

Bulk Liquid Oxygen Tanks – EN ISO 7396-1, HTM 02-01 and HTM2022 EurPh

SPECIFICATION

Bulk Liquid Oxygen Tanks

Bulk Liquid Oxygen tanks are stationary, vacuum-insulated pressure vessels and consist of an inner and an outer pressure vessel. The inner vessel, designed for the storage of low-temperature, liquefied oxygen is manufactured out of cold-stretched material (stainless steel 1.4301). The outer vessel is manufactured out of carbon steel.

The space between the inner and outer vessel is filled with perlite, a grained insulation material and is evacuated up to a pressure of below 100 microns in a warm state (20°C). In addition, a molecular sieve ensures, by means of absorption, the improvement and long-term stability of the vacuum during the operation of the tank.

An automatic regulation system helps maintain the working pressure and minimizes losses in case of lower withdrawal rates (economiser function).

The following features shall be included:

- All piping in stainless steel for strength and improved appearance.
- Pressure-building vaporisers made from aluminium fin tubes.
- Multiple separate penetration plates to avoid ice formation.
- Lifting lugs and foot plates in stainless steel to avoid corrosion.
- Positioning of feet within the diameter of the tank.
- Foot mounting point accessible from outside the tank, to ensure ease of installation.

Testing

The density of the welding seams is subjected to a leak test with helium, which secures long-term durability of the vacuum. Tanks are manufactured and tested according to the European Pressure Equipment Directive 2014/68/EU (PED).

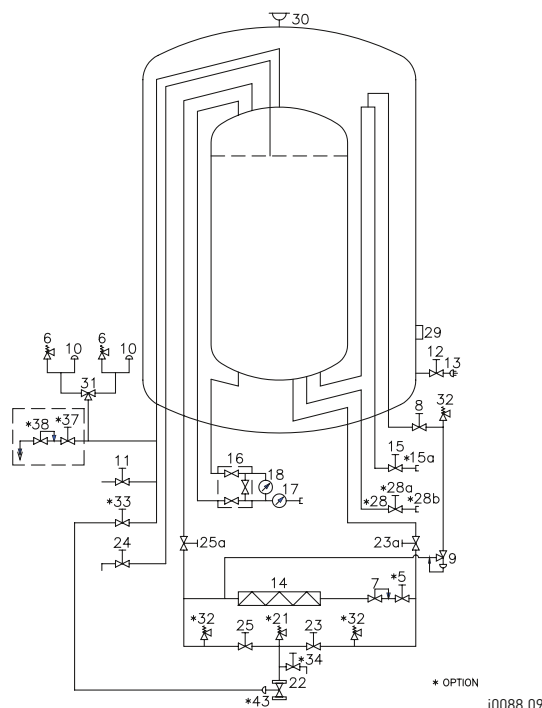
Materials

Outer Vessel	Carbon Steel
Inner Vessel	Stainless Steel
Insulation	Vacuum Perlite
Vessel Cleaned For	Oxygen Application
Coating	Blasted ground (to SA 2 1/2, DIN 559281) Hempadur UNIQ 47743 Hempaxane Classic 55000

CE Marking

The standard range of Bulk Liquid Oxygen Tanks are CE-marked according to PED 2014/68/EU.

Parts Diagram



POS	DESCRIPTION	DETAILS
5 *	Shut-off valve in P-B system (OPTION)	DN20 K
6	Main safety valve	1/2"-1"
7	Pressure building regulator	
8	Shut-off valve in pressure reducing system	DN15 K
9	Pressure reducing regulator (economizer)	
10	Inner tank bursting head	1/2"
11	Vent valve	DN20 L
12	Vacuum probe valve	DN6
13	Vacuum probe	
14	Pressure building vaporizer	
15	Product withdrawal valve	DN25 L
15a*	Screwed coupling of product Withdrawal (OPTION)	
16	Three valve manifold	DN3
17	Pressure gauge	
18	Liquid level indicator	
21*	Section safety valve (OPTION)	1/4"
22	Fill connection	DN40
23	Liquid phase fill valve	DN25 L
23a	Liquid phase service valve	DN25 L
24	Over flow valve	DN15 L
25	Gas phase fill valve	DN25 L
25a	Gas phase service valve	DN25 L
28*	Additional liquid Withdrawal line (OPTION)	
28a*	Valve at add. liquid Withdrawal line (OPTION)	DN25 L
28b*	Screwed coupling of add. liquid Withdrawal (OPTION)	
29	Evacuation connection	2"
30	Vacuum bursting disk for outer tank	4"
31	Change over valve	DN15
32*	Section safety valve (some as OPTION)	1/4"
33*	Service valve for Safety shut off device (OPTION)	DN15 K
34*	Purge valve (OPTION)	DN15 K
37*	Shut-off valve for process protection (OPTION)	DN15 K
38*	Pressure red. regulator for process prot. (OPTION)	
43*	Safety shut-off device (OPTION)	DN40

