



The CELLYTE TRA Series

2 Volt flooded tubular plate
OPzS battery

**A flooded
powerhouse
for excellence
in standby
applications**





Specification

Positive electrode:	Tubular spine grid/low antimony/multi woven polyester sleeve
Negative electrode:	Flat pasted grid
Float voltage:	2.20 - 2.24 vpc ± 1% at 25°C
Max. charge voltage:	2.40 vpc ± 1% at 25°C
Electrolyte:	Sulphuric acid with specific gravity 1.240
Separators:	Mirco porous separator
Terminals:	Integral brass insert for M8 stainless steel bolt
Electrical:	2V 100Ah - 3000Ah at C/10 to 1.80vpc @ 25°C

Design life

Years:	20 years in float service @ 25°C
Cycles:	2000 cycles @ 80% DOD @ 25°C

Product compliance

DIN	40736-1992
ISO	9001:2015
ISO	14001:2004
EUROBAT	

Company accreditation

ISO	9001:2015
ISO	14001:2004

Product information

The Cellyte TRA series

Long life and low maintenance

The SEC TRA series of flooded 2 Volt batteries was especially designed for use as a backup power source in industrial and other critical standby applications. The combination of low antimony alloy and a large electrolyte reserve keeps maintenance to a minimum. With a minimum need for equalisation and a design life of 20 years, it's a reliable choice for those demanding energy security.

Complies with international standards

The TRA is a flooded OPzS that complies with a range of international standards, offering operators complete peace of mind. This series consistently achieves DIN 40736, Eurobat, ISO 9001:2015 and ISO 14001:2004 certifications. SEC is proud to offer the CELLYTE TRA as a high integrity 2 Volt option that will match the best in the market.

High quality component

The CELLYTE TRA is constructed with the highest regard to quality. Our engineers used die cast tubular spine grids and a flat pasted negative plate to produce a battery with excellent float life, outstanding cycling capability and very high operational reliability.

The TRA has a tubular plate design and a positive grid with low antimony, guaranteeing both long operating life, and optimal performance. Final assembly is in a tough but translucent, non-conductive casing to provide you with a reliable powerhouse.

Innovative Feature

- ⌚ **Low self-discharge**
- ⌚ **Tolerates sub-zero temperature**
- ⌚ **Tubular plate formation**
- ⌚ **Accepts high charge rate**
- ⌚ **Requires minimal equalisation**
- ⌚ **SAN translucent casing**
- ⌚ **Large electrolyte reserve**
- ⌚ **Explosion proof / increased safety**
- ⌚ **Long life deep cycle capability**
- ⌚ **Cyclic and standby performance**
- ⌚ **Optimised negative plates**
- ⌚ **Low antimony alloys**

“The 2 Volt TRA series uses a tried and tested low antimony positive spine alloy. It is perfectly balanced to maximise float and cycle life while reducing water loss which minimises maintenance. This gives unbeatable cycle life with the lowest possible operating costs for OPzS technology.”

Dr. Mike McDonagh
SEC Group

Product benefits

Increased safety

The TRA has explosion-proof vent as standard. Our Japanese-manufactured triple-post sealant enhances durability, and provides extra security against leakage, preventing low performance issues.

Minimum maintenance

The Cellyte TRA is designed for standby and float requirements. As a low maintenance flooded battery, it has large reserves of electrolyte and requires minimal equalisation. This battery is ideal for high integrity critical applications including power generation & distribution, telecom and premium renewable energy projects.

High energy rating

The latest plate formation technology and the tubular grids mean the TRA will perform for longer. As a stand-by service 2 Volt battery made for critical applications, the TRA is an ideal choice when total energy output is a consideration

Long design life

The German-made separator prevents electrolyte stratification while special additives in the active material reduce self discharge and plate corrosion, so the battery lasts longer. In the right conditions, it has a design life of twenty years.

Quick charging

It features two layers of mesh around the negative electrode, which permits extremely low internal resistance, allowing quick recharge and operation at cooler temperatures. This makes it more efficient when your application demands a quick turnaround.

Low self discharge

The Cellyte TRA 2V series is available in a wide range of capacities from 100 to 3000 Ah. With a proven low self discharge rate it can be stored for long periods of time in the correct environments.

