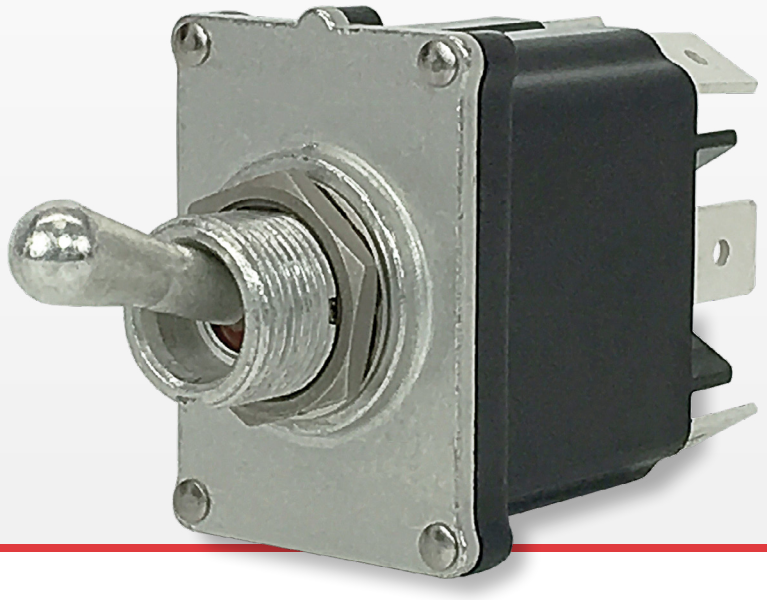
Carling Technologies®

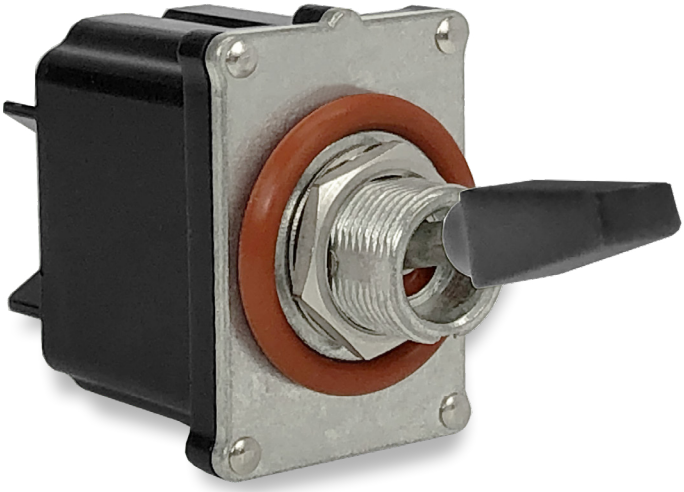
ST-Series

Sealed Toggle Switches

PRODUCT WEBPAGE

request sample, configure part, watch video





Designed to conform to MIL-DTL-3950G requirements for environmentally sealed toggle switches, and compliant to UL 60079-15 standard for use in explosive gas atmospheres. The ST-Series is fully sealed to IP68, including below the panel and features innovative design and performance principles sure to withstand the most demanding applications.

1-2	10-16	125, 250	12-24
Poles	Amps	VAC	VDC

Typical Applications

- Off-Highway
- Armored Vehicles
- Commercial Food
- Military
- Applications requiring stringent sealing in explosive environments

