Carling Technologies®
Innovative Designs. Powerful Solutions.

SWITCHES & CONTROLS

CATALOG

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

FOUNDED IN 1920

Since its founding, Carling Technologies has continually forged a tradition of leadership in quality and product innovation.

There are few products that Carling Technologies hasn't turned "ON" and fewer industries that haven't turned to Carling for solutions. With ISO and TS registered manufacturing facilities and technical sales offices worldwide, Carling ranks among the world's largest manufacturers of circuit breakers, switches, power distribution units, digital switching systems and electronic controls.

SWITCHES & CONTROLS
- Rocker
- Toggle
- Pushbutton
- Rotary

CIRCUIT PROTECTION
- Hydraulic-Magnetic
- Thermal
- GFCI / ELCI

CUSTOM SOLUTIONS
- PDU's
- Keypads
- Control Modules

MULTIPLEXED POWER SYSTEMS
- HMI Devices & I/O Modules
- Programmable Displays
- Data Communication Interfaces
- Electrical Systems Monitoring

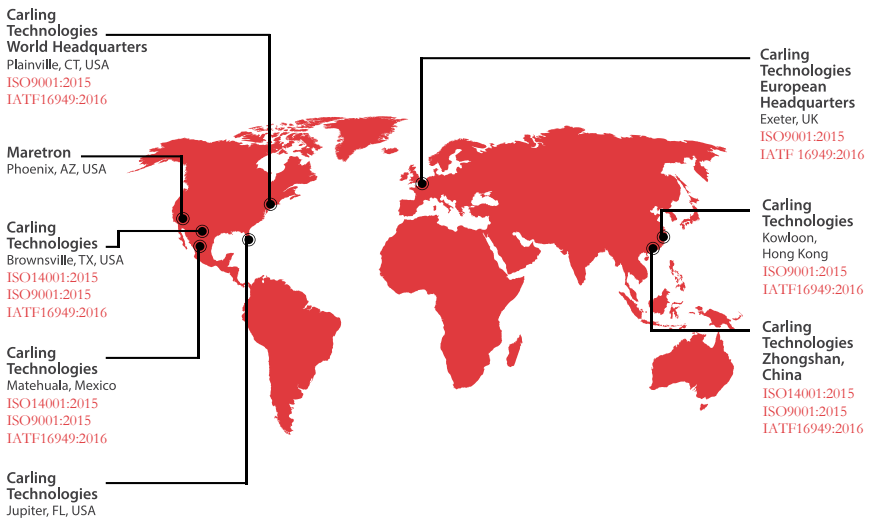
STRATEGIC MARKETS SERVED:

On/Off Highway | Marine | Telecom/Datacom | Military | Renewable Energy

OTHER SERVED INDUSTRIES:

Medical | Industrial Control | Audio / Visual | Commercial Food | HVAC | Floor Care | Generators | Small Appliances | Security Systems | Test & Measurment

GLOBAL LOCATIONS:



WORLDWIDE NUMBERS:

2400+ EMPLOYEES

150+ ENGINEERS

70+ DISTRIBUTORS

50+ REP FIRMS

COMPETITIVE ADVANTAGES+

Innovative & Eco-Friendly Products

Excellent Quality & Customer Service

Reliable & On-Time Delivery

Vertical Integration

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Available Online are tools such as a **configurit**, **product selector** and **stock check**. Please visit **www.carlingtech.com** for the latest information on all our products.

Application Solution Engineers are readily available to assist you in selecting the appropriate product for your application. For further assistance, please email us at team2@carlingtech.com

Custom Design Solutions can be tailor-made for most any application using our extensive engineering resources.

Other Products such as miniature switches, hydraulic-magnetic, thermal and ground fault circuit breakers are also available.

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ELECTRONIC SWITCHING

These CAN based, 6 pack of SAE J1939 compatible controls provide myriad options for the Transportation Market designers of today. Controlling up to 12 individual loads, these fully customizable products feature programmable illumination, diagnostic feedback, extended life and offer many other advantages over traditional switch products. Multiplexing is made easy by the use of rear mounted Deutsch connectors, eliminating the extra weight and cost of traditional wire harnesses.

SELECTOR GUIDE

NEW CKP-Series	NEW VM-Series	
SAE J1939 CAN 2.0b Protocol	SAE J1939 CAN 2.0b Protocol	**Software**
12 individual loads	6 individual rockers, up to 12 total loads	**Circuitry**
8-32 V	12 or 24 V	**Operating Voltage**
1, 2, or 3 LED's per load	Dependent or Independent LED's	**Illumination**
IP69 Front Panel; IP68 Back Panel when connected	IP68 Front Panel; IP68 Back Panel when connected	**Sealing**
Deutsch DT-Series Connector	Deutsch DT-Series Connector	**Termination**
Custom or standard laser etched backlighting	Custom or standard laser etched backlighting	**Legends**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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CKP-Series

SAE J1939 CAN KEYPAD

Compliant with SAE J1939 CAN standards, the CKP-Series is a customizable keypad featuring laser etched legends and up to three dimmable LED function lights per button, which also offer diagnostic feedback by blinking if there is a fault.

Sealed to an IP69 protection level, the CKP-Series can be installed inside or outside the cab making it ideal for any on/off-highway application. Its low profile design affords a seamless dashboard look and can be mounted either vertically or horizontally.

The CKP-Series offers significant advantages over traditional electromechanical switches such as 1,000,000 actuation cycles, reduced wire harnessing, and easy installation.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing ›

Watch Product Video

Product Highlights:

- SAE J1939 CAN 2.0b Protocol
- IP69 Front Panel Sealing Protection
- Up to 3 LED Function Lights Per Button
- Diagnostic Feedback
- Standard or Custom Laser Etched Legends
- 1,000,000+ Button Actuation Cycles
- Low Current Switching
- 8 to 32V Operating Voltage
- Tactile and Audible Feedback

Typical Applications:

- Military
- On/Off-Highway
  - Trucks & Buses
  - Construction
  - Mining
  - Agriculture
  - Among Others

CKP-Series
DESIGN FEATURES

LOW PROFILE DESIGN
0.57 inch [14.48 mm] thickness (see dimensional specifications for more detail)

Front View

SEALING PROTECTION
Fully sealed IP69 front panel

LED FUNCTION LIGHTS
One, two, or three LED Function Lights per button. Colors include Amber, Green, Red or Blue.

CUSTOMIZABLE ICONS
Choose from our standard library of icons or use custom icons.

Back View

SEALING PROTECTION
Fully sealed IP68 back panel when connected

CONNECTOR
Mates to the Deutsch DT-Series Connector

10-32 MOUNTING STUDS (2x)
Max tightening torque 30 inch lbs.

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General

Illumination	LED backlit icons and function lights Up to 3 function lights per button Dimmable illumination, controlled by CAN messages
Connection / Wiring	Duetsch DT series connector (See Dimensional Specifications)

Electrical

Operating Voltage	Designed for 12/24 Volt systems Minimum 8 VDC Maximum 32VDC
Sleep Mode	Low current sleep mode draws less than 1.5 mA throughout the supply voltage range wakes on keypress or CAN message
Supply Voltage ratings	The keypad passes SAE J1455 section 4.13.1 for power up, operating voltage, over voltage, reverse polarity, and short circuit
EMC	Transient immunity: ISO 11452-2, 100 V/m, 20 MHz to 2,000 MHz, Class A per ISO 11451-1 Conducted Transient immunity: ISO 7637-2:2004, Annex A Table A2 (for 24V systems), Class A ESD immunity: ISO 10605:2001, Test level IV (8 kV direct dis charge, 15 kV air discharge) Transient Emission: ISO 13766, Broadband: Annex D, Narrow band: Annex E, 30-1000 MHz

Mechanical

Overall Dimensions	See Dimensional Specifications
Panel cutout	See Dimensional Specifications
Endurance	Each button functions for at least 1,000,000 total actuations (100,000 actuations at -40°C, 100,000 actuations at +85°C, and 800,000 actuations at +25°C ± 10°C)

Software

CAN Protocol	CAN 2.0b type interface as defined by SAE J1939

Environmental

Thermal	-40°C to +85°C The following codes were passed: Cold Soak (IEC 60068-2-1) Heat Soak (IEC 60068-2-2) Cycling/Shock (IEC 60068-2-14)
Solar Radiation:	IEC 60068-2-5, procedure B, 10 cycles, Total irradiation per cycle = 22.4 kWh/m2
Low pressure	IEC 60068-2-13
Humidity	Soak: IEC 60068-2-78, 93% RH (±3%), 10 days
Cyclic	IEC 60068-2-30, test Db: Damp Heat Cyclic (12hr + 12hr cycle), variant 1, 6 cycles
Ingress Protection	IP6k9k per ISO 20653 (front side) IP6k8 per ISO 20653 when connected (back side)
Shock and Bump	IEC 60068-2-27, Shock 500 m/s^2 11 milliseconds, Bump 400 m/s^2 6 milliseconds 600 cycles
Drop test	IEC 60068-2-31, Free fall, Procedure 1, 1000 mm height, drop in all 3 axes in both directions
Vibration	IEC 60068-2-6, Swept sine wave section 8.2, 5 - 500 Hz 20 cycles 5g acceleration IEC 60068-2-6, Vibration sinusoidal, section 8.1, 10 - 2000 Hz, 5g acceleration IEC 60068-2-64, Method 1, random excitation, 10 - 350 Hz, 5 hours in each axis
Chemical Resistance	IEC 60068-2-74, Class B, Engine oil, Diesel, Hydraulic oil, Ethylene Glycol, Urea Nitrogen, Liquid Lime, NPK Fertilizer, Ammonia, Calcium Chloride, Brake fluid
Corrosion Resistance	IEC 60068-2-52, Test Kb, Severity level 4
Weathering/Cracking Resistance	ASTM D1171-99, method A, 72 hours
Abrasion/Wear Resistance:	40 cycles of ASTM F2357 testing with 0.25” paper at 175 grams of force

Software Interface Integration

Click below for details on integrating the CKP-Series into J1939 CAN network:
www.carlingtech.com/sites/default/files/documents/ckp-series_interface.pdf

*Manufacturer reserves the right to change product specification without prior notice.
GPS-0007 Rev: A

Ordering Scheme: Part 1 (Keypad)

CKP	1	–	1	A	1	–	A	B	–	A	–	J	000	/
1 Series	*2 Styling*		*3 Button Layout*	*4 Orientation*	*5 Keypad Color*		*6 Backlight*	*7 Function Light Color*		*8 Un-illuminated Image Code*		*9 Network Type*	*10 Source Address*	

1 SERIES
CKP Carling Keypad

2 KEYPAD STYLING
1 Standard

3 BUTTON LAYOUT
1 Two by Six

4 ORIENTATION
A Landscape
B Portrait
C Reverse Landscape
D Reverse Portrait
See "icon artwork button layout" section for details.

5 KEYPAD COLOR
1 Black

6 BACKLIGHT
A White

7 FUNCTION LIGHT COLOR
B Amber **C** Green **D** Red **E** Blue

8 NON-ILLUMINATED IMAGE CODE
A White

9 NETWORK TYPE
J J1939

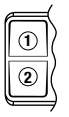
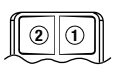
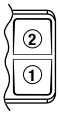
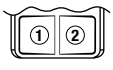
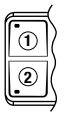
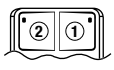
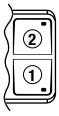
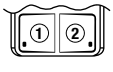
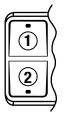
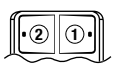
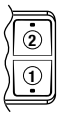
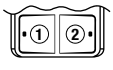
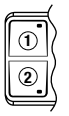
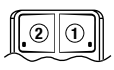
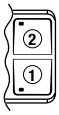
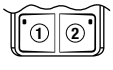
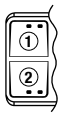
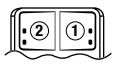
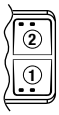
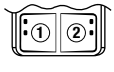
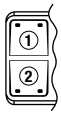
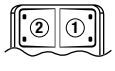
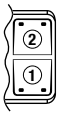
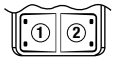
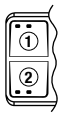
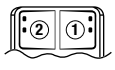
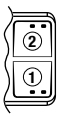
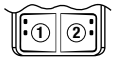
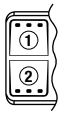
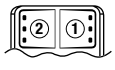
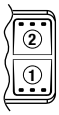
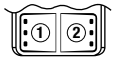
10 SOURCE ADDRESS
The Source Address is a unique number (000-248) assigned to each node on a CAN network, and is determined based on the specific CAN architecture of each customer application.

Ordering Scheme: Part 2 (Icon Artwork)

	Button 1		Button 2		Button 3		Button 4		Button 5		Button 6	
	2	RS	2	RA	3	UV	3	UW	6	MT	8	UB
	11 Function	*12 Icon Code*	*13 Function*	*14 Icon Code*	*15 Function*	*16 Icon Code*	*17 Function*	*18 Icon Code*	*19 Function*	*20 Icon Code*	*21 Function*	*22 Icon Code*

	Button 7		Button 8		Button 9		Button 10		Button 11		Button 12	
	8	NN	8	PU	5	PR	5	PP	4	RH	4	NU
	23 Function	*24 Icon Code*	*25 Function*	*26 Icon Code*	*27 Function*	*28 Icon Code*	*29 Function*	*30 Icon Code*	*31 Function*	*32 Icon Code*	*33 Function*	*34 Icon Code*

FUNCTION LIGHT CODE (Select for positions 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33)

		Landscape	*Portrait*	*Reverse Landscape*	*Reverse Portrait*
1	No Function Light				
2	Open-Closed-Closed				
3	Closed-Open-Closed				
4	Closed Closed-Open				
5	Closed-Open-Open				
6	Open-Closed-Open				
7	Open-Open-Closed				
8	Open-Open-Open				

Additional function light colors available, please consult factory.

ICON CODE
00 For standard icons, see next page. For additional icons, please consult factory.

COS-0094 Rev: D

Continue to next page for layout and icons.

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Orientation - Icon Artwork Button Number Layout

(see dimensional specifications for more detail)

A: Landscape

C: Reverse Landscape

B: Portrait

D: Reverse Portrait

Standard Icon Codes:

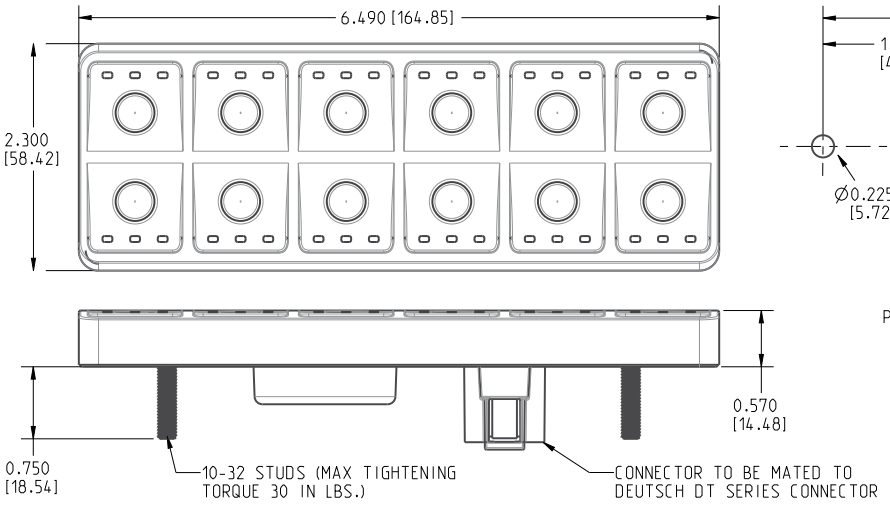
UB	UV	UW	UX	UY	MP	MR	PX	MS	MR	MT	VU	MW
NZ	NX	NY	YM	VW	PW	PZ	WG	RN	RP	YG	TX	HEAD LIGHTS SH
DASH LIGHTS SN	BEACON SR	LIGHT SY	DIM WY	BRIGHT WZ	UF	UG	MU	TN	NS	PB	WIPER SE	VZ
YE	NN	RW	PU	WA	YN	UE	NM	RJ	NR	YD	TL	VR
ENG FAN SL	UC	VN	PK	VY	HORN UZ	RH	NU	NV	RB	RC	RK	RL
MZ	RG	UP WS	DOWN WT	PM	VV	WB	TB	TC	TD	TE	MY	PV
TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK	VS	UL
UM	WK	TS	VT	TCS WL	VP	YJ	PJ	RY	UP	NW	NP	RE
RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR	STOP TK	RT

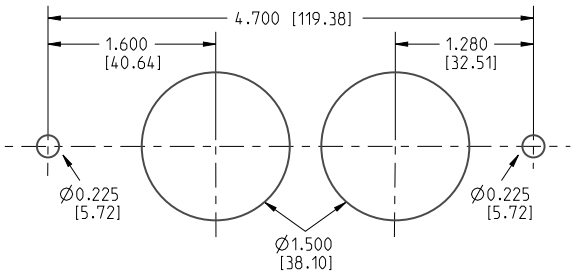
Standard Icon Codes continued on next page.

Standard Icon Codes:

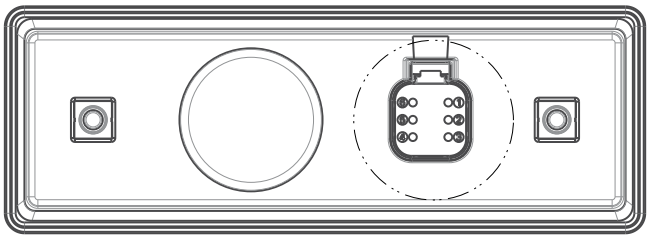
SEAT SZ	 VX	 WF	 WH	 PG	CRUISE SJ	 YA	 YB	 RM	 TM	 RD	 RS	 TP
 TR	 NT	 MX	 YC	 TW	 TJ	 YF	 TH	 TF	 TG	 YS	 YH	AUX SX
ON OFF RZ	OFF ON YP	I O WN	O I WP	OFF ON WW	ON WX	OFF SA	I SB	O SC	II SD	RAISE ST	LOWER SU	HIGH WU
LOW WV	FWD SV	REV SW	ACC VK	REAR SF	PARK SG	AUTO SS	 RU	 RV	 RX			

Dimensional Specifications: in. [mm]

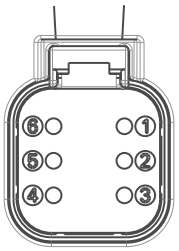




PANEL CUTOUT +/- .020
PANEL THICKNESS TO BE .050 MIN AND .300 MAX



PIN OUT AS SHOWN BELOW



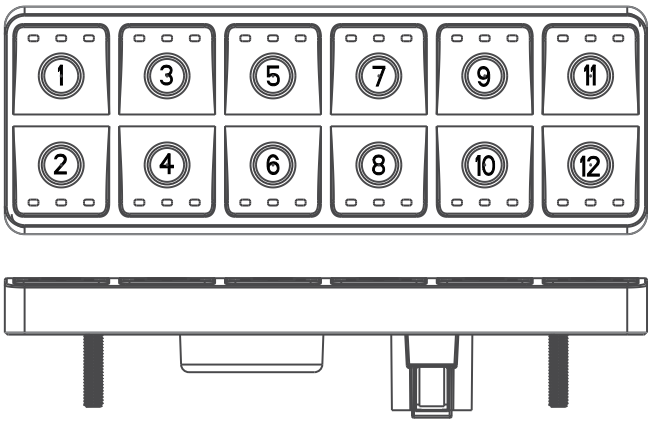
NO.	DESIGNATION
1	BATT +
2	CAN L
3	BATT -
4	IGN_ON
5	CAN H
6	CAN SHIELD

CLA-0145 Rev: A

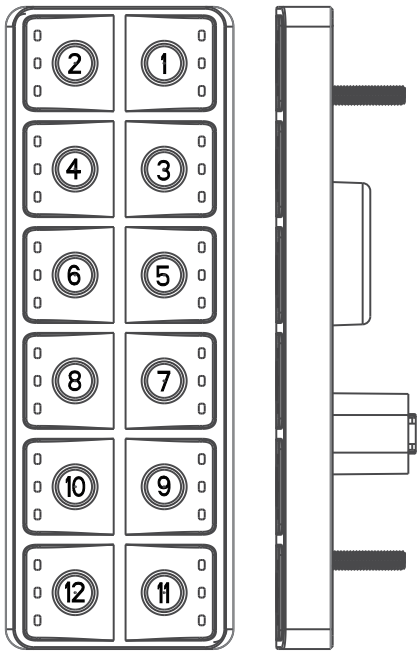
Dimensional Specifications: in. [mm]

ORIENTATION - ICON ARTWORK BUTTON NUMBER LAYOUT

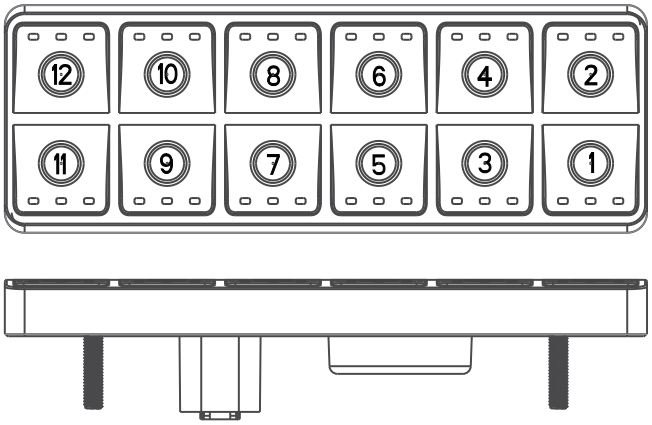
LANDSCAPE



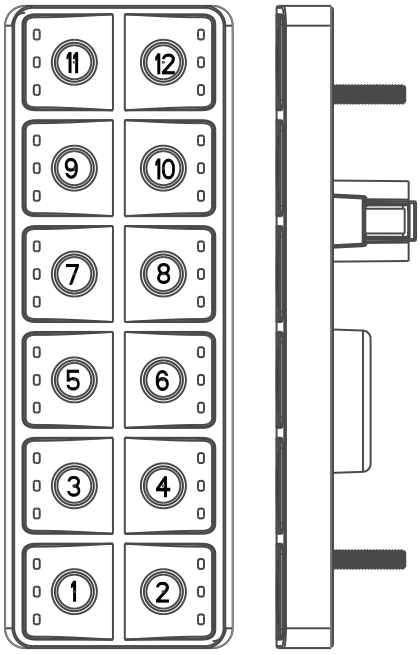
PORTRAIT



REVERSE LANDSCAPE



REVERSE PORTRAIT



VM-Series
OPERATOR CONTROL MODULE

The VM-Series is a multiplexed operator control module ideal for Construction, Agriculture and Commercial vehicles. Rugged and sealed to IP68, the VM-Series can be used in open or closed cab environments and it connects to industry standard SAE J1939 CAN Bus protocol.

The VM-Series reduces the complexity and cost of traditional wire harnesses, increases product life and reliability, and improves assembly efficiencies.

The VM-Series was developed in conjunction with the globally successful Contura® family of switches, providing the look and feel of our traditional rocker switches, but offering the benefits of a multiplexed product.

Resources:

Download 3D CAD Files

IGS > STP >

Watch Product Video

Product Highlights:

- SAE J1939 Compatible
- IP68 Sealing Protection with Connector
- Dimming Capabilities
- Horizontal or Vertical Mounting Options
- Variety of V-Series Contura® actuator styles

Typical Applications:

- On/Off-Highway
  - Construction
  - Agriculture
  - Commercial Vehicles
  - Among Others

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VM-Series
DESIGN FEATURES

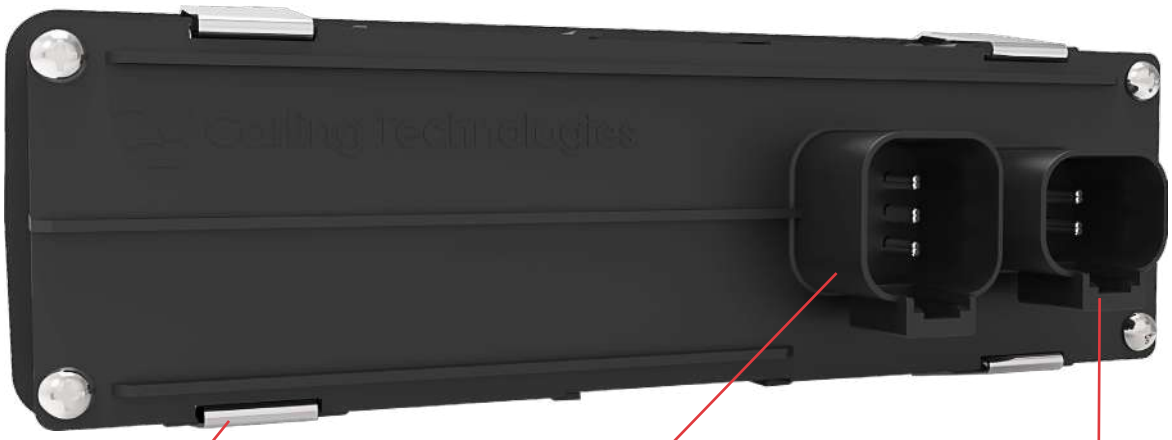
SEALING PROTECTION
Fully sealed IP68 front panel and back panel (when connected)

Front View

CUSTOMIZABLE ICONS
Choose from our extensive library of legends, or customize your own.

ROCKERS
Variety of V-Series Contura® actuator styles

Back View



SNAP-IN MOUNTING
For fast, easy assembly.

6 PIN CONNECTOR
Mates to the Deutsch DT-Series Connector.

4 PIN CONNECTOR
Mates to the Deutsch DT-Series Connector. Can be used to Daisy-chain multiple VM-Series.

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Electrical

Operating Voltage	12VDC or 24VDC systems
Max Current	Operation: 300mA Sleep Mode: 3mA
Communication	Master: CAN 2.0b (SAE J1939)
Programming	At factory or via CAN (special tool)
Reverse Polarity	12V systems: -24V for 5 minutes 24V systems: -36V for 5 minutes
Withstand Voltage	ISO 16750-2 500Vrms (50Hz to 60 Hz) with a duration of 60s
Insulation Resistance	ISO 16750-2 Minimum 10 Mohms at 500Vdc with a duration of 60s
Superimposed Alt Voltage	ISO 16750-2 severity 2, Upp of 4V for Un=12V and Un=24V
Overvoltage	ISO 16750-2 Apply voltage DC 36V for 60min at 65 °C
Slow Decrease/Increase of Supply Voltage	Test Method according to ISO 16750-2- 4.5
Momentary Drop in Supply Voltage	Apply the test pulse according to ISO 16750-2 (Figure 4 for 12V system, Figure 5 for 24V system)
Electrical Endurance	Minimum 250K Operations (50K cycles at Tmin, 150K cycles at Tnom, 50K cycles at Tmax)

Physical

Number of Switches	6 per module
Actuator Type	Rockers – all Contura styles (No locking feature available)
Materials	Housing - Acetal, UV stabilized Back Cover - Acetal, UV stabilized Rocker – Polycarbonate / Nylon Mounting Clips – Stainless steel
Weight	≈0.5 lbs
Functions	2 position maintained, 2 position momentary top, 2 position momentary bottom, 3 position maintained, 3 position momentary top/bottom, 3 position momentary top, 3 position momentary bottom Soft-lock
Sleep Mode	Defined as the state after a pre-defined time of no activity to reduce current draw on the system. Any switch can be configured to wake the unit, and doing so will also activate the switch function.
Illumination	Single-color LED Red, Green, Amber, Blue, White Illumination Table (for each switch position)
Dimming	LED dimming controlled by the ECU through the CAN bus
Connection	Deutsch DT-Series 4 and 6 pin
Mounting	Front panel, removable from a-side
Panel Opening	See dimensional specifications
Depth Behind Panel	≈ 1.6in (41mm) to bottom of header

Environmental

Operating Temperature	-40 °C to +85°C
Thermal, Hot Soak	IEC 60068-2-2 Test Bb, 85°C for 96 hours
Thermal, Cold Soak	IEC 60068-2-1 Test Ad, -40°C for 96 hours
Thermal, Shock	IEC 60068-2-14 Test Na, -40°C to 85°C, 1 hours per cycle (30 minutes at -40°C, 30 minutes at +85°C), total 10 cycles.
Humidity, Soak	IEC 60068-2-78 Test Cab, 30°C at 93% RH for 10 days
Humidity, Cyclic	IEC 60068-2-30 Test Db Method 1, 55°C to 25°C at >90% RH, 6 cycles of 24 hours each
Thermal, Cycling	IEC 60068-2-14 Test Nb, -40°C to 85°C, 2 cycles of 8 hours each
Solar Radiation	IEC 60068-2-5 Procedure B, 40°C for 10 days
Ingress Protection	IEC 60529, IP68, 1.2m deep water for 60+/-2 min
Shock	IEC 60068-2-27, 3 shocks in each direction of the 3 axes (18 total shocks) at 500 m/s2 for 11 ms
Bump	IEC 60068-2-27, 100 shocks in each direction of the 3 axes (600 total shocks) at 400 m/s2 for 6 ms
Drop	IEC 60068-2-31 Test Ec Free Fall – Procedure 1, drop in each direction of the 3 axes (6 drops) from 500mm
Vibration, General	IEC 60068-2-6, swept sine wave from 5-500 Hz, +/-15 mm amplitude, 5g, 20 cycles in each plane
Vibration, Random	IEC 60068-2-64 Test Fh Method 1, random excitation at 10, 150, 220, and 350 Hz breakpoint frequencies, 5 hours in each axis
Vibration, Resonance	IEC 60068-2-6, sinusoidal from 10-2000 Hz, 5 minutes at resonant points
Chemical Resistance	ISO 16750-5 Method II for Engine oil, hydraulic oil, diesel fuel, Grease and Urea at Tmax .
Salt Spray	IEC 60068-2-52 Test Kb, severity level 4

Electromagnetic (EMC)

Reference limits from ISO 13766 (Earth Moving Machinery) and EN 13309 (Construction Machinery)

Absorbed-Lined Chamber	ISO 11452-2, 100V/m, 20MHz to 2GHz
Bulk Current Injection	ISO 11452-4, 100mA, 20MHz to 400MHz
Transient Emission	ISO 13766 Annex D and E, 30MHz-1GHz
Conducted Transients	All test pulses according to ISO 7637-2:2004, Annex Table A2 for 24V systems Level 3 minimum
ESD	ISO 10605, ±15kV air discharges, ±8kV contact discharges

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

GPS-0009 Rev: A

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Software Interface Integration

Click below for details on integrating the VM-Series into J1939 CAN network:
www.carlingtech.com/sites/default/files/documents/vm-series_interface.pdf

Tables

Table A: Illumination Table (for each switch position)

Location	Type	Color	Option
Top LED	Backlight	Red, Green, Amber, Blue or White	Continuous Flashing
	Function	Red, Green, Amber, Blue or White	ON with Switch, ON with Device
Bottom LED	Backlight	Red, Green, Amber, Blue or White	Continuous Flashing
	Function	Red, Green, Amber, Blue or White	ON with Switch, ON with Device

Connector Pin Layout:

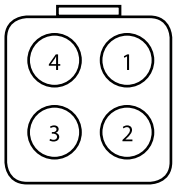
Connector 1 (mating connector: Deutsch DT-Series 4 pins)

Pin	1	2	3	4
Signal	VCC	GND	CAN_H	CAN_L

or

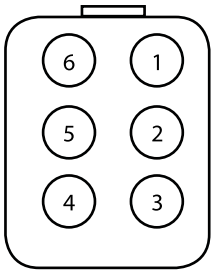
Pin	1	2	3	4
Signal	Out 1	Out 2	Out 3	Out 4

Out 1 to Out 4 is to control loads with max. output current 0.5A @ 24V



Connector 2 (mating connector: Deutsch DT-Series 6 pins)

Pin	1	2	3	4	5	6
Signal	CAN_L	CAN_H	NC	NC	GND	VCC



Ordering Scheme: Part 1 (Module and Rocker Style)

VM	6	-	1	F	1
1 Series	*2 Size*		*3 Protocol*	*4 Rocker*	*5 Orientation*

1 SERIES
VM V-Series Module System

2 SIZE
6 6 Positions

3 COMMUNICATION PROTOCOL
1 J1939
3 J1939 with Control Relay

4 ROCKER STYLE

A	Contura II	**B**	Contura III
C	Contura IV	**D**	Contura IV - Laser Etched
E	Contura V	**F**	Contura V - Laser Etched
G	Contura VI	**H**	Contura VII
J	Contura X	**K**	Contura XI
L	Contura XII	**M**	Contura XIV
N	Contura XIV - Laser Etched		
Z	No Rockers		

5 ORIENTATION

1	Landscape	**2**	Portrait
3	Reverse Portrait	**4**	Reverse Landscape

Ordering Scheme: Part 2 (Module Circuit and Lamps)

	Switch 1					*Switch 2*					*Switch 3*				
	1	B	2	A	-	2	A	1	0	-	6	0	0	0	-
	Circuit	*Lamp Circuit*	*Lamp 1*	*Lamp 2*		*Circuit*	*Lamp Circuit*	*Lamp 1*	*Lamp 2*		*Circuit*	*Lamp Circuit*	*Lamp 1*	*Lamp 2*	

	Switch 4					*Switch 5*					*Switch 6*			
	1	B	2	A	-	2	A	1	0	-	6	0	0	0
	Circuit	*Lamp Circuit*	*Lamp 1*	*Lamp 2*		*Circuit*	*Lamp Circuit*	*Lamp 1*	*Lamp 2*		*Circuit*	*Lamp Circuit*	*Lamp 1*	*Lamp 2*

SWITCH CIRCUIT
1 2 Position Maintained
2 2 Position Momentary Top
3 2 Position Momentary Bottom
4 3 Position Momentary Bottom
5 3 Position Maintained
6 3 Position Momentary Top and Bottom
7 3 Position Momentary Top

LAMP CIRCUIT
A L1 Backlight
B L1, L2 Backlight
C L2 Backlight
D L1 Backlight, L2 Function Light
E L1, L2 Function Light
F L1 Function Light, L2 Backlight
G L1 Function Light
H L2 Function Light
0 No Lamp

LAMP 1
1 LED 1, Red
2 LED 1, Green
3 LED 1, Blue
4 LED 1, Amber
5 LED 1, White
0 No LED

LAMP 2
A LED 2, Red
B LED 2, Green
C LED 2, Blue
D LED 2, Amber
G LED 2, White
0 No LED

Continue to next page for Part 3 (Rockers)

back to table of contents

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Ordering Scheme: Part 3 (Rockers)

All Rocker options must match box 4 from part 1. For additional options, consult factory.

Contura II, III, IV, V, VII and XIV Rockers

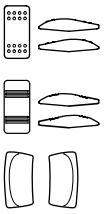
VV	A	Z	C	00	-	0	00
V-Series Rocker Only	*2 Style*	*3 Lens*	*4 Color*	*5 Legend*		*6 Orientation*	*7 Lens Legend*

2 ACTUATOR STYLE

Contura II
A Thick over terminals 1-4
B Thick over terminals 3-6

Contura III
C Thick over terminals 1-4
D Thick over terminals 3-6

Contura IV
E Left brow, lens
T Left brow, laser-etched
F Right brow, lens
R Right brow, laser-etched



Contura V
G Contura V
P Laser-Etched

Contura VII
Z Contura VII

Contura XIV
FA Contura XIV
FB Laser-Etched

3 LENS

Z - No Lens

Clear	White	Amber	Green	Red	Blue	Contura Lens Style Location II	III	IV	V	XIV
1	6	8	G	M	T					
2	7	C	H	N	U					
3	8	D	J	P	V					
4	9	E	K	R	W		N/A			
5	A	F	L	S	Y		N/A			
5	A	N/A	N/A	N/A	N/A	Contura XIV laser-etched only				

Only **Contura VII**
Z - No Lens

White	Amber	Green	Red	Blue	Lens Style Location
6	B	G	M	T	
7	C	H	N	U	
8	D	J	P	V	
9	E	K	R	W	
A	F	L	S	Y	
1	2	3	4	5	

Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

4 ACTUATOR COLOR AND TEXTURE

Contura II & Contura III

B black	**G** gray	**R** red	**W** white	(Soft Surface)
C black	**H** gray	**S** red	**Y** white	(Hard Surface)

Contura IV & Contura V

C black	**H** gray	**S** red	**Y** white
Laser-Etched only		**D** nickel	**E** pewter

Contura VII

C black	**H** gray	**S** red	**Y** white

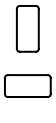
Contura XIV

C black	**S** red	**Y** white	

5 ACTUATOR LENS OR BODY LEGENDS

11 ON OFF **12** OFF ON **13** I O **14** O I

15 O O F N F **16** O O N F F **17** O I **18** I O

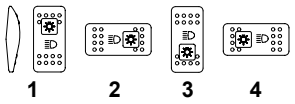


See next page for standard icons. Consult factory for additional icons.