Applications



Telecommunications



Power plant



Photovoltaic system



Emergency lighting



Transmission switching



UPS



Alarm system



Signalling



Industrial standby



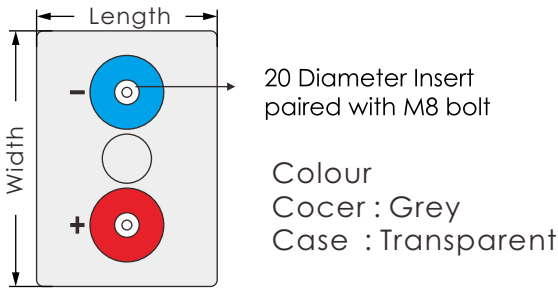
Grid services



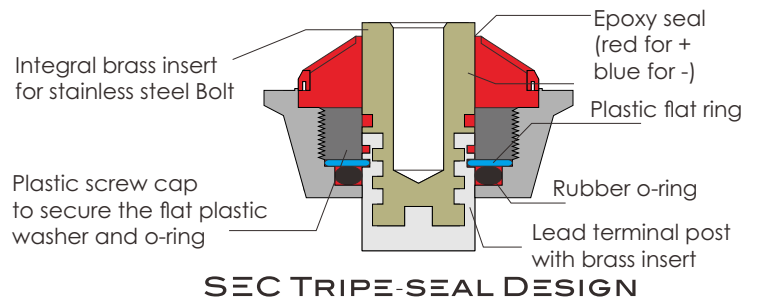
Renewables and energy storage

Engineering

Cell outline



Triple-post seal detail



Cell Dimensions

Dimensions/ Weights/ Data

SEC bloc type	European DIN type	Cell weight		Electrolyte	Overall battery dimension				Internal resistance (mΩ)	Short circuit current	Maximum charge current	Number of terminal	
		Dry	Wet		Length	Width	Height 1	Height 2					
		kg	kg	kg	ltr. +10%	mm	mm	mm	mm				
2-TRA-100	2 OPzS 100	7.60	12.6	5.00	4.44	105	208	356	411	2.23	1020	20	2
2-TRA-150	3 OPzS 150	10.8	15.3	4.50	3.99	105	208	356	441	1.62	1610	30	2
2-TRA-200	4 OPzS 200	13.2	17.2	0.40	3.55	105	208	356	471	0.95	2160	40	2
2-TRA-250	5 OPzS 250	16.2	20.8	4.60	4.08	126	208	356	501	0.76	2700	50	2
2-TRA-300	6 OPzS 300	19.2	24.3	5.10	4.52	147	208	356	531	0.63	3240	60	2
2-TRA-350	5 OPzS 350	19.4	26.9	7.50	6.65	126	208	472	527	0.70	2900	70	2
2-TRA-420	6 OPzS 420	23.4	31.5	8.10	7.19	147	208	472	527	0.58	3480	84	2
2-TRA-490	7 OPzS 490	27.4	36.1	8.70	7.72	166	208	472	527	0.50	1060	100	2
2-TRA-600	6 OPzS 600	33.9	44.8	10.9	9.67	147	208	647	702	0.46	4300	120	2
2-TRA-700	7 OPzS 700	40.2	56.2	15.5	13.8	193	212	647	702	0.39	4900	140	4
2-TRA-800	8 OPzS 800	45.3	61.3	16.0	14.2	193	212	647	702	0.35	5760	160	4