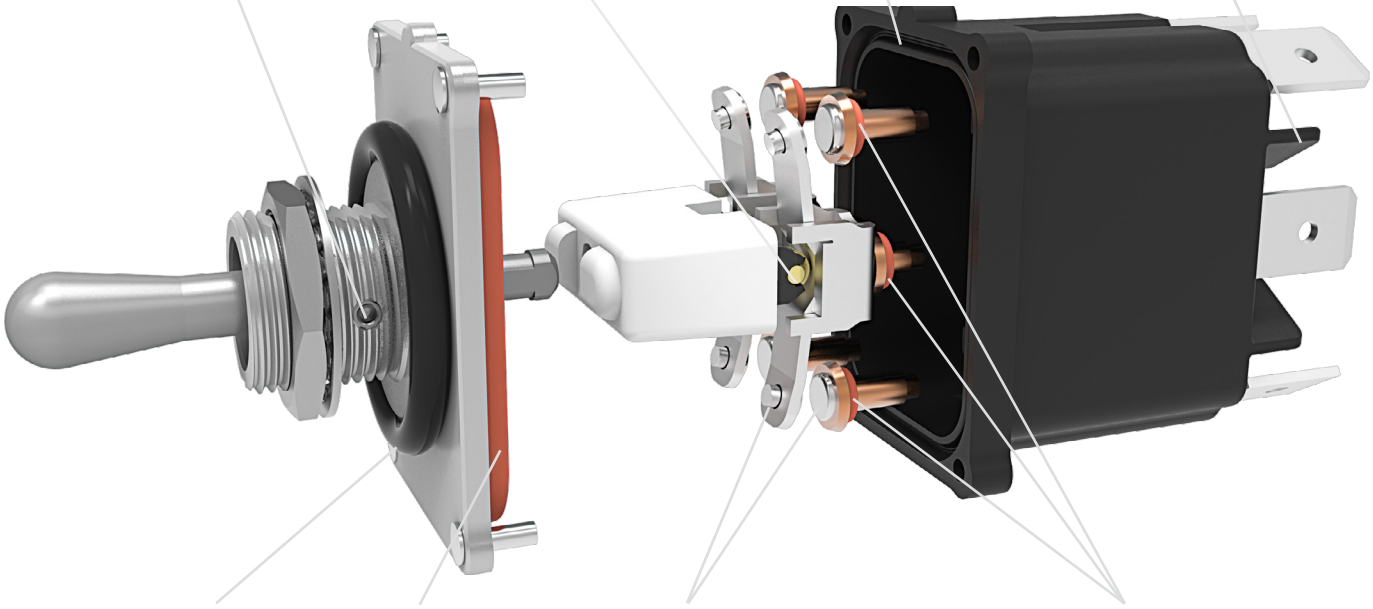
Design Features

PINNED ACTUATOR / BUSHING
Keeps toggle or paddle firmly in place and prevents rotation

BRASS ROLLER PIN
Provides rolling metal on metal actuation for maximum endurance

BASE SEAL CHANNEL
Perfectly fits the toggle assembly seal decreasing the dependence on clamping forces and rivets

TERMINAL BARRIERS
Comply with UL-61058-1 electrical spacing requirements



OPTIONAL O-RING
Assures additional under panel sealing protection

BUSHING/TOGGLE SEAL
Composed of dynamic silicone material that bonds to the metal toggle, pin, and bushing

RIVETS
High purity copper composite and silver alloy materials handle various electrical loads and maintain low contact resistance

TERMINAL SEALS
Assure a secure seal at extreme temperatures. Eliminates potential for separated joints associated with insert molded constructions

Tech Specs

Electrical

Contact Rating	10A 250VAC, 15A 125VAC, 16A 12/24VDC
Dielectric Strength	MIL-STD-202G, Method 301 (1500 Volts RMS)
Insulation Resistance	MIL-STD-202G, Method 302 (50 MegOhms, 500 VDC)
Initial Contact Resistance	MIL-STD-202G, Method 307 (10 milliOhms max.)
Insulation Resistance	Overload: MIL-DTL-3950G, Section 4.8.11.1 Electrical Endurance and Temperature: UL 61058-1 Momentary circuits: 25,000 operations, minimum. Maintained circuits: 50,000 operations, minimum.
Initial Contact Resistance	UL-1500 Ignition-Protection Test for Marine Products
Ignition Protection	Up to 100,000 cycles, circuit and load dependent
Explosion Protection	UL 60079-15 Electrical Apparatus for Explosive Gas Atmospheres
Contacts	Silver / Nickel Alloy
Terminals	Brass or Copper / silver plated. Tab Terminal: ¼" quick-connect Screw Terminal: #6-32 brass screw and cage clamp MIL-STD-202G, Method 211 Test Condition A, and B: 25 lb. pull test, two terminal bends.

Agency Approvals

UL and cUL
Reference: UL 61058-1 and CAN/CSA-C22.2 No. 61058-1-09, Switches for Appliances - Part 1: General Requirements.
Certificate number 20181012-E7560.
UL 1500 Ignition-Protection.
UL 60079-15 Electrical Apparatus for Explosive Gas Atmospheres.

Environmental

Temperature	Operating: -40°C to +85°C Storage: -65°C to +85°C
Vibration	MIL-STD-202G: Method 204D, Test Condition A (10 G peak, Harmonic, 10Hz to 500Hz sweeps, 9 hours total).
Shock	MIL-STD-202G: Method 213B, Test Condition K (30 G, half sine)
Sealing	IP68, for above and below-panel components of actual switch only.
Salt Atmosphere	MIL-STD-202G, Method 101, Test Condition A (96 hrs)
Thermal Shock	MIL-STD-202G, Method 107, Test Condition A (five cycles in air: -55°C, +25°C, +125°C, +25°C)
Moisture Resistance, Humidity	MIL-STD-202G, Method 106 (ten 24-hour stepped cycles)
Chemical Resistance	No permanent loss of function, obvious loss of sealing, distortion, softening, embrittlement, discoloration or corrosion after being brushed for 10 minutes, wetting all exposed surfaces. Relevant chemical compatibility documentation may be used in place of testing. Chemical — Concentration Gasoline — 100% Ethylene Glycol — 50% in water Ethanol/Methanol — 10% in water Diesel Fuel — 100%