6 LEGEND ORIENTATION

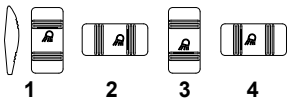
0 No legend (used with codes 11-18 in box 5)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

Contura II



1 2 3 4

Contura III



1 2 3 4

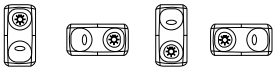
Contura IV

1 2 3 4

Contura V

1 2 3 4

Contura VII



1 2 3 4

Contura XIV

1 2 3 4

7 ACTUATOR LENS LEGEND

00 No legend this location
(used with codes 11-18 in box 5) Box 7 required when rocker requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in box 5; body legend specified in box 7.
See next page for standard icons. Consult factory for additional icons.

Continue to next page for Contura VI (WAVE), Contura X, XI and XII rocker styles.

Ordering Scheme: Part 3 (Rockers): Continued

All Rocker options must match box 4 from part 1. For additional options, consult factory.

Contura VI (WAVE) Rocker Style

VT	H	Z	Z	C	B	–	00	0	00
V-Series Contura VI	*2 Style*	*3 Lens 1*	*4 Lens 2*	*5 Rocker Color*	*6 Insert Color*		*7 Legend*	*8 Orientation*	*9 Lens Legend*

2 ACTUATOR STYLE
Contura VI
H High Insert **L** Low Insert

3, 4 LENS
Z - No Lens

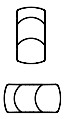
Clear	White	Amber	Green	Red	Blue	
–	7	C	H	N	U	Bar Lens Translucent
3	–	D	J	P	V	Bar Lens Transparent
4	–	E	K	R	W	Oval Lens Transparent
–	A	F	L	S	Y	Oval Lens Translucent

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

5 ACTUATOR COLOR
C Black **H** Gray **S** Red **Y** White

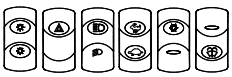
6 INSERT COLOR
B Black
C Bright Chrome Plated
D Satin Chrome Painted
N Bright Nickel Plated
S Satin Chrome Plated
T Satin Nickel Plated
W White

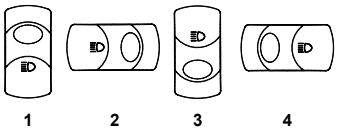
7 ACTUATOR LENS OR BODY LEGENDS
00 - No Legend this location
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



See next page for standard icons. Consult factory for additional icons.

8 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in box 7)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4





9 ACTUATOR LENS LEGEND
00 No legend this location
(used with codes 11-18 in box 7) Box 9 required when rocker requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in box 7; body legend specified in box 9.
See next page for standard icons. Consult factory for additional icons.

Contura X, XI and XII Rockers

VV	1	Z	C	00	–	0	00
V-Series Rocker Only	*2 Style & Color*	*3 Lens 1*	*4 Lens 2*	*5 Legend*		*6 Orientation*	*7 Lens Legend*

2 ACTUATOR STYLE

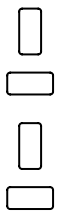
	Black	Gray	White	Red	
Contura X	1	2	3	4	
Contura XI	6	7	8	9	
Contura XII	J	K	N	M	

4 LENS - ABOVE LAMP #1 TERMINALS
4 LENS - ABOVE LAMP #2 TERMINALS
Z - No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
3	8	D	J	P	V	**Bar**
4	9	E	K	R	W	**One piece Square**
5	A	F	L	S	Y	**Two piece Square*** (With clear top protective lens)
2	7	C	H	N	U	**Two piece Square*** (With smoke top protective lens)
1	6	B	G	M	T	**Two piece Square*** (With white top protective lens)

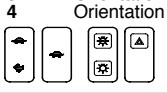
* All bottom lenses are molded of opaque material. Consult factory for other lens colors. Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

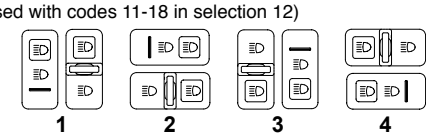
5 ACTUATOR LENS OR BODY LEGEND
00 - No Legend this location
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O
21 OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

6 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4





7 ACTUATOR LENS LEGEND
00 No legend this location
(used with codes 11-18 in box 5) Box 7 required when rocker requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in box 5; body legend specified in box 7.
See next page for standard icons. Consult factory for additional icons.

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Standard Legend Imprinting Codes:

YK	UA	UB	US	UV	UW	UX	UY	MP	MR	PX	MS	MT
VU	MW	NZ	NX	NY	YM	VW	PS	PW	PZ	WG	WM	RN
RP	YG	TX	NAV LIGHTS VD	COURT LIGHTS VE	PANEL LIGHTS VF	ANCH LIGHTS VG	HEAD LIGHTS SH	FOG LIGHTS SM	DASH LIGHTS SN	DOCK LIGHTS SP	BEACON SR	LIGHT SY
DIM WY	BRIGHT WZ	UH	UJ	PD	PE	PF	BILGE PUMP VC	BILGE VJ	UF	UG	MU	TN
NS	PB	WIPER SE	VZ	YE	NN	RW	PU	WA	YN	UE	NM	RJ
NR	YD	TL	VR	ENG FAN SL	BLWR VA	UC	VN	PK	VY	HORN UZ	RH	NU
NV	RB	RC	RK	RL	MZ	RG	UP WS	DOWN WT	UD	UR	WD	TY
PA	UK	WATER PUMP WR	UU	UT	ANCHOR YR	PM	VV	WB	TB	TC	TD	TE
MY	PV	TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK
VS	UL	UM	WK	TS	VT	TCS WL	VP	YJ	PJ	RY	UP	NW
NP	RE	RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR
STOP TK	RT	SEAT SZ	VX	WF	WH	PG	CRUISE SJ	YA	YB	RM	TM	RD
RS	UN	TP	TR	NT	MX	YC	TW	TJ	YF	TH	TF	TG
YS	YH	AUX SX	ON OFF RZ	OFF ON YP	I O WN	O I WP	OFF ON WW	ON WX	OFF SA	I SB	O SC	II SD
RAISE ST	LOWER SU	HIGH WU	LOW WV	FWD SV	REV SW	DEPTH VB	TRIM TAB VH	ACC VK	NAV ANCH VL	WIND LASS UP/DN VM	LIVE WELL WE	REAR SF
PARK SG	AUTO SS	RU	RV	RX								

Notes:
1 ISO compliant symbols. Consult factory for custom legends.
2 New legend codes recommended for new part set ups. Previous codes still valid for existing customers.

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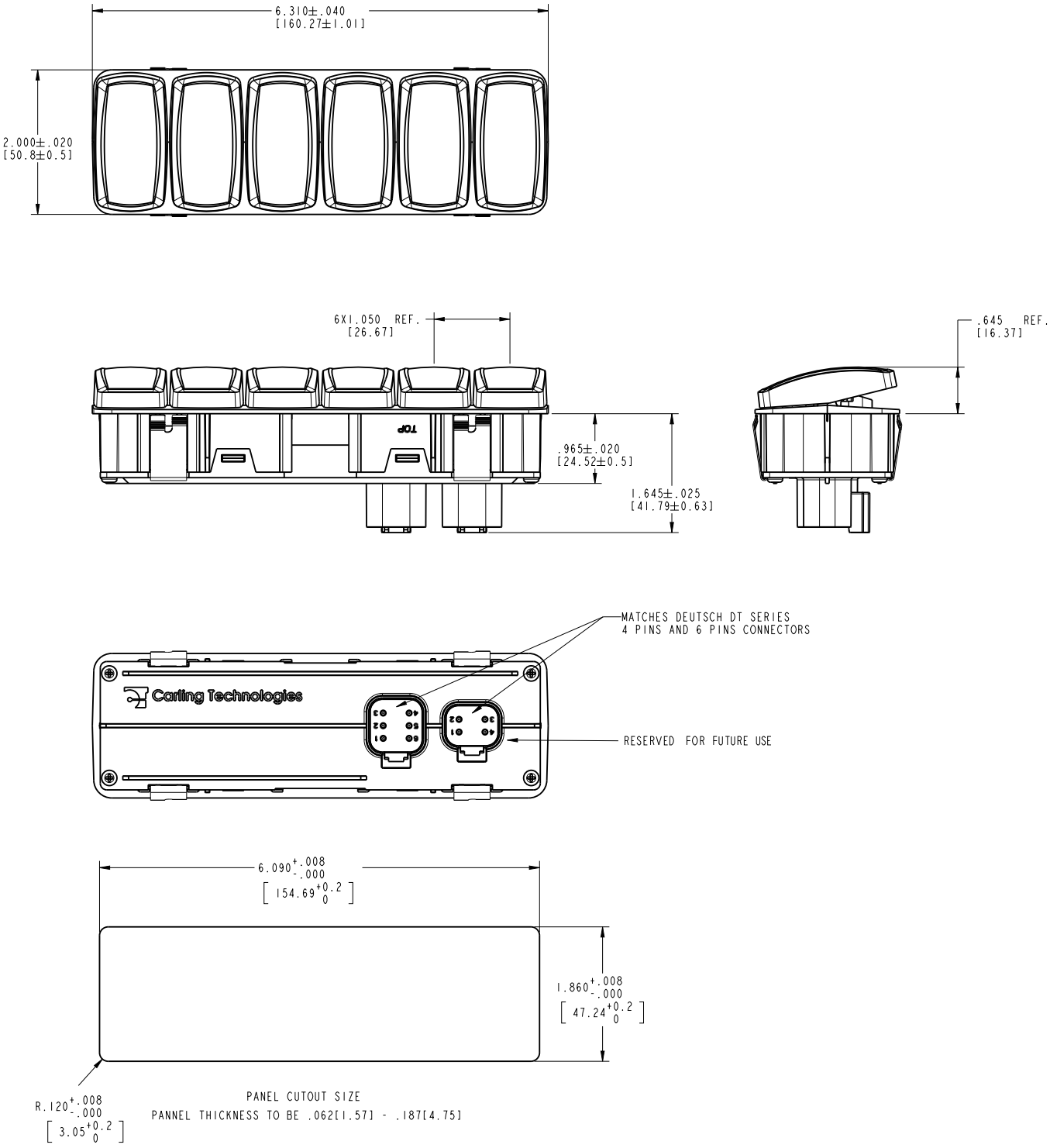
Dimensional Specifications: in. [mm]



CLA-0147 Rev: A

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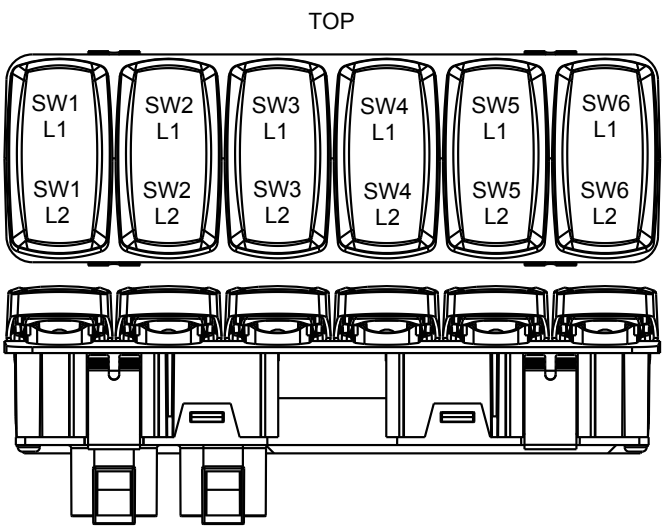
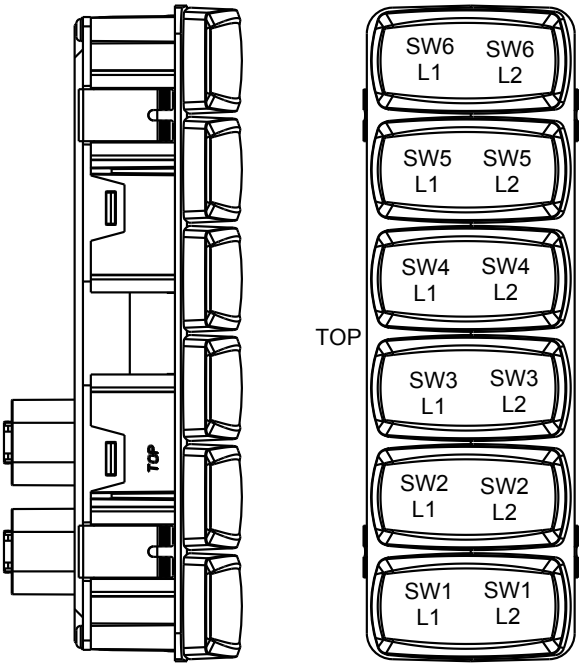
Dimensional Specifications: in. [mm]

ORIENTATION

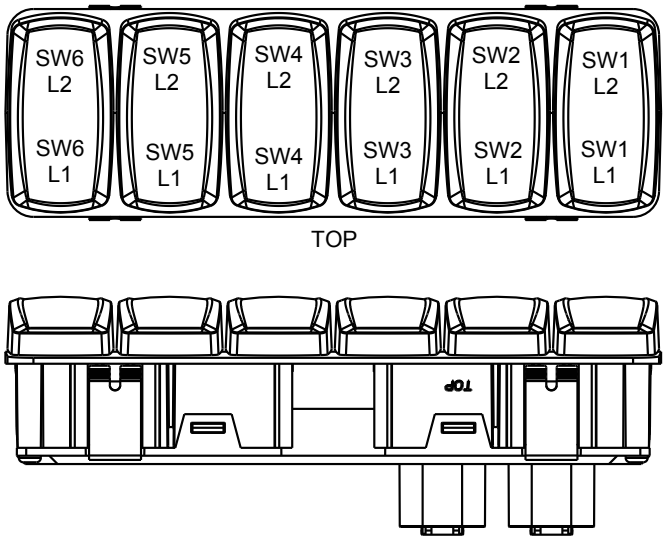
LANDSCAPE



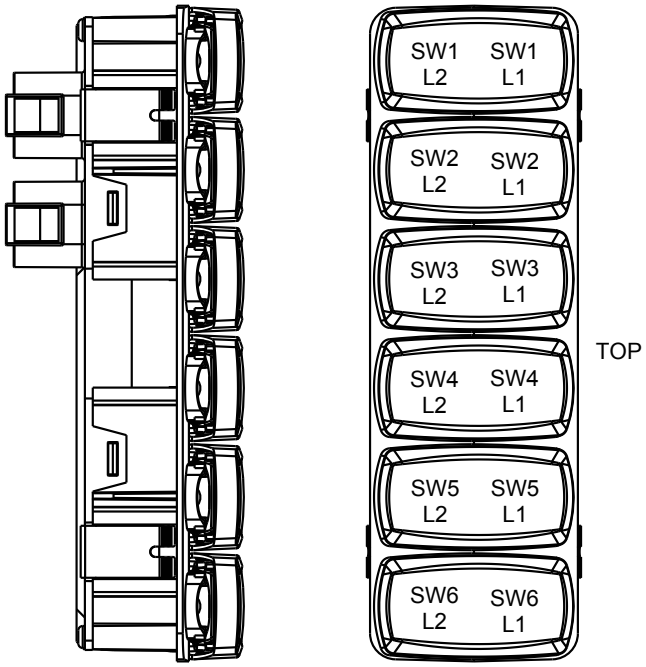
PORTRAIT



REVERSE LANDSCAPE



REVERSE PORTRAIT



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CONTROLS

Carling Technologies offers a variety of Control products for the Transportation Industry including Dimmer Control, Mirror Rotate Control, Wiper Washer Control, and USB Dual Port Charger. Engineers trust our products not only for their style but also for their performance.

SELECTOR GUIDE

V-Charger	LD Dimmer	LMR Mirror	LW Wiper	
1	multi-function	multi-function	multi-function	**Poles**
12V/24VDC	up to 10A 12VDC 5A 24VDC	up to 1A 14VDC .5A 28VDC	up to 8A 14VDC 4A 28VDC	**Ratings**
sealed spring-loaded access doors; curved or square	rocker, paddle	joystick	rocker, paddle	**Actuator**
.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.867" x 1.734" [22mm x 44mm] snap-in mount	.867" x 1.734" [22mm x 44mm] snap-in mount	.867" x 1.734" [22mm x 44mm] snap-in mount	**Mounting Hole Specifications**
.250 tabs	.250 tabs	wire leads with connector	.187 tabs	**Termination**
LED	LED	n/a	LED	**Illumination**
n/a	n/a	n/a	n/a	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

V-Charger

V-SERIES DUAL PORT USB 2.0 CHARGERS

The Carling Technologies USB V-Charger is designed to charge tablets, e-readers, mobile and gaming devices, digital cameras, as well as other compatible electronic devices.

Providing a total current of 3.15 amps, the V-Charger delivers fast charging times even in extreme temperatures from -40˚C to +80˚C. This innovative product safeguards its electronics with integrated over-current and thermal overload protection, as well as optional load dump circuitry, assuring prolonged safe and reliable operation. The center LED indicates charging is in progress. Snap-in mounting for an industry standard 1.450" x .830" panel cutout makes installation easy.

Additionally, the V-Charger's double torsion spring-loaded access doors automatically close and provide up to IP65 sealing protection with precision-fit silicone rubber seals.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing ›

Watch Product Video

Product Highlights:

- Dual USB Charging Ports
- 3.15 Amps for Faster Charging
- 10,000 Operating Cycles per Port
- Up to IP65 Sealing Protection
- 12-24V Operating Voltage
- Protection for Internal Components
- Curved or Square Style Doors

Typical Applications:

- On/Off-Highway Equipment
- Golf Carts
- Lawn & Garden Equipment
- Marine
- Military

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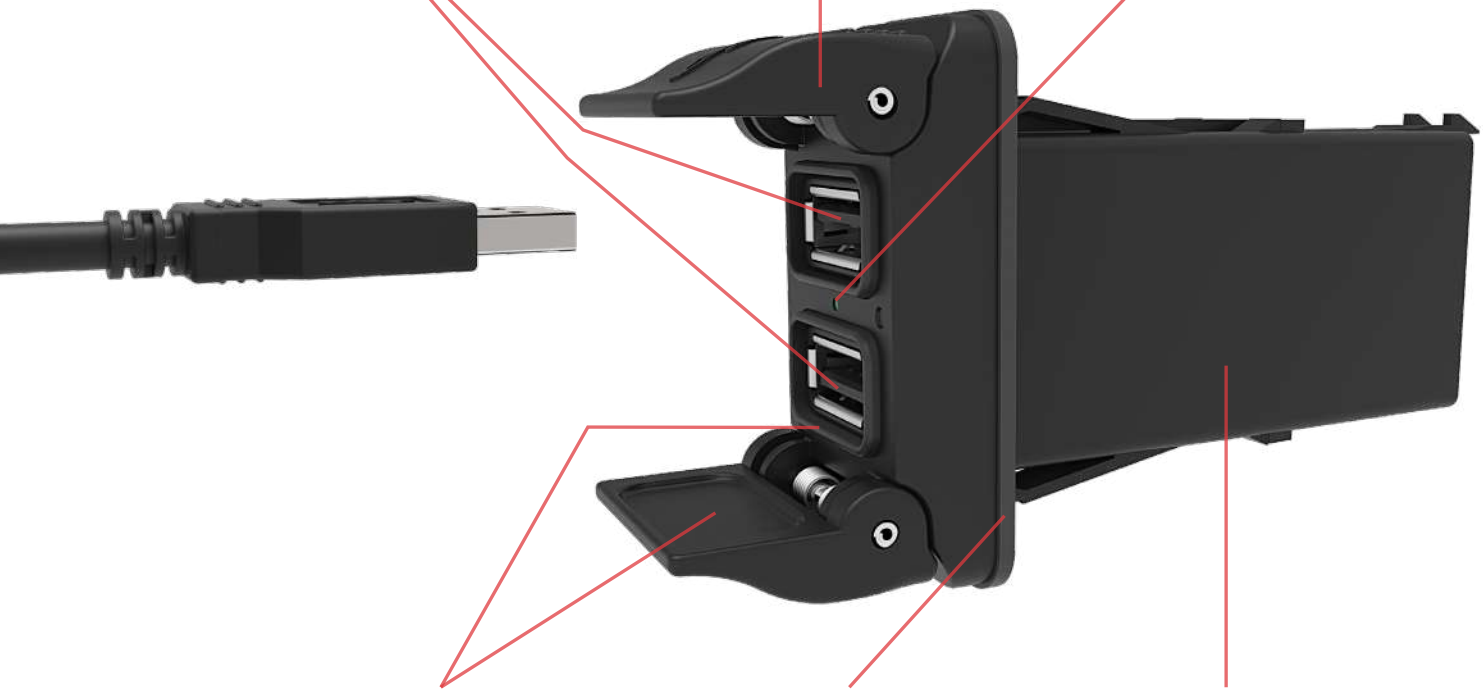
V-Charger
DESIGN FEATURES

DUAL USB 2.0 PORTS
Total current of 3.15 amps, facilitating faster charges

SPRING LOADED DOORS
Stylish, curved or square double doors automatically close to cover and seal each port when not in use

LED
Green LED brightens to indicate charging is in progress



SEALING PROTECTION
Silicone rubber seal perfectly mates with door indent to provide up to IP65 level of sealing protection

PANEL SEAL
Prevents water ingress beneath panel to protect critical connections

MOUNTING
Fits industry standard panel opening size of 1.450″ x .830″

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Electrical

USB Type	2.0
Number of USB Ports	2
Operating Voltage	12V/24V DC power systems (9 to 29 VDC)
Output Voltage	5.0 VDC
Max Output Current	3.15A DC Total
Current Draw (No Load)	12V: 1.5 mA, 24V: 3.5 mA
Compatibility	Charges mobile devices including iPad, iPhone, iPod, HTC, Galaxy, Blackberry, MP3 Players, Digital Cameras and PDA's
LED Indicator	Green LED brightens when charging is in progress.
Receptacle Insertion Life	10,000 operating cycles per port minimum
Terminals	Copper/silver plating 1/4" (6.3 mm) Quick Connect terminations
Reverse Polarity	Operational with correct polarity after reverse polarity exposure
Output Protection	Short Circuit and Overload
Thermal Overload Protection	Operation will cease if internal temperature reaches 125°C. Charging will resume after sufficient heat loss
ESD	15kV air, 8kV touch per ISO10605 for Operational; Packaging and Handling Tests
Load Dump Protection	ISO 16750-2: 10 pulses to 174V at 1 minute intervals (Pulse 5a, Ri= 8 ohms) ISO 7637-2 detailed data available. Consult factory for details.
Radiated Immunity	ISO 11452-2, 200 MHz to 2.7 GHz Field Strength for 200 MHz to 1 GHz: 60 V/m Field Strength for 1 to 2.7 GHz: 50 V/m Bulk Cable Injection ISO 11452-2, 1 to 400 MHz Field Strength: 80 mA
Emissions	FCC Part 15, Class B Radiated, Conducted and Far Field Emissions data available. Consult factory for details.

Mechanical

Endurance	10,000 open/close cycles minimum per door

GPS-0005 Ref: G

Environmental

Sealing	IP65 for front panel components (with closed curved style doors) IP64 for front panel components (with closed square style doors)
Operating Temperature	-40° to +60°C at 3.15A -40° to +70°C at 2.4A -40° to +80°C at 2.1A
Vibration	MIL-STD 202G, Method 204D, Test Condition A. 0.06DA or 10G, 10-500 Hz
Shock	MIL-STD 202G, Method 213B, Test Condition K @ 30-G. No loss of circuit during test.
Chemical Exposure	Brush method with USB doors closed: diesel, gasoline, brake fluid, Windex, Armor All
Thermal Shock	MIL-STD 202G, Method 107G, Test Condition A, -40° to 85°C. Test Criteria: Remains functional without damage.
Moisture Resistance	MIL-STD 202G, Method 106G. Test Criteria: Remains functional without damage
Thermal Cycling	25 Cycles -40° to 85°C, 2 hours for each temperature every cycle
Salt Spray	MIL-STD 202G, Method 101E, Test Condition A
Blowing Dust	MIL-STD 810G Method 510.5, Air Velocity: 1750 ± 250 ft/min, Test Duration: 12 hours

Physical

Materials	Housing: Polycarbonate/PBT Doors: Polyester Light Pipe: Polycarbonate Torsion Springs and Pins: Stainless Steel Door Seal: Silicone PCBA Gasket and Panel Gasket: Closed Cell Neoprene Terminals: Silver plated Copper Electronics: Two PCB Assemblies
Panel Opening	1.450" x .830"
Panel Thickness	.030 - .156 inches
Panel Mounting Method	Front Panel Insertion
Installation Insertion Force	12-28 lbs typical (dependent on panel design)
Panel Retention Force	Greater than 35 lbs (dependent on panel design)
Depth Behind Panel	See Dimensional Specifications
Connectors	VC1, VC2
Weight	Approximately 45g (1.6 oz)
Styling Options	Curved or square USB port doors (See Dimensional Specifications)
Port Protection	Twin, self-closing doors

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

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Ordering Scheme

V	–	USB	–	24	–	G	1	1	–	1	B	B	1
1 Series		2 Product Type		3 Source Voltage		4 LED Indicator	5 Circuit Protection	6 Termination		7 Door Style	8 Door Color	9 Base Color	10 Panel Seal

1 SERIES
V

2 PRODUCT TYPE
USB Charger

3 SOURCE VOLTAGE
24 24 / 12 Volts DC

4 LED INDICATOR (VOLTAGE MATCHES SOURCE)
G Green
0 None

5 CIRCUIT PROTECTION
1 Reverse Polarity, Thermal Overload & Overcurrent
2 Load Dump, Reverse Polarity, Thermal Overload & Overcurrent

6 TERMINATION
1 .250 Tab

7 DOOR STYLE
1 Curved
2 Square

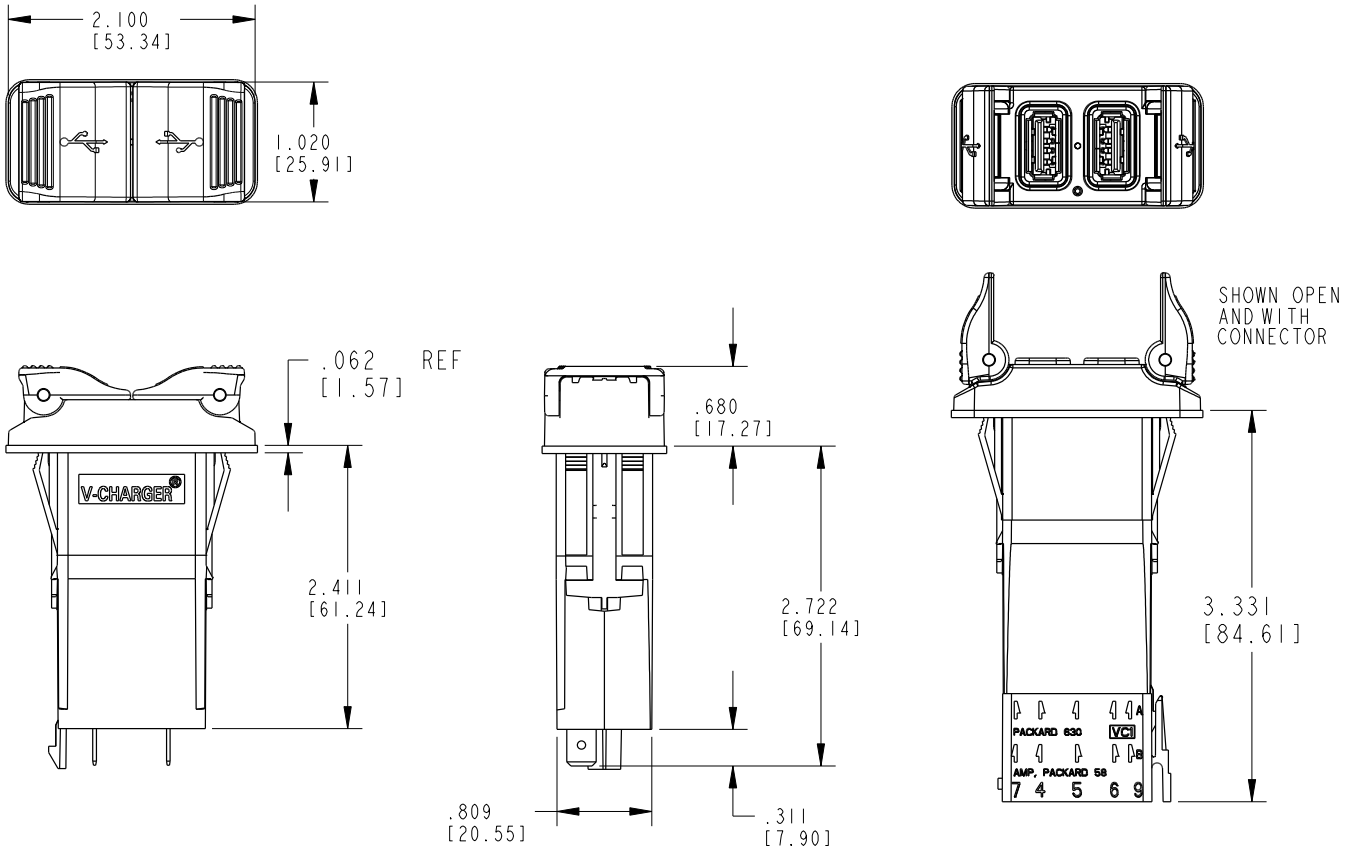
8 DOOR COLOR
B Black

9 FRAME COLOR
B Black

10 PANEL SEAL
1 Yes

Dimensional Specifications: in. [mm]

Curved Door Style Option

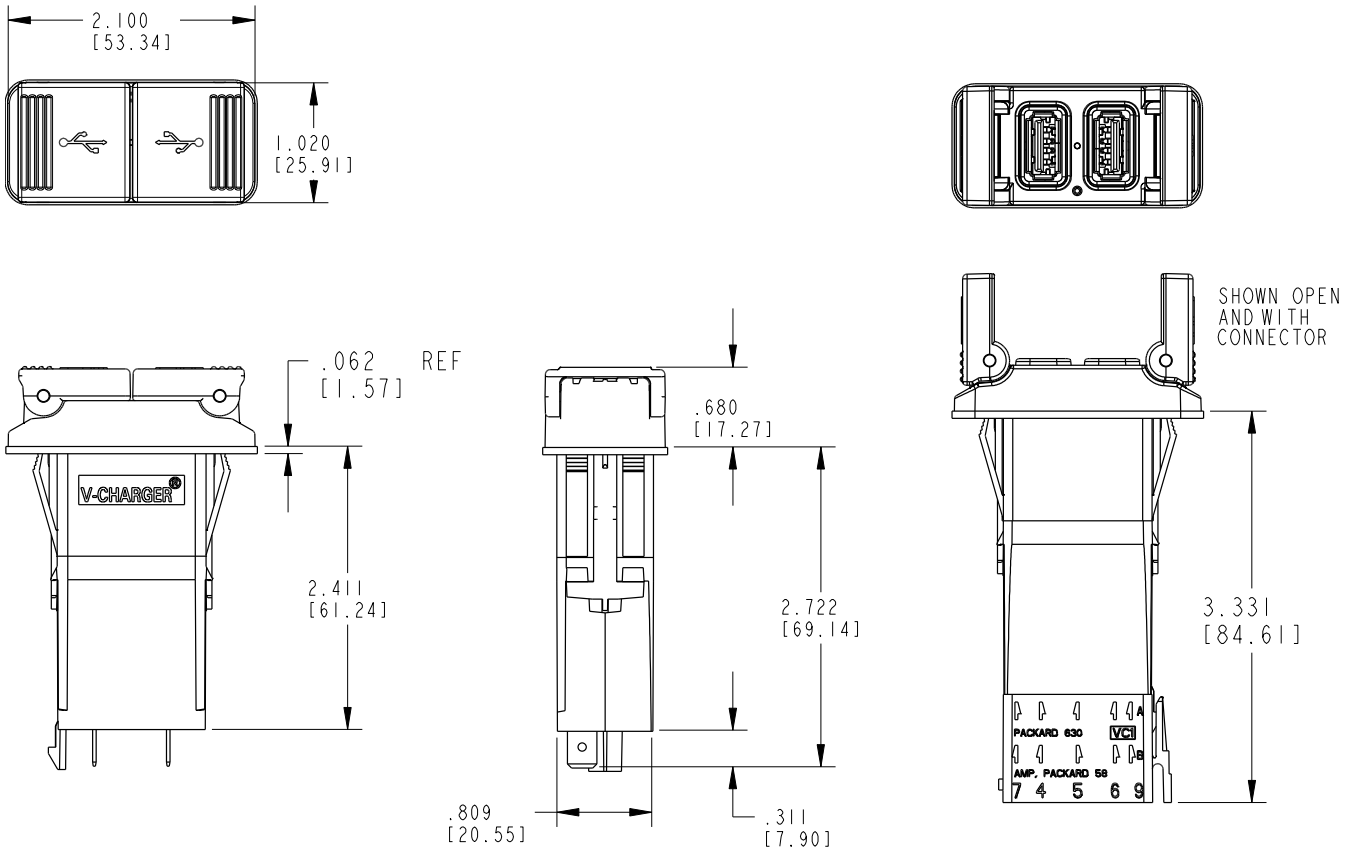


Notes:
1 Charger to install into 1.450" X 0.830" panel opening

COS-0075 Rev: C
CLA-0136 Rev: B

Dimensional Specifications: in. [mm]

Square Door Style Option



Notes:

1 Charger to install into 1.450” X 0.830” panel opening

CLA-0136 Rev: B

LD-Series

ELECTRONIC DIMMER CONTROLS

The LD-Series represents a dynamic breakthrough in dashboard technology, with its programmable circuitry, superior design, and unparalleled performance that affords seamless integration into most any dash panel. A variety of options, along with superior performance, functionality, and aesthetics assure compliance with the most stringent customer requirements. Key features include: robust design package with all components encased in switch housing, eliminating wire chafing and providing cost-savings as well with minimized electrical connections; IP67 sealing which prevents PCB degradation and eliminates short circuit potential. Superior heat dissipation is achieved with a heat sink mass which is over 50% larger than competitive products. Fully programmable circuitry lets the designer decide illumination levels and detent positions. EMC eliminates electrical "noise" and provides interference-free radio signals. Ease of assembly is accommodated with polarized integral connectors and an industry standard mounting hole.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing ›

Product Highlights:

- 3 Choices for incremental dimming rates
- 12 or 24 Volts
- Laser Etched or Lens Illumination
- IP67 Sealing

Typical Applications:

- On/Off-Highway Equipment
- Agricultural Equipment
- Construction Equipment

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Electrical

Contact Rating	9-16VDC, 2-10Amp.
Terminals	6.3mm (0.250" TAB)
Contacts	solid-state load switching
Output	PWM 200 Hz.
EMI/EMC	SAE J 1113 and SAE J 1455 Conducted Transient Emissions RF Conducted Emissions Conducted Susceptibility: Test pulse #1 Test pulse #2 Test pulse #3a, #3b Load Dump: Test Pulse #5 Power lead Disturbance (Power Dips) AF Conducted Immunity Direct RF Injection (DRFI) Abnormal Vehicle Operating Conditions RF Radiated Emissions Radiated Immunity-Absorber Lined Chamber Electrostatic Discharge: Shipping / handling Electrostatic Discharge: Human Static Discharge
Dielectric Strength	1000V @ 60 Hz was applied for each unit for 1 minute
Reverse Polarity	24VDC for 5 minutes

Environmental

Operating Temperature	-40°C to + 85°C
Vibration	Resonance Search Individual resonance searches were conducted with vibration applied along each of the three mutually perpendicular axes. 24-50 Hz 0.40DA 50-2000 Hz ± 10 G's peak Random Vibration The random vibration endurance test conditions were sequentially conducted in each of the three mutually perpendicular axes, 1hr/axis Freq. (Hz) PSD (G^2/Hz) 9.36 grms 24 Hz 0.06 60 Hz 0.50 100 Hz 0.025 1000 Hz 0.025 2000 Hz 0.025 During the test, all units were operated at a load current of 2A with 12.5VDC.
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A. Duration 96 hrs.
Dust	Per Mil-Std 810C, Method 510.2. Air velocity 300 ± 200 Feet/Min., Test Duration 16 Hr.
Moisture Resistance	Per Mil-Std 202F, Method 106E. Test Criteria-pre and post test operation of switch.