K - short spindle
L - long spindle

Technical Specification

Type	SCS	2,0	2,6	3,1	3,7	4,8	5,3	6,4
Part Numbers		2212 0215 80	2212 0215 81	2212 0215 82	2212 0215 83	2212 0215 84	2212 0215 85	2212 0215 86
Pressure	bar	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Gross capacity*	liter	2100	2600	3100	3700	4800	5300	6400
Net capacity (95%)*	liter	1995	2470	2945	3515	4560	5035	6080
Daily Evaporation Rate (O ₂)	%	0,35	0,33	0,32	0,30	0,28	0,28	0,28
Pressure building capacity	12bar	260	260	260	260	260	260	260
	8 bar	400	400	400	400	400	400	400
	2 bar	1400	1400	1400	1400	1400	1400	1400
Total Height A	mm	3460	3910	4430	4880	5880	6430	7400
Diameter B	mm	1600	1600	1600	1600	1600	1600	1600
Foot Hole Circle C	mm	1500	1500	1500	1500	1500	1500	1500
Fill flange height** D	mm	500	500	500	500	500	500	500
Width E	mm	1650	1650	1650	1650	1650	1650	1650
Weight empty	kg	1935	2190	2640	2760	3310	3615	4200

Type	SCS	7,0	9,7	11	16	20	23
Part Numbers		2212 0215 87	2212 0215 88	2212 0215 89	2212 0215 90	2212 0215 91	2212 0215 92
Pressure	bar	18.5	18.5	18.5	18.5	18.5	18.5
Gross capacity*	liter	6900	9700	10900	15600	20300	22700
Net capacity (95%)*	liter	6555	9215	10355	14820	19285	21565
Daily Evaporation Rate (O ₂)	%	0,27	0,22	0,21	0,19	0,19	0,18
Pressure building capacity	12bar	260	530	530	530	530	530
	8 bar	400	820	820	820	820	820
	2 bar	1400	2900	2900	2900	2900	2900
Total Height A	mm	7950	5900	6250	8270	10240	11410
Diameter B	mm	1600	2200	2200	2200	2200	2200
Foot Hole Circle C	mm	1500	2000	2000	2000	2000	2000
Fill flange height** D	mm	500	500	500	500	500	500
Width E	mm	1770	2350	2350	2350	2350	2350
Weight empty	kg	4550	5905	6275	8250	10045	11065

Technical Specification

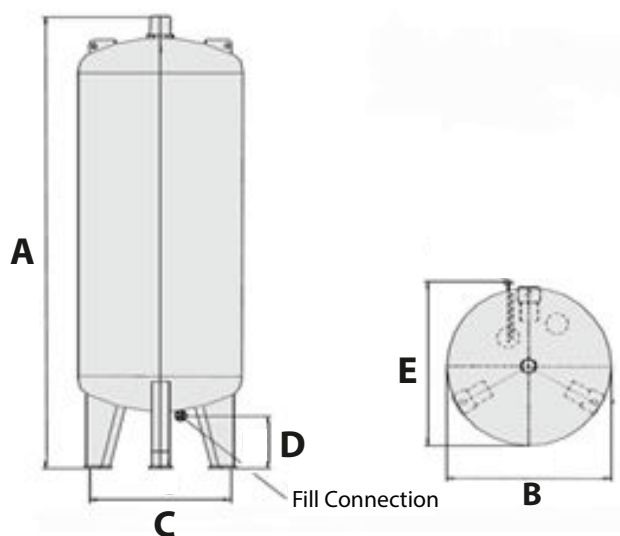
Type	SCS	12	28	32	35	41	45
Part Numbers		2212 0215 93	2212 0215 94	2212 0215 95	2212 0215 96	2212 0215 97	2212 0215 98
Pressure	bar	18.5	18.5	18.5	18.5	18.5	18.5
Gross capacity*	liter	12100	28500	31800	35100	41600	45400
Net capacity (95%)*	liter	11495	27075	30210	33345	39520	43130
Daily Evaporation Rate (O ₂)	%	0,19	0,16	0,16	0,16	0,16	0,14
Pressure building capacity	12bar	800	800	800	800	800	800
	8 bar	1240	1240	1240	1240	1240	1240
	2 bar	4400	4400	4400	4400	4400	4400
Total Height A	mm	5490	10430	11500	12600	14570	10700
Diameter B	mm	2500	2500	2500	2500	2500	3000
Foot Hole Circle C	mm	2300	2300	2300	2300	2300	2800
Fill flange height** D	mm	550	550	550	550	550	550
Width E	mm	2520	2520	2520	2520	2520	3015
Weight empty	kg	6840	13410	14510	15890	18170	19920