Cell dimensions

Dimensions/ Weights/ Data

SEC bloc type	European DIN type	Cell weight		Electrolyte		Overall battery dimension				Internal resistance (mΩ)	Short circuit current	Maximum charge current	Number of terminal
		Dry	Wet			Length	Width	Height 1	Height 2				
		kg	kg	kg	ltr. +10%	mm	mm	mm	mm				
2-TRA-1000	10 OPzS 1000	55.5	74.6	19.1	16.9	235	212	647	702	0.28	7200	200	4
2-TRA-1200	12 OPzS 1200	65.8	88.0	22.2	19.7	277	212	647	702	0.23	8640	240	4
2-TRA-1500	12 OPzS 1500	87.0	115	27.3	24.2	277	212	797	852	0.23	9180	300	6
2-TRA-1750	14 OPzS 1750	105	140	35.2	31.2	401	216	773	828	0.22	10200	350	6
2-TRA-1875	15 OPzS 1880	133	158	45.0	45.0	401	216	773	828	0.21	11000	375	6
2-TRA-2000	16 OPzS 2000	123	166	43.0	43.0	401	216	773	828	0.17	15600	400	6
2-TRA-2250	18 OPzS 2250	142	195	53.0	53.0	489	214	773	828	0.15	12200	450	8
2-TRA-2500	20 OPzS 2500	152	204	52.0	52.0	489	214	773	828	0.14	15600	500	8
2-TRA-3000	24 OPzS 3000	179	242	63.0	63.0	578	214	773	828	0.11	18900	600	8

Capacity

Ampere hour at 25°C

SEC bloc type	European DIN Type	Discharge data ampere hour at 25°C with specified end voltage													
		Discharge time in hours													
		0.5hr	1hr	2hr	3hr	4hr	5hr	6hr	8hr	10hr	24hr	48hr	72hr	100hr	
		1.65 vpc	1.67 vpc	1.75 vpc	1.75 vpc	1.75 vpc	1.77 vpc	1.77 vpc	1.75 vpc	1.80 vpc	1.85 vpc	1.85 vpc	1.85 vpc	1.85 vpc	
2-TRA-100	2 OPzS 100	39.0	53.0	62.0	75.0	79.0	87.5	88.0	100	100	125	134	140	141	
2-TRA-150	3 OPzS 150	58.0	80.0	95.0	113	120	126	133	150	150	188	201	210	212	
2-TRA-200	4 OPzS 200	77.0	106	126	150	160	169	178	200	200	250	268	280	282	
2-TRA-250	5 OPzS 250	96.0	130	157	188	200	211	222	250	250	310	335	350	352	
2-TRA-300	6 OPzS 300	115	160	188	225	239	253	266	300	300	374	402	420	420	
2-TRA-350	5 OPzS 350	134	186	220	263	279	294	310	350	350	434	469	500	505	
2-TRA-420	6 OPzS 420	161	224	263	315	334	353	372	420	420	525	562	600	605	
2-TRA-490	7 OPzS 490	188	260	307	368	390	412	437	500	500	610	656	705	709	
2-TRA-600	6 OPzS 600	213	310	373	450	478	505	532	600	600	732	804	864	865	
2-TRA-700	7 OPzS 700	214	365	435	525	556	590	618	608	700	852	936	1001	1010	
2-TRA-800	8 OPzS 800	284	418	498	600	636	674	708	800	800	974	1070	1150	1155	
2-TRA-1000	10 OPzS 1000	355	520	622	750	796	843	887	1000	1000	1210	1339	1440	1445	

Capacity

Ampere hour at 25°C

SEC bloc type	European DIN Type	Discharge data ampere hour at 25°C with specified end voltage												
		Discharge time in hours												
		0.5hr	1hr	2hr	3hr	4hr	5hr	6hr	8hr	10hr	24hr	48hr	72hr	100hr
		1.65 vpc	1.67 vpc	1.75 vpc	1.75 vpc	1.75 vpc	1.77 vpc	1.77 vpc	1.75 vpc	1.80 vpc	1.85 vpc	1.85 vpc	1.85 vpc	1.85 vpc
2-TRA-1200	12 OPzS 1200	426	620	747	900	956	1010	1062	1200	1200	1459	1608	1725	1730
2-TRA-1500	12 OPzS 1500	528	745	912	1116	1176	1235	1308	1500	1500	1800	2010	2100	2115
2-TRA-1750	14 OPzS 1750	621	870	1064	1302	1372	1440	1529	1750	1750	2100	2345	2448	2465
2-TRA-1875	15 OPzS 1880	660	930	1140	1395	1470	1544	1638	1872	1875	2250	2510	2625	2630
2-TRA-2000	16 OPzS 2000	704	990	1215	1488	1567	1645	1746	2000	2000	2400	2678	2800	2810
2-TRA-2250	18 OPzS 2250	792	1120	1378	1686	1792	1900	1992	2248	2250	2700	3014	3150	3160
2-TRA-2500	20 OPzS 2500	880	1235	1519	1860	1959	2058	2184	2500	2500	3000	3350	3499	3520
2-TRA-3000	24 OPzS 3000	1056	1480	1823	2232	2351	2470	2621	3000	3000	3600	4020	4198	4220