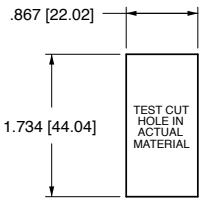
Mechanical

Endurance	100,000 cycles minimum

Physical

Function	Incremental for continuous dimming
Operation	Momentary
Lighted	LED's internally dimmed
Base	PBT Polyester V-0 flammability
Rocker	Polycarbonate or Nylon 6/6 Glass filled
Bracket	PBT Polyester V-0 flammability
Connector	Nylon 6/6 toughened
Actuation Force	300 gm ± 50 gm
Weight	52 grams

Mounting Specifications



MOUNTING HOLE

Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156

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

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LD	3	5	1	C	C	1	-	3	A	A	FE	-	1	FC
1 Series	*2 Rating*	*3 Dimming Rate*	*4 Termination*	*5 Illumination*	*6 Illumination*	*7 Bracket Color*		*8 Actuator Style/ Color*	*9 Lens Color*	*10 Lens Color*	*11 Legend 1*		*12 Legend Orientation*	*13 Legend 2*

1 SERIES
LD Electronic Dimmer Control

2 RATING
1	4A, 12 volts	**A**	2A, 24 volts
2	10A, 12 volts	**C**	5A, 24 volts

3 DIMMING RATE
1	30 - 100% 8 positions	**A**	0 - 100% 11 positions
5	10 - 100% 10 positions		

4 TERMINATION
1 .230 TABS (5.84 mm)

5 & 6 ILLUMINATION
No lamp	**S**		
	Red	Amber	Green
12V LED	**C**	**N**	**H**
24V LED	**D**	**P**	**J**

7 BRACKET COLOR [1]
1	Black	**2**	White	**3**	Gray

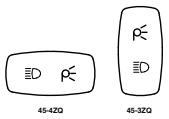
8 ACTUATOR STYLE / COLOR [1]
	Laser Etched	Black	White	Gray	Red
Rocker	**3**	**A**	**B**	**C**	**D**
Paddle	**4**	**J**	**K**	**M**	**N**

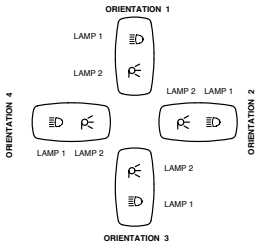
9 & 10 LENS COLOR
Z No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
1	-	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	-	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent
5	**A**	-	-	-	-	Laser Etch

11 LEGEND #1
00 No legend **FC** Dim **FE** Bright
For legend options, visit us at carlingtech.com

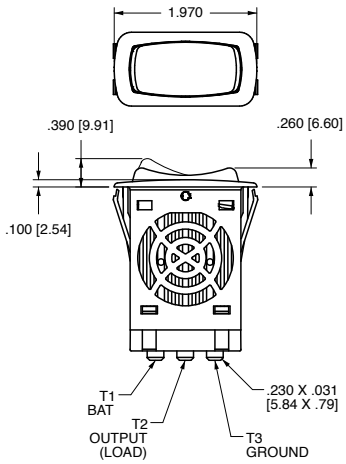
12 LEGEND ORIENTATION
0 No legend
1 vertical (lamp 1 on top)
2 horizontal (lamp 1 on right)
3 vertical (lamp 1 on bottom)

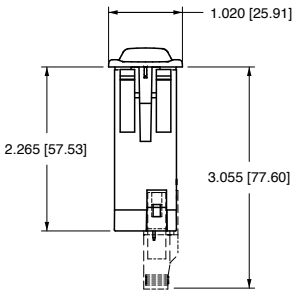


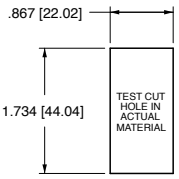


13 LEGEND #2
00 No legend **FC** Dim **FE** Bright
For legend options, visit us at carlingtech.com

Notes:
1 Custom colors are available. Consult factory.

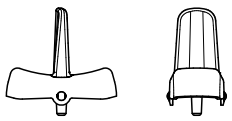




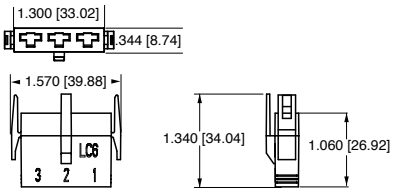


MOUNTING HOLE

Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156



PADDLE STYLE ACTUATOR



Q.C. SELECTION GUIDE			
COMPANY SERIES	PACKARD PART NO.	WIRE GAGE	
		AWG	MM [2]
PACKARD METRI-PACK 630 SERIES TIN PLATED BRASS	12084590	12	3.0
	12052224	12	3.0
	12015870	16-14	2.0-1.0
	12015869	20-18	1.0-.80
	12020035	22-18 (2 REQ'D)	.80-.50 (2 REQ'D)
	12052222	20-22	.50-.35

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LMR-Series

MIRROR ROTATE CONTROLS

As an extension of the L-Series family of control products, the LMR-Series provides the means to control one or two mirrors and up to four separate motors from one easy to operate joy stick control. When used in conjunction with our dimmer control and wiper/washer control, Carling Technologies provides a solution to most any dashboard control need within the Transportation market.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing >

Product Highlights:

- Two or four axis
- Controls up to four separate motors
- Industry standard 44 x 22mm mounting hole
- Includes Delphi-Packard 8 pin connector

Typical Applications:

- On/Off-Highway Equipment
- Agricultural Equipment
- Construction Equipment

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Actuator
4 axis joy stick style

Electrical
1A 14V; .5A 28V

Sealing
internal boot and potted wire leads protect critical components from dust and moisture

Termination [1]
9” wire leads with Delphi-Packard connector #12047886 [3]

Mechanism
Sliding contacts in conjunction with a circuit board

LMR - 01 - 1

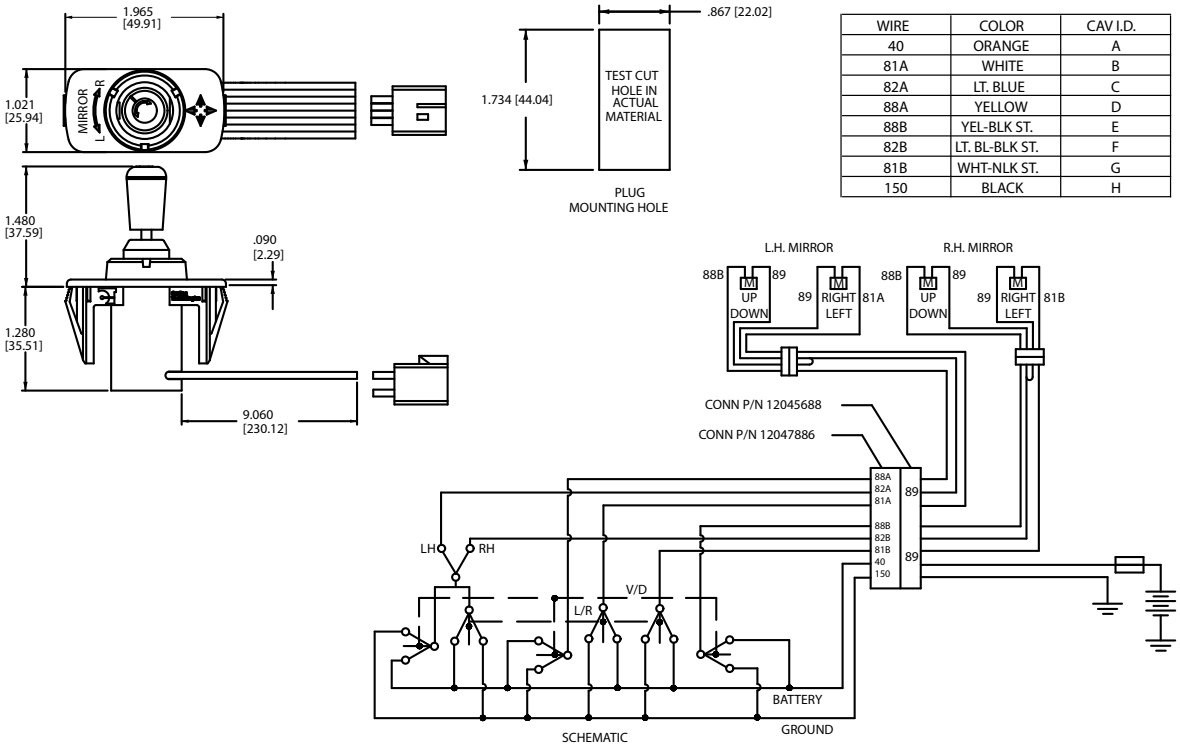
1 Base Part Number *2 Color* *3 Legend*

1 BASE PART NUMBER: SERIES / RATING / FUNCTION / TERMINATION
LMR 2 position (left, right), 4 axis (N,S,E,W) with wire leads

2 ACTUATOR /BRACKET COLOR
01 Black

3 LEGEND [2]
Z no legend
1 2 arrows symbol (left, right)
2 4 arrows symbol (front, back and left, right)

Notes:
1 Compatible with Delphi-Packard #12045688.
2 All legends are imprinted in white. All product supplied with Mirror L & R legend on top of bracket and detent and directional legend on actuator.
3 Delphi-Packard is a registered trademark of Delphi-Packard Electrical Systems, Warren, Ohio.



WIRE	COLOR	CAV I.D.
40	ORANGE	A
81A	WHITE	B
82A	LT. BLUE	C
88A	YELLOW	D
88B	YEL-BLK ST.	E
82B	LT. BL-BLK ST.	F
81B	WHT-NLK ST.	G
150	BLACK	H

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

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LW-Series

WIPER/WASHER CONTROLS

The LW-Series Electronic Wiper Washer Control combines two switches into one self-contained unit allowing effortless control of both wash and wipe functions from a singular location. A variety of features and options including, Continuous low and high speed wiper positions, Six intermittent delay intervals ranging from 3-18 seconds, Push-to-wash button and an LED Night-light indicator combine to provide the flexibility to meet most any Cab design. The LW-Series is available for 14 or 28 volt operation and can be adapted to single or dual relay systems.

Product Highlights:

- Controls both wash and wipe functions of vehicles
- 14 or 28 Volts
- Illuminated or Non-illuminated options
- Laser etched legends available

Typical Applications:

- On/Off-Highway Equipment
- Agricultural Equipment
- Construction Equipment

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Electrical

Contact Rating	1 relay 8 amps, 14VDC 4 amps, 28VDC 2 relays 1 amps, 14VDC 1 amps, 28VDC
Terminals	.187 (7.4mm) Quick Connect terminations standard.
Protection	Reverse polarity protection Over voltage protection Cold cranking protection according to SAE J1455, Sections. 4.11.1.1.1 and 4.11.1.2.1 Transient voltage protection which includes load dump and inductive switching according to SAE J1455, sec. 4.11.2.2 Electrostatic discharge protection according to SAE J1455 Sec. 4.11.2.2.5.1 (Discharge a 150 pf capacitor that has been charged to a potential of 15kV through 150 Ohm resistor.) Meets all other EMI/EMC requirements for class C trucks.

Mechanical

Mechanical Vibration	Sinusoidal Vibration: 10-55-10 Hz, 0.06" DA, one minute-cycle, three hours/axis Random Vibration: Three hours/axis, three mutually perpendicular axes with a test level 4G's.

Frequency	**Amplitude**
5Hz	0.16 G2/Hz
100Hz	0.16 G2/Hz
500Hz	-3dB/octave roll-off

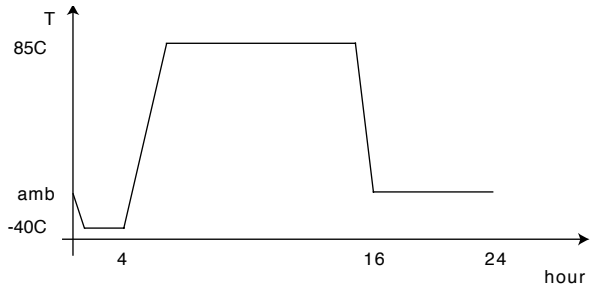
	Tests were conducted according to SAE J1455, Sec 5.7 and Sec. 4.9.4. Shock: MIL-STD-202G Method 213B, Test Condition K, 30G's, 11 ms.
Endurance	According to SAE J2349, March 97 for windshield washer switch for Trucks, Buses and Multipurpose Vehicles (20,000 cycle minimum).

Physical Characteristics

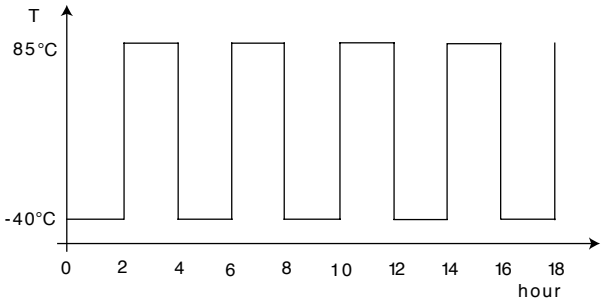
Illumination	LED, rated 100,000 hours 1/2 life
Cover	Acetate
Washer Actuator	Silicone
Toggle Actuator	Nylon 6/6 glass filled
Bracket	Nylon 6/6
Connector	Nylon 6/6 rated 85°C polarized
Washer Function	Momentary
Toggle Function	Maintained Intermittent
Operation	Momentary
Weight	44 grams

Environmental

Operating Temperature	-25°C to +85°C
Temperature Cycle	According to SAE J1455, Sec. 4.1.3.1 (See Figure below)



Thermal Shock	According to SAE J1455, Sec. 4.1.3.2 (See Figure below)



Humidity	According to SAE J1455, Sec. 4.2.3 (30 cycles for 8 hrs. with maximum temperature of 85°C and 95% relative humidity.
Dust Bombardment	According to SAE J1455, Sec. 4.7.3 (with dust concentration of 0.88gm/m for 24 hours.)
Salt Spray	MIL-STD-202G, Method 101D for 96 hours.

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

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LW	1	A	1	1	Z	-	1	1	AG	1	00
1 Series	2 Rating	3 Intermittent Timing	4 Wiper/ Washer Timing	5 Lamp 1	6 Lamp 2		7 Bracket Color	8 Rocker/ Paddle Color	9 Legend 1	10 Legend Orientation	11 Legend 2

1 SERIES
LW Wiper/Washer Control with six intermittent positions: low. high, wash/wipe

2 RATING [1]

1	8A, 14VDC (1 relay)	**4**	1A, 14VDC (1 relay)
2	4A, 28VDC (1 relay)	**5**	1A, 14VDC (2 relay)
3	1A, 14VDC (1 relay)	**6**	1A, 28VDC (2 relay)

3 INTERMITTENT TIMING
A 2-15 seconds

4 WIPER/WASHER TIMING
1 3 seconds

5 LAMP #1 (ABOVE WASH)

Z	No Lamp	**2**	Red LED
1	Green LED	**3**	Amber LED

6 LAMP #2 (ABOVE WIPE)

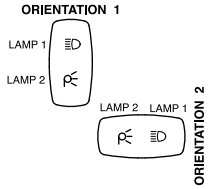
Z	No Lamp	**2**	Red LED
1	Green LED	**3**	Amber LED

7 BRACKET COLOR
1 Black

8 ROCKER / PADDLE COLOR
1 Black

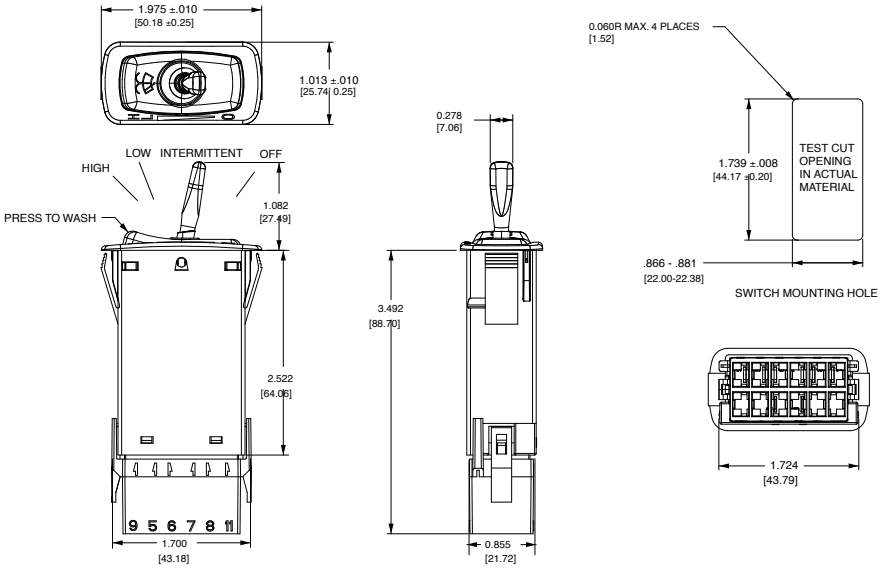
9 LEGEND #1
00 No legend
For legend options, visit us at carlingtech.com

10 LEGEND ORIENTATION
0 No legend
1 Vertical (lamp 1 on top)
2 Horizontal (lamp 1 on right)



11 LEGEND #2
00 No legend
For legend options, visit us at carlingtech.com

Notes:
1 Relay coil current is 1A max. Relay must have an arc suppression in parallel with the coil. Ref P/N LC2-01 for black wiper/washer connector housing.



Principles of operation:
From the OFF position, moving the toggle one step up puts the function into the intermittent slower mode (18 sec.). Moving the toggle another step up reduces the delay time by 3 sec for each of the next six steps. The seventh step up puts the motor into a continuous low-speed mode and the last step up puts the motor into the high-speed mode. Reversing the previous steps puts the motor finally into the stop/parking mode. During the OFF position, intermittent and low-speed modes, pressing the wash button activates the wash function. Wipe function starts after a two second delay from the onset of the washing and continues for three continuous wipes after the wash button is released. For convenience, the wash function is not active during the high-speed mode.

The Wiper Control is designed to interface with single or dual relay systems for intermittent delay and the park function. The high speed is driven directly via a power transistor internal to the module. The coil of the relay is pulled down to ground during the intermittent, low-speed and high-speed modes respectively. (Contact Carling Technologies for wiring diagrams)

N-Series
ADDRESSABLE ROCKER SWITCHES

The N-Series Addressable Switch combines the look and feel of a traditional electro-mechanical control coupled with a built in PCB and provides a flexible, cost effective alternative to a CAN/LIN based switch. The N-Series produces up to 144 individual switch IDs by using a resistive ladder circuit. Different switch IDs are achieved by changing the resistor values tied to individual loads, which can then be assigned to the specific functions that the switch is controlling. Each switch is connected to an ECU and the application software is written to recognize the switch IDs to determine which load is being controlled as well as the selected actuator position. As a result, the wiring harnesses are more simplified and specific loads can now be rearranged without the need for a costly and time consuming harness redesign, giving designers the ultimate in design flexibility.

Resources:

Download 3D CAD Files

IGS › STP ›

Product Highlights:

- Cost effective alternative to CAN/LIN based switch
- Up to 144 individual switch IDs
- Simplified wiring harnesses
- Readdressable loads without harness redesign
- Available with paddle or rocker actuator

Typical Applications:

- On-Highway Transportation Equipment
- Agricultural Equipment
- Construction Equipment
- Marine

Electrical

Contact Rating	.4VA @ 28VDC (MAX)
Dielectric Strength	1250 Volts RMS between pole to pole 3750 Volts RMS between live parts and accessible surfaces
Insulation Resistance	50 Megaohms
Contact Bounce	20 milliseconds max.
Contacts	gold plated
Terminals	Brass or copper/silver plate 3/16" (4.76mm) Quick Connect terminations standard.

Mechanical

Endurance	250,000 cycles minimum

Physical

Lighted	Incandescent - rated 10,000 hours LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24VDC)
Seals	Rocker, base & bracket are sealed.
Base	Nylon 66 GF rated to 85°C with a flammability rating of 94V0.
Rocker and Paddle	Nylon 66 Reinforced, rated to 105°C
Laser Etched Rocker	Polycarbonate rated at 100°C.
Lens	Polycarbonate rated at 100°C. Front snap-in.
Connector	Nylon 66 rated at 85°C. Polarized.
Bracket	Nylon Zytel

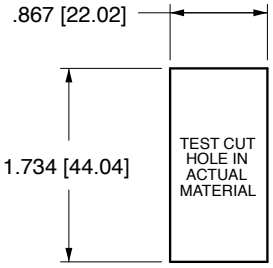
Actuator Travel (Angular Displacement)

2 position	26°
3 position	13° from center

Environmental

Environmental	IP67 for above the panel components of the actual switch, representing an index of protection as applied to electrical equipment in accordance with IEC 529, BS 5490, DIN 400 50 & NFC 20 010.
Operating Temperature	-40°C to +85°C
Vibration	Per SAE J1399 "electronic Tachometer Specification" for Class II truck and bus applications. Test Criteria: No change in resistance and no evidence of physical damage.
Salt Spray	Exposure to 95% water, 5% NCI fog solution at 95 degrees F according to ASTM B 117-90 "Standard Method of Salt Spray (fog) Testing". Test Criteria: No visual evidence of corrosion or external physical damage.
Humidity	Samples were exposed to selected temperature profile, while maintaining 90% +- 5% relative humidity for 30 cycles. Test Criteria: No evidence of external physical deterioration.

Mounting Specifications



MOUNTING HOLE

Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156

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

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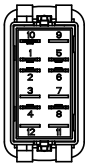
N	4	1	2	1	A	N	H	1	-	1	1	2	46	-	1	EK
1 Series	2 Circuit	3 R1 Resistive ID	4 R2 Resistive ID	5 Resistor Constants	6 Illumination	7 Lamp	8 Lamp	9 Bracket		10 Actuator	11 Lens Style & Color Lamp 1	12 Lens Style & Color Lamp 2	13 Legend		14 Legend Orientation	15 Actuator Lens Legend

1 SERIES
N

2 CIRCUIT [2]
Terminal Orientation



( ) - momentary

Position:	1	2	3
STANDARD			
	2 & 4	Connected Terminals	1 & 2
4	ON	NONE	ON
5	(ON)	NONE	ON
6	ON	ON	ON
7	(ON)	ON	ON
8	(ON)	ON	(ON)

3 R1 RESISTIVE IDENTIFICATION

1	1020	**7**	3570
2	1300	**8**	4320
3	1620	**A**	5230
4	2000	**B**	6340
5	2430	**C**	7870
6	2940	**D**	10000

4 R2 RESISTIVE IDENTIFICATION

1	1020	**7**	3570
2	1300	**8**	4320
3	1620	**A**	5230
4	2000	**B**	6340
5	2430	**C**	7870
6	2940	**D**	10000

5 RESISTOR CONSTANTS (INDICATES SWITCH STATE)

	R3	R4	R5
1	1300	10000	5230
2	825	6650	3830

6 ILLUMINATION
Lamp #1:above terminals 9 & 10 end of switch.; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

	Lamps	Illumination Type	Lamp wired to Terminals	
S	None			
A	# 1	Standard	10+	12-
	# 2	Standard	11+	9-
B	# 1 & 2	Special Parallel	11+	9-
C	# 1 & 2	Special Parallel	10+	9-
1	# 1	Independent	10+	9-
2	# 2	Independent	12+	11-
3	#1	Independent	10+	9-
	#2	Independent	12+	9-
4	#1	Independent	10+	9-
	#2	Independent	12+	11-

7,8 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 7: above terminals 10 & 9; Selection 8: above terminals 12 & 11

No lamp	**0**		
LED*	Red	Amber	Green
12VDC	**C**	**N**	**H**

* Consult factory for “daylight bright”, blue/green and white LED options. Typical current draw for LED is 20ma.

9 BRACKET COLOR [1]

	Black	White	Gray	Red
Standard Bracket	**6**	**7**	**8**	**9**
Rockerguard at Lamp 1	**L**	**B**	**C**	**D**
Rockerguard at Lamp 2	**E**	**F**	**G**	**H**

10 ACTUATOR STYLE AND COLOR [1]

	Black	White	Gray	Red	Laser Etched
Rocker	**A**	**B**	**C**	**D**	**1**
Paddle	**J**	**N**	**K**	**M**	

11 & 12 LENS STYLE AND COLOR
Lens color for LEDs must be clear, white, or match color of LED.

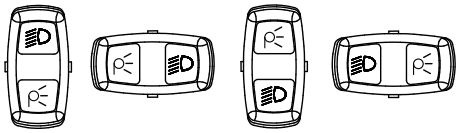
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent
5	**A**	**-**	**-**	**-**	**-**	Laser Etch background color

13 LEGEND ORIENTATION
00 No legend this location / no actuator

For legend options & codes, see pages 54-65 of this catalog.

14 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1 - vertical, lamp 1 on top
2 Orientation 2 - horizontal, lamp 1 on right
3 Orientation 3 - vertical, lamp 1 on bottom
4 Orientation 4 - vertical, lamp 1 on left



1 **2** **3** 3AA-146 **4** 3AA-246

15 ACTUATOR LENS LEGEND
00 No legend this location / no actuator

For legend options & codes, see pages 54-65 of this catalog.

Notes:
1 Custom colors are available. Consult factory.
2 Switch supplied with .187 tab terminals.

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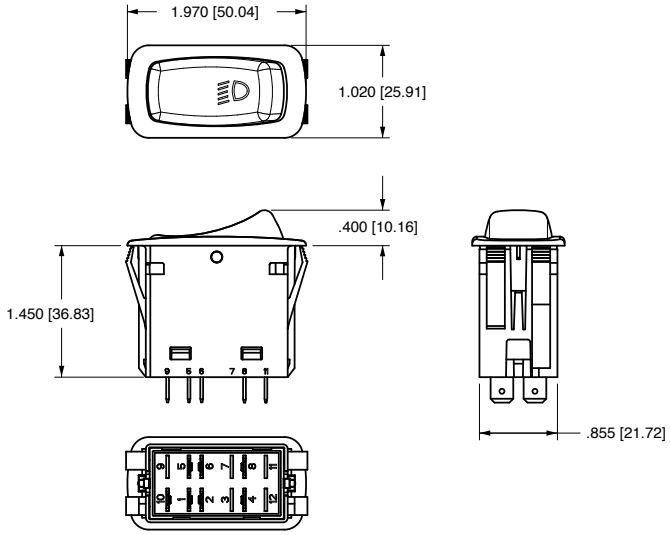
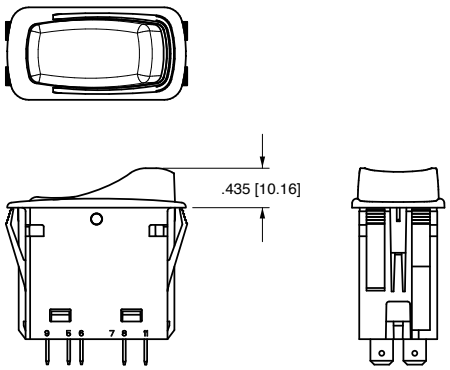
Dimensional Specifications: in. [mm]

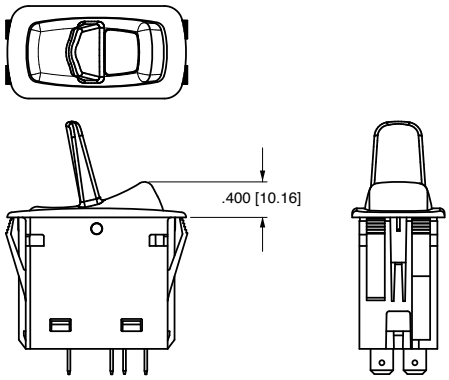
N-SERIES
SHOWN WITH LASER ETCHED ACTUATOR



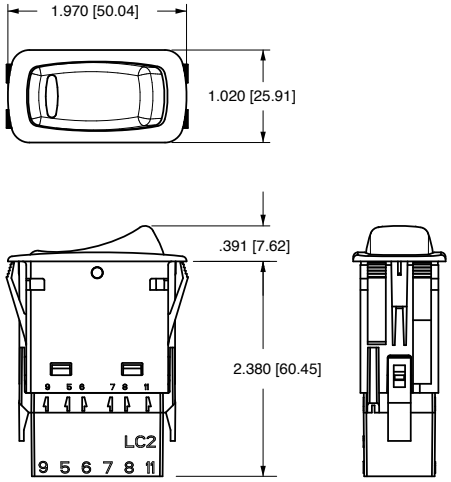
N-SERIES
SHOWN WITH ROCKER GUARD



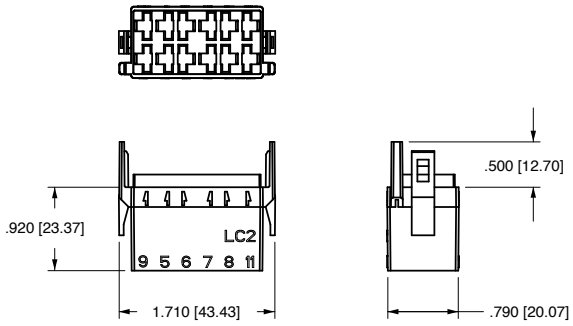
N-SERIES
SHOWN WITH LARGE LENS
AND PADDLE ACTUATOR



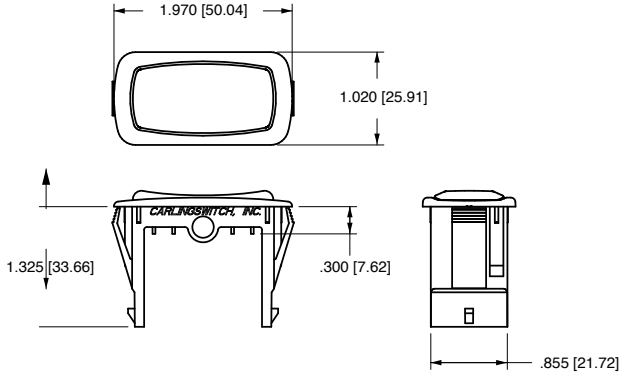
N-SERIES
SHOWN WITH BARS LENS
AND CONNECTOR



N-SERIES
LC2-01 BLACK .187 TAB CONNECTOR (PACKARD 480-SERIES)



N-SERIES
LH1 REMOVABLE HOLE PLUG WITH NON-SERRATED WINGS
LH2 HOLE PLUG WITH SERRATED WINGS



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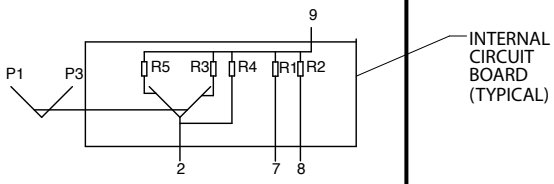
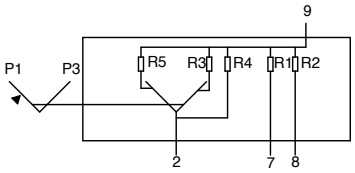
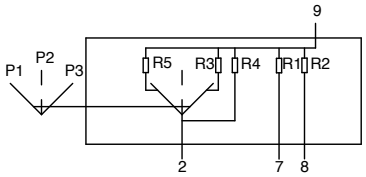
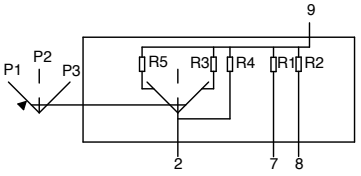
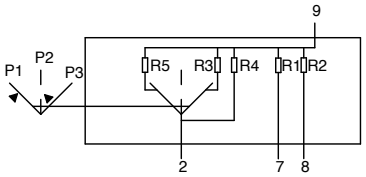
Circuit Diagrams:

CIRCUIT CODE	SCHEMATIC
4	
5	
6	
7	
8	

Lamp Circuit Diagrams:

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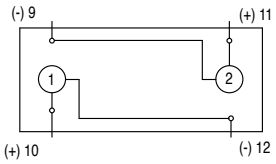
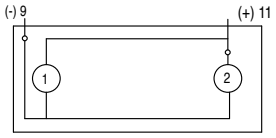
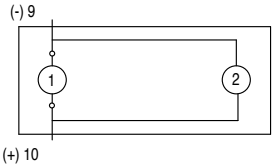
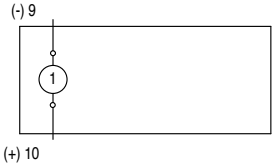
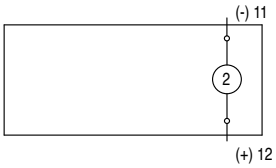
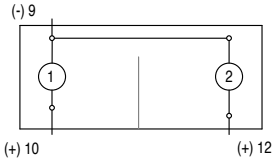
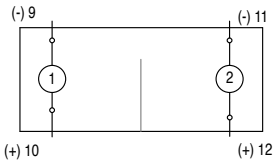
A	
B	
C	
1	
2	
3	
4	

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SEALED ROCKERS

Carling's Sealed Rocker switches feature the V-Series Contura and L-Series families of illuminated and non-illuminated rocker switches, which set the industry standard for sealed switches. They offer complete protection against dust and prolonged effects of spray and immersion under pressure.

SELECTOR GUIDE

NEW HR-Series	V-Series	W-Series	L-Series	
1, 2	1, 2	1, 2	1, 2	**Poles**
IP68; 20A 12V	IP66/68; up to 20/15A 12/24VDC 15A 125VAC 10A 250VAC	IP68 including connector; up to 10A 24VDC	IP67; up to 15A 125VAC 10A 250VAC 20A 18VDC	**Ratings**
Laser-Etched Rocker	Rocker, Paddle, Locking Rocker	Bezel-Less Rocker, Paddle & Locking Rocker	Rocker, Paddle, Locking Rocker	**Actuator**
.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.867" x 1.734" [22mm x 44mm] snap-in mount	**Mounting Hole Specifications**
.110 tabs	.250 tabs solder lug wire leads	.110 tabs	.187 tab .250 tabs	**Termination**
LED	incandescent, LED, neon	LED	incandescent, LED	**Illumination**
n/a	UL, CSA	n/a	n/a	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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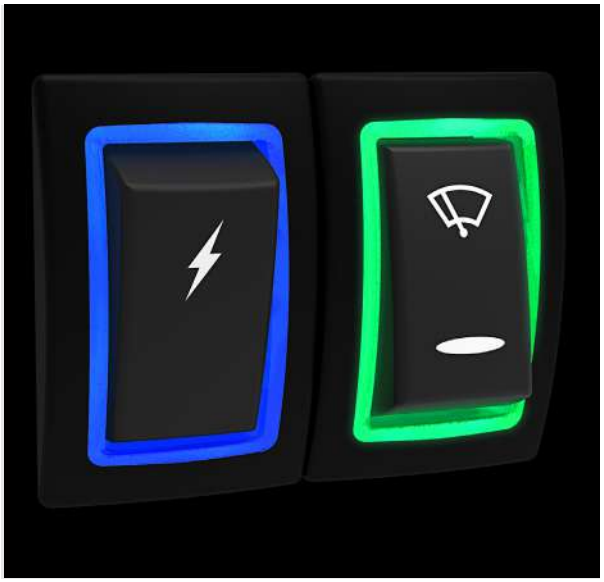
HR-Series

HALO ILLUMINATED SEALED ROCKER SWITCH

The HR-Series is a perimeter illuminated, IP68 sealed rocker switch, featuring a stylish, low profile actuator that is available in either two or three positions. These rocker switches have a variety of dependent and independent illumination options; momentary and maintained circuits; and up to two customizable laser-etched legends.

