

# Trombetta's 200A Magnetic Latching Battery Separator



**TROMBETTA**   
DC Power Solutions for a Harsh World

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**Trombetta's Battery Separator** solution features a modern, integrated package that eliminates dated side saddle mounting of electronics on a standard solenoid with exposed bus bars and wires. Our integrated circuitry and magnetic latching solenoid are O-ring sealed in an IP69K\* package to stand up to the elements.

Available in Bidirectional and Unidirectional with Start Assist to provide a cost effective and power saving device ideal for all truck, RV, and emergency vehicle applications. Advanced software with microprocessor controls provide an array of lockouts and delays with the ability to verify the contacts are in the correct state to prevent field issues.

Switch To Trombetta.



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Battery Separator**

## Theory of Operation

### Normal Operation

The device monitors the voltages on both M8 terminals each second. It will open or close the contacts after specified delay periods only if the voltages are within specified parameters. This eliminates reaction to transients and short-term voltage fluctuations. Except for a short 8 Amp pulse when changing states, the device draws less than 1mA when Open and no more than 10mA when Closed.

### Overvoltage/Undervoltage Lockout

Should the voltages on the M8 studs drop below the under-voltage limit ( $V_{USD}$ ) or exceed the over-voltage limit ( $V_{OSD}$ ), the device will disable contactor Open/Close changes until voltages return within the Functional Voltage Range.

### State Correction

If the device fails to Open or Close properly or if a significant mechanical shock forces the contactor to change state, the contactor coil is pulsed three times to restore the proper state. After the three unsuccessful attempts, the device will wait for two minutes before attempting another state correction pulse sequence.

### Start Assist

While the Start Assist Signal Voltage ( $V_{SS}$ ) is applied to the Start Assist Input -and- the difference between the battery voltages are within the Start Override Battery Difference ( $V_{SBD}$ ), the contactor will be Closed to assist with vehicle starting. The Start Assist Lamp output will be active as an indication that the Start Assist Mode is active. The  $V_{SBD}$  limit prevents activation in the presence of faulty battery conditions.

\*See Mechanical & Environmental Section



## Electrical and Software

Characteristic	Symbol	Min	Typical	Max	Notes
INPUT VOLTAGE	V <sub>IN</sub>	10V	12.8V	16V	Functional voltage range
MAXIMUM CONTINUOUS VOLTAGE	V <sub>MAX</sub>			40V	
CONTINUOUS CARRY CURRENT				200A	Requires 1AWG wire at 25C°, new unit 175A at 85°C, new unit 115A at 85°C, 50K cycles
ELECTRICAL SWITCHING LIFE		50,000 cycles			200A resistive load, 14.4 VDC, 25°C
OVERCURRENT RATING				450A	1 minute, 25°C
MAX CONTACT VOLTAGE DROP			100mV		At 200A steady state
FUSE REQUIREMENTS					Required, size to application
QUIESCENT CURRENT (OPEN)			1mA		
QUIESCENT CURRENT (CLOSED)			10mA		
UNDER-VOLTAGE SHUTDOWN	V <sub>USD</sub>		9.8V		Open/close action disabled
OVER-VOLTAGE SHUTDOWN	V <sub>OSD</sub>		17.0V		Open/close action disabled
CONNECT VOLTAGE	V <sub>CON</sub>	13.1V	13.2V	13.3V	
CONNECT VOLTAGE DELAY	T <sub>CON</sub>	19 seconds	20 seconds	21 seconds	The contactor will close if the connect voltage condition is maintained for this period
DISCONNECT VOLTAGE	V <sub>DIS</sub>	12.7V	12.8V	12.9V	
DISCONNECT VOLTAGE DELAY	T <sub>DIS</sub>	19 seconds	20 seconds	21 seconds	The contactor will open if the disconnect voltage condition is maintained for this period
START ASSIST LAMP DRIVE VOLTAGE	V <sub>LMP</sub>		Battery V <sub>MAX</sub> - 1.4V		V <sub>MAX</sub> source is from the battery with the highest voltage
START ASSIST SIGNAL VOLTAGE	V <sub>SS</sub>	1.5V			A voltage above this value will activate the start assist mode
START ASSIST BATTERY VOLTAGE DIFFERENCE	V <sub>SBD</sub>			0.85V	The difference between battery voltages must be less than this value
STATE CORRECTION ATTEMPTS			3		Attempts before each lockout period
STATE CORRECTION LOCKOUT PERIOD			2 minutes		Delay between state correction attempt sequence
SOLENOID DRIVE PULSE CURRENT			8A		
SOLENOID DRIVE PULSE PERIOD			40mS	100mS	
RUPTURE CURRENT				2000A	Single cycle
LOAD DUMP				100V	ISO 7637-2 12V Pulse 5a, 5b
ESD		-15 kV		-15 kV	J1113-13/J1455, Section 4.13.2.2.3
RADIATED EMISSIONS					ISO 7637-2:2004
EMI SUSCEPTIBILITY					ISO 7637-2:2004
INDUCTIVE SWITCHING		-600V		400V	J1455, Section 4.11.2.2.2
MUTUAL COUPLING		-300V		300V	J1455, Section 4.11.2.2.2
ELECTRICAL ISOLATION		500VAC			From base plate