Current

Ampere at 25°C

SEC bloc type	European DIN Type	Discharge data amps at 25°C with specified end voltage												
		Discharge time in hours												
		0.5hr	1hr	2hr	3hr	4hr	5hr	6hr	8hr	10hr	24hr	48hr	72hr	100hr
		1.65 vpc	1.67 vpc	1.75 vpc	1.75 vpc	1.75 vpc	1.77 vpc	1.77 vpc	1.75 vpc	1.80 vpc	1.85 vpc	1.85 vpc	1.85 vpc	1.85 vpc
2-TRA-100	2 OPzS 100	78.0	53.0	31.0	25.0	19.8	17.5	14.7	12.5	10.0	5.21	2.79	1.94	1.41
2-TRA-150	3 OPzS 150	116	80.0	47.5	37.7	30.0	25.2	22.2	18.8	15.0	7.83	4.19	2.92	2.12
2-TRA-200	4 OPzS 200	154	106	63.0	50.0	40.0	33.8	29.7	25.0	20.0	10.4	5.58	3.89	2.82
2-TRA-250	5 OPzS 250	192	130	78.5	62.7	50.0	42.2	37.0	31.3	25.0	12.9	6.98	4.86	3.52
2-TRA-300	6 OPzS 300	230	160	94.0	75.0	59.8	50.6	44.3	37.5	30.0	15.6	8.38	5.83	4.20
2-TRA-350	5 OPzS 350	268	186	110	87.7	69.8	58.8	51.7	43.8	35.0	18.1	9.77	6.94	5.05
2-TRA-420	6 OPzS 420	322	224	132	105	83.5	70.6	62.0	52.5	42.0	21.9	11.7	8.33	6.05
2-TRA-490	7 OPzS 490	375	260	154	123	97.5	82.4	72.8	62.5	50.0	25.4	13.7	9.79	7.09
2-TRA-600	6 OPzS 600	426	310	187	150	120	101	88.7	75.0	60.0	30.5	16.8	12.0	8.65
2-TRA-700	7 OPzS 700	427	365	218	175	139	118	103	76.0	70.0	35.5	19.5	13.9	10.1
2-TRA-800	8 OPzS 800	568	418	249	200	159	135	118	100	80.0	40.6	22.3	16.0	11.6
2-TRA-1000	10 OPzS 1000	710	520	311	250	199	169	148	125	100	50.4	27.9	20.0	14.5

Current

Ampere at 25°C

SEC bloc type	European DIN Type	Discharge data amps at 25°C with specified end voltage												
		Discharge time in hours												
		0.5hr	1hr	2hr	3hr	4hr	5hr	6hr	8hr	10hr	24hr	48hr	72hr	100hr
		1.65 vpc	1.67 vpc	1.75 vpc	1.75 vpc	1.75 vpc	1.77 vpc	1.77 vpc	1.75 vpc	1.80 vpc	1.85 vpc	1.85 vpc	1.85 vpc	1.85 vpc
2-TRA-1200	12 OPzS 1200	852	620	374	300	239	202	177	150	120	60.8	33.5	24.0	17.3
2-TRA-1500	12 OPzS 1500	1056	745	456	372	294	247	218	188	150	75.0	41.9	29.2	21.2
2-TRA-1750	14 OPzS 1750	1242	870	532	434	343	288	255	219	175	87.5	48.9	34.0	24.7
2-TRA-1875	15 OPzS 1880	1320	930	570	465	368	309	273	234	188	93.8	52.3	36.5	26.3
2-TRA-2000	16 OPzS 2000	1408	990	608	496	392	329	291	250	200	100	55.8	38.9	28.1
2-TRA-2250	18 OPzS 2250	1584	1120	689	562	448	380	332	281	225	113	62.8	43.8	31.6
2-TRA-2500	20 OPzS 2500	1760	1235	760	620	490	412	364	313	250	125	69.8	48.6	35.2
2-TRA-3000	24 OPzS 3000	2112	1480	912	744	588	494	437	375	300	150	83.8	58.3	42.2

