RVTA CE LINE 3

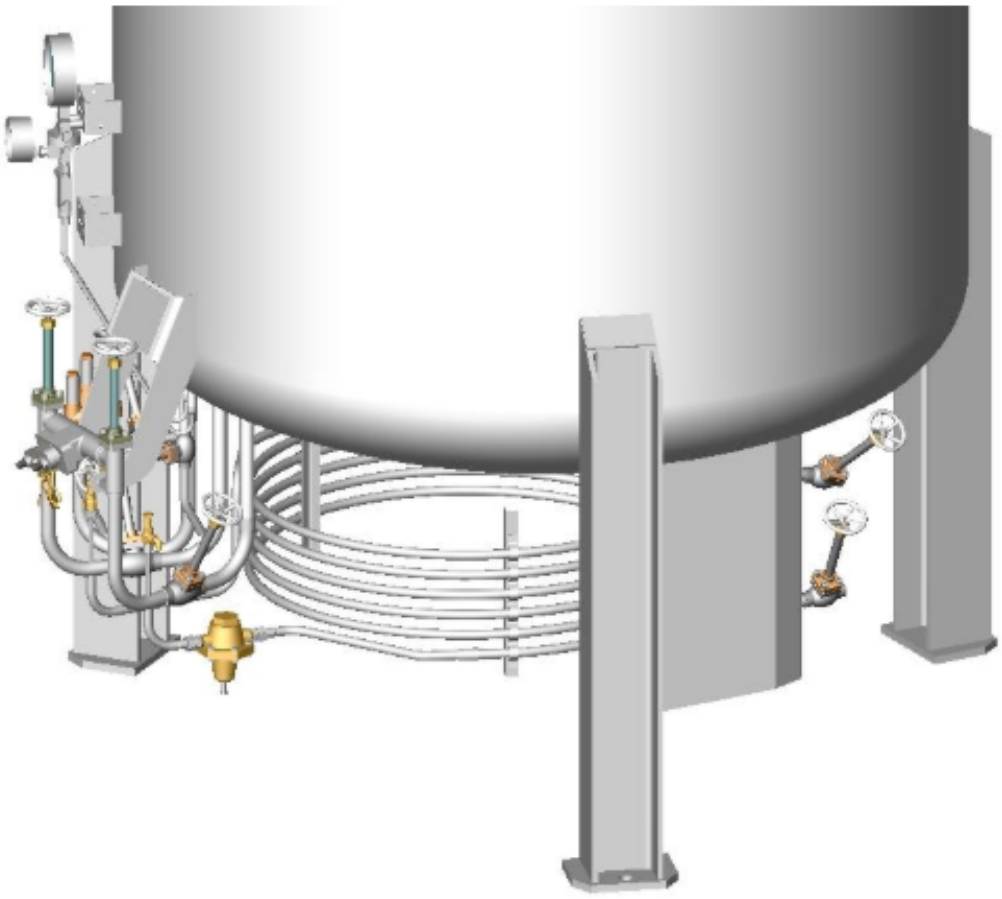
Vertical Thermosiphon Tank

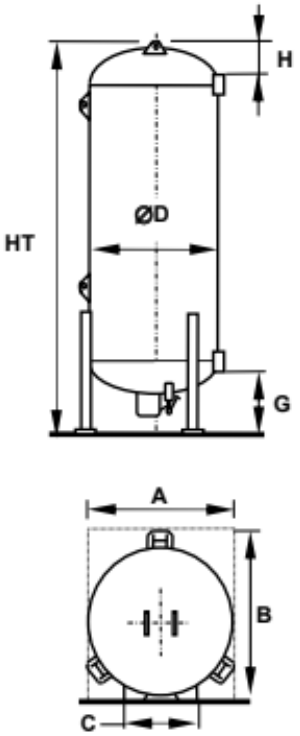
CRYOLOR ASIA PACIFIC introduces the latest generation vacuum insulated cryogenic thermosiphon tank, the **RVTA Céline 3**, for liquid nitrogen, oxygen or argon service and developed in partnership with leading cryogenic pump manufacturers. Specifically for cylinder filling systems, the **RVTA Céline 3** is simply the most efficient, economical pumping solution for cutting costs by reducing product losses and pump maintenance.

Available in a range of sizes with a Maximum Allowable Working Pressure of **250 psig** (≈ 17 bar), **RVTA Céline 3** is designed in accordance with **ASME Section VIII Division 1 + Mandatory appendix-44 (cold stretched vessel) with 'U' stamp**.