The patented design supports the various illumination options and allows the switch to be rated up to 20 amps, eliminating the need for relays. Additionally, these low profile rocker switches fit the industry standard cutout.



Resources:

Configure a Complete Part

Download CAD & Sales Drawing >

Watch Product Video

Product Highlights:

- Dynamic Perimeter Illumination
- IP68 Above Panel Sealing Protection
- 20A 12VDC
- Maintained and Momentary Circuits
- Various Illumination Options
- Single and Double Pole

Typical Applications:

- Marine
- On/Off-Highway
- Lawn Equipment
- Golf Carts
- Outdoor Construction Signage
- Any Application Requiring Sealing Protection

HR-Series Switch
DESIGN FEATURES

20A 12VDC RATING
Robust construction to handle a multitude of electrical loads.

SNAP-IN MOUNTING
Fits into an industry standard mounting hole of 1.450 x .830 in. (Same as V-Series and W-Series)

PERIMETER ILLUMINATION
Choice of independent (full) or dependent (half) lighting, in a variety of colors.

IP68 ABOVE PANEL SEALING
Seals out dust and moisture.

.110 TERMINALS
With dedicated TE connector for ease of installation. Sold Separately.
(See General Specs for TE Part Numbers).

MAINTAINED/ MOMENTARY
Circuits available in 2 or 3 positions.

LASER ETCHED LEGENDS
Rocker icons convey a clean, sleek OEM look, with independent or dependent illumination.

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Electrical

Operating Voltage	Designed for 12 Volt systems 9-16 VDC operating
Contact Rating	Maximum 20 amps at 12 VDC
Supply Voltage ratings	The switch passes the following supply voltage testing: SAE J1455 section 4.13.1 for power up, operating voltage, over voltage, reverse polarity, and short circuit
Dielectric Strength	Across open contacts: 500 V RMS AC for 1 minute From pole to pole (on multi pole variants) 500 V RMS AC for 1 min.
Insulation Resistance	50 Megaohms
Initial contact resistance	10 milliohms max
Life	Up to 100,000 cycles, circuit and load dependent
Contacts	Silver tin-oxide
Terminals	Up to 10 external connector terminals 0.110” wide silver-plated copper terminals

Mechanical

Endurance	200,000 cycles minimum, circuit dependent

Physical

Illumination	One or two LED backlit laser marked icons (configurable to be independent or dependent)
illumination	Uniform full or half perimeter (configurable to be independent or dependent) Dimmable illumination (icons and perimeter), controlled by supply voltage LEDs rated for 50,000 hour life
Seals	Internal
Base	Nylon, V-0 UL flammability rating
Actuator	Polycarbonate, V-2 UL flammability rating, painted and laser marked
Perimeter lens	Polycarbonate, V-2 UL flammability rating
Bracket/Bezel	Polycarbonate polyester blend, V-0 UL flammability rating

Mounting Specifications

Panel thickness range	0.062” to 0.187”
Panel cutout	0.830” x 1.450” See Dimensional Specs (same as V-Series and W-Series)

Environmental

Sealing	IP68 per ISO 20653. This rating applies to front panel components of the actual switch only
Operating Temp.	-40°C to 85°C The following codes were passed: Cold Soak (IEC 60068-2-1) Heat Soak (IEC 60068-2-2) Cycling/Shock (IEC 60068-2-14)
Vibration	General: IEC 60068-2-6, Swept sine wave section 8.2, 5 - 500 Hz 20 cycles 10g acceleration Resonance: IEC 60068-2-6, Vibration sinusoidal, section 8.1, 10 - 2000 Hz, 5g acceleration Random: IEC 60068-2-64, Method 1, random excitation, 10 - 350 Hz, 5 hours in each axis
Shock and Bump	IEC 60068-2-27, Shock 500 m/s^2 11 milliseconds, Bump 200 m/s^2 6 milliseconds 600 cycles
Salt Spray (Corrosion resistance)	IEC 60068-2-52, Test Kb, Severity level 4 (test duration 336 hours)
Moisture resistance	MIL-STD-202 Method 103B, Test Condition A (240 hours)
Solar Radiation	IEC 60068-2-5, procedure B, 10 cycles, Total irradiation per cycle = 22.4 kWh/m2
Chemical Resistance	ISO 16750-5, spray or brush method. Gasoline, diesel fuel, motor oil, brake fluid, Armour all, Windex
Weathering/Cracking Resistance	ASTM D1171-99, method A, 72 hours
Abrasion/Wear Resistance	40 cycles of ASTM F2357 testing with 0.25” paper at 175 grams of force

Connector

Switch mates with TE connector housing part number 1418994-1. Based on application wire size choose receptacle part number below (or equivalent):

1-968880-1	20-24 AWG wire
1-968849-1	17-20 AWG wire
1-968851-1	13.5-17 AWG wire
1-968853-1	12 AWG wire

Actuator Travel (Angular Displacement)

2 position	24°
3 positions	12° from center

*Manufacturer reserves the right to change product specification without prior notice.
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HR	11	D	1	A1	1	B	A	1	–	1	1	–	00	00	0
1 Series	*2 Circuit*	*3 Rating*	*4 Termination /Base Style*	*5 Illumination Circuit*	*6 Perimeter Style*	*7 Perimeter Illumination Color*	*8 Rocker Illumination Color*	*9 Bracket Color*		*10 Rocker Color*	*11 Rocker Style*		*12 Legend*	*13 Legend*	*14 Legend Orientation*

1 SERIES
HR HR-Series Halo Illuminated Rocker Switch

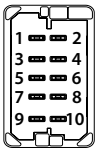
2 CIRCUIT

Position:		1	2	3
Single Pole	Double Pole	5&7, 6&8	Connected Terminals	3&5, 4&6
11	**21**	ON	NONE	OFF
12	**22**	(ON)	NONE	OFF
14	**24**	ON	NONE	ON
15	**25**	ON	NONE	(ON)
16	**26**	ON	OFF	ON
18	**28**	(ON)	OFF	(ON)

3 RATING
D 20A 12V

4 TERMINAL / BASE STYLE
1 .110 TAB (QC)

5 ILLUMINATION CIRCUIT [1, 2, 3]
Terminal Connections as viewed from back of switch:



FULL PERIMETER ILLUMINATION

Perimeter Illumination: Independent 9(+) 1(-) for codes **A1 to A7**

Rocker Illumination:
2 and 3 Position Switches

A1	Independent	LED 1: 10(+) 1(-)	LED 2: 2(+) 1(-)
A2	Independent	LED 1: 10(+) 1(-)	No Illumination
A3	No Illumination		

2 Position Switch		*Position 1*	*Position 3*
A4	Dependent	LED 1: 5(+) 1(-)	LED 2: 5(+) 1(-)
A5	Dependent	LED 1: 10(+) 1(-)	LED 2: 5(+) 1(-)
A6	Dependent	LED 1: 5(+) 1(-)	No Illumination

3 Position Switch		*Position 1*	*Position 2*	*Position 3*
A7	Dependent	LED 1: 5(+) 1(-)	No Illumination	LED 2: 5(+) 1(-)

HALF PERIMETER ILLUMINATION

Rocker Illumination: LED 1 and 2: 10(+) 1(-)

Perimeter Illumination:

3 Position Switch		*Position 1*	*Position 2*	*Position 3*
B1	Dependent	Top Half On 10(+) 2(+) 1(-)	Full Illumination 10(+) 1(-)	Bottom Half On 10(+) 9(+) 1(-)

For a visual representation of the illumination options, see next page.
For custom illumination options, please consult factory.

6 PERIMETER STYLE
1 Full Ring

7 PERIMETER ILLUMINATION COLOR
B Blue
G Green

8 ROCKER ILLUMINATION COLOR
Z None
W White
B Blue
G Green
A Amber
R Red

9 BRACKET COLOR
1 Painted Black
2 Painted Silver

10 ROCKER COLOR
1 Painted Black
2 Painted Silver

11 ROCKER STYLE
1 Laser Etch

12 LEGEND
00 No Legend
For standard legends, see “Standard Legend Codes” page.
For additional legends, please consult factory

13 LEGEND
00 No Legend
For standard legends, see “Standard Legend Codes” page.
For additional legends, please consult factory

10 LEGEND ORIENTATION
0 No Legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

Notes:
1 Code (A4) only available with 2 Position Circuits (14, 15, 24, 25)
2 Codes (A5, A6) only available with 2 Position Circuits (11, 12, 13, 14, 15, 21, 22, 23, 24, 25)
3 Codes (A7, B1) only available with 3 Position Circuits (16, 17, 18, 26, 27, 28)

COS-0090 Rev: A

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Independent Illumination:

	2 Position Switch	
	Position 1	Position 3
A1		
A2		
A3		

	3 Position Switch		
	Position 1	Position 2	Position 3
A1			
A2			
A3			

Dependent Illumination:

	2 Position Switch	
	Position 1	Position 3
A4		
A5		
A6		

	3 Position Switch		
	Position 1	Position 2	Position 3
A7			
B1			

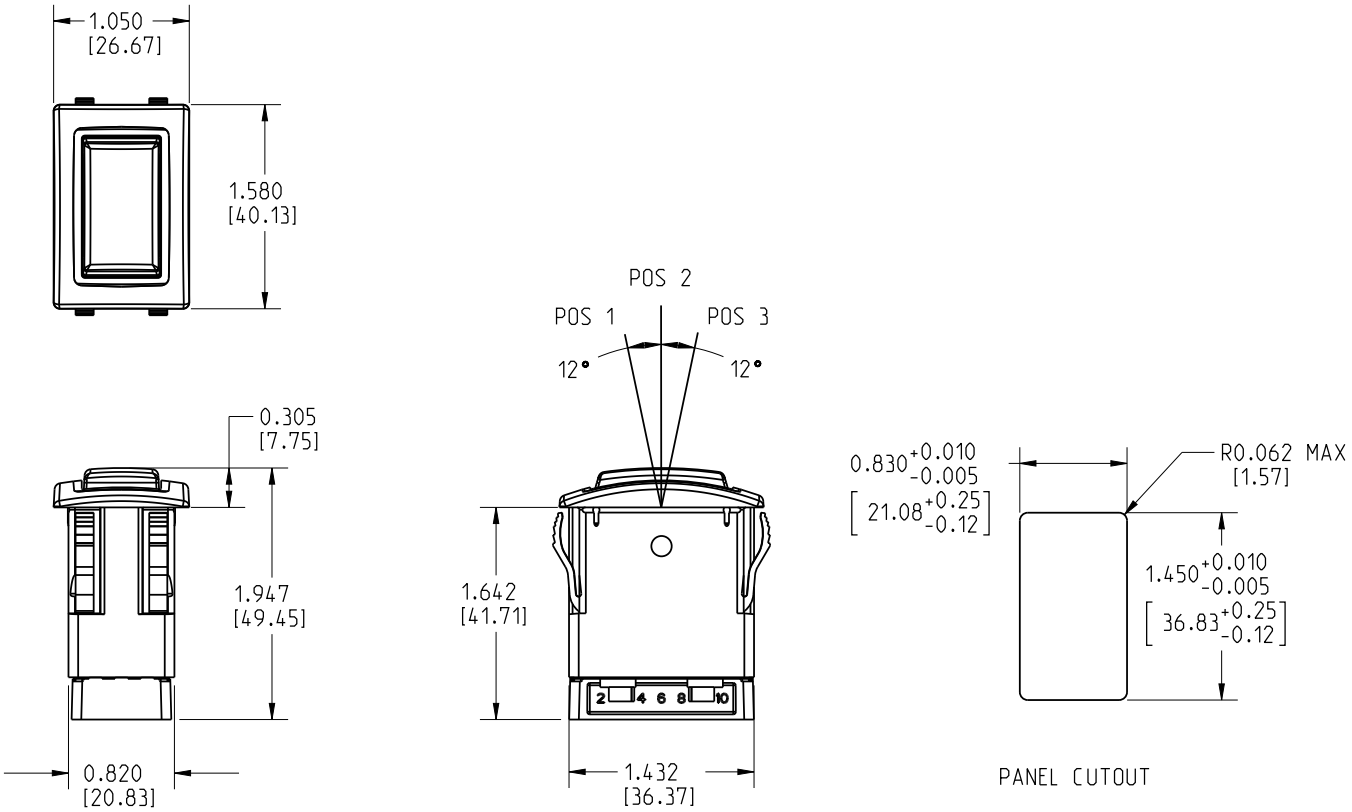
LEGEND: Used for illumination representation only.
Refer to legend code page for complete list if standard legends.

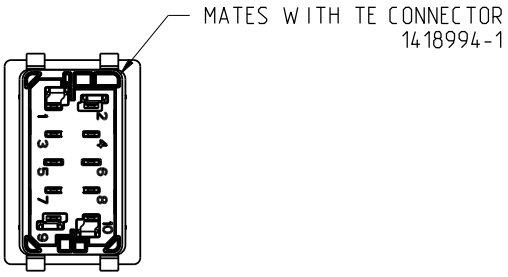
Standard Legend Codes:

YK	UA	UB	US	UV	UW	UX	UY	MP	MR	PX	MS	MT
VU	MW	NZ	NX	NY	YM	VW	PS	PW	PZ	WG	WM	RN
RP	YG	TX	NAV LIGHTS VD	COURT LIGHTS VE	PANEL LIGHTS VF	ANCH LIGHTS VG	HEAD LIGHTS SH	FOG LIGHTS SM	DASH LIGHTS SN	DOCK LIGHTS SP	BEACON SR	LIGHT SY
DIM WY	BRIGHT WZ	UH	UJ	PD	PE	PF	BILGE PUMP VC	BILGE VJ	UF	UG	MU	TN
NS	PB	WIPER SE	VZ	YE	NN	RW	PU	WA	YN	UE	NM	RJ
NR	YD	TL	VR	ENG FAN SL	BLWR VA	UC	VN	PK	VY	HORN UZ	RH	NU
NV	RB	RC	RK	RL	MZ	RG	UP WS	DOWN WT	UD	UR	WD	TY
PA	UK	WATER PUMP WR	UU	UT	ANCHOR YR	PM	VV	WB	TB	TC	TD	TE
MY	PV	TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK
VS	UL	UM	WK	TS	VT	TCS WL	VP	YJ	PJ	RY	UP	NW
NP	RE	RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR
STOP TK	RT	SEAT SZ	VX	WF	WH	PG	CRUISE SJ	YA	YB	RM	TM	RD
RS	UN	TP	TR	NT	MX	YC	TW	TJ	YF	TH	TF	TG
YS	YH	AUX SX	ON OFF RZ	OFF ON YP	I O WN	O I WP	O F F O N WW	ON WX	OFF SA	I SB	O SC	II SD
RAISE ST	LOWER SU	HIGH WU	LOW WV	FWD SV	REV SW	DEPTH VB	TRIM TAB VH	ACC VK	NAV ANCH VL	WIND LASS UP/DN VM	LIVE WELL WE	REAR SF
PARK SG	AUTO SS	RU	RV	RX								

Notes:
1 ISO compliant symbols. Consult factory for custom legends.
2 New legend codes recommended for new part set ups. Previous codes still valid for existing customers.

Dimensional Specifications: in. [mm]





CLA-0156 Rev: A

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Circuit Diagrams:

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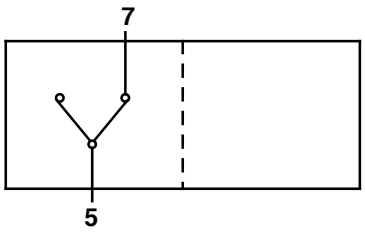
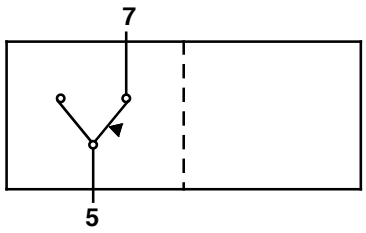
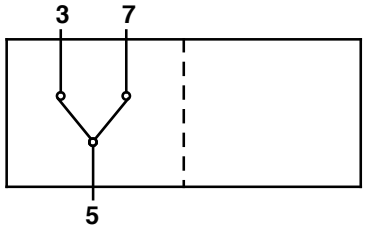
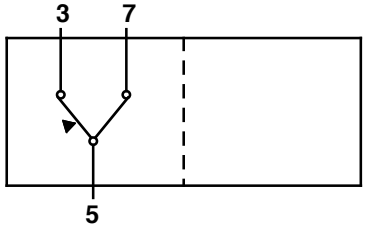
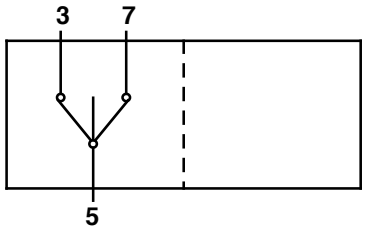
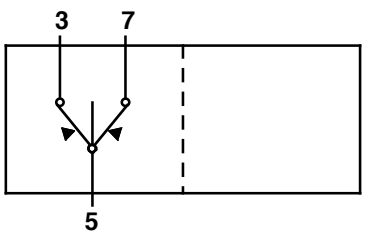
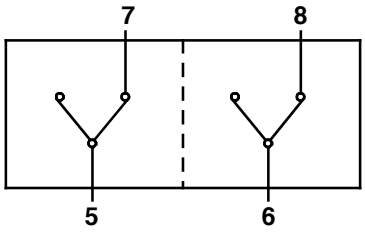
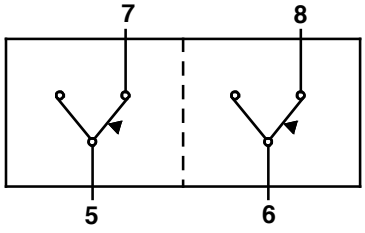
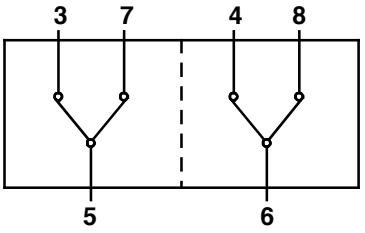
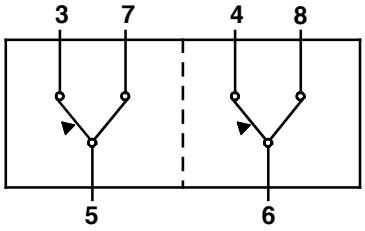
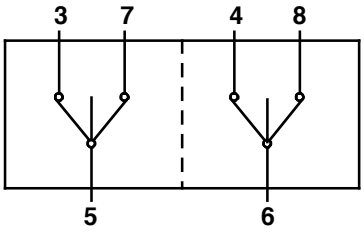
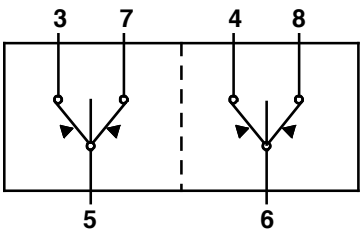
11	
12	
14	
15	
16	
18	

Circuit Code	CIRCUIT DIAGRAM
21	
22	
24	
25	
26	
28	

CAD-0083 Rev: A

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Illumination Circuit Diagrams:

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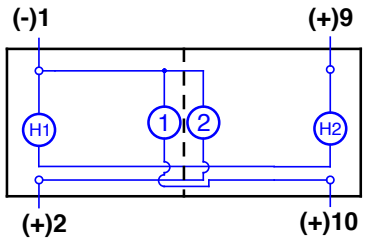
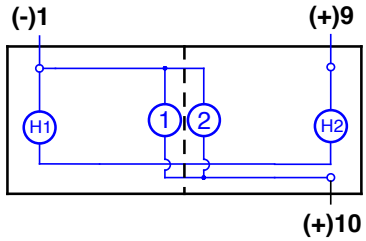
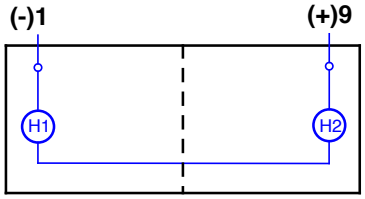
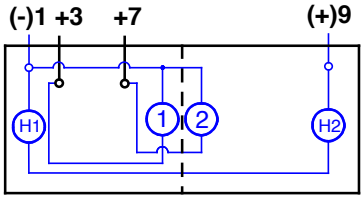
A1	
A2	
A3	
A4	

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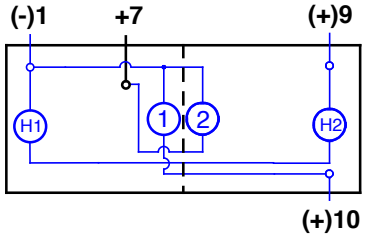
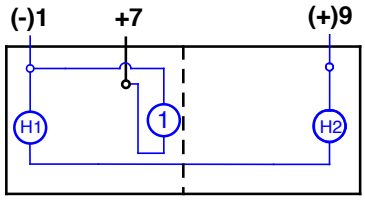
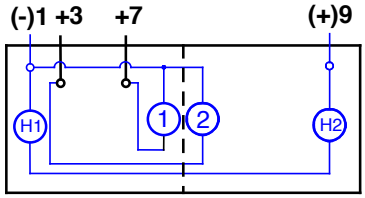
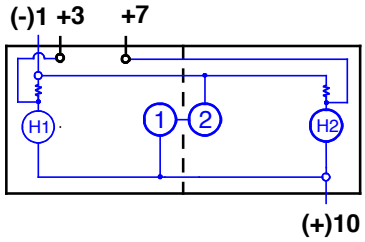
A5	
A6	
A7	
B1	

V-Series

CONTURA SWITCHES

Carling Technologies' sealed V-Series Contura switches are well known for their cutting edge design, high quality, maximum performance and unmatched reliability. These switches are a staple in the marine and transportation industries and have passed a range of environmental, corrosion, temperature, vibration, shock and sealing tests including MIL Std 202F, MIL Std 510.1, UL 1500, ISO 8846, IEC 60529 and BS 5490 among others, making them one of the most rugged and reliable switches ever manufactured.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

- Certified to IP66/68 with dual seals around lamps and rocker stem.
- Silver plated butt contact mechanism provides reliability up to and beyond 100K electrical cycles
- Greaseless construction withstands temperature extremes down to -40˚C
- The switch accommodates up to 10 terminals and endless illumination and circuit options.
- The switch connector allows the user to preload FQC terminals for ease of assembly.
- Numerous choices of removable rockers allow for style change without having to retest or re-qualify the switch base.

Typical Applications:

- Marine Panels
- Emergency Vehicles
- Trucks
- Buses
- Construction Equipment
- Motorcycles & ATVs
- Farm Equipment
- Commercial Appliances
- Military Vehicles
- Mining Equipment
- Golf Carts
- Floor Cleaning Equipment
- Utility Vehicles

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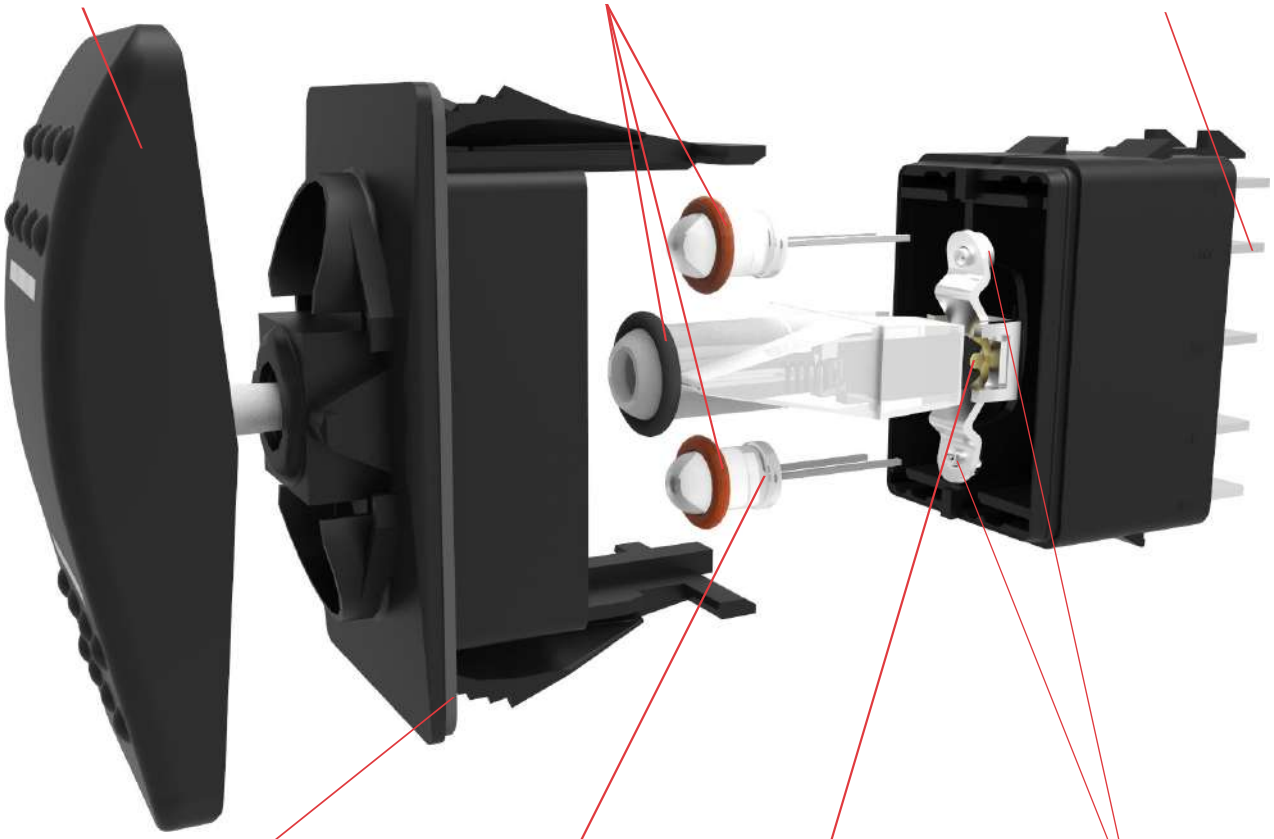
V-Series Switch
DESIGN FEATURES

INTERCHANGEABLE ACTUATORS
Panel redesign is a snap with our wide range of rocker styles. Achieve maximum design variety with minimum inventory. Simply swap rockers to create an entirely new look for your panel.

DUAL SEAL PROTECTION
Seals out water, dust, debris, and enables switch certification to IP66/68 for front panel components.

CLEAN CONNECTIONS
Options for both eight and ten terminal base styles with AMP & Packard compatible connectors affords myriad circuit options while providing ease of assembly.



OPTIONAL PANEL SEAL
Helps prevent water/dust ingress behind panel.

MULTIPLE LIGHTING OPTIONS
In addition to Incandescent lamps, our LED illumination is offered in a wide array of light intensities, colors, as well as dual level, tri-color, and flashing options.

BRASS ROLLER PIN
Robust mechanism eliminates the need for lubricants. Enables switch to withstand -40°C to +85°C temperatures.

SILVER PLATED BUTT CONTACT MECHANISM
Providing 50k to 100k electrical cycles and a variety of different electrical ratings.

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

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Contura II & III

The Contura II & III actuators are constructed of thermoplastic polycarbonate and are offered with a hard nylon overlay or a "soft-touch" elastomer overlay. These models incorporate aesthetic designs on the top and bottom of the rocker featuring two rows of raised "bumps" on the Contura II and three "indented" lines on the Contura III.

Contura IV

The Contura IV's "Shape to create a Shape" actuator works with the curves, contours & advanced styling of the latest panel designs, flowing with these advanced curves & radii. This actuator style fits on the Contura flush bracket/bezel.

Contura V

The symmetrically curved Contura V actuator provides the perfect complement to the Contura IV's "Shape to create a Shape" design concept. With its flush style mounting bracket, Contura V can be mounted in between two Contura IV's, by itself, or in groups.

Contura VI (WAVE)

The Contura VI WAVE sealed rocker switches, when used in a row, create an uniquely appealing "wave" design on your panel. A variety of colors and finishes are available for both rocker and wave insert. Contura VI features bar and oval lenses.

Contura VII

Contura VII featuring gently curved corners and edges assuring compatibility with most any panel design. Intuitive feel is maximized by the use of 2 embossed circular pads located at opposite ends of the rocker. Any combination of Bar or Oval style lenses can be located in the pads providing a truly unique look, exclusive to Contura VII.

Contura X

The raised bracket/bezel on the Contura X helps prevent inadvertent actuation of the rocker, as well as preventing debris from being trapped under the actuator. This curved rocker style is available with a variety of lenses and legends.

Contura XI

The raised bracket/bezel on the Contura XI helps prevent inadvertent actuation of the rocker, as well as preventing debris from being trapped under the actuator. This convex style rocker is available with a wide variety of lenses and legends.

Contura XII

The Contura XII version features a paddle style actuator with the raised bracket/bezel of Contura X and XI. The contoured handle design provides intuitive recognition and ease of operation and is available with all Contura X and XI lens and legend offerings.

Contura XIV

The Contura XIV represents a sleek new crossover rocker design which should appeal to Trucks, Buses and Heavy Vehicles as well as the Marine Industry. Intuitive feel is provided by recessed ridges along with a Center Groove which effectively defines the boundary between top and bottom switch functions.

Illuminated Indicators & Accessories

Alert operator of systems functions or malfunctions, are offered with removable/replaceable lamps in Contura II, II, V or X styles. Accessories include connectors, mounting panels, hole plugs, panel seals, and actuator removal tools. Refer to accessories page for full details

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Electrical

Contact Rating	.4VA @ 24VDC (MAX) resistive 15 amps, 125VAC 10 amps, 250VAC 1/2 HP 125-250VAC 20 amps, 4-14VDC 15 amps, 15-28VDC 10A, 14VT 6A, 125VAC L
Dielectric Strength	1500 Volts RMS
Insulation Resistance	50 Megohms
Initial Contact Resistance	10 milliohms max. @ 4VDC
Life	50,000 - 100,000 cycles circuit dependent
Contacts	Silver alloy, silver tin-oxide, fine silver
Terminals	Brass or copper/silver plate 1/4" (6.3mm) Quick Connect terminations standard. Solder lug, Wire Lead

Mechanical

Endurance	150,000 cycles minimum circuit dependent

Physical

Lighted	Incandescent - rated 10,000 hours Neon - rated 25,000 hours LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24VDC)
Seals	Internal Optional external gasket panel seal
Base	Polyester blend rated to 125°C with a UL flammability rating of 94V0.
Contura II,III,IV,V, VI, VII Actuator	**Hard Surface:** Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay. **Soft Surface:** Basic actuator structure molded of thermoplastic polycarbonate with an elastomer overlay.
Contura X,XI,XII Actuator,VP	Nylon 66 Reinforced rated to 105°C
Lens	Polycarbonate rated at 100°C
Contura XIV	Polycarbonate lens/sub-rocker with ABS shell

Actuator Travel (Angular Displacement)

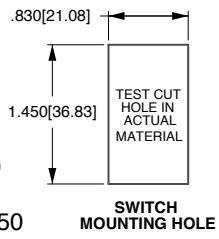
2 position	18°
3 positions	9° from center

Mounting Specifications

Panel Thickness Range

Gaskets	Acceptable Panel Thickness
0	.030 to .250 (.76 to 6.35mm)
1	.030 to .109 & .147 to .157 (.76 to 2.77mm & 3.73 to 3.98mm)

Recommended: No gasket with panel thickness of .032, .062, .093, .125,.187 or .250



Agency Certifications

Environmental

Sealing	Sealed version: IP66/68, this rating applies to front panel components of the actual switch only, and signifies complete protection against dust as well as powerful jets of water.
Corrosion	Mixed Flowing Gas (MFG) Class III 3 year accelerated exposure per ASTM B-827, B-845 Silver and gold contacts
Operating Temp.	-40°C to +85°C
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with VCH connector. Test criteria - No loss of circuit during test, pre and post test contact resistance.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 Hz ±10 G's peak Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025 No loss of circuit during test; <10µ seconds chatter.
Shock	Per Mil-Std 202F, Method 213B, Test Condition K @ 30G's. Tested with VCH connector. Test criteria - No loss of circuit during test, pre and post test contact resistance.
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 96 Hrs. Sealed version only.
Dust	Mil STD 810, Method 510.2 Air Velocity 300 Ft/Min Duration 16Hr
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Cond. A, -55°C to +85°C. Test criteria - pre and post test contact resistance
Moisture Resistance	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance
Ignition Protection	All Contura switches with sealed construction meet the requirements of UL1500/ISO8846 for ignition protection, in addition to conformance with EC directive 94/25/EC for marine products.

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V	1	D	A	B	T	0	B	-	A	R	B	00	-	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright Green	**7** 18V superbright Red	**8** 24V
LED*	Red	Amber			
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator
A, B Contura II
C, D Contura III

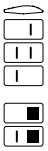
Actuator thick end over terminals: 3,6 1,4

10 LENS
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue
1	**6**	**8**	**G**	**M**	**T**
2	**7**	**C**	**H**	**N**	**U**
3	**8**	**D**	**J**	**P**	**V**

Square lens options only available for Contura II.

4	**9**	**E**	**K**	**R**	**W**
5	**A**	**F**	**L**	**S**	**Y**

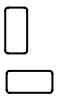


Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1] AND TEXTURE
0 - No Actuator

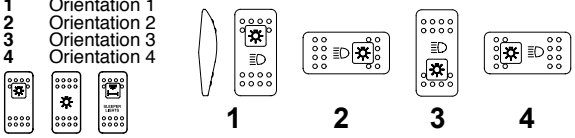
	Black	Gray	Red	White
Soft Surface	**B**	**G**	**R**	**W**
Hard Surface	**C**	**H**	**S**	**Y**

12 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Body legends not available on Soft surface actuators; White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Additional ratings available. See V-Series Switch Accessories page.
4 Contura II available with two square lenses. Consult factory for details.

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V	1	D	A	S	W	0	B	–	A	Z	E	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Function	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
9	**N**	OFF	NONE	ON
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
C	**3**	2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
M	**R**	1	UP	3 (+) 6 (–)

6 LOCK
Lock above terminals 1 & 4 end of switch
W lock

7 LAMP
Lamp above terminals 3 & 6 end of switch

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

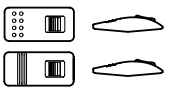
* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 HARD SURFACE ACTUATOR [1]

	Black	Gray	Red	White
Contura II	**A**	**B**	**G**	**H**
Contura III	**C**	**D**	**E**	**F**



Actuator orientation above terminals: 3,6 1,4

10 LENS
Z - No Lens

Clear	White	Amber	Green	Red	Blue
3	**8**	**D**	**J**	**P**	**V**

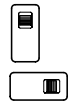
Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK FUNCTION AND COLOR [1]

Lock Color	Up	Down	Up & Down	Center [3]
Match Actuator	**A**	**H**	**R**	**1**
Black	**B**	**J**	**S**	**2**
White	**C**	**K**	**T**	**3**
Red	**D**	**L**	**V**	**4**
Safety Orange	**E**	**M**	**W**	**5**

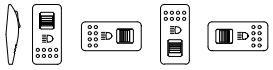
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend

21 OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 21-28 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Only available with 3 position circuits. Center OFF and special circuits only available with center position lock function.
4 Additional ratings available. See V-Series Switch Accessories page.

