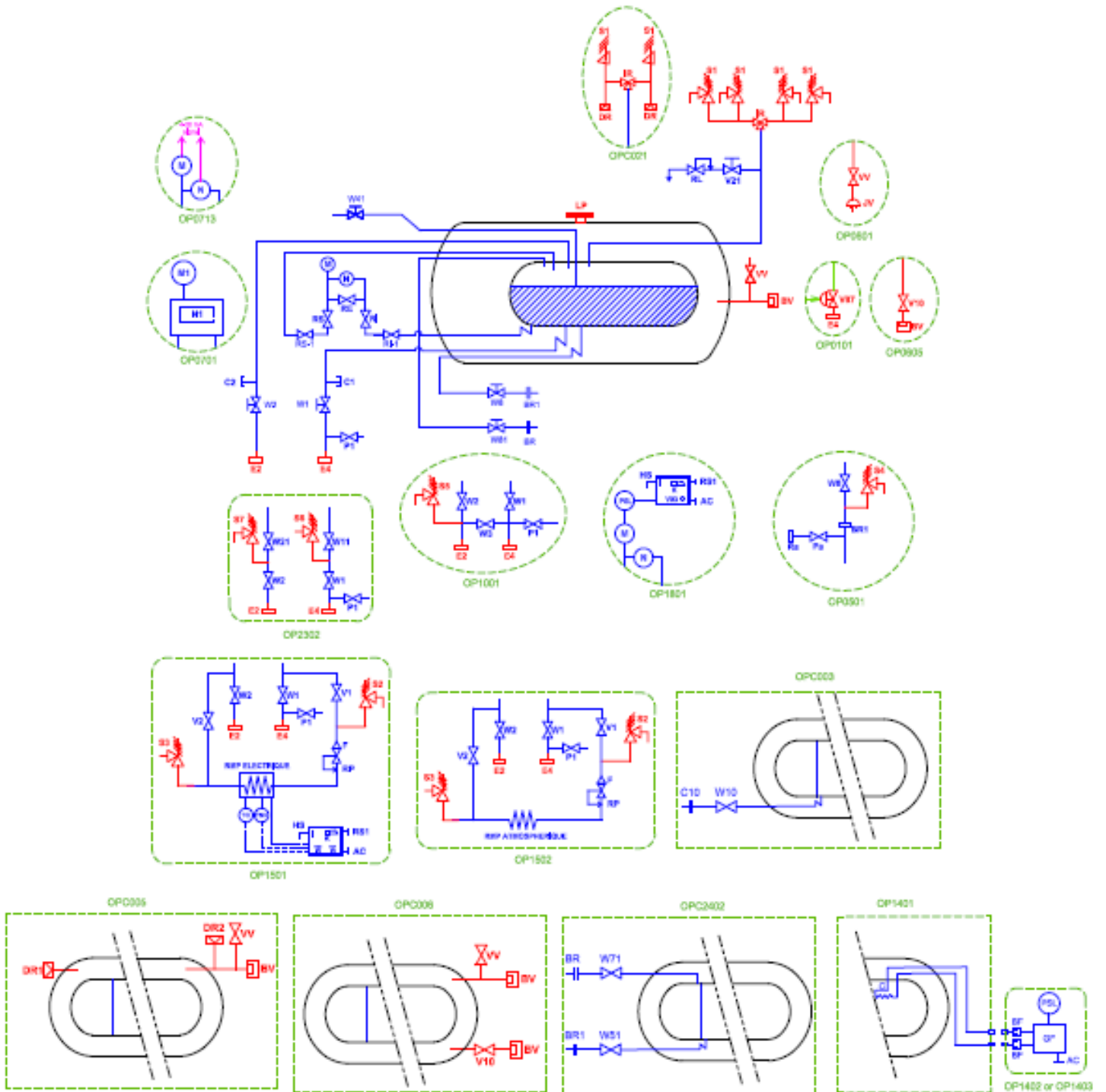
Red = EIS (Element Important for Safety)

