

Rebling Datasheet: 500 amp Top Seal Lithium Battery Terminal

The 500 amp Top Seal Terminal uses the same nickel-plated brass conductor, accepts the same rigid and flexible covers and has the same performance characteristics as Rebling’s 500 amp MFT-style feed-through terminal. This terminal is intended for lithium battery OEMs which are packaging their cell packs inside molded plastic or aluminum cases that are 1 to 20 times the size of an automotive starter battery. The Top Seal Terminal enables the OEM to attach the terminal to the lithium cell pack first, place the cell pack into the battery case, place the lid onto the battery case (allowing the terminals to poke through clearance holes in the lid), attach the lid to the terminals with flat-head sheet metal screws then screw, glue or weld the battery lid to the battery case. The Top Seal Terminal reduces the amount of labor and eliminates two cables which the OEM previously used to attach the terminals. The Top Seal is intended for OEMs which are graduating from producing hundreds of batteries per year to tens or hundreds of thousands per year. The “Arc of Forgiveness” feature allows the terminal to be mis-rotated by 30 degrees and still align with the screw holes in the battery lid. It also includes an “Orientation Key” feature which high precision OEMs can use to aid in alignment.

Electrical

Current each current profile causes a max 30° C temperature rise when tested per IEC 61984

Current Profile #1	Continuous Rated Current (CRC)	-----	500 amps
Current Profile #2	50% CRC for 60min + 1 sec peak + 50% CRC for 60 min		3,000 amps
Current Profile #3	50% CRC for 60min + 10 sec peak + 50% CRC for 60 min	-----	2,000 amps
Current Profile #4	50% CRC for 60min + 30 sec peak + 50% CRC for 60 min		1,250 amps
Current Profile #5	50% CRC for 60min + 60 sec peak + 50% CRC for 60 min	-----	1,000 amps

Voltage & Resistance

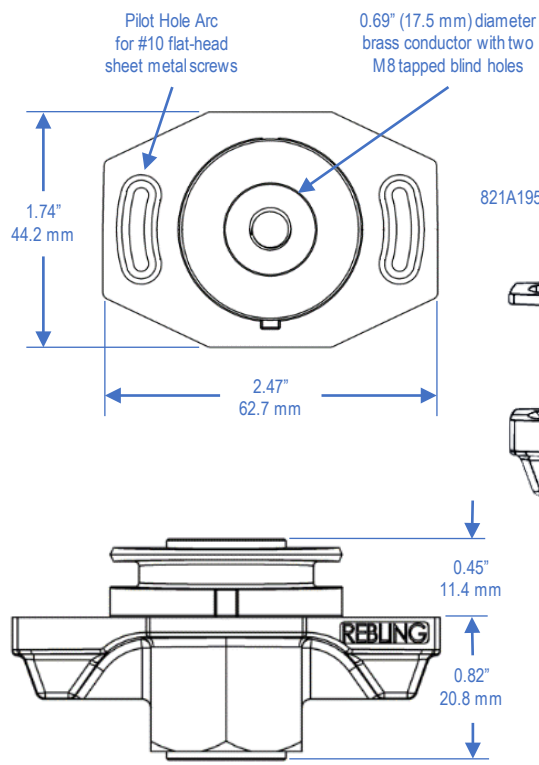
Continuous Rated Voltage	UL1977 Section 17	2,000 volts
Minimum Dielectric Withstanding Voltage	UL1977 Section 17	5,000 volts
Insulation Resistance	MIL-PRF-18148D Section 3.12.6	500 mega-ohms
Maximum Contact Resistance	MIL-STD-202H Method 307	70 micro-ohms

Mechanical & Environmental

Flammability Rating:	Terminal -----	UL 94	V-0
	Flexible Cover and Rigid Cover	UL 94	V-0
Environmental Sealing:	with Optional Gasket -----	IEC 60529	IP68+ watertight
	without Optional Gasket	IEC 60529	IP65
Operating Temperature:	Terminal and Rigid Covers -----		-40 to +125 C
	Flexible Cover		-40 to +90 C
Mechanical Shock	MIL-STD-202H Method 213 Condition A		50 Gs – 3 axes
Vibration	MIL-STD-202H Method 204 Condition A		10 Gs – 3 axes
Minimum Panel Thickness Required for Mounting			0.025" (0.64 mm)
Maximum Wire Size:	Terminal only -----		450 MCM (230 mm ²)
	with Flexible Cover		4/0 (110 mm ²)
	with Short Rigid Snap-on Cover		3/0 (80 mm ²)
	with Long Rigid Snap-on Cover		2 AWG (35 mm ²)

Compliance & Conformance

RoHS, REACH, CMRT/3TG All parts listed on this datasheet are RoHS, REACH and CMRT/3TG Compliant
 UL and CE Conformance Declarations of UL and CE Conformity can be downloaded from Rebling.com



For complete dimensions, download 3D Step files of Terminal and Accessories at Rebling.com