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V	1	D	A	B	T	0	B	–	E	P	C	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright Green	**7** 18V superbright Red	**8** 24V
LED*	Red	Amber			
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**JV**		

* Consult factory for "daylight bright" LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator
E Contura IV, left orientation
T Contura IV, left orientation, laser etched
F Contura IV, right orientation
R Contura IV, right orientation, laser etched
Actuator orientation over terminals:

10 LENS
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue
1	**6**	**8**	**G**	**M**	**T**
2	**7**	**C**	**H**	**N**	**U**
3	**8**	**D**	**J**	**P**	**V**
4	**9**	**E**	**K**	**R**	**W**
5	**A**	**F**	**L**	**S**	**Y**

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1,5,6]

No Actuator	**0**	Black	**C**	Gray	**H**	Red	**S**
White	**Y**	Nickel	**D**	Pewter	**E**		

12 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O

For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Gloss brow is on left side of E actuator and right side of F actuator.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Laser etched rocker only available with lens code Z & actuator colors black, nickel or pewter.
6 Pewter and nickel colors only available with laser etched actuator.

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V	1	D	A	B	T	0	B	–	G	P	C	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - - 7 8 - - 7
1 - - 4 1 - - 4
2 - - 5 2 - - 5
3 - - 6 3 - - 6
10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright Green	**7** 18V superbright Red	**8** 24V
LED*	Red	Amber			
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator
G Contura V
P Contura V, laser etched

10 Lens
0 - No Actuator **Z** - No Lens style & location: #1 / #2

Clear	White	Amber	Green	Red	Blue	
1	**6**	**8**	**G**	**M**	**T**	
2	**7**	**C**	**H**	**N**	**U**	
3	**8**	**D**	**J**	**P**	**V**	
4	**9**	**E**	**K**	**R**	**W**	
5	**A**	**F**	**L**	**S**	**Y**	

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1,3,5]

No Actuator	**0**	Black	**C**	Gray	**H**	Red	**S**
White	**Y**	Nickel	**D**	Pewter	**E**		

12 ACTUATOR LENS OR BODY LEGENDS [2,6]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O
For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Laser Etched rocker only available with lens code Z & actuator colors black, nickel or pewter.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Nickel and Pewter colors only available with laser etched actuator.
6 Consult factory for laser etched lens callout.

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V	1	D	A	S	W	0	B	–	J	Z	E	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Function	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT [3]
Terminal Connections as viewed from bottom of switch:

8 terminal ***10 terminal***
8 - - 7 8 - - 7
1 - - 4 1 - - 4
2 - - 5 2 - - 5
3 - - 6 3 - - 6
10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
9	**N**	OFF	NONE	ON

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
C	**3**	2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
M	**R**	1	UP	3 (+) 6 (–)

6 LOCK
Lock above terminals 1 & 4 end of switch.
W low profile lock
Y [6] high profile lock

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Only available with 3 position circuits. Center OFF and special circuits only available with center position lock function.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Located at T3-6 end of switch.
6 Contura V style only.

7 LAMP
Lamp above terminals 3 & 6 end of switch

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 HARD SURFACE ACTUATOR
CONTURA IV:

Orientation	Black	Gray	Red	White
Left	J	K	L	M
Right	N	P	R	S

Actuator orientation over terminals: 3,6 1,4

CONTURA V:

Orientation	Black	Gray	Red	White
	U	V	W	Y

Actuator orientation over terminals: 3,6 1,4

10 LENS [5]
Z - No Lens

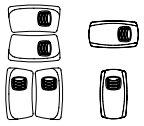
Clear	White	Amber	Green	Red	Blue	
A	**B**	**C**	**D**	**E**	**F**	bar lens
G	**H**	**J**	**K**	**L**	**M**	oval lens

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK FUNCTION AND COLOR [1]

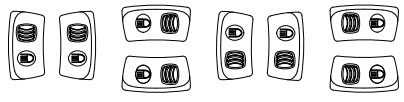
Lock Color	Up	Down	Up & Down	Center [3]
Match Actuator	**A**	**H**	**R**	**1**
Black	**B**	**J**	**S**	**2**
White	**C**	**K**	**T**	**3**
Red	**D**	**L**	**V**	**4**
Safety Orange	**E**	**M**	**W**	**5**
Gray	**F**	**G**	**N**	**6**

12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend
21 OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



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V	1	D	B	G	N	T	B	–	H	A	7	C	B	–	AC	1	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lens	12 Color	13 Insert Color		14 Actuator Lens	15 Legend Orientation	16 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - - 7 8 - - 7
1 - - 4 1 - - 4
2 - - 5 2 - - 5
3 - - 6 3 - - 6
10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP
Lamp above terminals 3 & 6 end of switch

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*			superbright	superbright	
	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for "daylight bright" LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

9 ACTUATOR
0 No Actuator **H** High Insert **L** Low Insert

10,11 LENS
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
–	**7**	**C**	**H**	**N**	**U**	Bar Lens Translucent
3	–	**D**	**J**	**P**	**V**	Bar Lens Transparent
4	–	**E**	**K**	**R**	**W**	Oval Lens Transparent
–	**A**	**F**	**L**	**S**	**Y**	Oval Lens Translucent

Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

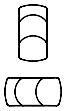
12 ACTUATOR COLOR
C Black **H** Gray **S** Red **Y** White

13 INSERT COLOR
B Black
C Bright Chrome Plated
D Satin Chrome Painted
N Bright Nickel Plated
S Satin Chrome Plated
T Satin Nickel Plated
W White

14 ACTUATOR LENS OR BODY LEGENDS [2]
00 - No Legend this location/No actuator

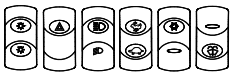
11 ON OFF **12** OFF ON **13** I O **14** O I

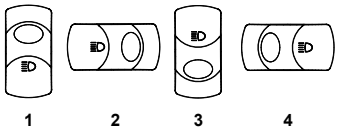
15 O O F N F **16** O O N F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

15 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4





16 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators. Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Additional ratings available. See V-Series Switch Accessories page.

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V	1	D	A	B	T	0	B	–	Z	R	C	00	–	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7 / 1 - - 4 / 2 - - 5 / 3 - - 6
10 terminal 8 - - 7 / 1 - - 4 / 2 - - 5 / 3 - - 6 / 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
	0	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (same coding for both selections)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	superbright Green	superbright Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Seal	**B**	**W**	**G**
One Seal	**C**	**Y**	**H**

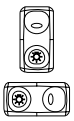
9 ACTUATOR
0 No Actuator
Z Contura VII
Actuator orientation over terminals: 3,6 1,4

10 LENS
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.
0 - No Actuator **Z** - No Lens

White	Amber	Green	Red	Blue	Lens style & location
6	**B**	**G**	**M**	**T**	
7	**C**	**H**	**N**	**U**	
8	**D**	**J**	**P**	**V**	
9	**E**	**K**	**R**	**W**	
A	**F**	**L**	**S**	**Y**	
1	**2**	**3**	**4**	**5**	

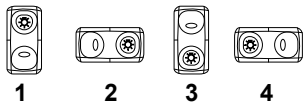
11 ACTUATOR COLOR / THUMB PRINT COLOR [1]
O N/A - No Actuator
H Grey/Black
Y White/Black
C Black/Black
S Red/Black

12 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON / OFF **12** OFF / ON **13** I / O **14** O / I
15 O O / F N / F **16** O O / N F / F **17** O I **18** I O



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators. Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
3 Additional ratings available. See V-Series Switch Accessories page.
4 Legends available for lighted oval lens version only

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V	1	D	A	B	6	0	1	-	6	P	Z	00	-	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lens	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:	1	2	3
SP DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1 A	ON	NONE	OFF
2 B	(ON)	NONE	OFF
3 C	ON	NONE	(OFF)
4 D	ON	NONE	ON
5 F	ON	NONE	(ON)
6 J	ON	OFF	ON
7 K	ON	OFF	(ON)
8 L	(ON)	OFF	(ON)
SPECIAL CIRCUITS			
H*	2 & 3	2 & 3, 5 & 4	5 & 4
G*	2 & 3, 5 & 6	2 & 3	OFF
S*	2 & 3, 5 & 6	2 & 3	1 & 2
M*	(2 & 3, 5 & 6)	2 & 3	OFF
R*	(2 & 3, 5 & 6)	2 & 3	2 & 1
E*	5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
A	**1**	1	INDEPENDENT	8 (+) 7 (–)
B	**2**	1	DOWN	3 (+) 7 (–)
C	**3**	2	UP	3 (+) 7 (–)
D	**4**	1	DOWN	3 (+) 7 (–)
		2	DOWN	1 (+) 7 (–)
E	**5**	1	UP	1 (+) 7 (–)
		2	UP	3 (+) 7 (–)
F	**6**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 6 (–)
G	**7**	1	INDEPENDENT	8 (+) 7 (–)
		2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
U	**Y**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	10 (+) 9 (–)
SINGLE POLE SWITCHES ONLY				
J	**8**	1	DOWN	3 (+) 8 (–)
		2	INDEPENDENT	6 (+) 7 (–)
K	**W**	1	INDEPENDENT	8 (+) 7 (–)
		2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
L	**9**	1	DOWN	3 (+) 6 (–)
M	**R**	1	UP	3 (+) 6 (–)
N	**T**	1	DOWN	3 (+) 6 (–)
		2	DOWN	1 (+) 4 (–)
P	**V**	1	UP	1 (+) 4 (–)
		2	UP	3 (+) 6 (–)

6,7 LAMP (same coding for both selections)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright Green	**7** 18V superbright Red	**8** 24V
LED*	Red	Amber			
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

*Consult factory for "daylight bright" LED. Typical current draw for LED is 20ma

8 BRACKET COLOR [1], PANEL SEAL (EXTERNAL FOAM GASKET)

X & XI with Flush Bracket			X, XI, XII with Raised Bracket		
# of gaskets	**0**	**1**	**2**	**0**	**1**
Black	**B**	**C**	**D**	**1**	**4**
White	**W**	**Y**	**Z**	**2**	**5**
Gray	**G**	**H**	**J**	**3**	**6**

9 ACTUATOR

No Actuator	**0**				
	Black	Gray	White	Red	
Contura X	**1**	**2**	**3**	**4**	
Contura XI	**6**	**7**	**8**	**9**	
Contura XII	**J**	**K**	**N**	**M**	

Actuator orientation over terminals: 3,6 1,4

10 LENS - ABOVE LAMP #1 TERMINALS [1,4]
11 LENS - ABOVE LAMP #2 TERMINALS [3,6]
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
3	**8**	**D**	**J**	**P**	**V**	**Bar**
4	**9**	**E**	**K**	**R**	**W**	**One piece Square**
5	**A**	**F**	**L**	**S**	**Y**	**Two piece Square*** **(With clear top protective lens)**
2	**7**	**C**	**H**	**N**	**U**	**Two piece Square*** **(With smoke top protective lens)**
1	**6**	**B**	**G**	**M**	**T**	**Two piece Square*** **(With white top protective lens)**

* All bottom lenses are molded of opaque material. Consult factory for other lens colors. Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

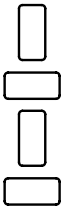
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location / No actuator

11 ON / OFF **12** OFF / ON **13** I / O **14** O / I

15 O O / F N F **16** O O / N F F **17** O I **18** I O

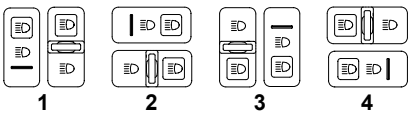
21 OFF **22** ON **23** O **24** I

25 O / F F **26** O / N **27** O **28** I



For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION [3]
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators. Custom colors are available, consult factory.
3 With 2 square lenses, use selection 12 for lens above lamp 1, & selection 14 for lens above lamp 2.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Not available with Contura XI rockers.

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V	1	D	A	S	W	0	1	–	1	P	B	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Function	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - - 7 8 - - 7
1 - - 4 1 - - 4
2 - - 5 2 - - 5
3 - - 6 3 - - 6
10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
9	**N**	OFF	NONE	ON
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
S*		2 & 3, 5 & 6	2 & 3	1 & 2
E*		5 & 6	5 & 3	5 & 1

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [4]
1 .4VA @ 28VDC Resistive
B 15A 24V
C 20A 18V
D 20A 12V
E 20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F 10A 14V, 6A 14VT (circuit G only)
M .4VA/20A 12V
N .4VA/15A 24V

4 TERMINATION / BASE STYLE

8 term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**5**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION & SWITCH SEALING
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

Sealed	Unsealed	Lamps	Illumination Type	Lamp wired to Terminals
S	**0**	NONE	–	–
C	**3**	2	UP	3 (+) 7 (–)
H	**Z**	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY				
M	**R**	1	UP	3 (+) 6 (–)

6 LOCK
Lock above terminals 1 & 4 end of switch.
W Lock

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators; Custom colors are available, consult factory.
3 Located over T1-4 end of switch.
4 Additional ratings available. See V-Series Switch Accessories page.
5 Located over T3-6 end of switch.

6,7 LAMP (same coding for both selections)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for "daylight bright" LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

	Black	White	Gray
No Gasket	**1**	**2**	**3**
One Gasket	**4**	**5**	**6**

9 HARD SURFACE ACTUATOR

Contura X	Black	Gray	Red	White
	1	**2**	**3**	**4**

Actuator orientation over terminals:

10 LENS - ABOVE LAMP #2 TERMINALS [5]
Z - No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
3	**8**	**D**	**J**	**P**	**V**	**Bar**
4	**9**	**E**	**K**	**R**	**W**	**One piece Square**
5	**A**	**F**	**L**	**S**	**Y**	**Two piece Square*** **(with clear top protective lens)**
2	**7**	**C**	**H**	**N**	**U**	**Two piece Square*** **(with smoke top protective lens)**
1	**6**	**B**	**G**	**M**	**T**	**Two piece Square*** **(with white top protective lens)**

* All bottom lenses are molded of opaque material. Consult factory for other lens colors.
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK FUNCTION AND COLOR [3]

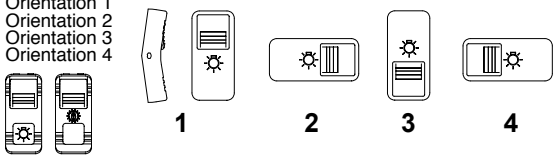
Lock Color Match Actuator	Up	Down	Up & Down
Black	**A**	**H**	**R**
White	**B**	**J**	**S**
Red	**C**	**K**	**T**
Gray	**D**	**L**	**V**
Safety Orange	**E**	**M**	**W**
	F	**N**	**Y**

12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend

21	**22**	**23**	**24**
OFF	ON	O	I
25 O F F	**26** O N	**27** O	**28** I

For additional legend options & codes, visit us at www.carlingtech.com.

13 LEGEND ORIENTATION [3]
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



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V	1	D	B	B	C	0	B	–	FA	P	C	AB	–	1	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Actuator Color	12 Legend		13 Legend Orientation	14 Actuator, Lens Legends

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6
10 terminal 8 - - 7, 1 - - 4, 2 - - 5, 3 - - 6, 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
2	**B**	(ON)	NONE	OFF
3	**C**	ON	NONE	(OFF)
4	**D**	ON	NONE	ON
5	**F**	ON	NONE	(ON)
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
H*		2 & 3	2 & 3, 5 & 4	5 & 4
G*		2 & 3, 5 & 6	2 & 3	OFF
M*		(2 & 3, 5 & 6)	2 & 3	OFF
R*		(2 & 3, 5 & 6)	2 & 3	2 & 1
E*		5 & 6	5 & 3	5 & 1
S*		2 & 3, 5 & 6	2 & 3	1 & 2

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]
1	.4VA @ 28VDC Resistive
B	15A 24V
C	20A 18V
D	20A 12V
E	20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F	10A 14V, 6A 14VT (circuit G only)

4 TERMINATION / BASE STYLE
8 Term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5
3	**4**	Solder Lug no barriers	No
C	**D**	Solder Lug	No
5	**6**	Wire Leads no barriers	No
E	**F**	Wire Leads	No

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Illumination Type	Lamp wired to Terminals
S	NONE	–	–
A	1	INDEPENDENT	8 (+) 7 (–)
B	1	DOWN	3 (+) 7 (–)
C	2	UP	3 (+) 7 (–)
D	1	DOWN	3 (+) 7 (–)
	2	DOWN	1 (+) 7 (–)
E	1	UP	1 (+) 7 (–)
	2	UP	3 (+) 7 (–)
F	1	INDEPENDENT	8 (+) 7 (–)
	2	UP	3 (+) 6 (–)
G	1	INDEPENDENT	8 (+) 7 (–)
	2	UP	3 (+) 7 (–)
H	2	INDEPENDENT	8 (+) 7 (–)
SINGLE POLE SWITCHES ONLY			
J	1	DOWN	3 (+) 8 (–)
	2	INDEPENDENT	6 (+) 7 (–)
K	1	INDEPENDENT	8 (+) 7 (–)
	2	INDEPENDENT	6 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY			
L	1	DOWN	3 (+) 6 (–)
M	1	UP	3 (+) 6 (–)
N	1	DOWN	3 (+) 6 (–)
	2	DOWN	1 (+) 4 (–)
P	1	UP	1 (+) 4 (–)
	2	UP	3 (+) 6 (–)
U	1	INDEPENDENT	8 (+) 7 (–)
	2	INDEPENDENT	10 (+) 9 (–)

6 & 7 LAMP
No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 BRACKET COLOR & PANEL SEAL
Color	No Gasket	1 Gasket	2 Gasket
Black	**B**	**C**	**D**
Gray	**G**	**H**	**J**
White	**W**	**Y**	**Z**

9 ACTUATOR STYLE
0	No Actuator - Furnished separately
FA	Contura XIV
FB	Contura XIV - Laser Etched

10 LENS COLOR / STYLE
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**6**	**B**	**G**	**M**	**T**	
2	**7**	**C**	**H**	**N**	**U**	
3	**8**	**D**	**J**	**P**	**V**	
4	**9**	**E**	**K**	**R**	**W**	
5	**A**	**F**	**L**	**S**	**Y**	
5	**A**	**N/A**	**N/A**	**N/A**	**N/A**	Laser-Etched Actuator Only

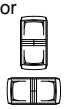
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR [1]
O	N/A - No Actuator
C	Black
S	Red
Y	White

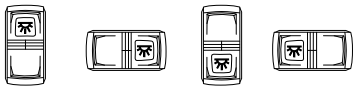
12 ACTUATOR LENS or BODY LEGEND [2]
00 - No Legend this location / No actuator

11 ON / OFF **12** OFF / ON **13** I / O **14** O / I

15 O O / F N F **16** O O / N F F **17** O I **18** I O



13 LEGEND ORIENTATION
0	No legend
1	Orientation 1
2	Orientation 2
3	Orientation 3
4	Orientation 4



14 ACTUATOR / LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection 14.
For legend options & codes, visit us at www.carlingtech.com.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators.
3 Additional ratings available. See V-Series Switch Accessories page.

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V	1	D	A	B	W	0	B	-	FC	Z	B	00	-	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Actuator Color	12 Legend		13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
8 terminal ***10 terminal***
8 - - 7 / 1 - - 4 / 2 - - 5 / 3 - - 6
8 - - 7 / 1 - - 4 / 2 - - 5 / 3 - - 6 / 10 - - 9

( ) - momentary
SP - single pole - uses terminals 1, 2 & 3.
DP - double pole uses terminals 1, 2, 3, 4, 5 & 6.
Terminals 7, 8, 9 & 10 for lamp circuit only.

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
1	**A**	ON	NONE	OFF
-	**B**	(ON)	NONE	OFF
4	**D**	ON	NONE	ON
6	**J**	ON	OFF	ON
7	**K**	ON	OFF	(ON)
8	**L**	(ON)	OFF	(ON)
9	**N**	OFF	NONE	ON

SPECIAL CIRCUITS

H*	2 & 3	2 & 3, 5 & 4	5 & 4
G*	2 & 3, 5 & 6	2 & 3	OFF
M*	(2 & 3, 5 & 6)	2 & 3	OFF
R*	(2 & 3, 5 & 6)	2 & 3	2 & 1
E*	5 & 6	5 & 3	5 & 1
S*	2 & 3, 5 & 6	2 & 3	1 & 2

*Jumper between terminals 2 & 5 for circuits H,G,M,R & S are specified in selection 4. External jumper between terminals 2 & 4 for circuit E are provided by customer. Circuit E may be used for SP OFF-ON-ON circuit.

3 RATING [3]

1	.4VA @ 28VDC Resistive
B	15A 24V
C	20A 18V
D	20A 12V
E	20A 14V, 10A 14VT (circuit 1, 4 , A & D only)
F	10A 14V, 6A 14VT (circuit G only)

4 TERMINATION / BASE STYLE

8 Term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) no barriers	No
A	**B**	.250 TAB (QC) with barriers	No
J	**K**	.250 TAB (QC) no barriers	Yes T2 to 5

Note: Codes J & K for circuits H, G & M. Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 1 & 4 end of switch.; Lamp #2 above terminals 3 & 6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Illumination Type	Lamp wired to Terminals
S	NONE	–	–
C	2	UP	3 (+) 7 (–)
H	2	INDEPENDENT	8 (+) 7 (–)
DOUBLE POLE SWITCHES ONLY			
M	1	UP	3 (+) 6 (–)

6 LOCK OPTION
W Low Profile Lock

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators.
3 Additional ratings available. See V-Series Switch Accessories page.

7 LAMP

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*			superbright	superbright	
	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 BRACKET COLOR & PANEL SEAL

Color	No Gasket	1 Gasket	2 Gasket
Black	**B**	**C**	**D**
Gray	**G**	**H**	**J**
White	**W**	**Y**	**Z**

9 ACTUATOR COLOR / STYLE

FC	Black - Standard Rocker
FD	Black - Laser Etched
FS	Red - Standard Rocker
FT	Red - Laser Etched

10 LENS COLOR / STYLE
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**6**	**B**	**G**	**M**	**T**	
3	**8**	**D**	**J**	**P**	**V**	
5	**A**	**N/A**	**N/A**	**N/A**	**N/A**	Laser-Etched Actuator Only

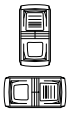
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR LOCK COLOR / FUNCTION [1]

	LOCK IN POSITION			
Lock Color	*UP*	*DOWN*	*UP & DOWN*	*CENTER*
Match Actuator	**A**	**H**	**R**	**1**
Black	**B**	**J**	**S**	**2**
White	**C**	**K**	**T**	**3**
Red	**D**	**L**	**V**	**4**
Orange	**E**	**M**	**W**	**5**
Gray	**F**	**G**	**N**	**6**

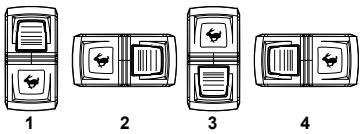
12 ACTUATOR LENS or BODY LEGEND [2]
00 - No Legend

21	**22**	**23**	**24**
OFF	ON	O	I
25 O F F	**26** O N	**27** O	**28** I



13 LEGEND ORIENTATION

0	No legend
1	Orientation 1
2	Orientation 2
3	Orientation 3
4	Orientation 4



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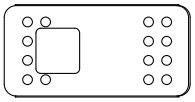
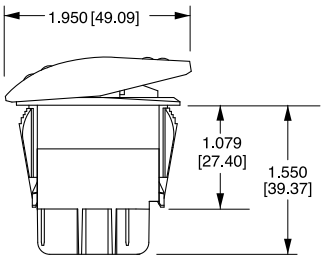
Dimensional Specifications: in. [mm]

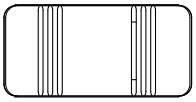
CONTURA II
SHOWN WITH
SQUARE LENS

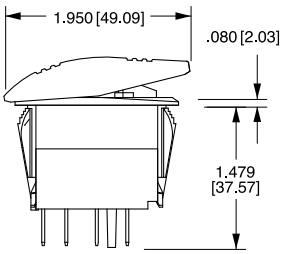




8 TERMINAL BASE
W/BARRIERS

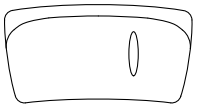
CONTURA III

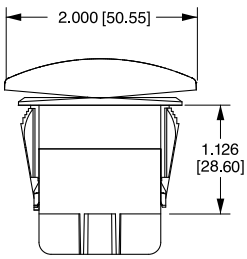




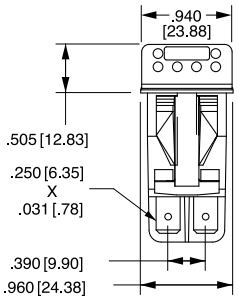
8 TERMINAL BASE
W/O BARRIERS

CONTURA IV
SHOWN WITH
BAR LENS

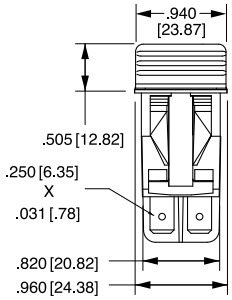




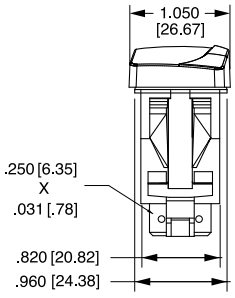
10 TERMINAL BASE
W/BARRIERS



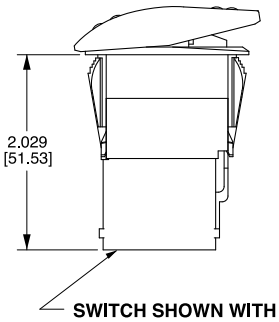
8 TERMINAL BASE
W/BARRIERS



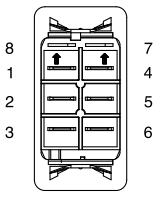
10 TERMINAL BASE
W/BARRIERS



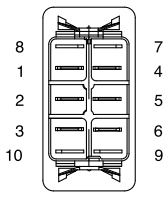
10 TERMINAL BASE
W/O BARRIERS



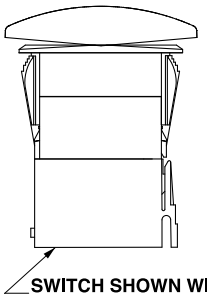
SWITCH SHOWN WITH
VCH CONNECTOR 8
TERMINAL



BOTTOM VIEW
TERMINAL
ARRANGEMENT
8 TERMINAL BASE



BOTTOM VIEW
TERMINAL
ARRANGEMENT
10 TERMINAL BASE

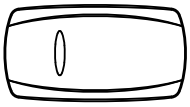


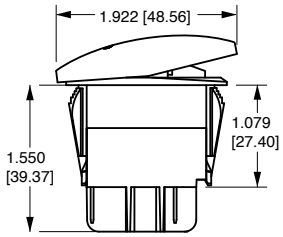
SWITCH SHOWN WITH
VC1 CONNECTOR 10
TERMINAL

Dimensional Specifications: in. [mm]

CONTURA V

SHOWN WITH BAR LENS

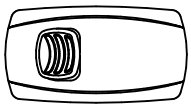


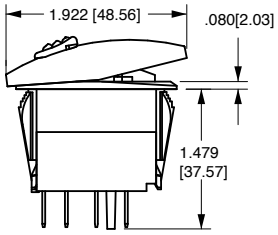


8 TERMINAL BASE W/BARRIERS

CONTURA V

SHOWN WITH LOW PROFILE LOCK

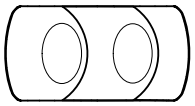


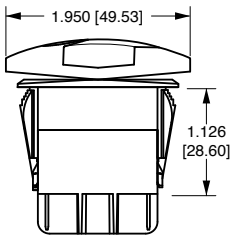


8 TERMINAL BASE W/O BARRIERS

CONTURA VI

SHOWN WITH OVAL LENS

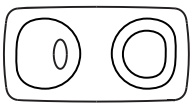


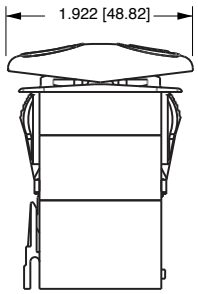


10 TERMINAL BASE W/BARRIER AND LAMP TERMINAL

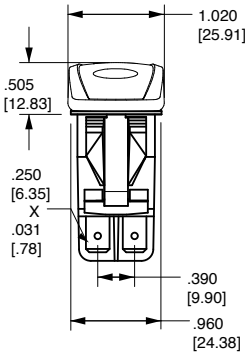
CONTURA VII

SHOWN WITH LARGE LENS AND BAR LENS

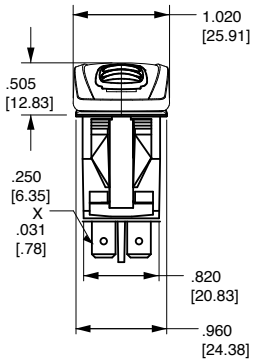




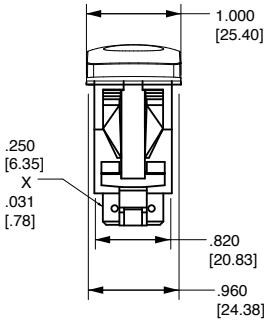
10 TERMINAL BASE W/O BARRIERS



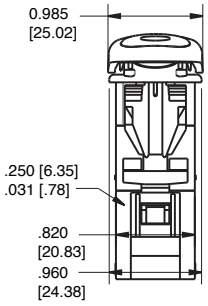
8 TERMINAL BASE W/BARRIERS



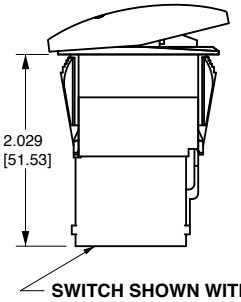
8 TERMINAL BASE W/O BARRIERS



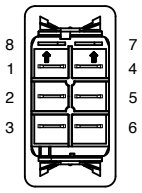
10 TERMINAL BASE W/O BARRIERS



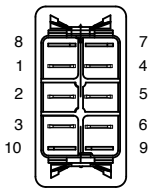
10 TERMINAL BASE W/O BARRIERS



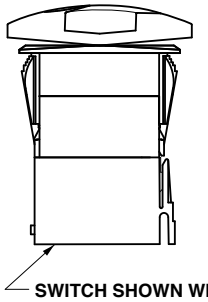
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL



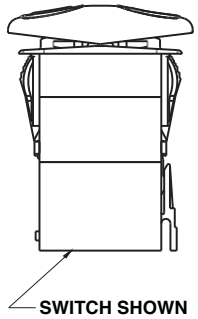
BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE



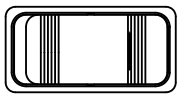
SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

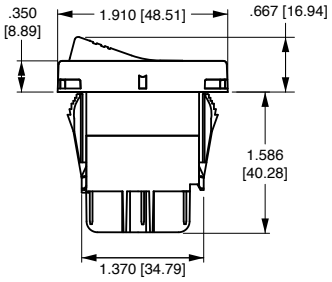


SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

Dimensional Specifications: in. [mm]

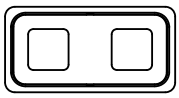
CONTURA X
SHOWN WITH RAISED BRACKET

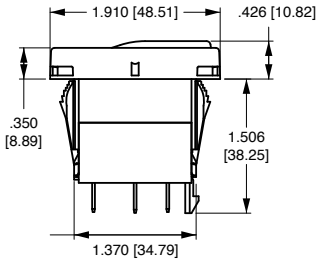




8 TERMINAL BASE W/BARRIERS

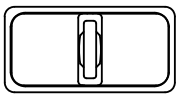
CONTURA XI
SHOWN WITH RAISED BRACKET AND TWO SQUARE LENSES

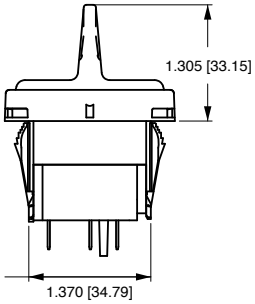




10 TERMINAL BASE W/O BARRIERS

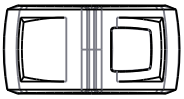
CONTURA XII
SHOWN WITH PADDLE ACTUATOR

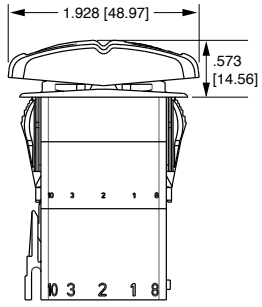




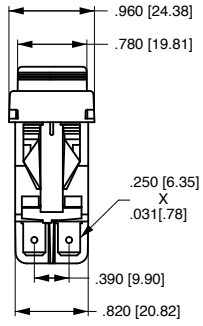
8 TERMINAL BASE W/O BARRIERS

CONTURA XIV
SHOWN WITH LARGE LENS

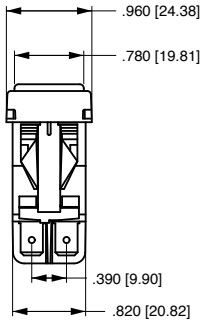




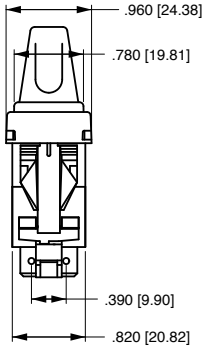
10 TERMINAL BASE W/O BARRIERS



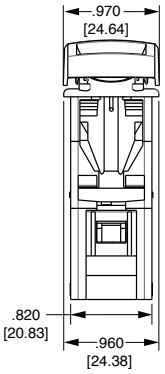
8 TERMINAL BASE W/BARRIERS

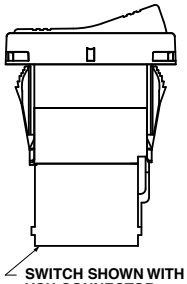


10 TERMINAL BASE W/BARRIERS

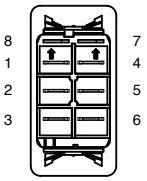


10 TERMINAL BASE W/O BARRIERS

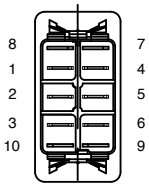




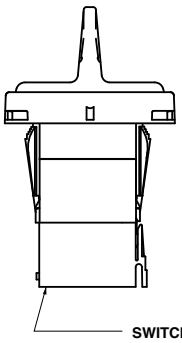
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL

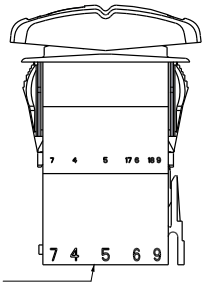


BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



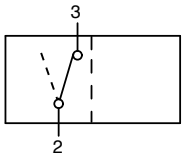
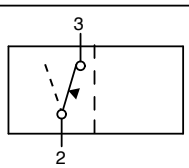
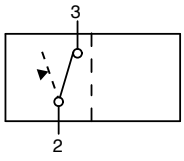
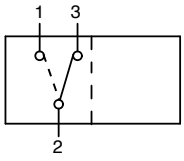
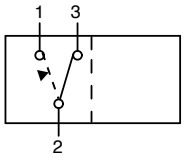
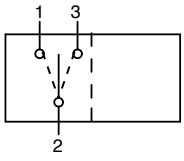
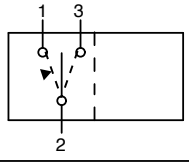
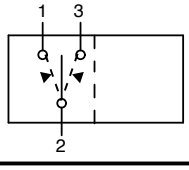
BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE

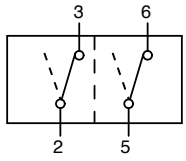
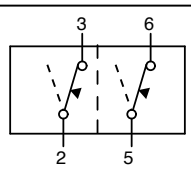
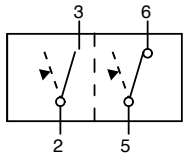
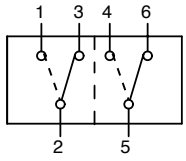
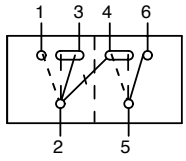
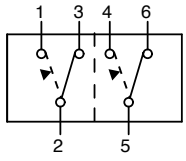
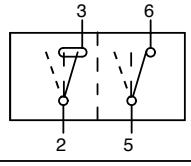
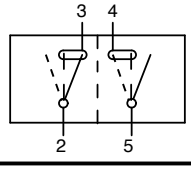


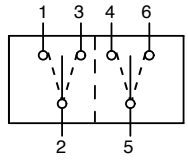
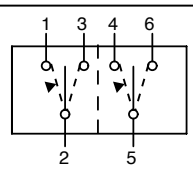
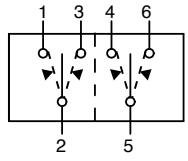
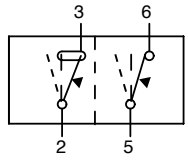
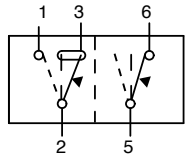
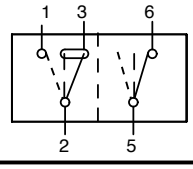


SWITCHES SHOWN WITH VC1 CONNECTOR 10 TERMINAL

Circuit Diagrams:

CIRCUIT CODE	CIRCUIT DIAGRAM
1	
2	
3	
4	
5	
6	
7	
8	

CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	

CIRCUIT CODE	CIRCUIT DIAGRAM
J	
K	
L	
M	
R	
S	

SYMBOL LEGEND	
SYM.	DEFINITION
	DESIGNATES TERMINALS AND CONTACTS
	DESIGNATES MAINTAINED CIRCUITS
	DESIGNATES OTHER POSITION
	DESIGNATES MOMENTARY CIRCUITS
	DESIGNATES TWO POSITION CONNECTION
	DESIGNATES EXTERNAL JUMPER PROVIDED BY CUSTOMER

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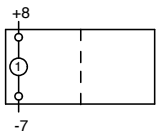
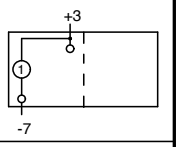
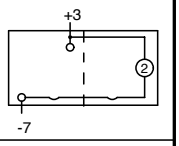
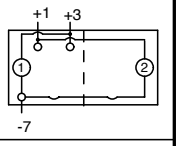
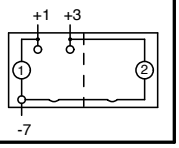
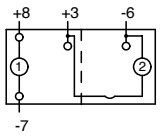
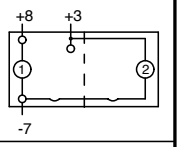
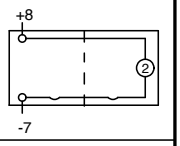
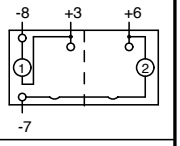
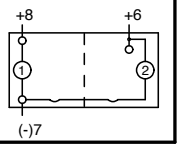
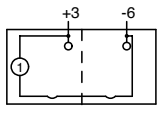
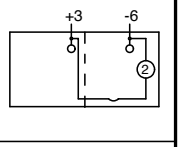
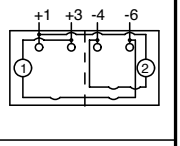
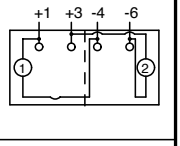
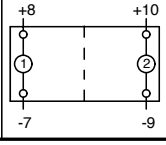
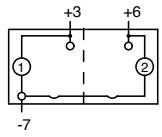
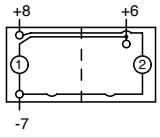
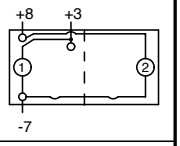
Lamp Circuit Diagrams:

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A / 1	
B / 2	
C / 3	
D / 4	
E / 5	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
F / 6	
G / 7	
H / Z	
J / 8	
K / W	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
L / 9	
M / R	
N / T	
P / V	
U / Y	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
SPECIAL #1	
SPECIAL #3	
SPECIAL #4	

J-Series Hazard Warning Circuit Diagrams:

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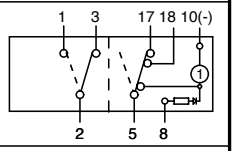
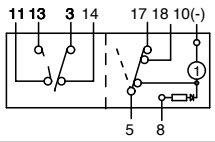
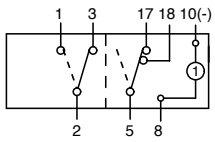
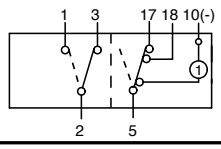
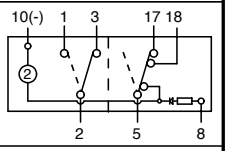
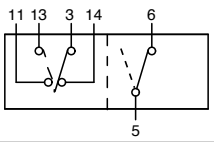
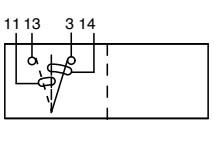
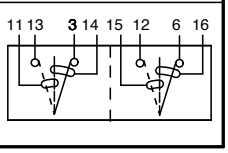
J1	
J2	
J3	
J4	

CIRCUIT CODE	CIRCUIT DIAGRAM
J5	
JA	
JJ	
JK	

NOTE:
J circuits are available for all non-locking V-Series styles.
Consult factory for partnumber details.