Moreover, the support legs used in the Céline 3 range are calculated **to resist high winds and earthquakes (IBC code)**

- **A maximum use of Stainless steel:** Only Céline 3 uses as much stainless in its construction to guarantee the lowest life cycle costs - valves, interconnecting piping, pressure raising coil and all welded connections are stainless steel.
- **Components selected for their operational reliability -** mono-bloc pressure building economizer - regulator, safety system with dual relief valves and burst discs 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, proven painting techniques guarantee years of care-freeP 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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Vertical Thermosiphon Tank

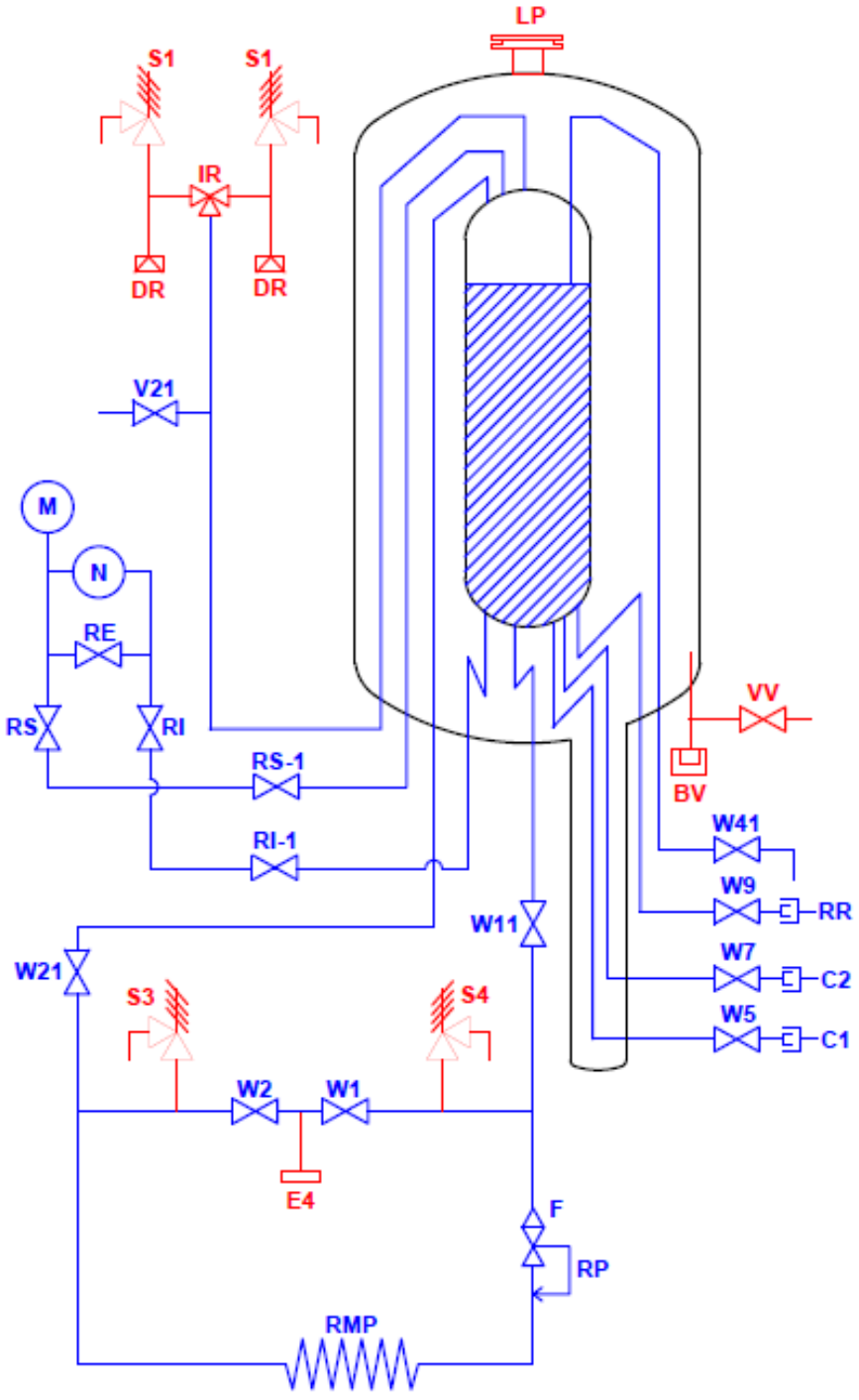
TYPE	RVTA 6 (1.5 KUSG)		RVTA 11 (3 KUSG)		RVTA 14 (4 KUSG)		RVTA 19 (5 KUSG)		RVTA 21 (6 KUSG)		RVTA 27 (7.5 KUSG)	
Gross capacity (liters / USG) *	6150	1625	10540	2784	14910	3939	19290	5096	23660	6250	28040	7407
Net capacity (liters / USG) *	5843	1544	10013	2645	14165	3742	18326	4841	22477	5938	26638	7037
Boil off Rate O2 (%)	0.28		0.26		0.24		0.23		0.22		0.20	
Empty weight (kg / lbs)	4300	9480	5700	12566	7350	16204	8750	19290	10300	22708	11800	26015
Weight full Nitrogen (kg / lbs) - LIN	9021	19888	13791	30403	18795	41437	23557	51935	28461	62747	33324	73466
Weight full Oxygen (kg / lbs) - LOX	10967	24178	17125	37754	23512	51836	29660	65389	35946	79248	42194	93022
Weight full Argon (kg / lbs) - LAR	12439	27424	19648	43317	27082	59705	34278	75570	41610	91735	48907	107821
Continuous flow rate												
For 8 Hours at 8 bar (Nm3/h) - LIN	500		500		500		500		500		500	
For 8 Hours at 8 bar (Nm3/h) - LOX	555		555		555		555		555		555	
For 8 Hours at 8 bar (Nm3/h) - LAR	585		585		585		585		585		585	
⌀ Diameter (mm / feet)	2200 / 7.2											
HT height (mm / feet)	4200	13.8	5200	17.1	7660	25.1	8600	28.2	10235	33.6	11740	38.5
H (mm / feet)	520 / 1.7											
G (mm / feet)	1055 / 3.5											
A (mm / feet)	2300 / 7.5											
B (mm / feet)	2500 / 8.2											
C (mm / feet)	1245 / 4.1											