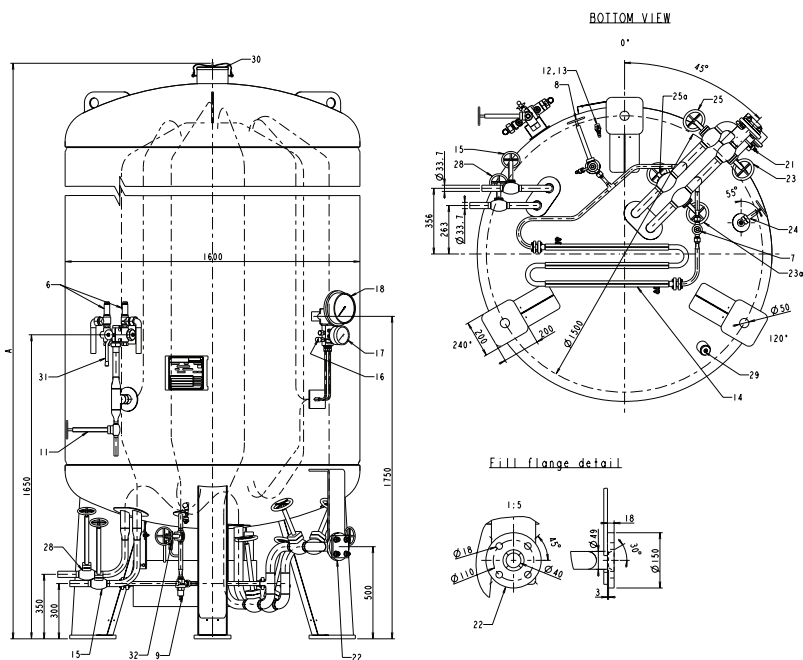
Type	SCS	50	55	60	65	75	81
Part Numbers		2212 0215 99	2212 0216 00	2212 0216 01	2212 0216 02	2212 0216 03	2212 0216 04
Pressure	bar	18.5	18.5	18.5	18.5	18.5	18.5
Gross capacity*	liter	50500	55600	60800	65900	76200	81300
Net capacity (95%)*	liter	47975	52820	57760	62605	72390	77235
Daily Evaporation Rate (O ₂)	%	0,14	0,14	0,13	0,14	0,13	0,13
Pressure building capacity	12bar	800	800	800	800	800	800
	8 bar	1240	1240	1240	1240	1240	1240
	2 bar	4400	4400	4400	4400	4400	4400
Total Height A	mm	11570	12670	13540	14640	16610	17710
Diameter B	mm	3000	3000	3000	3000	3000	3000
Foot Hole Circle C	mm	2800	2800	2800	2800***	2800 ***	2800 ***
Fill flange height** D	mm	550	550	550	550	550	550
Width E	mm	3015	3015	3015	3025	3025	3025
Weight empty	kg	21820	23455	25445	27060	30315	31850