SYMBOL LEGEND	
SYM.	DEFINITION
○	DESIGNATES TERMINALS AND CONTACTS
◯	DESIGNATES LAMP LOCATION

Reduce inventory levels and cost by stocking actuators and base switches separately.

Contura II, III, IV, V, VI, VII, X, XI, XII, XIV Base switches separately: specify **V** with code selections 2-8 in the ordering schemes.
Contura II, III, IV, V Actuator only: **VV** with code **A** or **C** for selection 9, & with selections 10-14 in the ordering schemes.
Contura VI Actuator with lenses and inserts only: **VV** with code selections 9-16
Contura II, III, IV, V, VII Actuator only: **VV** with code **A**, **C**, **E**, **G, P** or **Z** for selection 9 & with selections 10-14 in the ordering schemes.
Contura X, XI, XII, XIV actuators with lenses separately: **VV** with code selections 9-14 in the ordering schemes.
Panel Seal: VPS

Contura X & XI actuators without lenses separately:

VVR	6	1	00	1
1 Actuator Separately	*2 Actuator Style/Color*	*3 Lens Opening*	*4 Actuator Legend*	*5 Legend Orientation*

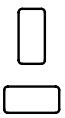
1 CONTURA X & XI ACTUATOR SEPARATELY
VVR

2 ACTUATOR STYLE & COLOR

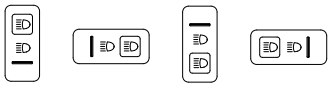
	Black	Gray	White	Red
Contura X	**1**	**2**	**3**	**4**
Contura XI	**6**	**7**	**8**	**9**

3 LENS OPENING FOR [1]
1 One bar lens
2 One bar lenses
3 One square lens
4 two square lens
5 square lens on top/ bar lens on bottom (Contura X only)

4 ACTUATOR LENS OR BODY LEGEND
00 - No Legend this location
11 ON / OFF **12** OFF / ON **13** I / O **14** O / I
15 O O / F N / F **16** O O / N F / F **17** O I **18** I O
For additional legend options & codes, visit us at www.carlingtech.com.



5 LEGEND ORIENTATION [1]
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



Contura X, XI & XII top piece of 2-piece lens separately:

VVT	1
1 Lens Separately	*2 Color*

1 TOP OF LENS SEPARATELY
VVT

2 COLOR
1 Clear **2** Smoke **3** White

Contura X, XI & XII actuator lens assembly:

1 piece lens/bar lens are positioned the same as bottom lens for assembly, minus the top lens. Lenses snap in from bottom.

Notes:
1 If actuator lens opening for 2 bar or 2 square lenses, legend orientation 0,1, or 2 must be chosen.
2 Center of actuator marking not available for Contura XII.
3 Legend is not available for bar style lens.
4 Not recommended with neon lamps.
5 Must also order top piece of 2 piece square lens separately.

Contura XII actuators without lenses separately:

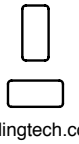
VVP	J	1	Z	21	1	00
1 Actuator	*2 Style & Color*	*3 Lens Opening*	*4 Lens Opening*	*5 Legend*	*6 Legend Orientation*	*7 Legend*

1 CONTURA XII ACTUATOR SEPARATELY
VVP

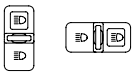
2 ACTUATOR STYLE & COLOR
J Black **K** Gray **N** White **M** Red

3,4 LENS OPENING FOR
Z No lens **1** Bar lens **2** Square lens

5, 7 LENS OR BODY LEGEND [2]
00 - No Legend **21** OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I
For additional legend options & codes, visit us at www.carlingtech.com.



6 LEGEND ORIENTATION [3]
0 No legend
1 Orientation 1
2 Orientation 2



Contura X, XI & XII actuator lens assembly separately:

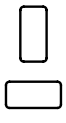
VVL	2	1	00	0
1 Lens Separately	*2 Lens Style*	*3 Lens Color*	*4 Legend*	*5 Legend Orientation*

1 CONTURA X, XI & XII LENS SEPARATELY
VVL

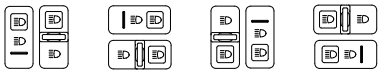
2 LENS STYLE [3]
1 Bar lens
2 One Piece Square lens
3 Bottom of Two-Piece Square lens [5]

3 TRANSLUCENT LENS COLOR
1 Clear **2** White **3** Amber **4** Green [4] **5** Red **6** Blue [4]

4 LENS OR BODY LEGEND [2]
00 - No Legend **21** OFF **22** ON **23** O **24** I
25 O F F **26** O N **27** O **28** I
For additional legend options & codes, visit us at www.carlingtech.com.



5 LEGEND ORIENTATION [3]
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



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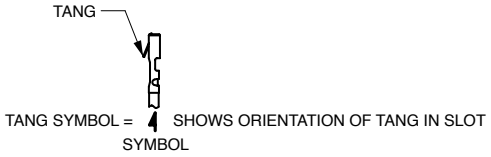
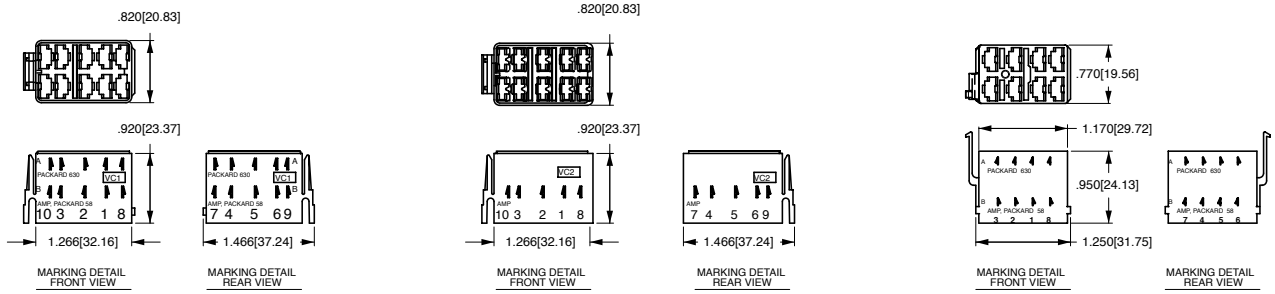
Easily integrate Contura products into your system, with Contura Accessories

Contura Connectors

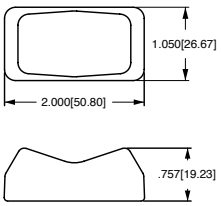
Q.C. SELECTION GUIDE					
COMPANY SERIES	PART NO		WIRE RANGE		ORIEN-TATION
	PLAIN BRASS	TIN PLATED BRASS	AWG	MM 2 (REF)	
PACKARD 58 SERIES	02965580		12	3.0	B
	02965471	12010601	(2)16-14	(2)1.0-2.0	
	02965470		16-14	1.0-2.0	
	02965469	06288318	20-18	.5-.8	
PACKARD METRI-PACK 630 SERIES		12084590	10	5.0	A
		12052224	12	3.0	
		12015870	16-14	1.0-2.0	
		12020035	(2)22-18	(2).5-.8	
	12015832	12015869	20-18	.5-.8	
		12052222	20-22	.35-.5	
AMP 250 SERIES FASTIN-FASTON	60253-1	60253-2	16-12	1.3-3	B
			(2) 16	(2) 1.3	
	42100-1	42100-2	18-14	.8-2	
	60295-1	60295-2	22-18	.3-.9	



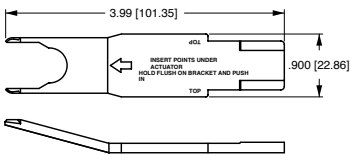
NOTE: Consult Delphi Packard and/or Amp on actual part numbers and availability.
AMP is a registered trademark of AMP Inc. Harrisburg, PA
Delphi Packard is a registered trademark of Delphi-Packard Electrical Systems Warren, Ohio



Contura X Boot (P/N VB1-01)



Contura II, III, IV, V, VI & VII Actuator Removal Tool (P/N VRT)

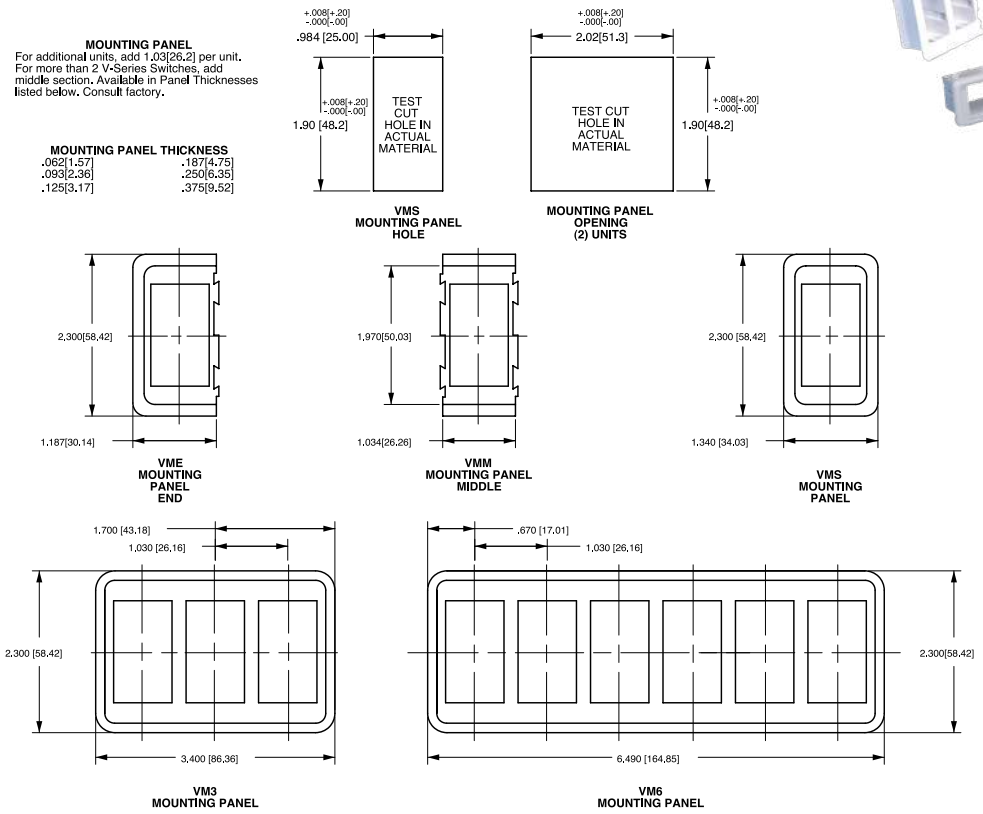


Additional V-Series Ratings

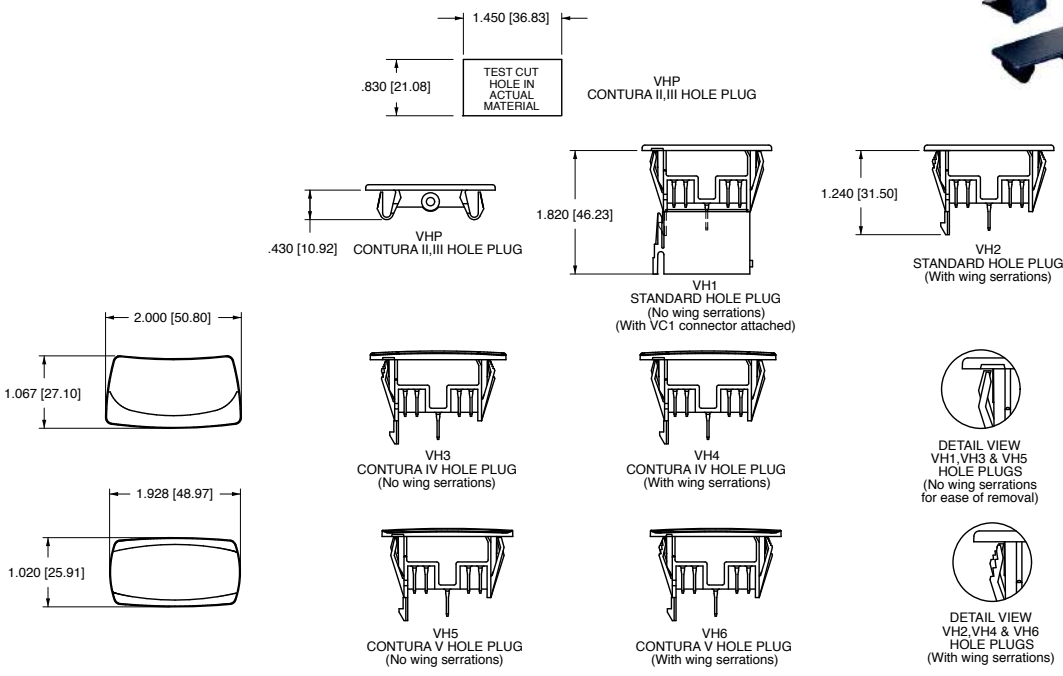
1	.4VA @ 28VDC Resistive
4	10A 250VAC 1/2 HP, 15A 125 VAC 1/2 HP, No Agency Listings
5 [1]	10A 250VAC 1/2 HP, 15A 125 VAC 1/2 HP, UL Recognized, CSA Certified
B	15A 24V
C	20A 18V
D	20A 12V
E	20A 14V, 10A 14VT (circuits 1, 4, A, & D only)
F	10A 14V, 6A, 14VT (circuit G only)
G	20A 6V
H	20A 3V
L [2]	15A 125 VAC, 10A 250VAC, 1/2 HP 125-250 VAC; 6A 125 VAC L
M	.4VA/20A 12V (combi-contact) (combination gold/silver contacts for borderline dry circuit applications)
N	.4VA/15A 24V (combi-contact) (combination gold/silver contacts for borderline dry circuit applications)

NOTES
Consult factory to determine availability for individual circuits and their HP rating.
1. Not available with Contura 7 or 14 rocker styles.
2. Rating L available with circuits 1, 4, A & D only.

Contura Mounting Panels
Dimensional Specifications: in. [mm]



Contura Hole Plug
Dimensional Specifications: in. [mm]



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VP-Series

CONTURA ILLUMINATED INDICATORS

The Illuminated Indicator is offered with removable/replaceable lamps, Contura styling, and LED illumination. As a critical safety feature, it's illumination alerts the operator of essential system functions or malfunctions like: oil pressure, high temperature, transmission or other fluid levels, parking brake, or general system malfunction. Three different style housings (flush, raised panel, oval) assure seamless integration with Contura switches and into most any dashboard panel.

Product Highlights:

- 3 Styles to choose from
- Single or double window Illumination
- 25 lens colors and configurations
- Available connector for easily installation

Typical Applications:

- Transportation

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Flush Housing:

VP	1	6	6	-	B	1	1	6	6	-	00	0	00
1 Series	*2 Termination*	*3 Lamp*	*4 Lamp*		*5 Housing Color*	*6 Lens Style*	*7 Lens Style*	*8 Lens Color*	*9 Lens Color*		*10 Lens Legend*	*11 Legend Orientation*	*12 Lens Legend*

1 SERIES
VP Illuminated plug for V and J Mounting Hole
H2 Housing only
H3 Lamp module only

2 TERMINATION
1 .250 TAB (QC)

3, 4 LAMP [4]

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Amber	Green	Red		
2VDC	**L**	**F**	**R**		
6VDC	**M**	**G**	**S**		
12VDC	**N**	**H**	**T**		
24VDC	**P**	**J**	**V**		

*Typical current draw for LED is 20ma.

5 FLUSH HOUSING COLOR / STYLE
B Black / Rectangular
W White / Rectangular
R Red / Rectangular
G Gray / Rectangular
1 Black / Oval (Contura V)

6, 7 LENS STYLE [5]
Z No Lens
1 Transparent Diamond Square
2 Translucent Square [9]
3 Laser Etched [10]
4 Transparent Oval
5 Translucent Oval
6 Laser Etched Oval [10]

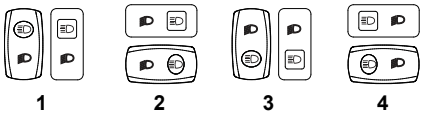
8, 9 LENS COLOR [6, 11]
Z No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
4	**9**	**E**	**K**	**R**	**W**	One piece lens
5	**A**	**F**	**L**	**S**	**Y**	Two piece lens* (with ***clear top*** *protective lens)*
2	**7**	**C**	**H**	**N**	**U**	Two piece lens* (with **smoke top** protective lens)
1	**6**	**B**	**G**	**M**	**T**	Two piece lens* (with **white top** protective lens)

*All bottom lenses are molded of opaque material. Consult factory for other lens colors.

10 LENS LEGEND OVER LAMP 1 [7]
00 No legend
For legend options, visit us at carlingtech.com

11 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



12 LENS LEGEND OVER LAMP 2 [7]
00 No legend
For legend options, visit us at carlingtech.com

Notes:
1 To order housing only, specify H2 followed by fields 5-11.
2 To order lamp module only, specify H3 followed by fields 2-3.
3 To order connector housing specify HP1-01 (black).
4 Field 3 specifies lamp 1 is located over terminals 1A & 1B.
Field 4 specifies lamp 2 is located over terminals 2A & 2B.
5 Field 6 specifies lens 1 is located over terminals 1A & 1B.
Field 7 specifies lens 2 is located over terminals 2A & 2B.
6 Field 8 specifies lens 1 is located over terminals 1A & 1B.
Field 9 specifies lens 2 is located over terminals 2A & 2B.
7 Field 10 specifies legend is over lens 1.
Field 12 specifies legend is over lens 2.
8 If only one lens is chosen, it will be located over terminals 1A & 1B.
9 Translucent lens is available with two piece lens option only.
10 Laser etched option is available with one piece lens.
11 Oval lens option is available as one piece lens.

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

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Raised Bracket:

VP	1	6	6	–	6	1	1	6	6	–	00	0	00
1 Series	*2 Termination*	*3 Lamp*	*4 Lamp*		*5 Bracket Color*	*6 Lens Style*	*7 Lens Style*	*8 Lens Color*	*9 Lens Color*		*10 Lens Legend*	*11 Legend Orientation*	*12 Lens Legend*

1 SERIES
VP Illuminated plug for V and J Mounting Hole

2 TERMINATION
1 .250 TAB (QC)
2 Solder Lug

3, 4 LAMP [1]

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Amber	Green	Red		
2VDC	**L**	**F**	**R**		
6VDC	**M**	**G**	**S**		
12VDC	**N**	**H**	**T**		
24VDC	**P**	**J**	**V**		

*Typical current draw for LED is 20ma.

5 RAISED BRACKET / INSERT COLOR
5 White / White
6 Black / Black
7 White / Black
8 Black / White

6, 7 LENS STYLE [2]
Z No Lens
1 Transparent Diamond Square
2 Translucent Square [6]
3 Laser Etched [7]

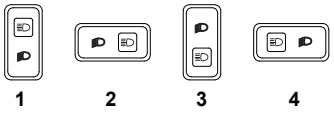
8, 9 LENS COLOR [3]
Z No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
4	**9**	**E**	**K**	**R**	**W**	One piece lens
5	**A**	**F**	**L**	**S**	**Y**	Two piece lens* (with ***clear top*** *protective lens)*
2	**7**	**C**	**H**	**N**	**U**	Two piece lens* (with **smoke top** protective lens)
1	**6**	**B**	**G**	**M**	**T**	Two piece lens* (with **white top** protective lens)

*All bottom lenses are molded of opaque material. Consult factory for other lens colors.

10 LENS LEGEND OVER LAMP 1 [4]
00 No legend
For legend options, visit us at carlingtech.com

11 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



12 LENS LEGEND OVER LAMP 2 [4]
00 No legend
For legend options, visit us at carlingtech.com

Notes:
1 Field 3 specifies lamp 1 is located over terminals 8 (+) & 7 (–).
Field 4 specifies lamp 2 is located over terminals 10 (+) & 9 (–).
2 Field 6 specifies lens 1 is located over terminals 8 (+) & 7 (–).
Field 7 specifies lens 2 is located over terminals 10 (+) & 9 (–).
3 Field 8 specifies lens 1 is located over terminals 8 (+) & 7 (–).
Field 9 specifies lens 2 is located over terminals 10 (+) & 9 (–).
4 Field 10 specifies legend is over lens 1.
Field 12 specifies legend is over lens 2.
5 If only one lens is chosen, it will be located over terminals 8 (+) & 7 (–).
6 Translucent lens is available with two piece lens option only.
7 Laser etched option is available with one piece lens.

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

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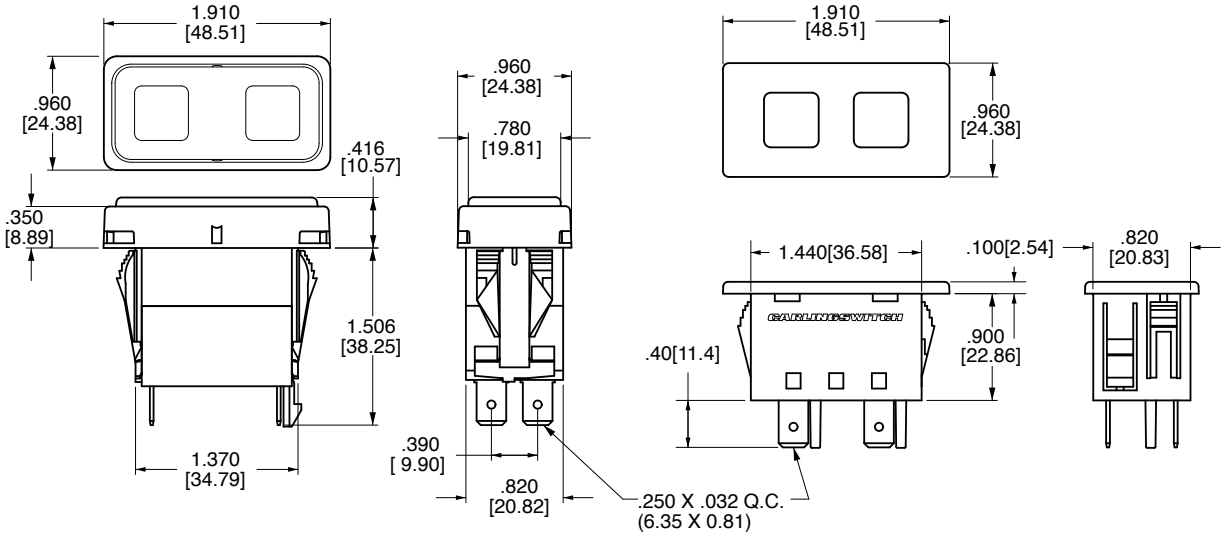
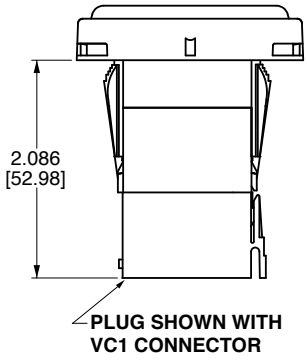
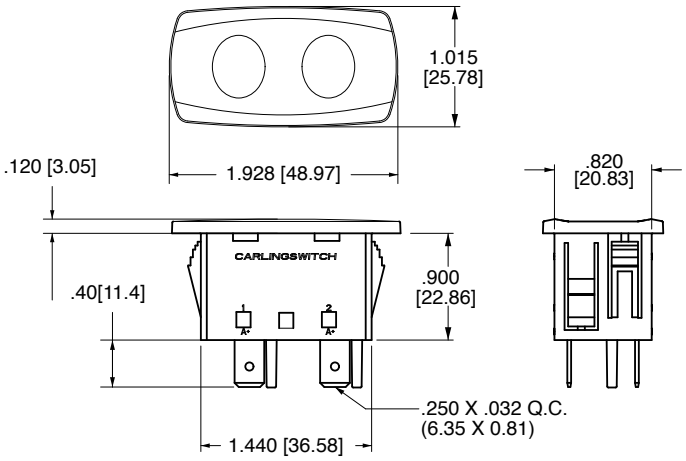
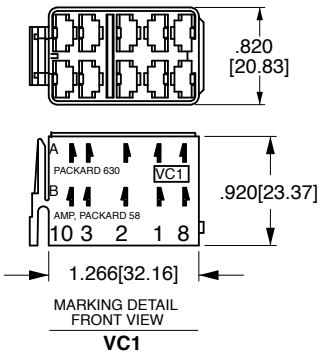
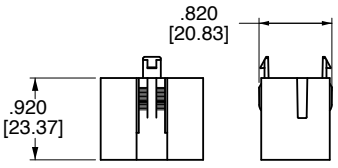
Dimensional Specifications: in. [mm]

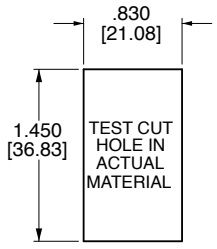


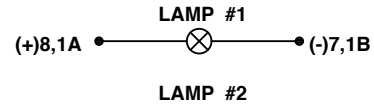












(OVAL, FLUSH AND RAISED BEZELS)
MOUNTING PANEL THICKNESSES:

.062[1.57]	.250[6.35]
.093[2.36]	.375[9.52]
.125[3.17]	.500[12.70]
.187[4.75]	

Notes:
Oval and flush bezel styles use terminals 1A, 1B, 2A, 2B. Raised bezel style uses terminals 7, 8, 9, 10.

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W-Series

SEALED ROCKER SWITCHES

Carling Technologies set the standard for performance and aesthetics with the widely successful, often imitated, but never duplicated, V-Series rocker switches. Building further upon that platform, Carling has once again raised the bar with the fully sealed W-Series. The W-Series' traditional appearance features complete IP68 protection, including below the panel, where the critical connection is made from the wiring harness. When used in conjunction with the integrated connector, the totally submersible W-Series provides a seal for up to ten individual wires, assuring compatibility with even the most complex circuitry.

The W-Series also offers a wide variety of accoutrements, including endless illumination options featuring dual level and multicolor LEDs, progressive and hazard warning circuits, ratings up to 10A 24V, choice of paddle, rocker, locking or laser etched actuators, hundreds of standard legend choices and the electrical performance and reliability that is the hallmark of Carling Technologies products.

Product Highlights:

- Fully sealed and submersible
- IP68 protection, including below the panel
- Tri-seal design
- Connector with twin locking tabs

Typical Applications:

- Marine equipment
- ON/OFF Highway equipment

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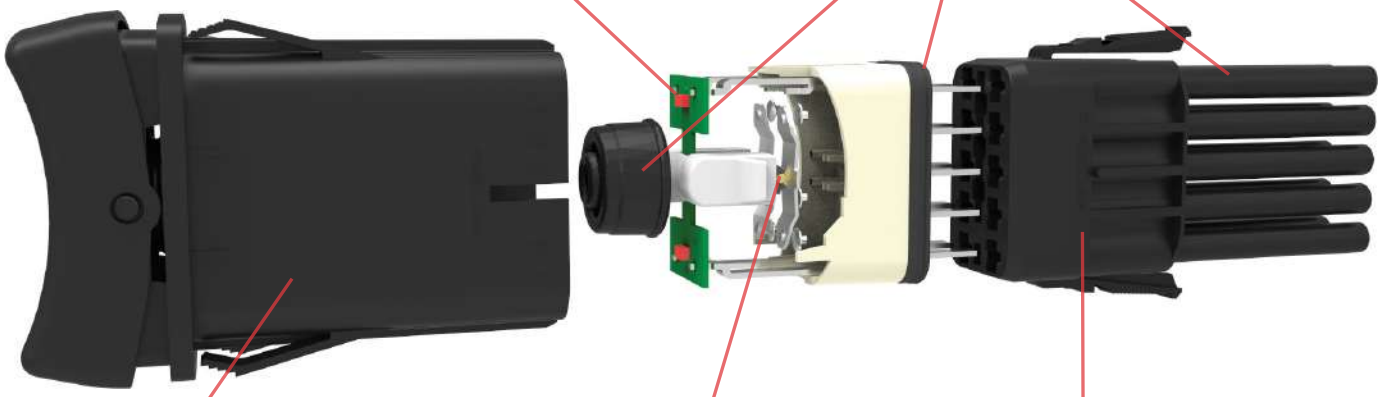
W-Series Switch
DESIGN FEATURES

ILLUMINATION
Choice of highly reliable SMT LED or incandescent lighting with 21 dependent or independent circuit options.

TRI-SEAL DESIGN
Sealing at actuator, an insert molded neoprene base seal, along with wire lead seals, assures water tight, fully submersible protection.



BODY
One piece polyester 94V0 seamless body acts as an umbrella to protect critical internal components.

ROLLER PIN
Proven reliable mechanism is lubricant free and allows for 100k electrical and 250k mechanical cycles, and withstands extreme temperatures from -40˚C to +85˚C.

INTEGRATED CONNECTOR
Accommodates Tyco/Amp .110 junior power timer contacts with twin locking tabs to provide a safe, secure, sealed connection.