TYPE	RVTA 33 (9 KUSG)		RVTA 41 (11 KUSG)		RVTA 47 (13 KUSG)		RVTA 53 (15 KUSG)		RVTA 63 (17 KUSG)	
Gross capacity (liters / USG) *	34340	9072	41300	10910	47530	12556	56270	14865	63750	16841
Net capacity (liters / USG) *	32623	8618	39235	10365	45154	11928	53457	14122	60563	15999
Boil off Rate O2 (%)	0.18		0.16		0.15		0.15		0.13	
Empty weight (kg / lbs)	14500	31967	16800	37038	19200	42329	21600	47620	23800	52470
Weight full Nitrogen (kg / lbs) - LIN	40859	90080	48502	106928	55684	122763	64793	142845	72735	160353
Weight full Oxygen (kg / lbs) - LOX	51723	114029	61567	135732	70721	155912	82594	182090	92902	204815
Weight full Argon (kg / lbs) - LAR	59944	132154	71454	157530	82100	180998	96066	211788	108164	238461
Continuous flow rate										
For 8 Hours at 8 bar (Nm3/h) - LIN	1000		1000		1000		1000		1000	
For 8 Hours at 8 bar (Nm3/h) - LOX	1110		1110		1110		1110		1110	
For 8 Hours at 8 bar (Nm3/h) - LAR	1170		1170		1170		1170		1170	
⌀ Diameter (mm / feet)	2840 / 9.3									
HT height (mm / feet)	8850	29.04	10510	34.48	11543	37.87	13510	44.32	15025	49.29
H (mm / feet)	650 / 2.2								3660 / 12	
G (mm / feet)	1100 / 3.6									
A (mm / feet)	3000 / 9.8									
B (mm / feet)	3350 / 11									
C (mm / feet)	1530 / 5									

* Manufacturing tolerance : ± 4% Note: Trycock level is 95%.

The density of LIN / LOX / LAR is 808 / 1141 / 1393 Kg/m3 respectively, and has been considered in the weight calculation.

FLOW DIAGRAM (Standard)