Physical

Function, Operation, Circuits	Single Pole/ Double Pole with Circuits Single Throw/ Double Throw,Two/Three position, Maintain/ Momentary circuits
Toggle	Tin plated brass bat or tall bat
Paddle	Acetal, UV stabilized yellow, red, white and black.
Mechanism Actuator	Polyester PBT, UL94-V0 and fungus resistant per MIL-STD- 810G, Section 508.6
Internal Seals	Silicone per A-A-59588-1A.
Mounting, Hardware	15/32"-32 UNS-2A threaded bushing with a keyway. A single nut and lock washer are supplied unassembled.
Bushing/Top Plate	Zinc/aluminum die cast, with tin plating.
Base	Polyester PBT, UL94-V0 and fungus resistant per MIL-STD- 810G, Section 508.6
Actuation Force	Initial Actuation Forces ± 0.3 lb (for 2-Pole circuits, short bat)
Angular Movement	14.5 degrees, each side of center

*Manufacturer reserves the right to change product specification without prior notice.

Ordering Scheme

Sample Part Number	ST	A	2	E	1	-	53
Selection	1	2	3	4	5		6

1. SERIES

ST Sealed Toggle

2. CIRCUIT

	2 & 3, 5 & 6Connected Terminals		1 & 2, 4 & 5
Position:	**1**	**2**	**3**
A	ON	NONE	OFF
B	(ON)	NONE	OFF
C	ON	NONE	(OFF)
D	ON	NONE	ON
F [6]	ON	NONE	(ON)
J	ON	OFF	ON
K	ON	OFF	(ON)
L	(ON)	OFF	(ON)
Special Circuits [6]			
E [2,3]	5 & 6	5 & 3	5 & 1
G [2,4]	2 & 3, 5 & 6	2 & 3	OFF
M [2,4]	(2 & 3, 5 & 6)	2 & 3	OFF

3. POLES

1 Single pole using terminals 1, 2 & 3
2 Double pole using terminals 1, 2, 3, 4, 5 & 6

Notes:
1 Standard hardware is (1) inner tooth lock washer and (1) hex nut bulk.
2 Available only with 2 pole option in selection box # 3.
3 External customer supplied jumper required between terminals 2 & 4 to get SP ON-ON-ON circuit.
4 Available with termination B and E only.
5 Available with special circuit G and M only.
6 Not available with rating 5.
7 Available with termination 1 and 4 only.

Configure Complete Part Number > | Browse Standard Parts >

4. RATING

4 10A 250VAC; 15A 125VAC
5 [7] 10A 250VAC; 15A 125VAC (UL, cUL Recognized)
E 16A, 12/24VDC

5. TERMINATION

1 .250 (6.4mm) TAB (QC)
4 Screw with Cage Clamps
B [5] .250 (6.4mm) TAB (QC). Jumper T2 to T5. No terminal at T5
E [5] Screw with Cage Clamps. Jumper T2 to T5. No terminal at T5

6. ACTUATOR STYLE

TOGGLE (SEALED METAL)

Without Panel Seal	With Panel Seal (Bulk)	Toggle Color	Toggle Length	Bushing Length
53	**58**	Dull Nickel	.561	.385
73	**78**	Dull Nickel	.687	.385

PADDLE (SEALED PLASTIC)

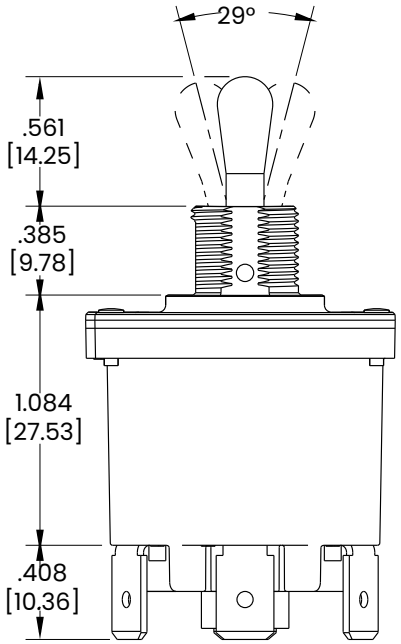
Without Panel Seal	With Panel Seal (Bulk)	Paddle Color	Paddle Length	Bushing Length
B3	**B8**	Black	.880	.385
W3	**W8**	White	.880	.385
R3	**R8**	Red	.880	.385
Y3	**Y8**	Yellow	.880	.385