REF.	NOMENCLATURE	SIZE	Valve Make	Remarks
W1 / W2	Bottom Filling / Top Filling Valve	DN 40	Meca-Inox*	Ball valve*
E4 / E2	Filling Connection - Liquid / Gas	DN 40	-	ANSI Flange,#300
S1	Inner Vessel Safety Valve	1/2"	Herose	Safety valve
IR	3-Way valve	DN 20	Herose	Ball type
M	Pressure Indicator	-	Wika	712.15.160
N	Level Indicator			
RI	Level Gauge Manifold, Liquid			
RE	Level Gauge Manifold, Equalizer			
RS	Level Gauge Manifold, Gas			
RI-1 & RS-1	Isolation valve	OD 1/4"	Swagelok / Parker	SS-1RS4-SC11 / 4A-V4LR-SS-C3
RL	Back pressure regulator	1/2"	Cash Acme	FRM2 type
V21	Isolation valve	DN 15	Meca-Inox*	Ball valve*
W41	Full trycock Valve	DN 15	Meca-Inox*	Ball valve*
LP	Lift plate	-	Cryolor	-
BV	Vacuum Connection	-	-	-
W8 / BR1	Liquid withdrawal valve + Connection	Below 25 MT : DN 25 Above 25 MT: DN 40	Meca-Inox*	Ball valve* + ANSI Flange connection
W81 / BR	Gas return valve + Connection	DN 25	Meca-Inox*	Ball valve* + ANSI Flange connection
P1	Purge valve	DN 15	Meca-Inox*	Ball valve*
VV	Vacuum probe isolation valve	-	Hoke	4551-F2B-1/8"
C1 & C2	Connection for PBU	DN15	-	Dummy plug welded

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FLOW DIAGRAM (with options)



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REF.	NOMENCLATURE	SIZE	MAKE	REMARKS
OP0101 : OVER PRESSURIZATION PROTECTION				
V97	Over pressurization protection valve	DN40	Herose	-
C6	MG 97 valve connection	1/4"	-	-
OP0501 : LIQUID ANALYSIS CONNECTION				
Pa	Liquid analysis valve	DN15	Meca-Inox*	Ball valve*
Ra	Quick connection	DN15	-	-
OP0601 : ANNULAR SPACE VACUUM DETECTION / VACUUM SENSOR / VACUUM MEASURING PROBE				
JV	Vacuum Thermocouple Connection	1/8"	HASTINGS	DV-6-R
OP0605 : VACUUM ISOLATION VALVE-Edwards				
V10	Vacuum isolation valve	-	Edwards	SP10K & SP25K
OPC045 : VACUUM ISOLATION VALVE - Saunders				
V10	Vacuum isolation valve	-	Saunders	2205-S-11R-E2
OP0701 : TELEFLO DIVA				
-	Digital Level indicator & Analog Pressure indicator	-	-	-
OP0713 : WIKA WITH TELEMETRY (4-20 mA) OPTION				
-	4-20 mA Telemetry provision with wika gauge	-	-	-
OP1001 : EQUALISING / FILLING VALVE				
W3	Equalizing valve between Top & Bottom filling valves	DN 40	Meca-Inox*	Ball valve*
S5	Thermal relief valve	1/4"	Bestobell	-
OP1401 : CONDENSING COIL				
C	Condensing coil placed inside tank to convert gas into liquid	DN 15	-	-
OP1402 : REFRIGERATION UNIT (Countries with ambient temperature < or = 30° C during a long time)				
OP1403 : REFRIGERATION UNIT (Countries with ambient temperature > 30° C during a long time)				
BF	Connection to coil	DN15	-	-
PSL	Pressure switch, increasing pressure shutdown indicator, setting 20 bar	-	-	-
GF	Refrigerating Unit: 250 W	-	-	-
AC	Power source required : 230 V	-	-	-
OP1501 : ELECTRIC PRESSURE RAISING COIL (Continuous flow rate at 16 BAR : 400 Kg/hr) (Not recommended for LN₂O service)				
V1, V2	Isolating valves	DN15	Meca-Inox*	Ball valve*
S2, S3	Thermal relief valve	1/4"	Bestobell	-
F-RP	Filter & Pressure regulator	1/2"	Samson	Type 2357-1
RMP	Pressure raising coil : 2000 W - 400 V AC	DN15	-	-
I	Electrical control box with alarm light & manual general power stop	-	-	-
TC-TSH	Safe & regulation thermostatic units	-	-	-

Note (*):

- For LCO₂ tanks : All operating valves are "Meca-Inox make Ball valves".
- For LN₂O tanks : All operating valves are "Bestobell make Globe valves".
- 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.