## Mechanical and Environmental

OPERATING & STORAGE TEMPERATURE RANGE	-40°C to 85°C	
THERMAL CYCLIC AGING	SAE J1455	-40°C to 85°C, 25/ 8 hr. cycles
THERMAL SHOCK (AIR TO AIR)	SAE J1455	-40°C to 85°C, 36/ 6 hr. cycles
HUMIDITY	SAE J1455, Section 4.2.3.4a	95% at 38°C
SEALING	IP69K/ IP61	*Rating above IP61 is dependent on connector rating
MECHANICAL SHOCK-OPERATIONAL	20g when mounted with studs up	** See note below
MECHANICAL SHOCK-HANDLING	SAE J1455, Section 4.11.3.1	
MECHANICAL SHOCK – TRANSIT DROP	SAE J1455, Section 4.11.3.2	
VIBRATION RANDOM	5-500 Hz 4g	9 hours
FATIGUE RESISTANCE	ISO 16750-3/4.1.2.7/8	96 hours
SALT SPRAY	ASTM B 117	96 hours
CHEMICAL TESTING	SAE J1455 4.4	Automotive fluids
COMPLIANCE	RoHS/ REACH/ Conflict free	

*Values given are based on design intent and lab testing, however customer testing is required to ensure the product operates as intended in each specific application.*