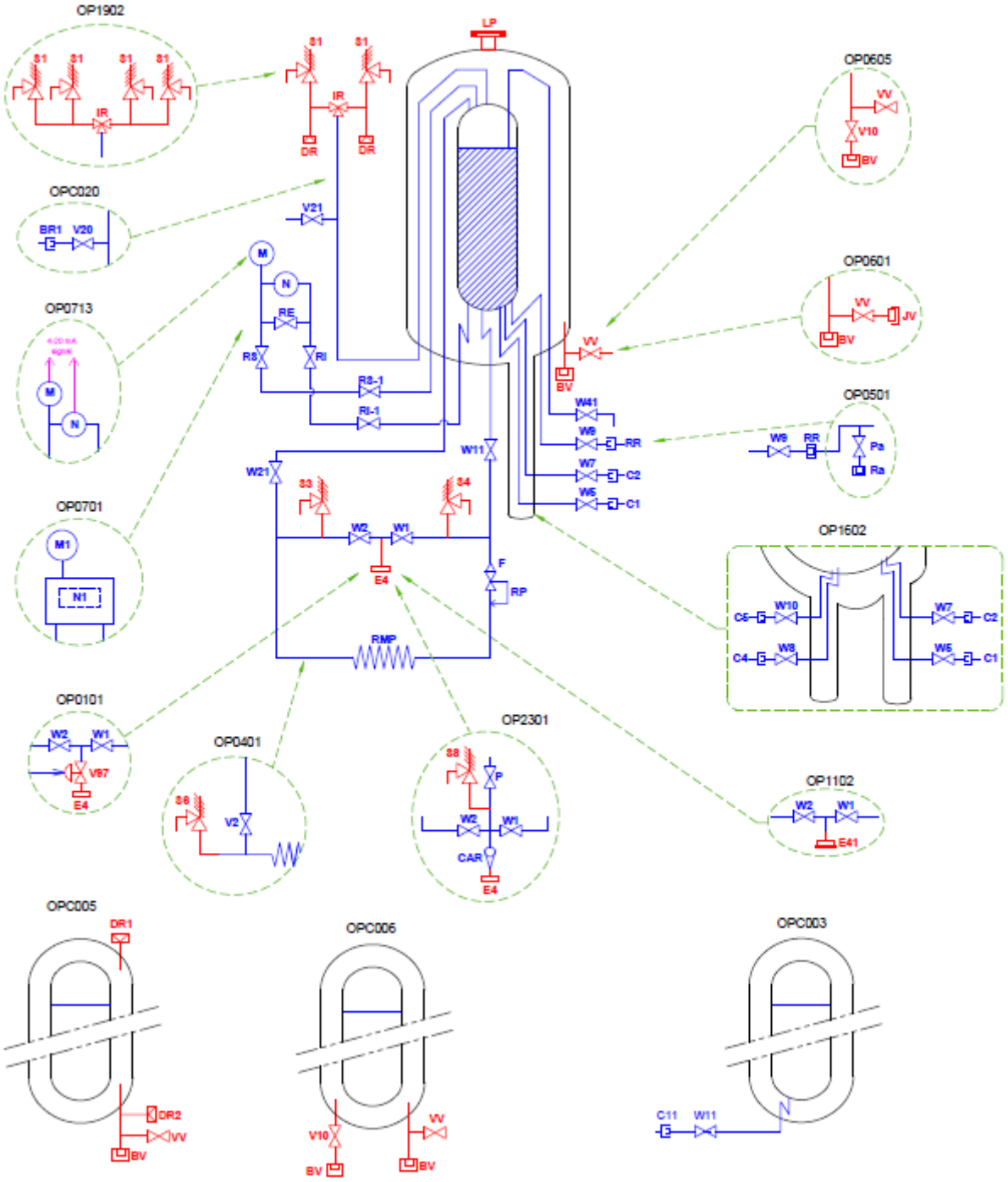


Red = EIS (Element Important for Safety)

REFERENCE	NOMENCLATURE (Standard)	SIZE
W1, W11	Bottom Filling Valves	DN 25 < 21 kl Tanks DN 40 ≥ 21 kl Tanks
W2, W21	Top Filling Valves	
S3-S4	Line Safety Valve	¼"
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	-
W5 +C1	Pump feed valve + Connection	DN 20
W7 + C2	Pump return valve + Connection	DN 20
W9 + RR	Liquid Use Valve + Connection	DN 25 < 21 kl Tanks & DN 40 ≥ 21 kl Tanks
RP+ F	Pressure Regulator with Filter	-
RMP	Pressure Building Coil	
V21	Vent Valve	DN 25
VV	Vacuum probe isolation valve	-
RS-1 & RI-1	Isolation valves for gauges	OD10

Note : All operating valve are "Bestobell" make as per standard.

FLOW DIAGRAM (with Options)



Red = EIS (Element Important for Safety)

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	¼"
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 1½" 300 lbs**	
E41	ISO Flange connection for Filling	DN 40
OP1602	**Double Thermosiphon Tank**	
W8+C48	Pump feed valve + Connection	DN 20
W10+C5	Pump return valve + Connection	DN 20
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	¼"
P	Purge Valve	
CAR	Check Valve	
OP5301	**Footprint template**	
	Foot print drawing available before tank shipment (For foundation work at customer site)	
OPC001	**10% Trycock**	
	Net capacity of tank with 10% gas phase	
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)	

REFERENCE	NOMENCLATURE (OPTIONS)	SIZE
OPC006	**Additional vacuum pumping line for vacuum valve**	
BV	Vacuum pump down connection	
V10	Vacuum isolation valve -Edwards Vacuum valve Type SP10K & P25K	
OPC007	**ANSI flange connection on withdrawals**	
	ASNI 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.	
OPC019	**Spare valves of Thermosiphon**	
	Spare valves of Thermosiphon (2 Nos. of DN20 valve)	
OPC020	**High pressure Gas withdrawal**	
V20	Isolation valve for Gas withdrawal	
BR1	Connection for Gas withdrawal	

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.