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Electrical

Contact Rating	.4VA @ 24VDC 10 amps, 3-24VDC
Dielectric Strength	1500 Volts RMS
Insulation Resistance	50 Megaohms
Initial Contact Resistance	10 milliohms max. @ 4 VDC
Life	100,000 cycles
Contacts	Silver tin-oxide, 88/12
Terminals	Copper with silver or gold plating
Quick	Connect terminations.
Voltage	3-24 VDC
Overcurrent	15A for 50 cycles

Mechanical

Endurance	250,000 cycles minimum

Physical

Lighted	LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24 VDC)
Seals	Neoprene
Base	Polyester blend rated to 125C with a UL flammability rating of 94V0.
Actuator	Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay.
Lens	Polycarbonate rated at 100°C
Function	2 & 3 Position Rocker Style
Operation	Maintained & Momentary
Base	PA 6/6 30GF (glass filled)
Actuator	PA 6/6 13GF
Bracket	PBT 10GF
Connector	PBT 10GF, polarized

Actuator Travel (Angular Displacement)

24° full throw

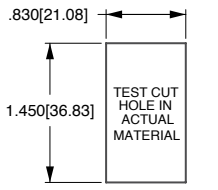
Environmental

Environmental	IP68, Fully sealed
Corrosion/ Chemical Splash	Flowing Mixed Gas (FMG) Class III 3 year accelerated exposure per ASTM B-827, B-845
Operating Temperature	-40°C to +85°C, 22 cycles, 300 hours
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 ±10 G's peak Results Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025
Handling/Drop	One meter onto concrete floor
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs.
Dust	IP6X
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C Test criteria - pre and post test contact resistance
Moisture Resistance/ Humidity	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance

Mounting Specifications

Panel Thickness Range .032 to .125

For optimum panel fit, the following panel thicknesses are suggested: .032, .062, .093, .125



SWITCH MOUNTING HOLE

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

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W	11	D	2	B	C	0	1	-	A	7	Z	00	-	0	00
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lens	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
W

2 CIRCUIT ( ) - momentary
For terminal arrangement, see dimensional specifications

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
11	**21**	ON	NONE	OFF
12	**22**	(ON)	NONE	OFF
13	**23**	ON	NONE	(OFF)
14	**24**	ON	NONE	ON
15	**25**	ON	NONE	(ON)
16	**26**	ON	OFF	ON
17	**27**	ON	OFF	(ON)
18	**28**	(ON)	OFF	(ON)
-	**42**	2 & 3, 5 & 6	NONE	1 & 8
-	**43**	2 & 3	2 & 3, 4 & 5	4 & 5
-	**44**	2 & 3, 5 & 6	2 & 3	OFF
-	**45**	(2 & 3), (5 & 6)	2 & 3	OFF
-	**46**	(2 & 3), (5 & 6)	2 & 3	2 & 1
-	**47**	2 & 3 & 4, 5 & 6	2 & 3, 4 & 5	2 & 1, 4 & 5
-	**48**	2 & 3, 5 & 6	2 & 3	2 & 1
-	**49**	2 & 3, 5 & 6	2 & 3, 4 & 5	2 & 1, 4 & 5
51	**-**	3 & 10	2 & 3	OFF
52	**-**	3 & 10	2 & 3	2 & 1
53	**-**	(3 & 10)	2 & 3	OFF
54	**-**	3 & 10	2 & 3	(OFF)
55	**-**	(3 & 10)	2 & 3	2 & 1
56	**-**	(3 & 10)	2 & 3	(OFF)
57	**-**	(3 & 10)	2 & 3	(2 & 1)
58	**-**	OFF	2 & 3	2 & 1
-	**61**	3 & 10, 6 & 9	2 & 3, 5 & 6	OFF, OFF
-	**62**	3 & 10, 6 & 9	2 & 3, 4 & 5	2 & 1, 5 & 4
-	**63**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	OFF, OFF
-	**64**	3 & 10, 6 & 9	2 & 3, 4 & 5	(OFF, OFF)
-	**65**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	2 & 1, 5 & 4
-	**66**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	(OFF, OFF)
-	**67**	(3 & 10, 6 & 9)	2 & 3, 4 & 5	(2 & 1, 5 & 4)
-	**68**	OFF, OFF	2 & 3, 4 & 5	2 & 1, 5 & 4

3 RATING [3]
B 10A 24V **D** 10A 12V **G** 10A 6V **H** 10A 3V

4 TERMINATION / BASE STYLE
2 .110 TAB (QC)

5 ILLUMINATION
Lamp #1:above terminals 1&4 end of switch.; Lamp #2 above terminals 3&6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Actuator Lens Position Illumination Type	Lamp Wired to Terminals	
O	NONE			
A	# 1	Independent	8+	7-
B	# 1	Down	3+	7-
C	# 2	Up	3+	7-
D	# 1	Down	3+	7-
	& # 2	Down	1+	7-
E	# 1	Up	1+	7-
	& # 2	Up	3+	7-
F	# 1	Independent	8+	7-
	& # 2	Up	3+	6-
G	# 1	Independent	8+	7-
	& # 2	Up	3+	7-
H	# 2	Independent	8+	7-
Selections for Single Pole Switches Only:				
J	# 1	Down	3+	8-
	& # 2	Independent	6+	7-
K	# 1	Independent	8+	7-
	& # 2	Independent	6+	7-
Selections for Double Pole Switches Only:				
L	# 1	Down	3+	6-
M	# 2	Up	3+	6-
N	# 1	Down	3+	6-
	& # 2	Down	1+	4-
P	# 1	Up	1+	4-
	& # 2	Up	3+	6-
R	# 1	Down	3+	7-
	& # 2	Up	6+	7-
S	# 1	Down	6+	7-
	& # 2	Independent	8+	7-
U	# 1	Independent	8+	7-
	& # 2	Independent	10+	9-
V	# 2	Independent	10+	9-
W	# 1	Independent	8+	7-
	& # 2	Independent	10+	7-
Y	# 1 & # 2	Independent in Series	8+	7-
Z	# 1 & # 2	Independent in Parallel	8+	7-

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

No lamp	0			
LED*	Red	Amber	Green	White
2VDC	**A**	**L**	**F**	**4**
6VDC	**B**	**M**	**G**	**5**
12VDC	**C**	**N**	**H**	**6**
24VDC	**D**	**P**	**J**	**8**

* Consult factory for “daylight bright”, blue/green and white LED options.
Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]
1 Black

9 ACTUATOR [1]
3 Black with Laser Etched
A Black

10 LENS COLOR / STYLE - ABOVE LAMP #1 TERMINALS 1 AND 4
11 LENS COLOR / STYLE - ABOVE LAMP #2 TERMINALS 3 AND 6
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent
5	**A**	**-**	**-**	**-**	**-**	Laser-Etched

Lens color for LEDs must be clear, white, or match color of LED.

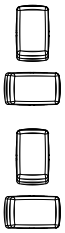
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location/No actuator

11 ON OFF **12** OFF ON **13** I O **14** O I

15 O O F N F **16** O O N F F **17** O I **18** I O

21 OFF **22** ON **23** O **24** I

25 O F F **26** O N **27** O **28** I



For additional legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

14 ACTUATOR LENS LEGEND [2]
00 No legend this location/no actuator (used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens & one body legend, lens legend must be specified in selection 12; body legend specified in selection 14. For legend options & codes, visit us at carlingtech.com

Notes:
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.
3 .4VA @ 24VDC rating is available, consult factory for circuit compatibility.

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W	11	D	2	0	W	0	J	–	P	7	B	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lock Function	12 Legend		13 Legend Orientation

1 SERIES
W

2 CIRCUIT ( ) - momentary
For terminal arrangement, see dimensional specifications

Position:		1	2	3
SP	DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
11	**21**	ON	NONE	OFF
14	**24**	ON	NONE	ON

3 RATING
B 10A 24V
D 10A 12V
G 10A 6V
H 10A 3V

4 TERMINATION / BASE STYLE
2 .110 TAB (QC)

5 ILLUMINATION
Lamp #1:above terminals 1&4 end of switch.; Lamp #2 above terminals 3&6 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only

	Lamps	Actuator Lens Position Illumination Type	Lamp Wired to Terminals	
O	NONE			
C	# 2	Up	3+	7-
H	# 2	Independent	8+	7-

6 LOCK
W Lock Option

7 LAMP #2

No lamp	0			
LED*	Red	Amber	Green	White
2VDC	**A**	**L**	**F**	**4**
6VDC	**B**	**M**	**G**	**5**
12VDC	**C**	**N**	**H**	**6**
24VDC	**D**	**P**	**J**	**8**

* Consult factory for “daylight bright”, blue/green and white LED options. Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]
J Black

9 ACTUATOR [1]
P Black
R Red

10 LENS
Z - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent

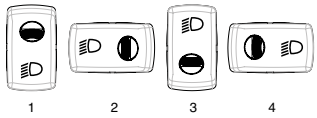
Lens color for LEDs must be clear, white, or match color of LED.

11 LOCK FUNCTION

Up	Down	Lock Color
B	**J**	Black
C	**K**	White
D	**L**	Red
E	**M**	Safety Orange

12 LASER ETCHED, LENS OR BODY LEGEND [1]
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



Notes:
1 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.

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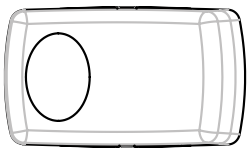
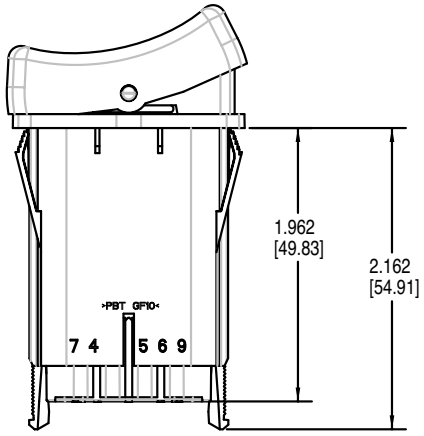
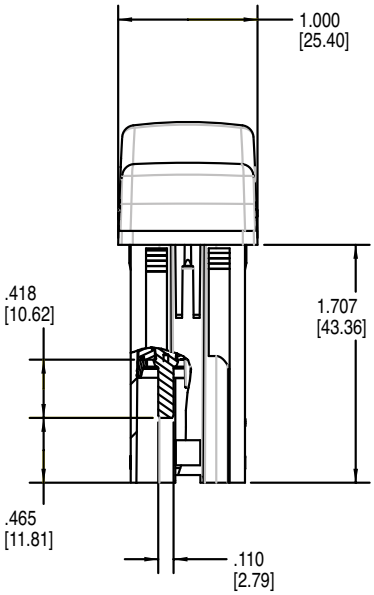
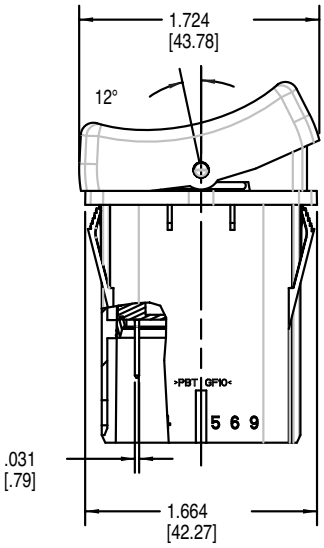
Dimensional Specifications: in. [mm]



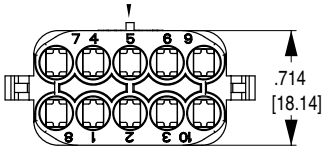


SWITCH SHOWN WITH
CONNECTOR INSTALLED

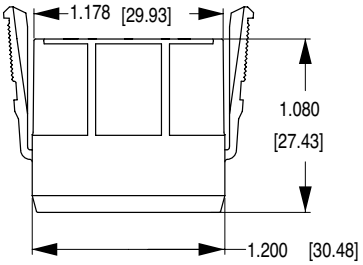




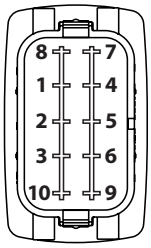
KEYING FEATURE



WCH CONNECTOR
(190-31214-001)



TERMINAL ARRANGMENT



Notes:
WCH connector is intended for use with Tyco/Amp .110 Junior Power Timer, female contacts, and wire seals.
For 14-16 awg wire, specify Tyco/Amp P/N 927766-3
For 16-20 awg wire, specify Tyco/Amp P/N 927770-3
Tyco/Amp cable seal P/N 828904-1 (20-18 awg wire) or P/N 828905-1 (16-14 awg wire) is required for each individual wire lead, and Tyco/Amp cable plug, P/N 828922-1, is required to seal each unused connector opening. Consult Tyco/Amp for the cable seal recommended for your specific wire gauge and thickness.

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Circuit Diagrams:

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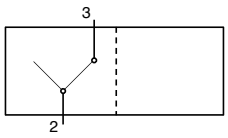
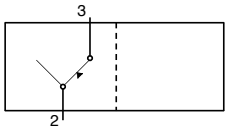
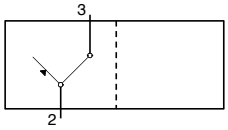
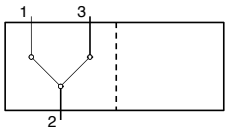
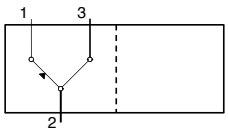
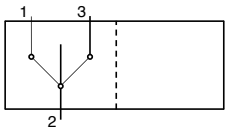
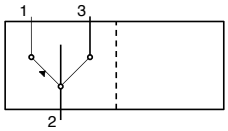
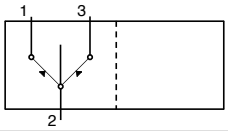
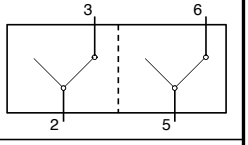
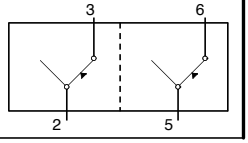
11	
12	
13	
14	
15	
16	
17	
18	
21	
22	

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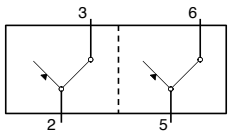
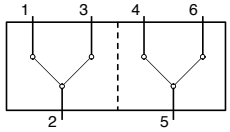
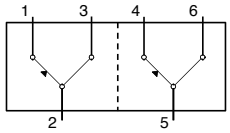
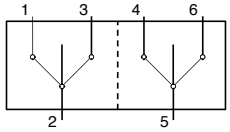
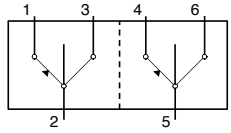
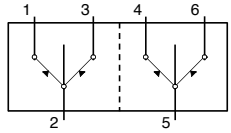
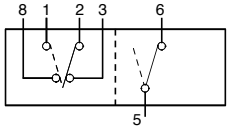
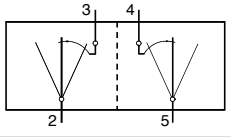
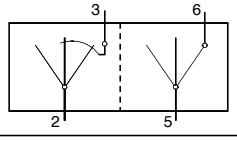
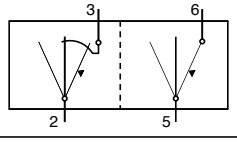
23	
24	
25	
26	
27	
28	
42	
43	
44	
45	

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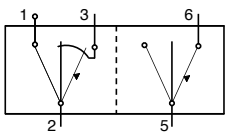
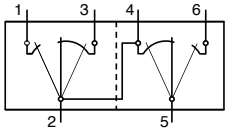
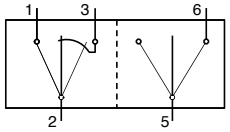
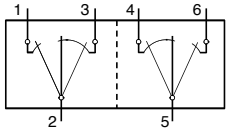
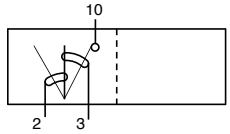
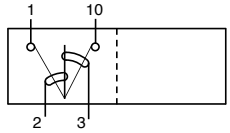
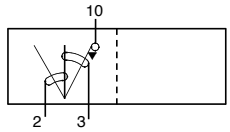
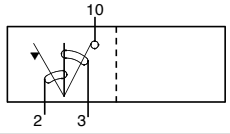
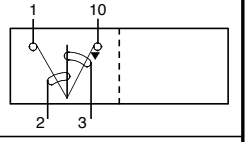
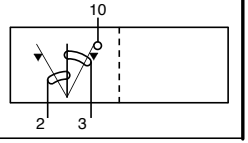
46	
47	
48	
49	
51	
52	
53	
54	
55	
56	

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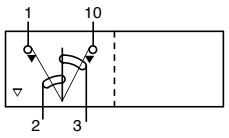
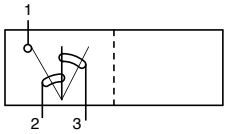
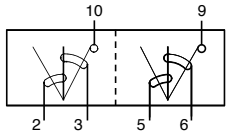
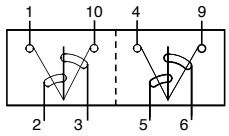
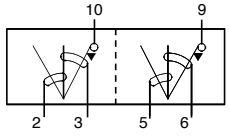
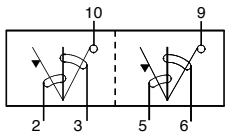
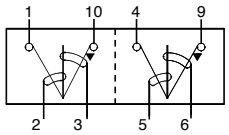
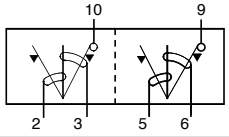
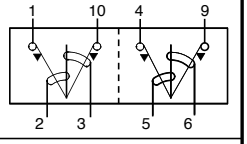
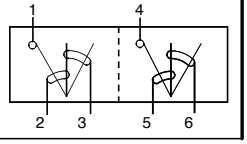
57	
58	
61	
62	
63	
64	
65	
66	
67	
68	

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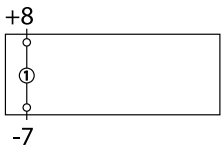
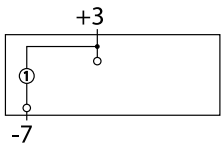
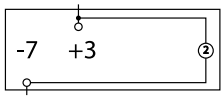
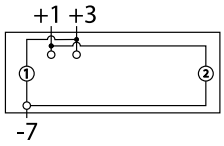
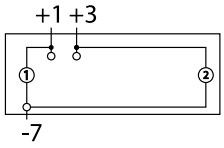
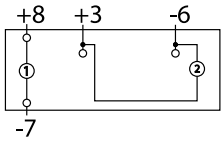
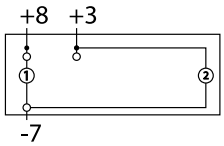
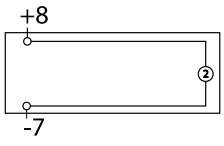
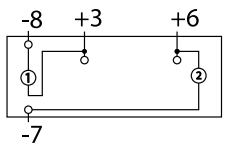
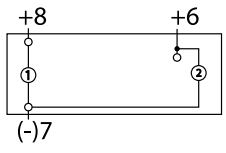
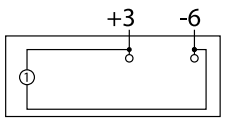
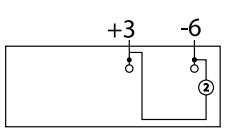
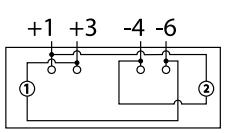
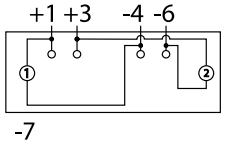
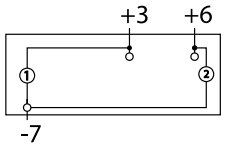
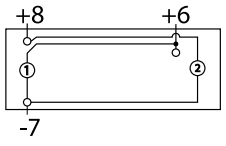
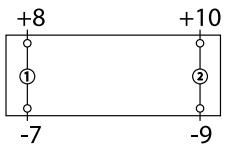
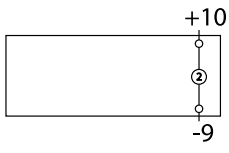
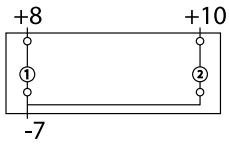
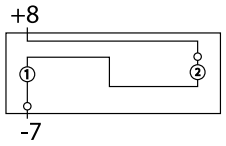
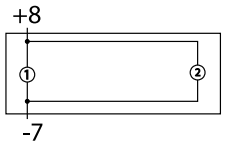
Lamp Circuit Diagrams:

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
J	
K	
L	
M	
N	
P	
R	
S	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
U	
V	
W	
Y	
Z	

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L-Series

SEALED ROCKER SWITCHES

The L-Series rocker switch is an innovative product offering total design flexibility, while at the same time setting new standards for performance and reliability. Its versatile design features include a neatly proportioned size that fits into an industry standard mounting hole of 1.734 x .867 (44.0mm x 22.0mm), countless unique choices for ratings, circuits, colors, illuminations and laser etched legends. These single or double pole switches also feature a broad choice of actuator styles, colors, and lenses with up to twelve terminals offering an extensive range of switch and lamp circuit options, including LED or incandescent illumination. Additionally, an optional plug-in terminal connector enables pre-wiring of wire harness.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

- IP67 certified sealed front panel components
- Withstands temperatures from -40°C to +85°C
- Vibration, shock, thermoshock, moisture and salt spray resistant

Typical Applications:

- Construction machinery
- Agricultural equipment
- On-highway transportation equipment

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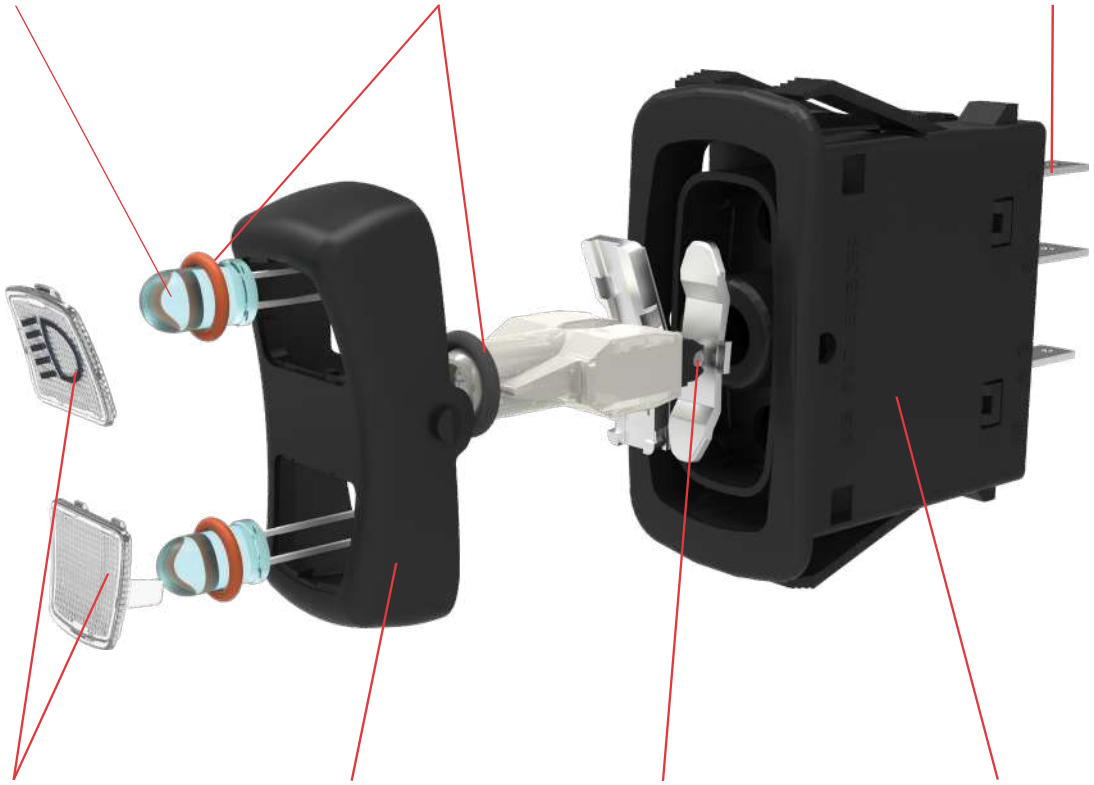
L-Series Switch
DESIGN FEATURES

LED LIGHTING
Utilize less current and are not affected by vibration, providing long lasting illumination. Available in 3 standard colors.

SEAL PROTECTION
Locks out elements such as water, dust & debris. Certified to IP67 for front panel components.

TERMINALS
Available with 2 industry standard termination options: .250 or .187 tabs with up to 12 terminal options.



LENS & LEGENDS
Lens available in 2 sizes and 6 standard colors in either translucent or transparent materials. Numerous symbols and text available for imprinting or laser etching.

ACTUATOR
Available in rocker or paddle styles. Several standard color options also available.

ROLLER PIN
Eliminates need for lubricants, increasing the temperature range of the switch from -40˚ C to +85˚C [-40˚ F to 185˚ F].

BASE
Fits into industry standard mounting hole of 1.734 x .867 in [44.0mm x 22.0mm].

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Electrical

Contact Rating	.4VA @ 24VDC (MAX) resistive 15 amps, 125VAC 10 amps, 250VAC 20 amps, 4-14VDC 15 amps, 15-28VDC
Dielectric Strength	1250 Volts RMS between pole to pole 3750 Volts RMS between live parts and accessible surfaces
Insulation Resistance	50 Megaohms
Initial Contact Resistance	10 milliohms max. @ 4 VDC
Life	100,000 cycles maintained, 50,000 cycles momentary at rated voltage and current
Contacts	90/10 silver-nickel, silver tin-oxide, gold
Terminals	Brass or copper/silver plate 3/16" (4.76mm) & 1/4" (6.3mm) Quick Connect terminations standard.

Mechanical

Endurance	250,000 cycles minimum

Physical

Lighted	Incandescent - rated 10,000 hours LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24 VDC)
Seals	Rocker, base & bracket are sealed.
Base	Nylon 66 GF rated to 85°C with a flammability rating of 94V0.
Actuator	Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay.
Lock	Acetal
Lens	Polycarbonate rated at 100°C
Function	2 & 3 Position Rocker Style
Bracket	Nylon Zytel
Connector	Nylon 66 rated at 85°C. Polarized.

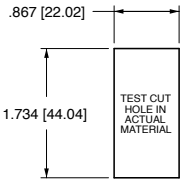
Actuator Travel (Angular Displacement)

2 position	26°
3 positions	13° from center

Environmental

Environmental	IP67 for above panel components of the actual switch, representing an index of protection as applied to electrical equipment in accordance with IEC 529, BS 5490, DIN 400 50 & NFC 20 010.
Corrosion	Mixed Flowing Gas MFG Class III per ASTM B-827 & B-845, Method H, with 3 years exposure.
Operating Temperature	-40°C to + 85°C
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with VCH connector. Test criteria - No loss of circuit during test and pre and post test contact resistance.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 ±10 G's peak Results Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025 No loss of circuit during test; <10µ chatter.
Shock	Per Mil-Std 202F, Method 213B, Test Condition K @ 30G's. Tested with VCH connector. Test criteria - No loss of circuit during test, pre, and post test contact resistance.
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs.
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C. Test criteria - pre and post test contact resistance.
Moisture Resistance	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance.

Mounting Specifications



MOUNTING HOLE

Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156

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

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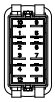
L	11	E	3	C	H	N	1	-	3	A	A	45	-	1	48
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp	7 Lamp	8 Bracket		9 Actuator	10 Lens Style & Color	11 Lens Style & Color	12 Legend		13 Legend Orientation	14 Actuator Lens Legend

1 SERIES
L

2 CIRCUIT [2]
Terminal Orientation



( ) - momentary
SP - single pole - uses terminals 1, 2 & 4.
DP - double pole uses terminals 5, 6 & 8.
Terminals 9, 10 & 11 for lamp circuit only.

Position: SP	DP	1	2	3
		2 & 4, 6 & 8	Connected Terminals	1 & 2, 5 & 6
11	**21**	ON	NONE	OFF
12	**22**	(ON)	NONE	OFF
13	**23**	ON	NONE	(OFF)
14	**24**	ON	NONE	ON
15	**25**	ON	NONE	(ON)
16	**26**	ON	OFF	ON
17	**27**	ON	OFF	(ON)
18	**28**	(ON)	OFF	(ON)
CIRCUITS WITH JUMPER TERMINALS				
30*		(2,4&5), (1,6&8)	OFF, OFF	(1,2&8), (4,5&6)
31		1, 2 & 5	2, 3 & 7	2, 4 & 8
PROGRESSIVE CIRCUITS				
51		3 & 4	2, 3	1 & 2
52		3 & 4	2, 3	OFF
53		(3 & 4)	2, 3	1 & 2
54		(3 & 4)	2, 3	(OFF)
55		(3 & 4)	2, 3	(1 & 2)
56		(3 & 4)	2, 3	(OFF)
57		3 & 4	2, 3	(OFF)
58*		2 & 4	2, 3	1 & 2
61		3 & 4, 7 & 8	2 & 3, 6 & 7	1 & 2, 5 & 6
62		3 & 4, 7 & 8	2 & 3, 6 & 7	OFF, OFF
63		(3 & 4), (7 & 8)	2 & 3, 6 & 7	1 & 2, 5 & 6
64		(3 & 4), (7 & 8)	2 & 3, 6 & 7	OFF, OFF
65		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(1 & 2), (5 & 6)
66		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(OFF, OFF)
67		3 & 4, 7 & 8	2 & 3, 6 & 7	(OFF, OFF)
68		2 & 4, 7 & 8	2 & 4, OFF	OFF, OFF
69*		2 & 4, 1, 7 & 8	2 & 4, OFF	OFF, OFF
70		(2 & 4), (7 & 8)	2 & 4, 5 & 7	(1 & 2), (5 & 7)
71		(2&4), (7 & 8)	2 & 4, 5 & 7	1 & 2, 5 & 7
72		2 & 4, 7 & 8	2 & 4, 5 & 7	1 & 2, 5 & 7
73		(2 & 4), (7 & 8)	2 & 4, OFF	OFF, OFF
80		2 & 4, 6 & 8	2 & 4, OFF	OFF, 5 & 6
HAZARD WARNING CIRCUITS				
A2		6,7 & 8, 3 & 4	NONE	OFF, 1 & 2
A3		6,7 & 8, 2 & 4	NONE	OFF, 1 & 2

* Available with ratings 1, 4, & E only.

3 RATING [2]
1 .4VA @ 28VDC Resistive
4 10A 250VAC 1/2 HP, 15A 125VAC 1/2 HP, No Listings
B 15A 24V
C 20A 18V
D 20A 12V
E 15A 12V
G 20A 6V
H 20A 3V

4 TERMINATION [2,3]
1 .250 (6.4mm) TAB (QC)
3 .187 (4.7mm) TAB (QC)

Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Circuits 30, 31, 58, 69 are not available with rating codes 4, C, D, G or H.
3 Termination 3 only available with rating codes 1, B, and E.
4 Not available with circuits 11-18, 51-57 and 69.

5 ILLUMINATION
Lamp #1:above terminals 9 & 10 end of switch.; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

	Lamps	Illumination Type	Lamp Wired to Terminals		
S	None				
A	# 1	Independent	10+	9-	
B	# 2	Independent	12+	11-	
C	# 1	Independent	10+	9-	
	& # 2	Independent	12+	9-	
D	# 1	Dependent	4+	9-	
E	# 1	Independent	10+	9-	
	& # 2	Dependent	4+	9-	
F[4]	# 1	Independent	10+	9-	
	& # 2	Dependent	8+	9-	
G	# 1	Dependent	4+	9-	
	& # 2	Independent	10+	9-	
H	# 1	Both Independent	10+	9-	
	& # 2	(in series)			
J	# 1	Dependent	4+	9-	
	& # 2	Dependent	1+	9-	
1	# 2	Hazard	6+	10-	12-
2	# 1	Hazard	6+	10-	12-

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)
Selection 6: above terminals 10 & 9; Selection 7: above terminals 12 & 11

No lamp	**0**				
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	Green		
2VDC	**A**	**L**	**F**		
6VDC	**B**	**M**	**G**		
12VDC	**C**	**N**	**H**		
24VDC	**D**	**P**	**J**		

* Consult factory for "daylight bright", blue/green and white LED options.
Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]

	Black	White	Gray	Red
Standard Bracket	**1**	**2**	**3**	**4**
Rockerguard at Lamp 1	**A**	**B**	**C**	**D**
Rockerguard at Lamp 2	**E**	**F**	**G**	**H**

9 ACTUATOR STYLE AND COLOR [1]

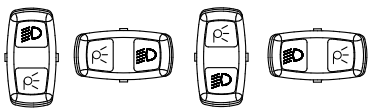
	Black	White	Gray	Red	Laser Etched
Rocker	**A**	**B**	**C**	**D**	**3**
Paddle	**J**	**N**	**K**	**M**	**4**

10 & 11 LENS STYLE AND COLOR
Lens color for LEDs must be clear, white, or match color of LED.
0 - No Actuator **Z** - No Lens

Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent
5	**A**	**-**	**-**	**-**	**-**	Laser Etched *background color*

12 LASER ETCHED, LENS OR BODY LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1 - vertical, lamp 1 on top
2 Orientation 2 - horizontal, lamp 1 on right
3 Orientation 3 - vertical, lamp 1 on bottom
4 Orientation 4 - vertical, lamp 1 on left



14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

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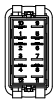
L	11	D	1	S	W	C	J	–	P	M	H	00	–	0
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lock	7 Lamp	8 Bracket		9 Actuator	10 Lens	11 Lock	12 Legend		13 Legend Orientation

1 SERIES
L

2 CIRCUIT [5]
Terminal Orientation



( ) - momentary
SP - single pole - uses terminals 1, 2 & 4.
DP - double pole uses terminals 5, 6 & 8.
Terminals 9, 10 & 11 for lamp circuit only.

Position: SP	DP	1 2 & 4, 6 & 8	2 Connected Terminals	3 1 & 2, 5 & 6
11	**21**	ON	NONE	OFF
14	**24**	ON	NONE	ON
16	**26**	ON	OFF	ON
17	**27**	ON	OFF	(ON)
18	**28**	(ON)	OFF	(ON)
CIRCUITS WITH JUMPER TERMINALS				
30 [2]		(2,4&5), (1,6&8)	OFF, OFF	(1,2&8), (4,5&6)
31 [2]		1, 2 & 5	2, 3 & 7	2, 4 & 8
PROGRESSIVE CIRCUITS				
51		3 & 4	2, 3	1 & 2
52		3 & 4	2, 3	OFF
53		(3 & 4)	2, 3	1 & 2
54		(3 & 4)	2, 3	(OFF)
55		(3 & 4)	2, 3	(1 & 2)
56		(3 & 4)	2, 3	(OFF)
57		3 & 4	2, 3	(OFF)
58		2 & 4	2, 3	1 & 2
61		3 & 4, 7 & 8	2 & 3, 6 & 7	1 & 2, 5 & 6
62		3 & 4, 7 & 8	2 & 3, 6 & 7	OFF, OFF
63		(3 & 4), (7 & 8)	2 & 3, 6 & 7	1 & 2, 5 & 6
64		(3 & 4), (7 & 8)	2 & 3, 6 & 7	OFF, OFF
65		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(1 & 2), (5 & 6)
66		(3 & 4), (7 & 8)	2 & 3, 6 & 7	(OFF, OFF)
67		3 & 4, 7 & 8	2 & 3, 6 & 7	(OFF, OFF)
68		2 & 4, 7 & 8	2 & 4, OFF	OFF, OFF
69		2 & 4, 1, 7 & 8	2 & 4, OFF	OFF, OFF
70		(2 & 4), (7 & 8)	2 & 4, 5 & 7	(1 & 2), (5 & 7)
71		(2&4), (7 & 8)	2 & 4, 5 & 7	1 & 2, 5 & 7
72		2 & 4, 7 & 8	2 & 4, 5 & 7	1 & 2, 5 & 7
73		(2 & 4), (7 & 8)	2 & 4, OFF	OFF, OFF
80		2 & 4, 6 & 8	2 & 4, OFF	OFF, 5 & 6

3 RATING [2]
1 .4VA @ 28VDC Resistive
4 10A 250VAC 1/2 HP, 15A 125VAC 1/2 HP, No Listings
B 15A 24V
C 20A 18V
D 20A 12V
E 15A 12V
G 20A 6V
H 20A 3V

4 TERMINATION [4]
1 .250 (6.4mm) TAB (QC)
3 .187 (4.7mm) TAB (QC)

Do not use silicone based lubricants to reduce terminal insertion forces during connector assembly, as it is detrimental to function and performance.

5 ILLUMINATION
Lamp #1:above terminals 9 & 10 end of switch.; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

	Lamps	Illumination Type	Lamp Wired to Terminals	
S	None			
B	# 2	Independent	12+	11-

Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Additional lamp circuits available. Consult factory.
3 Available only with 3 position circuits.
4 Termination 3 only available with ratings 1, B and E.
5 Circuits 30, 31, 58 and 69, are not available with rating codes 4, C, D, G or H.

6 LOCK
W Lock above terminals 10 & 9.

7 LAMP
Above terminals 12 & 11

No lamp	**0**				
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED*	Red	Amber	Green		
2VDC	**A**	**L**	**F**		
6VDC	**B**	**M**	**G**		
12VDC	**C**	**N**	**H**		
24VDC	**D**	**P**	**J**		

* Consult factory for "daylight bright", blue/green and white LED options.
Typical current draw for LED is 20ma.