* Geometric volumes may deviate in consequence of the cold stretching process

** Flange DN40

*** SCS 65, 75 & 81 - fitted with 4 legs



General Arrangement SCS- 2,0 - SCS 7,0


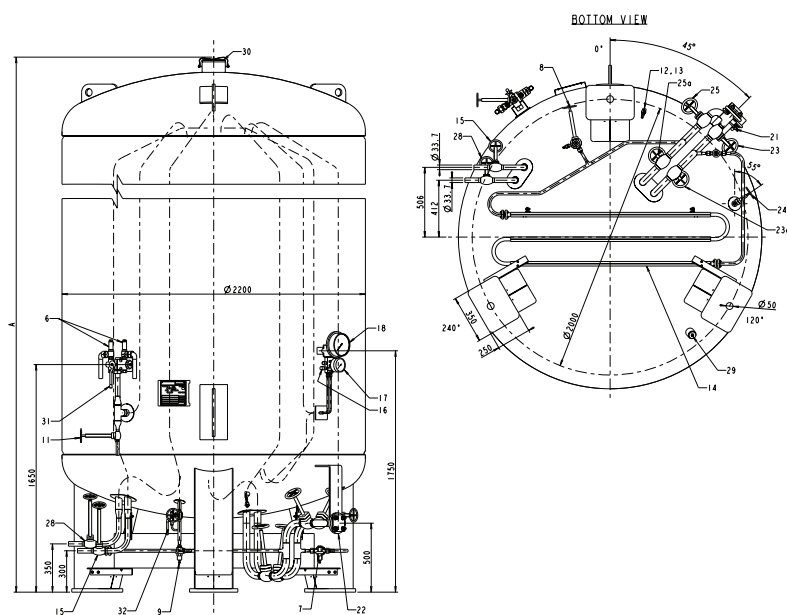
Type	MAWP [bar]	A [mm]	W1 [kg]	W2 [kg]
SCS-2,0	18,5	3460	1935	4715
	25		2030	4680
	37		2210	4860
SCS-2,6	18,5	3910	2190	5635
	25		2305	5750
	37		2525	5970
SCS-3,1	18,5	4430	2640	6745
	25		2775	6880
	37		3030	7135
SCS-3,7	18,5	4880	2760	7660
	25		2915	7815
	37		3330	8095
SCS-4,8	18,5	5880	3310	9665
	25		3510	9730
	37		3880	10100
SCS-5,3	18,5	6430	3615	10630
	25		3840	10855
	37		4245	11260
SCS-6,4	18,5	7400	4200	12670
	25		4465	12935
	37		4945	13285
SCS-7,0	18,5	7950	4550	13685
	25		4835	13970
	37		5350	14485

A - Height of tank

W1 - Empty weight

W2 - Total weight with 95% of Ar content

Numbering refers to flow diagram i0088.02

General Arrangement SCS- 9,7 - SCS 23


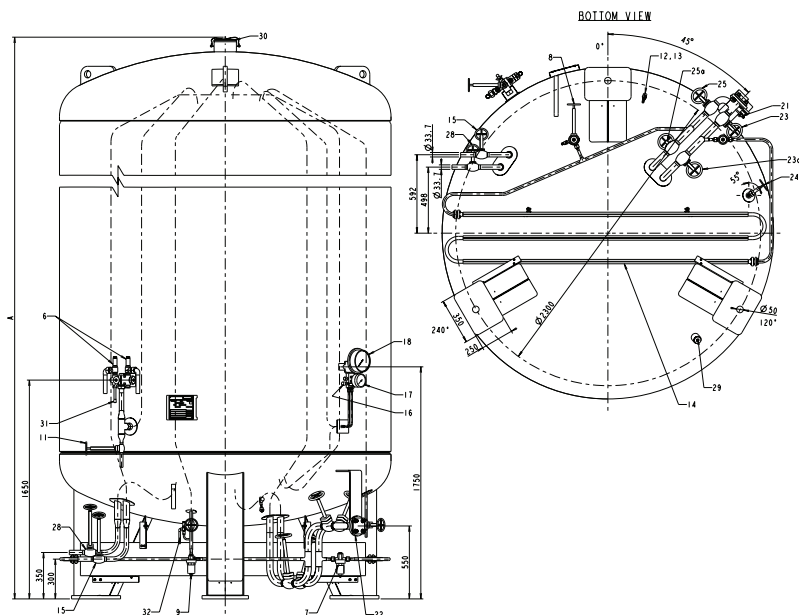
Type	MAWP [bar]	A [mm]	W1 [kg]	W2 [kg]
SCS-9,7	18,5	5900	5905	18745
	22		6120	18960
	37		7135	19840
SCS-11	18,5	6250	6275	20700
	22		6510	20805
	37		7630	21925
SCS-16	18,5	8270	8250	28990
	22		8575	29320
	37		10125	30680
SCS-20	18,5	10240	10045	36985
	22		10460	37400
	37		12435	39115
SCS-23	18,5	11410	11065	41190
	22		11525	41645
	37		13720	43575