P/N	Description	Plastic Color	Weight (Grams)	Min Thick (mm)	UL 94 Rating	UL Material Yellow Card # **
Top500-P-B	Terminal Kit*, Brass, Nickel plated	Black	107	2.0	V-0	E121562-220886
713A1806-B	Flexible Snap-On Cover (3.75" OAL, 0.82" ID)	Black	26	2.0	V-0	E80017-250533
698A1789-S-B	Rigid Snap-On Cover, Short (1.44" OAL)	Black	9	2.0	V-0	E121562-101513781
Top500-P-R	Terminal Kit*, Brass, Nickel plated	Red	107	2.0	V-0	E121562-220886
713A1806-R	Flexible Snap-On Cover (3.75" OAL, 0.82" ID)	Red	26	2.0	V-0	E80017-250533
698A1789-S-R	Rigid Snap-On Cover, Short (1.44" OAL)	Red	9	2.0	V-0	E121562-101513781
821A1951	Top Seal Gasket	Black	3	1.5	V-0	E80017-250535

*Terminal Kit = one Terminal + two Bolts + two Split Washers, all parts in a small poly bag
 **UL Material Yellow Cards can be downloaded from ULprospector.com

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Mounting and Assembly

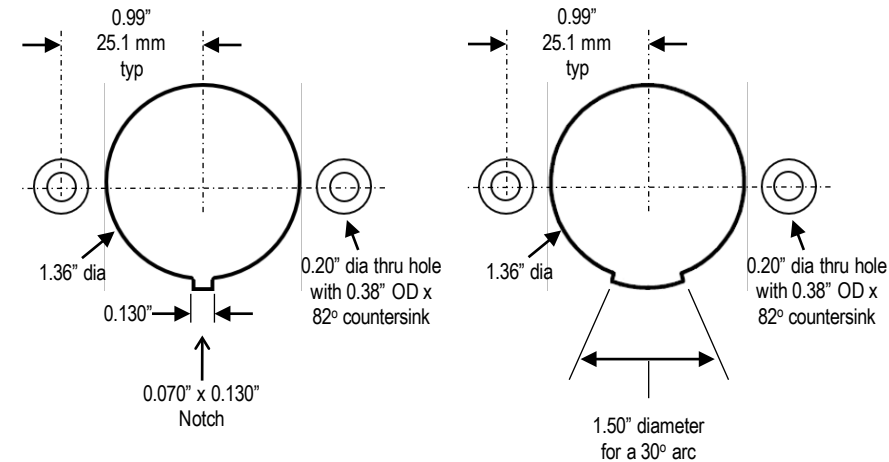
Minimum Panel Thickness	0.040" (1.00 mm)
Mounting Hole Pattern	See Diagrams Below
Torque on M8 Bolts:	
Recommended	50 to 60 in-lbs (5.6-6.8 Nm)
Maximum Recommended	240 in-lbs (27 Nm)
Torque on #10 flat-head sheet metal screws	
Recommended	25 in-lbs (2.8 Nm)
Maximum Recommended	40 in-lbs (4.5 Nm)
Maximum Crimp Lug Tongue Width:	
with Flexible Cover	1.10" (28 mm)
with Short Rigid Snap-on Cover	0.91" (23 mm)
with Long Rigid Snap-on Cover	0.70" (18 mm)

electrical performance does not get better or worse above 50 in-lbs (5.6 Nm)
 a Grade 4, M8 stainless bolt will snap at 330 in-lbs (37 Nm)

mechanical performance does not improve above 20 in-lbs (2.3 Nm)
 a #10 flat-head sheet metal screw will snap at 60 in-lbs (6.8 Nm)

Application Notes

- Watertight is superior to IP68: Rebling's Top Seal terminal is not only IP68, it is watertight which is superior to any IP Rating. The definitions of IP67, IP68 and IP69k per IEC 60529 state that "water may penetrate the seal but shall do no harm", a condition that is unacceptable to lithium battery designers.
- Interchangeability of 250 amp and 500 amp Terminals: if you are uncertain whether your application needs a 250 amp or 500 amp Top Seal Terminal, not a problem; the mounting hole patterns for the 250 amp and 500 amp are identical.
- Loctite (Thread Locking Fluid) Warning: some thread-locking fluids can cause a terminal's plastic body to crack.** Loctite's datasheets warn that its products should not be used near any thermoplastic because their fluid (or its vapor) can change the chemical structure of thermoplastic, causing stress cracks to appear weeks or months after the fluid was applied to metal bolts on or near a terminal.
- Flat Head Mounting Screws: See table on the right



Mounting Hole Pattern for High Precision

Mounting Hole Pattern for Arc of Forgiveness

Rebling Top Seal Terminal Recommended Mounting Screw Types and Lengths					
Battery Lid Thickness inches	mm	# of stacked Gaskets	Screw Length inches	Standard #10	Undercut #10
				82° Flat-head Wood Screw	82° Flat-head Sheet Metal Screw
0.039	1.0	0	0.38	Amazon PTM 10x3/8-100	McMaster 90065A240
0.039	1.0	1	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.039	1.0	2	0.63	McMaster 90294A244	McMaster 98903A308
0.051	1.3	0	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.051	1.3	1	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.051	1.3	2	0.63	McMaster 90294A244	McMaster 98903A308
0.063	1.6	0	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.063	1.6	1	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.063	1.6	2	0.63	McMaster 90294A244	McMaster 98903A308
0.079	2.0	0	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.079	2.0	1	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.094	2.4	0	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.094	2.4	1	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.106	2.7	0	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.106	2.7	1	0.63	McMaster 90294A244	McMaster 98903A308
0.125	3.2	0	0.50	Amazon PTM 10x1/2-100	McMaster 90065A242
0.125	3.2	1	0.63	McMaster 90294A244	McMaster 98903A308
0.185	4.7	0	0.63	McMaster 90294A244	McMaster 98903A308