COS-0059 Rev: J

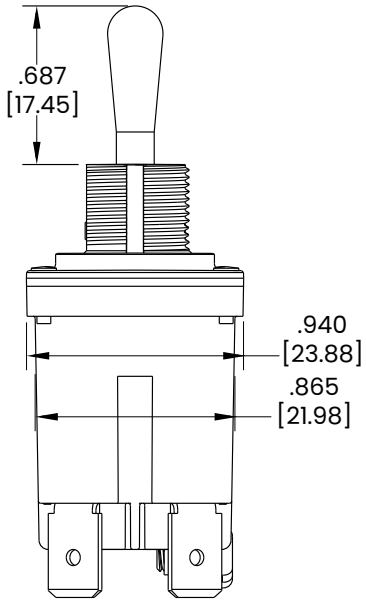
Dimensional Specs

inches [millimeters]

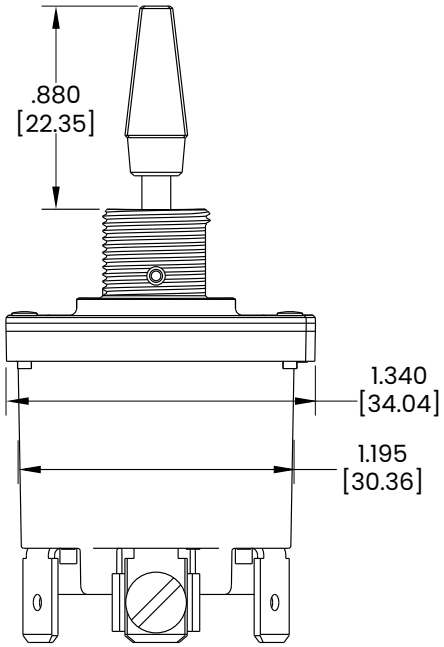
BAT TOGGLE



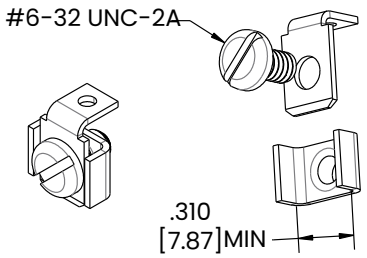
TALL BAT TOGGLE



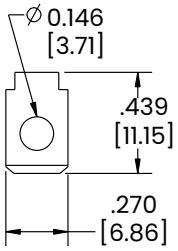
PADDLE TOGGLE

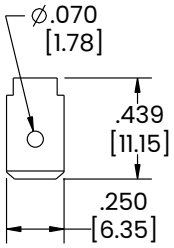


TERMINALS

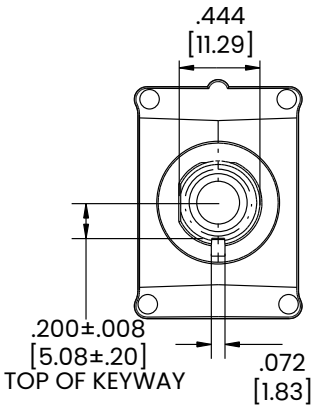


SCREW (AND CAGE) TERMINAL

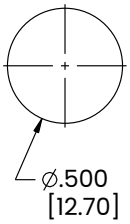




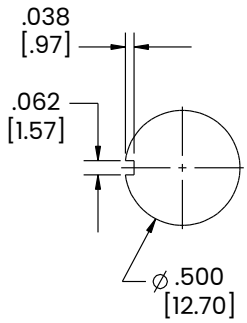
.250 TAB(Q.C.) TERMINAL



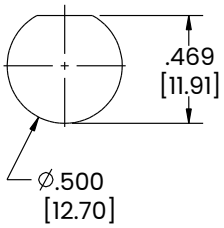
PANEL CUTOUTS



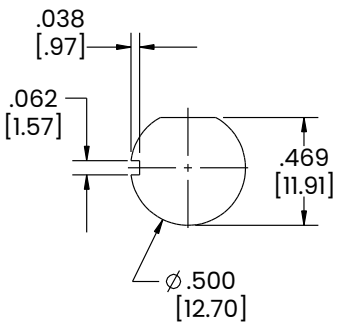
MOUNTING HOLE



WITH KEYWAY



WITH FLAT



WITH KEYWAY, FLAT

CLA-0133 Rev: F

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