A - Height of tank

W1 - Empty weight

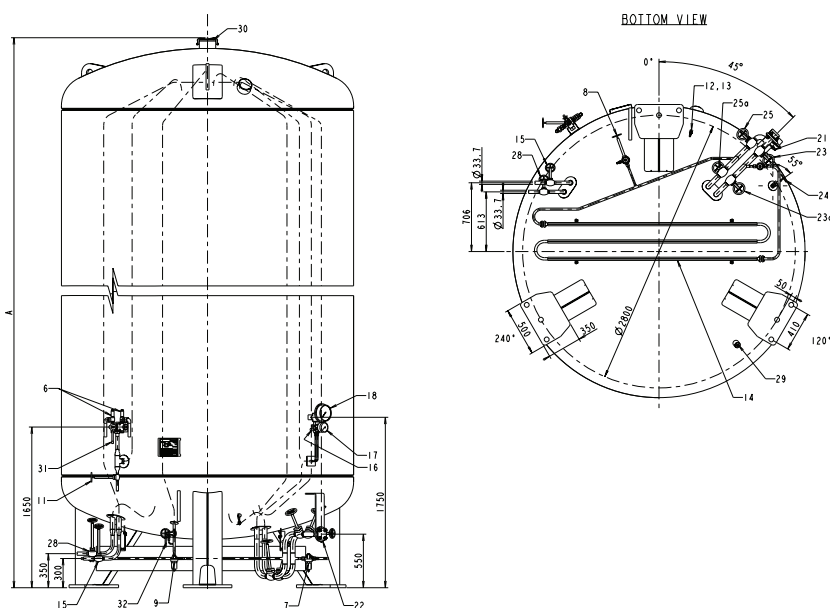
W2 - Total weight with 95% of Ar content

Numbering refers to flow diagram i0088.02

General Arrangement SCS-12 - SCS 41


Type	MAWP [bar]	A [mm]	W1 [kg]	W2 [kg]
SCS-12	18,5	5490	6840	22895
	22		7115	23045
	37		8420	24345
SCS-28	18,5	10430	13410	50645
	22		14005	51105
	37		16795	53630
SCS-32	18,5	11500	14510	56520
	22		15170	57045
	37		18265	59875
SCS-35	18,5	12600	15890	62255
	22		16610	62845
	37		20000	65840
SCS-41	18,5	14570	18170	73125
	22		19020	73840
	37		23005	77430

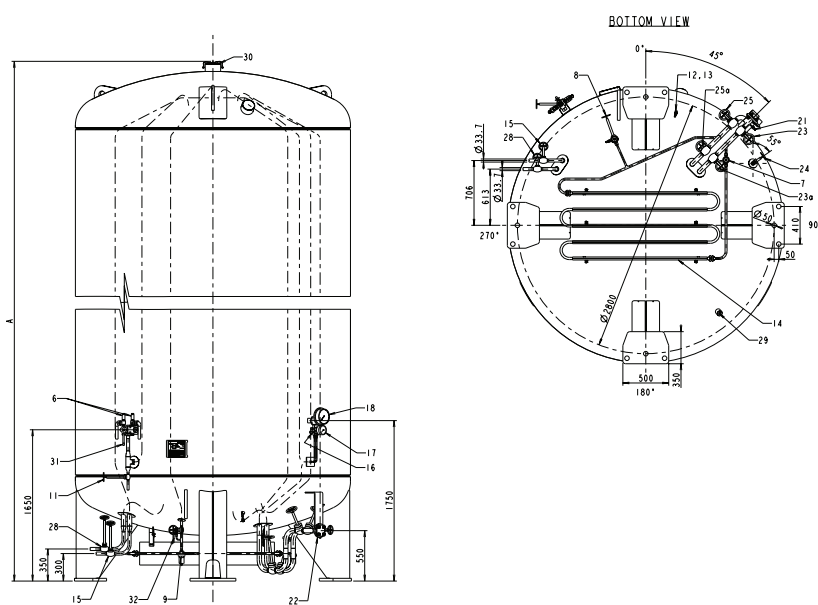
A - Height of tank
W1 - Empty weight
W2 - Total weight with 95% of Ar content
Numbering refers to flow diagram i0088.02