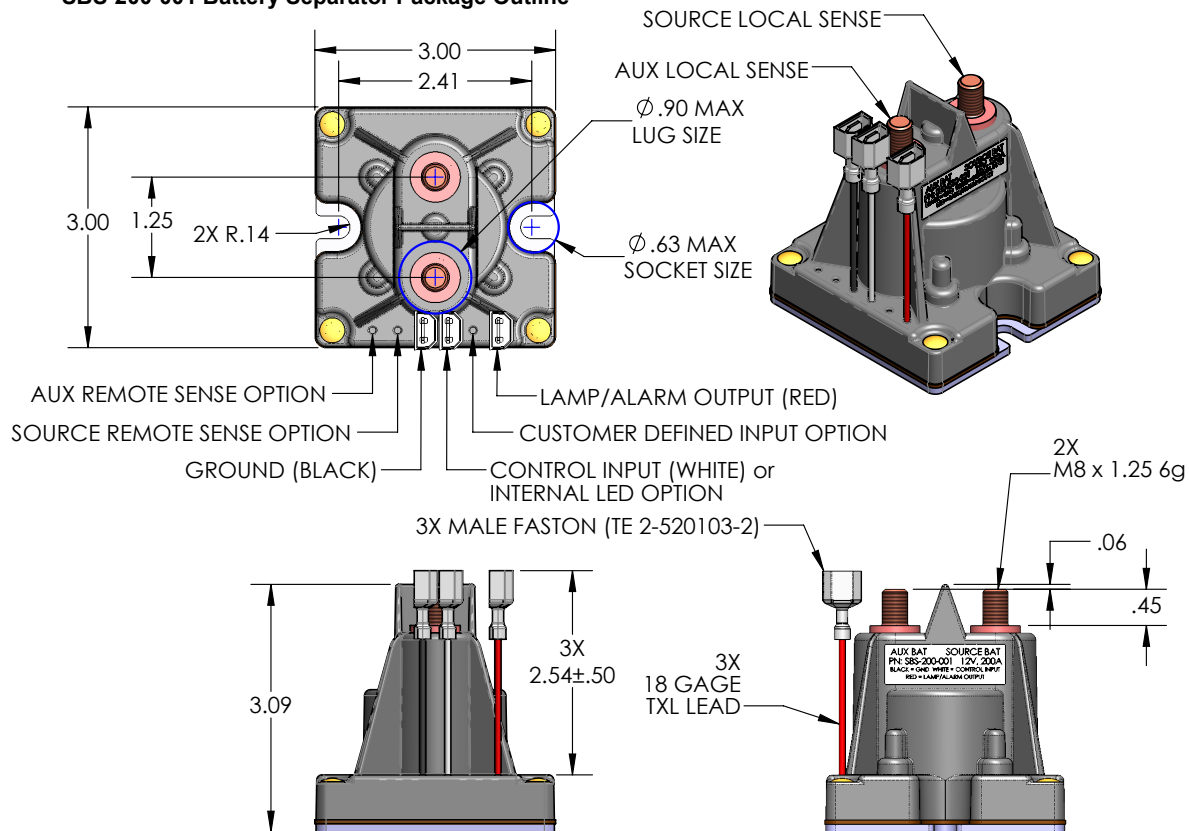
*\*\*Shock greater than 20g with studs facing up and unit in open-state may result in unintended closure of contacts, higher resistance to inadvertent state change may be achievable in other orientations. Unit withstands forces up to 30g without physical damage to unit.*

***(Optional LED) conditions***

OFF	During the state correction lockout period or the stud voltages are not within the functional voltage range
BLINKING	The contactor is open and operating within normal operating conditions
ON STEADY	The contactor is closed



## SBS-200-001 Battery Separator Package Outline

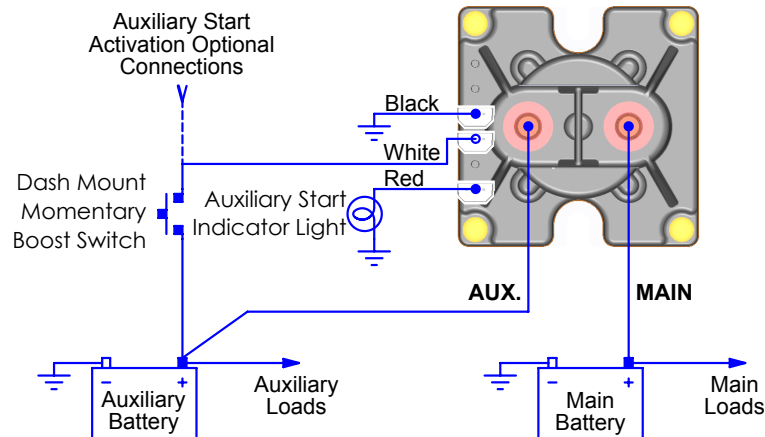


NOTE: ALL DIMENSIONS, UNLESS OTHERWISE STATED, ARE  $\pm 0.04$ .

MODEL NUMBER	LEADS	LED OPTION	CONNECTOR
SBS-200-001	3	NO	3) 1/4" MALE FASTON
*SBS-200-002	3	NO	DEUTSCH DT04-3P
*SBS-200-003	1	YES	1) LUG FOR 3/8" STUD

\*ITEM NOT SHOWN

## SBS-200-001 Battery Separator Connection Diagram



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