Operating temperature

Design operating temperature	25°C
Limit for charging	-10 to +50°C
Limit for discharging	-15 to +50°C
Limit for storage	-20 to +50°C

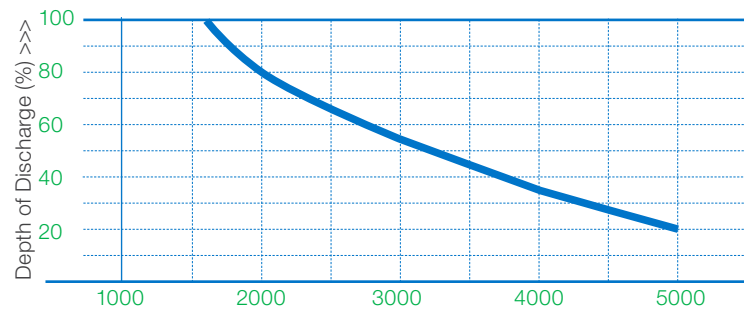
Charging method

Float charging voltage at 25°C	2.20 - 2.24vpc with temperature compensation
Maximum charging voltage at 25°C	2.40 vpc with temperature compensation
Float charge temperature compensation factor	-3 mV/cell/°C above 25°C +3 mV/cell/°C below 25°C
Cyclic charge temperature compensation factor	-5 mV/cell/°C above 25°C +5 mV/cell/°C below 25°C

Cycle life

Relationship between depth of discharge and life

Ambient temperature 25°C



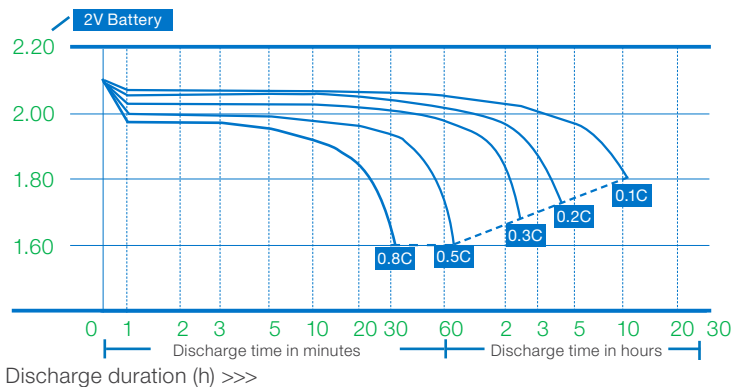
Cycle Life >>>

The depth of discharge critically affects the number of cycles that a battery will complete during its life time.

Discharge characteristic

Discharge current VS discharge time curve

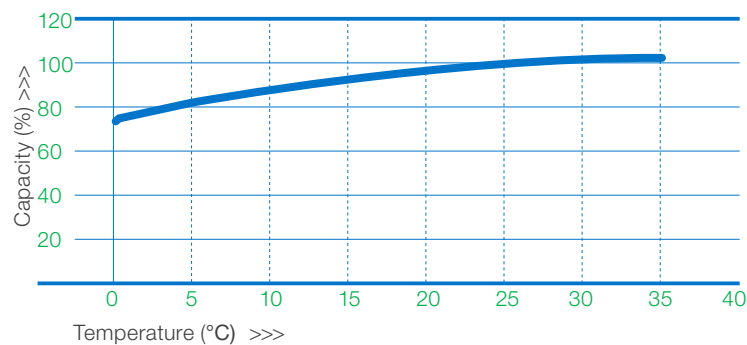
Ambient temperature 25°C



Effect of discharge rate on battery capacity.