General Arrangement SCS- 45 - 60


Type	MAWP [bar]	A [mm]	W1 [kg]	W2 [kg]
SCS-35S	18,5	8545	17165	63615
	22		17975	64295
	37		21370	67425
SCS-45	18,5	10700	19920	80005
	22		20930	80880
	37		25205	84760
SCS-50	18,5	11570	21820	88650
	22		22935	89635
	37		27660	93830
SCS-55	18,5	12670	23455	97035
	22		24665	98115
	37		29820	102740
SCS-60	18,5	13540	25445	105905
	22		26760	106960
	37		32365	112035

A - Height of tank
W1 - Empty weight
W2 - Total weight with 95% of Ar content
Numbering refers to flow diagram i0088.02

General Arrangement SCS- 65- 81



Type	MAWP [bar]	A [mm]	W1 [kg]	W2 [kg]
SCS-65	18,5	14640	27060	114270
	22		28470	115550
	37		34505	120790
SCS-75	18,5	16610	30315	131155
	22		31930	132505
	37		38845	138630
SCS-81	18,5	17710	31850	139440
	22		33565	140890
	37		40930	147330

A - Height of tank

W1 - Empty weight

W2 - Total weight with 95% of Ar content

Numbering refers to flow diagram i0088.02

Vaporiser

Technical Specification

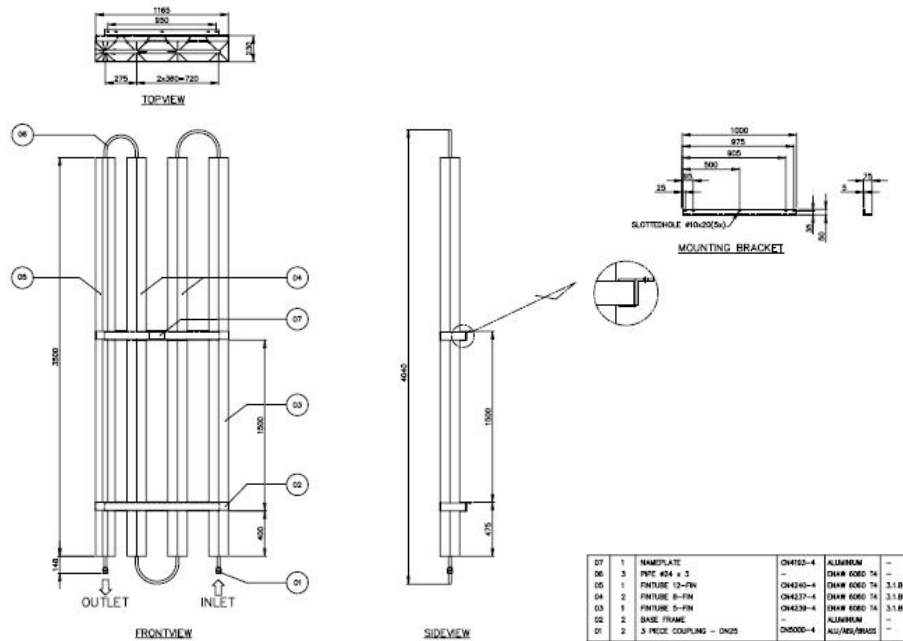
Model	Capacity [Nm³/hr]	Capacity [l/min]	Type of connection	Length (mm)	Width (mm)	Height (mm)	Weight (kg)
CNLP1x4x3500TM	70	1,167	SAE flanged	230	1,165	4,040	100
CNLP1x6x3500TM	105	1,750	SAE flanged	230	1,715	3,990	135
CNLP1x8x3500TM	140	2,333	SAE flanged	510	1,165	3,990	200
CNLP2x2x3500S	70	1,167	SAE flanged	608	595	4,275	100
CNLP2x3x3500S	100	1,667	SAE flanged	883	595	4,275	130
CNLP2x4x3500S	140	2,333	SAE flanged	1,160	595	4,275	165
CNLP3x4x3500S	200	3,333	SAE flanged	1,315	885	4,275	225
CNLP4x4x3500S	280	4,667	SAE flanged	1,315	1,158	4,275	335

Ordering

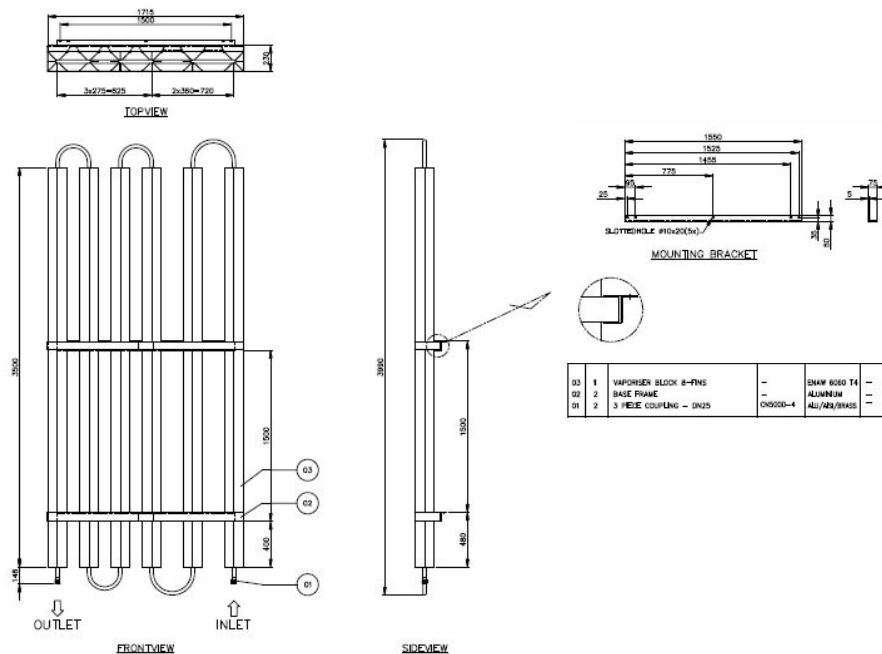
Part No	Description
CNLP1x4x3500TM	CNLP1x4x3500TM Tank mounted vaporiser
CNLP1x6x3500TM	CNLP1x6x3500TM Tank mounted vaporiser
CNLP1x8x3500TM	CNLP1x8x3500TM Tank mounted vaporiser

Part No	Description
CNLP2x2x3500S	CNLP2x2x3500S Stand alone vaporiser
CNLP2x3x3500S	CNLP2x3x3500S Stand alone vaporiser
CNLP2x4x3500S	CNLP2x4x3500S Stand alone vaporiser
CNLP3x4x3500S	CNLP3x4x3500S Stand alone vaporiser
CNLP4x4x3500S	CNLP4x4x3500S Stand alone vaporiser

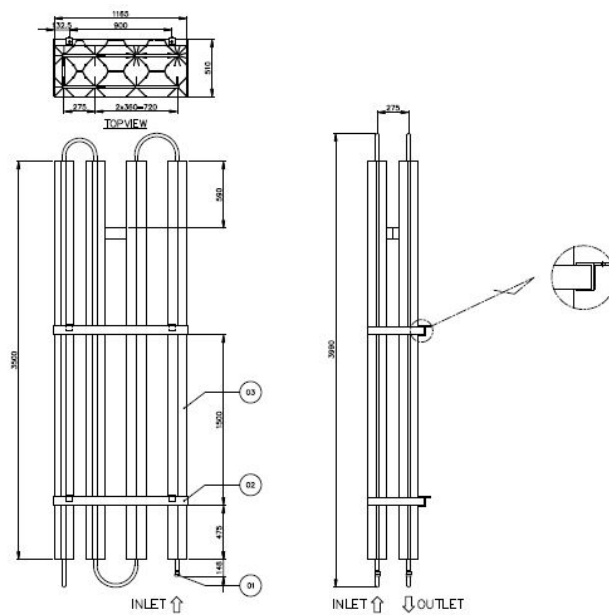
General Arrangement CNLP1x4x3500TM



General Arrangement CNLP1x6x3500TM



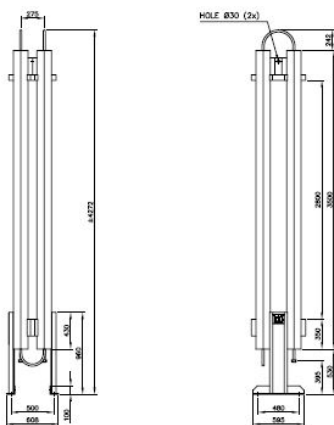
General Arrangement CNLP1x8x3500TM



03	1	VAPORIZER BLOCK	-	ALUMINUM	-
02	2	BASE FRAME	-	ALUMINUM	-
01	2	COUPLING - FEMALE PART ACC. TO CRYSOLOR STD.	AA R 57884	ALUMINUM	-