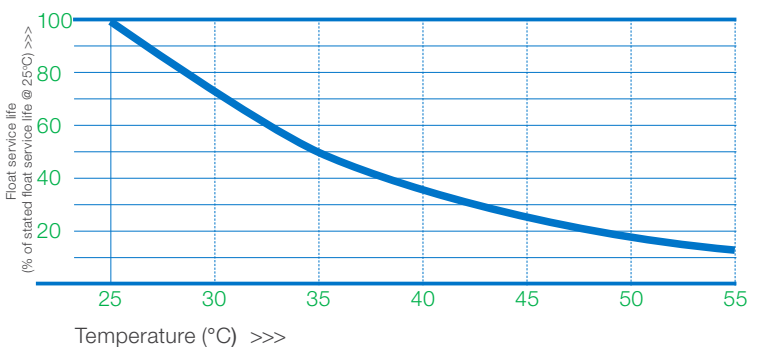
Effect of inclined temperature

Effect of temperature on capacity at C/10 discharge rate



A high ambient temperature will increase the cell capacity but will significantly shorten its calendar and cycle life.

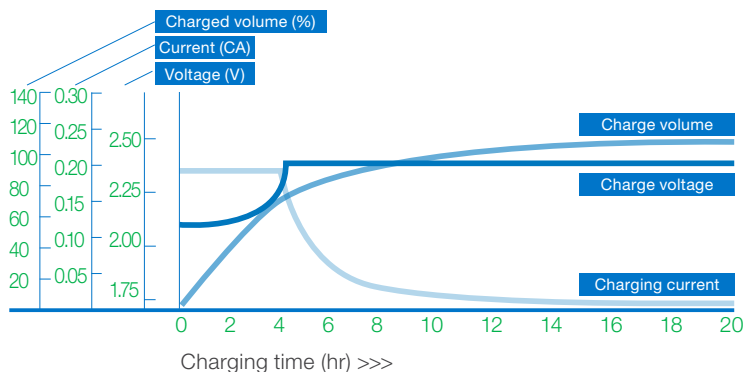
Float service life VS temperature



Effect of temperature on float service life

Charge method

Constant current/voltage charge characteristic



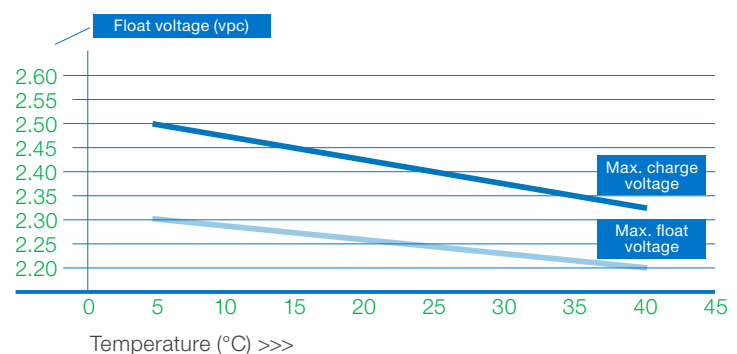
The preferred charging procedure should be in accordance with DIN 41773, constant current/constant voltage (IU characteristic). Constant float charging utilising a constant voltage charger is also acceptable.

Charging voltage measured at the battery terminals: $2.35 \pm 1\% \times \text{number of cells}$.

Equalising or fast charging can occasionally be permitted in which the charging voltage is $2.40V \times \text{number of cells}$ for a maximum fixed period of 8 hours (depends on state of charge). This will apply in deep discharge and limited recharge operations such as stand-by with parallel connections. Automatic changeover to the charging voltage of $2.24V \pm 1\% \times \text{number of cells}$ should follow after this period.

Charge compensation

Temperature compensation for float voltage



Join the SEC partner grid programme for increased profits

The energy storage market is booming. From 2012 to 2016, the market has tripled from 6 billion to 18 billion US dollars, driven in large part by renewable energy needs. With more than half of the world's energy supply destined to come from renewable energy sources in the near future, continued rapid growth is a certainty. The opportunities are immense.

Let us help you grow your share of this expanding market and maximise your profits with the SEC Partner Grid Programme. We provide our partners with quality leads generated by our global marketing efforts.

Partners also receive free technical and sales marketing training, discounts, software, rewards for developing new sources of repeat business, and even subsidies for marketing efforts.



Benefits

Lead generation

Technical training

Product discounts

Market growth incentives

Sales and marketing training

Partner performance awards

Customer recruitment rewards

On demand technical and sales support

On-line tools for easy direct access to SEC



Contact us today to learn more about how you can grow your profits in the booming market for energy storage with the SEC Partner Grid Programme.



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