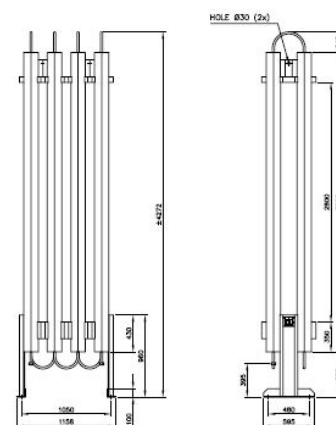
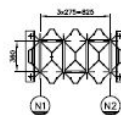
General Arrangement CNLP2x2x3500S

NOZZLE CONNECTIONS				
POS.	QNT.	DESCRIPTION	SIZE	REMARKS
N1	1	INLET	DN25-PN40	FOR BRAZING PIPE #28
N2	1	OUTLET	DN25-PN40	FOR BRAZING PIPE #28



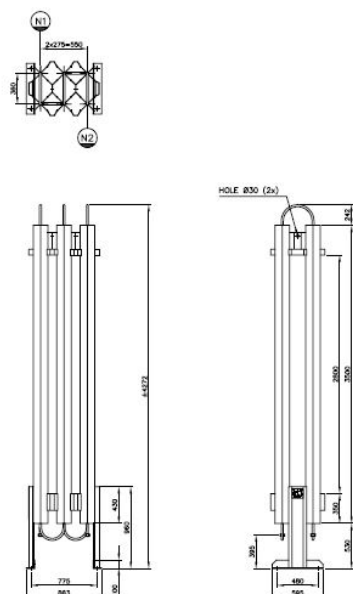
General Arrangement CNLP2x4x3500S

NOZZLE CONNECTIONS				
POS.	QNT.	DESCRIPTION	SIZE	REMARKS
N1	1	INLET	DN25-PN40	FOR BRAZING PIPE #28
N2	1	OUTLET	DN25-PN40	FOR BRAZING PIPE #28



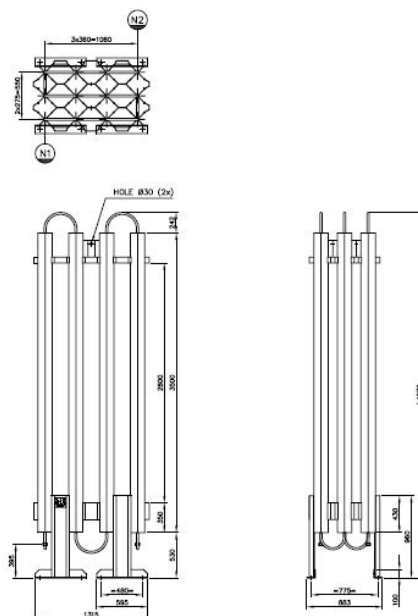
General Arrangement CNLP2x3x3500S

NOZZLE CONNECTIONS				
POS.	QNT.	DESCRIPTION	SIZE	REMARKS
N1	1	INLET	DN25-PN40	FOR BRAZING PIPE #28
N2	1	OUTLET	DN25-PN40	FOR BRAZING PIPE #28



General Arrangement CNLP3x4x3500S

NOZZLE CONNECTIONS				
POS.	QNT.	DESCRIPTION	SIZE	REMARKS
N1	1	INLET	DN25-PN40	FOR BRAZING PIPE #28
N2	1	OUTLET	DN25-PN40	FOR BRAZING PIPE #28



General Arrangement CNLP4x4x3500S

NOZZLE CONNECTIONS				
POS.	QNT.	DESCRIPTION	SIZE	REMARKS
N1	1	INLET	DN25-PN40	FOR BRAZING PIPE #28
N2	1	OUTLET	DN40-PN40	FOR BRAZING PIPE #43