8 BRACKET COLOR [1]
J Black

9 ACTUATOR STYLE AND COLOR [1]

	Black	Red
Locking Rocker	**P**	**R**

10 & 11 LENS STYLE AND COLOR
Lens color for LEDs must be clear, white, or match color of LED.
0 - No Actuator **Z** - No Lens

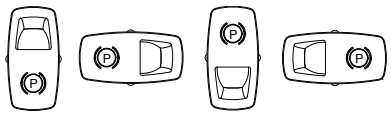
Clear	White	Amber	Green	Red	Blue	
1	**-**	**B**	**G**	**M**	**T**	Large Transparent
-	**7**	**C**	**H**	**N**	**U**	Large Translucent
3	**-**	**D**	**J**	**P**	**V**	Bar Transparent
-	**9**	**E**	**K**	**R**	**W**	Bar Translucent

11 LOCK FUNCTION AND COLOR
Locking Position

Up	Down	Up & Down	Center [3]	Lock Color
A	**H**	**R**	**1**	Match Actuator
B	**J**	**S**	**2**	Black
C	**K**	**T**	**3**	White
D	**L**	**V**	**4**	Red
E	**M**	**W**	**5**	Safety Orange

12 LASER ETCHED, LENS OR BODY LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

13 LEGEND ORIENTATION
0 No legend (used with codes 11-18 in selection 12)
1 Orientation 1 - vertical, lamp 1 on top
2 Orientation 2 - horizontal, lamp 1 on right
3 Orientation 3 - vertical, lamp 1 on bottom
4 Orientation 4 - vertical, lamp 1 on left



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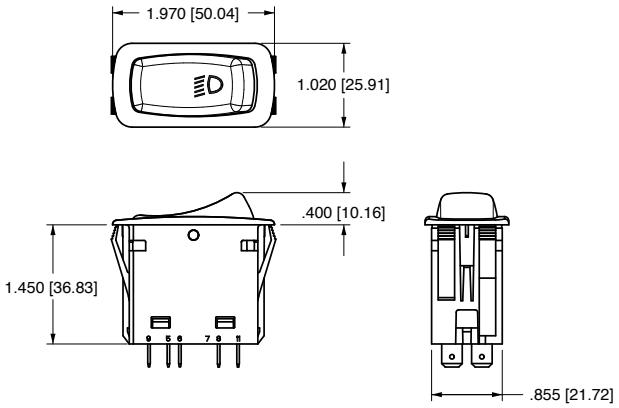
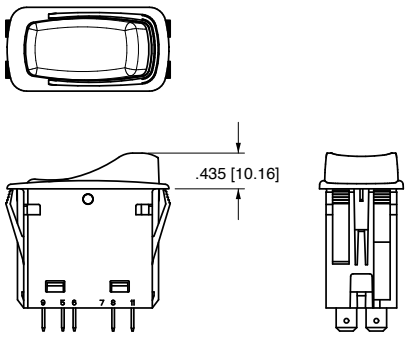
Dimensional Specifications: in. [mm]

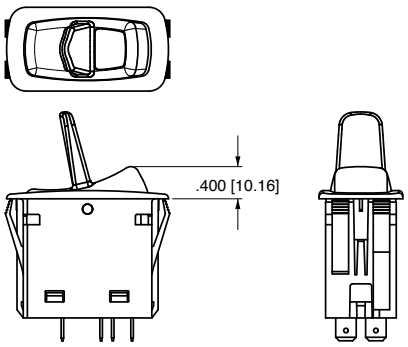
L-SERIES
SHOWN WITH LASER ETCHED ACTUATOR



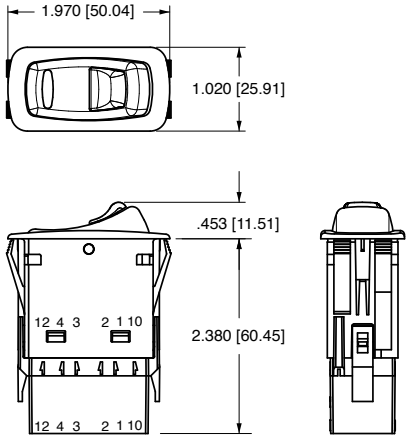
L-SERIES
SHOWN WITH ROCKER GUARD



L-SERIES
SHOWN WITH LARGE LENS AND PADDLE ACTUATOR



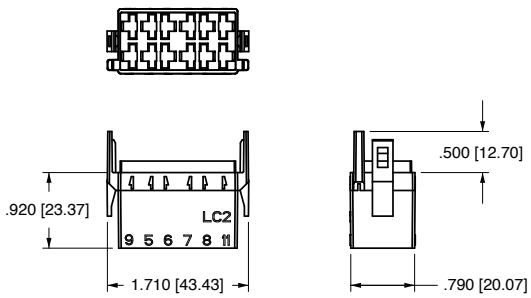
L-SERIES
SHOWN WITH BAR LENS, LOCK AND CONNECTOR



Connector

L-SERIES
CONNECTOR

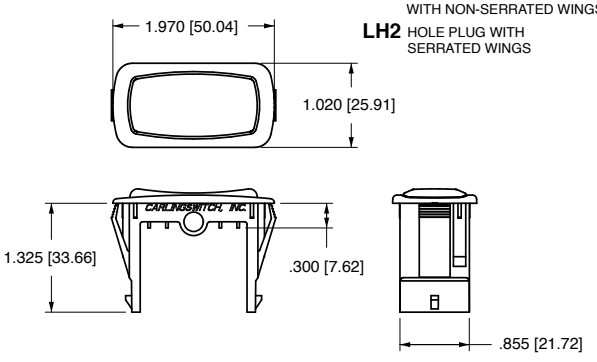
LC1-01 BLACK .250 TAB CONNECTOR (PACKARD 630 SERIES)
LC2-01 BLACK .187 TAB CONNECTOR (PACKARD 480 SERIES)
LC3-01 BLACK .250 TAB CONNECTOR (AMP ONLY)



Hole Plug

L-SERIES
HOLE PLUG

LH1 REMOVABLE HOLE PLUG WITH NON-SERRATED WINGS
LH2 HOLE PLUG WITH SERRATED WINGS



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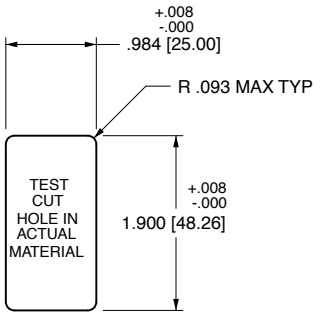
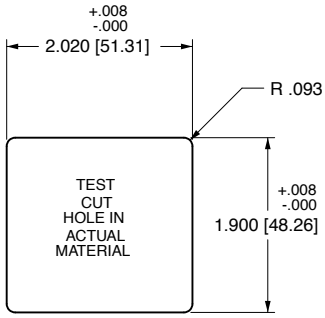
Dimensional Specifications: in. [mm]



LMS
MOUNTING PANEL
HOLE



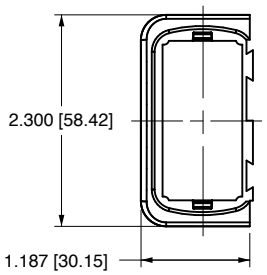
MOUNTING PANEL
OPENING
(2) UNITS

MOUNTING PANEL

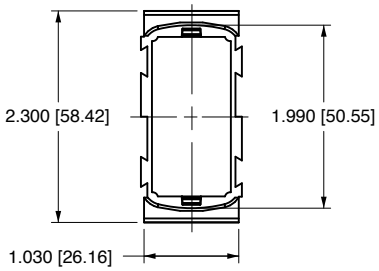
FOR ADDITIONAL UNITS, ADD 1.03 [26.2] PER UNIT. FOR MORE THAN 2 L-SERIES SWITCHES, ADD MIDDLE SECTION. AVAILABLE IN PANEL THICKNESSES LISTED BELOW. CONSULT FACTORY

DIMENSIONS: LME 2.02 [51.3mm] PLUS NUMBER OF CENTER BEZELS (LMM) X 1.034 [26.26mm]

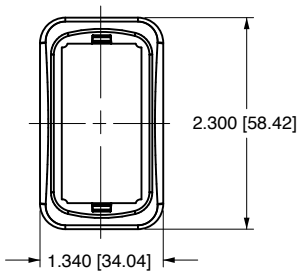
MOUNTING PANEL THICKNESS
.062 [1.57]
.093 [2.36]
.125 [3.17]
.156 [3.96]



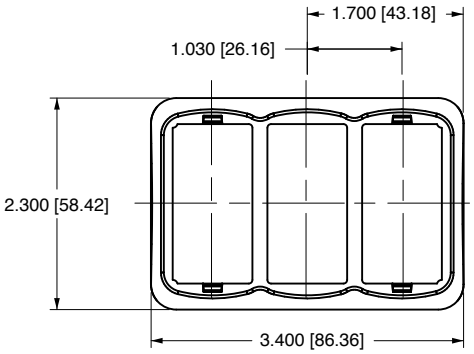
LME MOUNTING PANEL
END



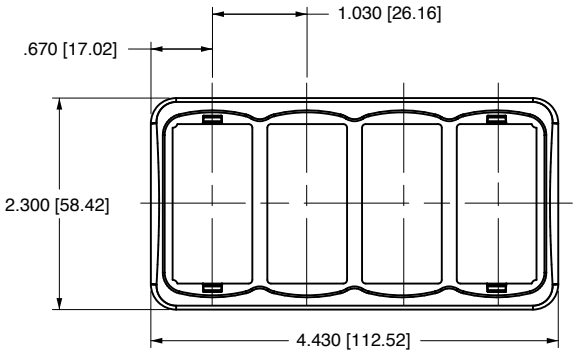
LMM MOUNTING PANEL
MIDDLE



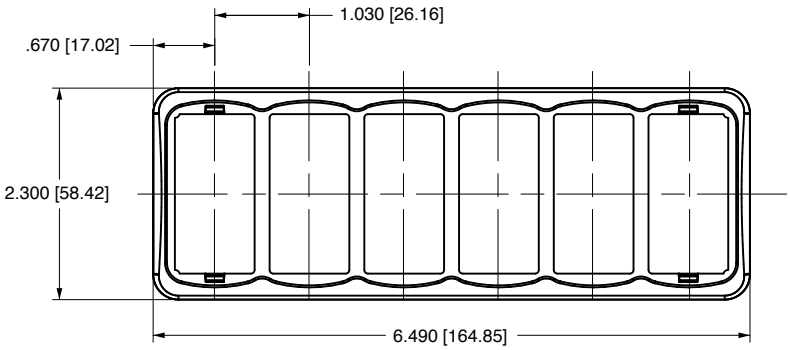
LMS
MOUNTING PANEL



LM3 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 3.06 [48.3mm X 77.7mm]



LM4 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 4.09 [48.3mm X 103.9mm]



LM6 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 6.15 [48.3mm X 156.2mm]

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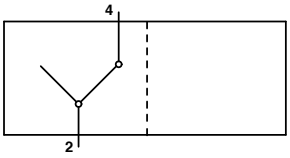
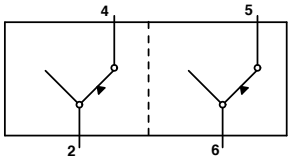
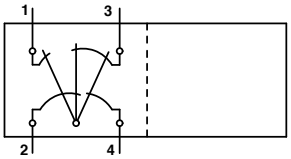
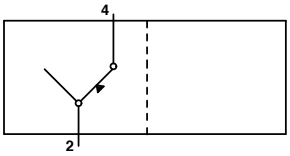
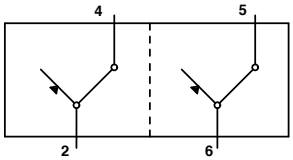
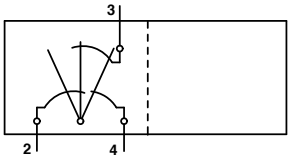
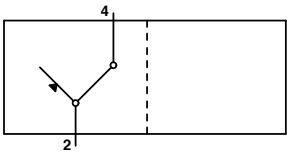
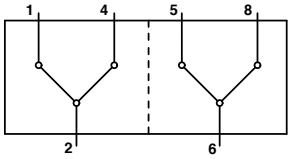
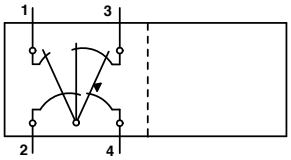
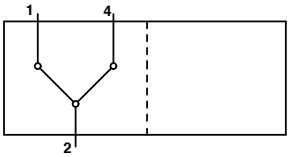
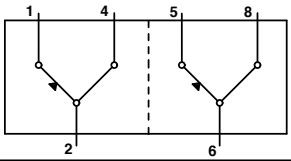
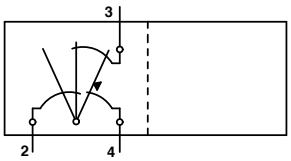
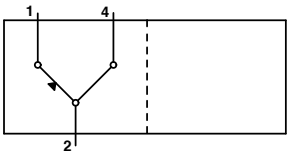
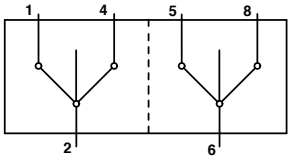
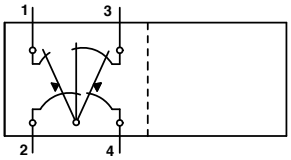
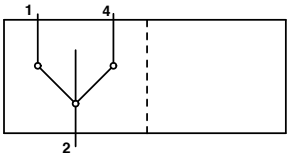
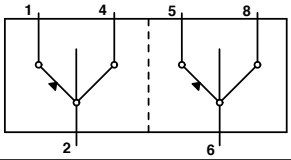
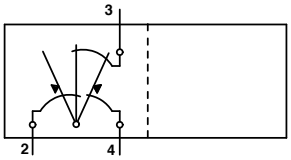
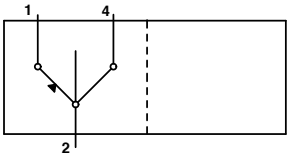
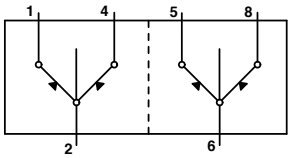
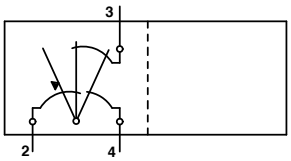
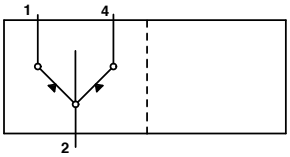
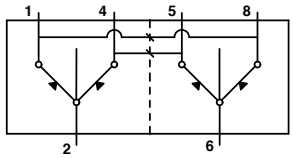
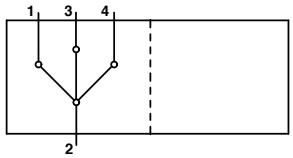
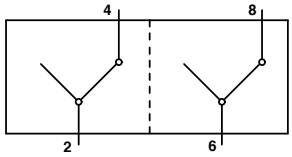
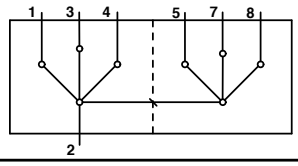
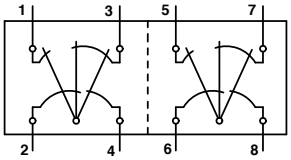
Circuit Diagrams:

CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM
11		22		51	
12		23		52	
13		24		53	
14		25		54	
15		26		55	
16		27		56	
17		28		57	
18		30		58	
21		31		61	

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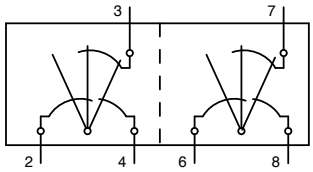
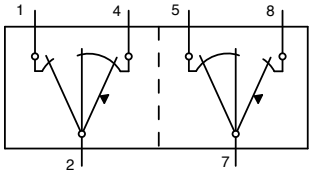
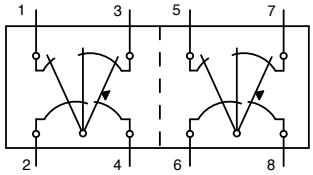
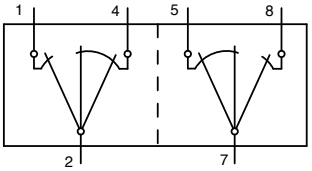
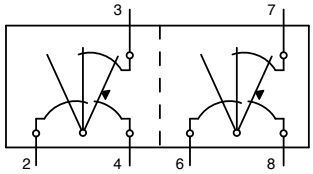
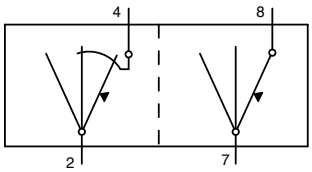
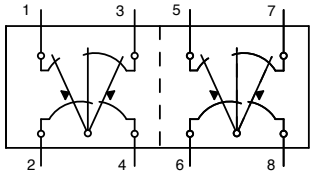
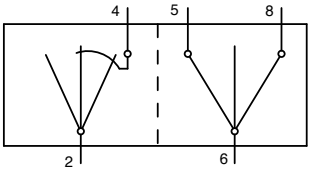
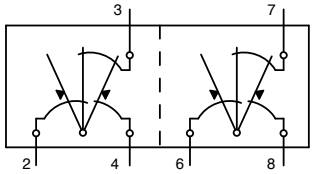
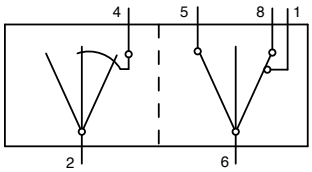
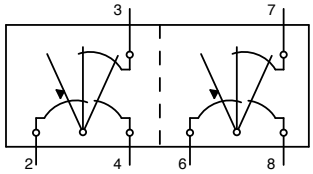
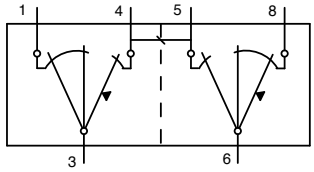
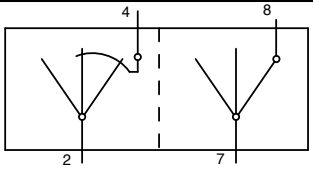
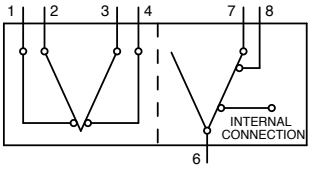
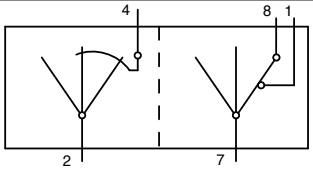
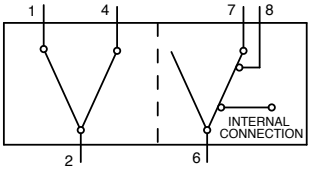
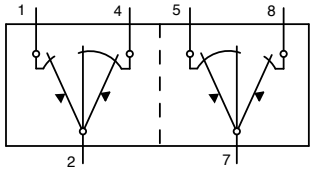
Circuit Diagrams:

CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM
62		71	
63		72	
64		73	
65		80	
66		81	
67		82	
68		A2	
69		A3	
70			

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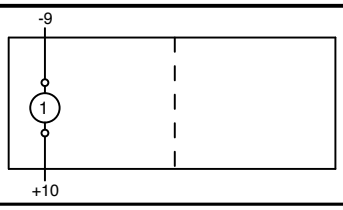
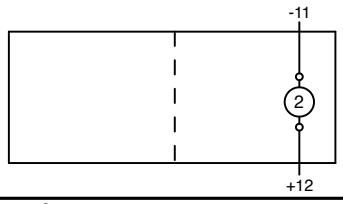
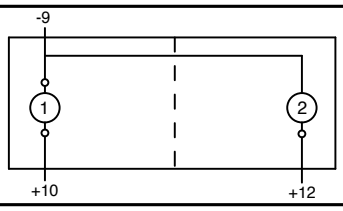
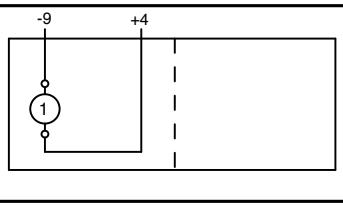
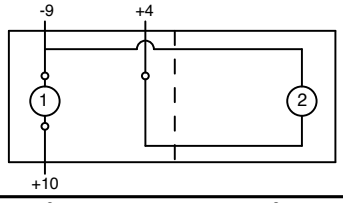
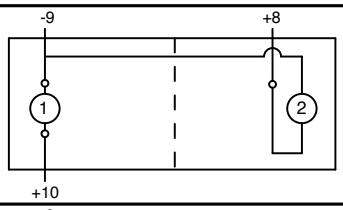
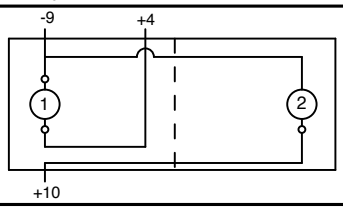
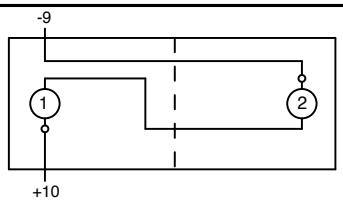
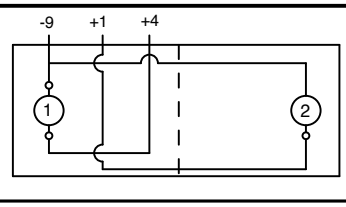
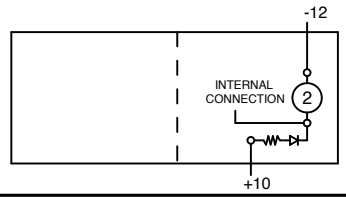
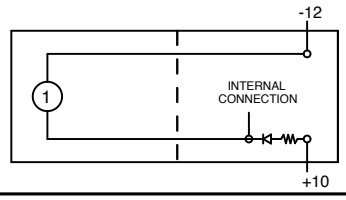
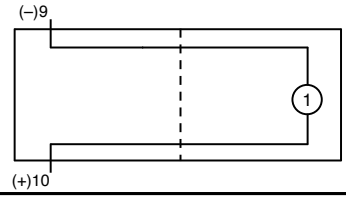
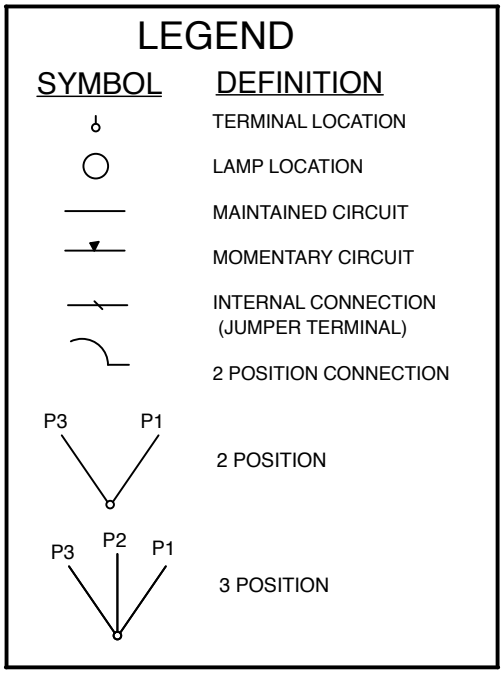
Lamp Circuit Diagrams:

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
J	
1	
2	
K	



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LP-Series
ILLUMINATED INDICATORS

The LP-Series Illuminated Indicators are the perfect complement to the aesthetics, reliability and performance of our L-Series rocker switches. As a critical safety feature, the illumination alerts the operator of essential system functions or malfunctions, such as: Oil Pressure, High Temperature, Transmission or other fluid levels, Parking Brake or General System confirmations. The L-Series styling assures seamless integration into most any dashboard panel.

Product Highlights:
- Vibration, Shock, and Thermoshock Resistant
- 12 or 24 Volts
- Laser Etched or Lens Illumination
- IP67 Sealing

Typical Applications:
- On/Off-Highway Equipment
- Agricultural Equipment
- Construction Equipment

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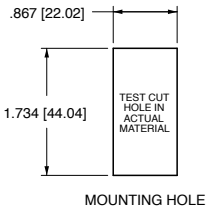
Electrical

Terminals	Brass or copper/silver plate 3/16" (4.76mm) & 1/4" (6.3mm) Quick Connect terminations standard.
Lighted	Incandescent - rated 10,000 hours LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24VDC)

Physical

Seals	Insert, base & bracket are sealed.
Base	Nylon 66 GF rated to 85°C with a flammability rating of 94VO.
Insert	Polycarbonate rated at 100°C.
Connector	Nylon 66 rated at 85°C. Polarized
Markings	Over 1000 pad printed or laser etched legends available
Bracket	Nylon 66 GF rated to 85°C

Mounting Specifications



MOUNTING HOLE

Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156

Environmental

Environmental	IP67, representing an index of protection as applied to electrical equipment in accordance with IEC 529, BS 5490, DIN 400 50 & NFC 20 010.
Corrosion Resistance	Mixed Flowing Gas MFG Class III per ASTM B-827 & B-845, Method H, with 3 years exposure.
Operating Temperature	-40°C to +85°C
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with VCH connector. Test criteria - No loss of circuit during test and pre and post test contact resistance.
Vibration 2	Resonance search 24-50 Hz 0.40 DA 50-2000 ±10 G's peak Results Horizontal Axis 3-5 G's max. Random 24 Hz 0.06 PSD-Gsq/Hz 60 Hz 0.50 100 Hz 0.50 200 Hz 0.025 2000 Hz 0.025 No loss of circuit during test; <10µ chatter.
Shock	Per Mil-Std 202F, Method 213B, Test Condition K @ 30G's. Tested with VCH connector. Test criteria - No loss of circuit during test, pre, and post test contact resistance.
Salt Spray	Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs.
Thermal Shock	Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C. Test criteria - pre and post test contact resistance.
Moisture Resistance	Per Mil-Std 202F, Method 106F, Test Criteria - pre and post test contact resistance.

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

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LP	1	H	R	R	5	–	9	A	A	Y2	–	1	DU
1 Series	2 Termination	3 Illumination	4 Lamp	5 Lamp	6 Bracket Color		7 Insert Color	8 Style	9 Style	10 Legend 1		11 Legend Orientation	12 Legend 2

1 SERIES
LP L-Series Illumination Plug

2 TERMINATION [3]
1 .250 (8.35) x .032 (0.51) Quick Connect
3 .187 (4.75) x .032 (0.51) Quick Connect

3 ILLUMINATION

	LAMPS	ILLUMINATION	LAMP WIRED TO TERMINALS
A	1	–	10 (+) 9 (–)
B	1	–	10 (+) 9 (–)
	2	–	12 (+) 11 (–)
C	1	–	10 (+) 9 (–)
	2	–	12 (+) 9 (–)
E	1 & 2	Parallel	10 (+) 9 (–)
H	1 & 2	Series	10 (+) 9 (–)

LAMP 1 LOCATED ABOVE TERMINALS 9 & 10 END OF BRACKET.
LAMP 2 LOCATED ABOVE TERMINALS 11 & 12 END OF BRACKET.
POSITIVE (+) AND NEGATIVE (–) SYMBOLS APPLY TO LED LAMPS ONLY.

4,5 LAMP (same coding for both selections) [2]

Selection 4: specifies lamp 1 located above terminals 10 (+) & 9 (-).
Selection 5: specifies lamp 2 located above terminals 12 (+) & 11 (-).

No lamp	**0** (position 5 only)				
Incandescent	**4** 3V	**5** 6V	**6** 12V	**7** 18V	**8** 24V
LED	Amber	Green	Red		
2VDC	**L**	**F**	**R**		
6VDC	**M**	**G**	**S**		
12VDC	**N**	**H**	**T**		
24VDC	**P**	**J**	**V**		

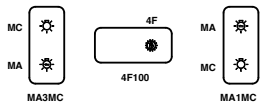
6 BRACKET COLOR
5 Black

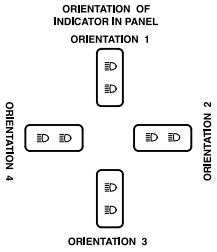
7 INSERT COLOR [1, 2]
9 Painted Black - Laser Etch
A Clear (Transparent)
B White (Translucent)
C Red (Translucent)
D Amber (Translucent)
E Green (Translucent)
F Blue (Translucent)

8, 9 STYLE (same coding for both selections)
Z Not Painted (used with Insert Colors A-F)
5 Clear Laser Etch Background Color (used with Insert Color 9)
A White Laser Etch Background Color (used with Insert Color 9)

10 LEGEND OVER LAMP [1]
00 No legend
__ Laser Etched or Body Legends
For legend options, visit us at carlingtech.com

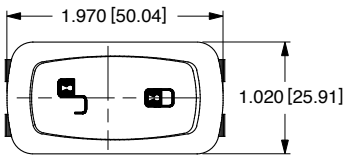
11 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

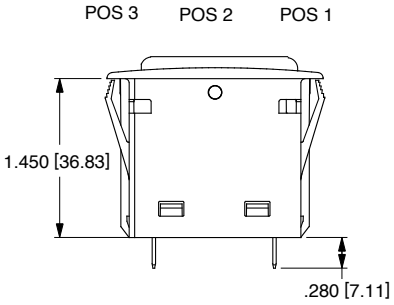


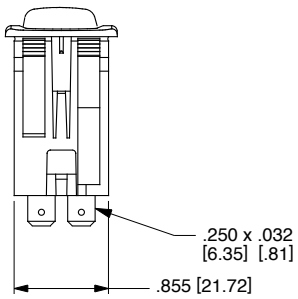


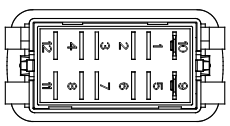
12 LEGEND OVER LAMP [2]
00 No legend
__ Laser Etched or Body Legends
For legend options, visit us at carlingtech.com

Notes:
1 To order separately, specify LPC and selection 7 code. Ex LPC-9
2 For LEDs, insert color must be clear, white or match color of LED.
3 For connector, specify part number LC2-01 (.187 tabs), LC3-01 (.250 tabs).









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FULL-SIZED ROCKERS

Carling's Full-sized Rocker Switches range from 3 to 20 amp illuminated and non-illuminated, one to four pole, with many styles of solid colored, translucent rockers. Illumination options include LED, neon, and incandescent lamps.

SELECTOR GUIDE

TIG / LTIG / TIH / LTIH / TIL / LTIL / TII / LS	S-Series	
1, 2, 3, 4	1, 2	**Poles**
up to 15A 125VAC 10A 250VAC	up to 10A 28VDC	**Ratings**
rocker, paddle	bezel-less rocker	**Actuator**
.830" x 1.450" [21.08mm x 36.83mm] snap-in mount screw mount	.787" x 1.575" snap-in, keyed	**Mounting Hole Specifications**
.187 tab solder lug .250 tabs screw terms wire leads	.110 Tabs	**Termination**
incandescent, neon	LED	**Illumination**
UL, CSA, VDE	n/a	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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Tippette®
FULL SIZED ROCKER SWITCHES

The Tippette Series is a traditionally styled rocker switch, available in sealed or unsealed versions. These switches are appropriate for use in general purpose applications which may or may not require a modicum of environmental protection. The Tippette Series is available in both illuminated and non-illuminated versions and features a wide variety of circuits, actuator styles and bracket options. This versatile offering includes international agency certifications and ratings to 26 amps for select circuits.

Product Highlights:
- Ratings Up to 26 Amps 250 VAC
- Illuminated or Non-Illuminated
- Multiple Termination, Mounting and Rocker Options

Typical Applications:
- General Purpose Applications
- Commercial Food Equipment
- Recreational Vehicles

Electrical

Contact Rating	15 amps, 125 VAC 10 amps, 250 VAC 3/4 HP 125-250 VAC 15 amps, 12-30 VDC
Life	25,000 cycles circuit dependent 50,000 cycles circuit dependent consult factory for applicable circuits.
Contacts	Fine silver, silver cad-oxide
Terminals	Brass or copper/silver plate 1/4" (6.3mm) Quick Connect terminations standard. Solder lug - Brass Tin Plated Wire Lead 16 gauge standard 105°C 600VAC Screw Terminals - Brass

Physical

Lighted	Incandescent - rated 10,000 hours Neon - rated 25,000 hours
Seals	Bracket - Actuator WBL/MBL optional external gasket panel seal
Base	Phenolic (150°C)
Rocker/Bracket	Nylon 66 (105°C)

Mechanical

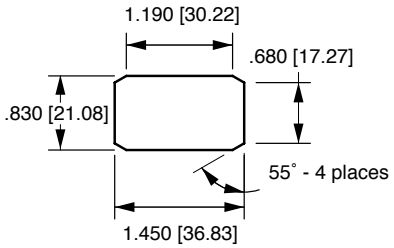
Endurance	100,000 cycles minimum

Agency Certifications

Select circuits and constructions with VDE/IEC approvals are available. Consult factory

Mounting

MOUNTING HOLE
(Nylon Snap-in Brackets)
Panel Thickness:
.040 min. - .250 max.



*Angled corners are suggested for optimum fit. Standard rectangular cutout is acceptable.

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

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TIGA51 - 6M - BL - MBL

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bracket

1 BASE PART NUMBER: SERIES/POLES / CIRCUITRY [8,11] / RATING [7] / TERMINATION [10]

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 15A 6-28VDC

Single Pole in Double Pole base [2]

solder lug	.250 tab	screw term.	wire leads	
TIGA50	**TIGA51**	**TIGA54**	**TIGA55**	On-None-Off
TIGA5A	**TIGA5B**	**TIGA5E**	**TIGA5F**	(On)-None-Off
TIGA5L	**TIGA5M**	**TIGA5S**	**TIGA5T**	On-None-(Off)
TIGB50	**TIGB51**	**TIGB54**	**TIGB55**	On-None-On
TIGB5A	**TIGB5B**	**TIGB5E**	**TIGB5F**	On-None-(On)
TIGC50	**TIGC51**	**TIGC54**	**TIGC55**	On-Off-On
TIGC5A	**TIGC5B**	**TIGC5E**	**TIGC5F**	On-Off-(On)
TIGC5L	**TIGC5M**	**TIGC5S**	**TIGC5T**	(On)-Off-(On)

Double Pole

solder lug	.250 tab	screw term.	wire leads
TIGK50	**TIGK51**	**TIGK54**	**TIGK55**
TIGK5A	**TIGK5B**	**TIGK5E**	**TIGK5F**
TIGK5L	**TIGK5M**	**TIGK5S**	**TIGK5T**
TIGL50	**TIGL51**	**TIGL54**	**TIGL55**
TIGL5A	**TIGL5B**	**TIGL5E**	**TIGL5F**
TIGM50	**TIGM51**	**TIGM54**	**TIGM55**
TIGM5A	**TIGM5B**	**TIGM5E**	**TIGM5F**
TIGM5L	**TIGM5M**	**TIGM5S**	**TIGM5T**

Three Pole

solder lug	.250 tab	screw term.	wire leads	
TIHK50	**TIHK51**	**TIHK54**	**TIHK55**	On-None-Off
TIHK5A	**TIHK5B**	**TIHK5E**	**TIHK5F**	(On)-None-Off
TIHK5L	**TIHK5M**	**TIHK5S**	**TIHK5T**	On-None-(Off)
TIHL50	**TIHL51**	**TIHL54**	**TIHL55**	On-None-On
TIHL5A	**TIHL5B**	**TIHL5E**	**TIHL5F**	On-None-(On)
TIHM50	**TIHM51**	**TIHM54**	**TIHM55**	On-Off-On
TIHM5A	**TIHM5B**	**TIHM5E**	**TIHM5F**	On-Off-(On)
TIHM5L	**TIHM5M**	**TIHM5S**	**TIHM5T**	(On)-Off-(On)

Four Pole

solder lug	.250 tab	screw term.	wire leads
TIIK50	**TIIK51**	**TIIK54**	**TIIK55**
TIIK5A	**TIIK5B**	**TIIK5E**	**TIIK5F**
TIIK5L	**TIIK5M**	**TIIK5S**	**TIIK5T**
TIIL50	**TIIL51**	**TIIL54**	**TIIL55**
TIIL5A	**TIIL5B**	**TIIL5E**	**TIIL5F**
TIIM50	**TIIM51**	**TIIM54**	**TIIM55**
TIIM5A	**TIIM5B**	**TIIM5E**	**TIIM5F**
TIIM5L	**TIIM5M**	**TIIM5S**	**TIIM5T**

VDE APPROVED

10A 250VAC, 15A 125VAC, 12(6)A 250VAC T85

Single Pole in Double Pole base [2]

solder lug	.250 tab	wire lead	
TIGA90	**TIGA91**	**TIGA95**	On-None-Off
TIGB90	**TIGB91**	**TIGB95**	On-None-On
TIGC90	**TIGC91**	**TIGC95**	On-Off-On

Double Pole

solder lug	.250 tab	wire lead
TIGK90	**TIGK91**	**TIGK95**
TIGL90	**TIGL91**	**TIGL95**
TIGM90	**TIGM91**	**TIGM95**

Additional ratings up to 20A 125-277VAC, 1 1/2HP 125 VAC, 2HP 250VAC are available.
Consult factory for specifics.

2 ACTUATOR STYLE

1S	Angular/Smooth Face Gloss [12]	**6M**	Curved/Smooth Face Matte [3]
1C	Angular/Cross Serrations Gloss [12]	**6S**	Curved/Smooth Face Gloss [3]
1F	Flatted/Smooth Face Gloss [12]	**7S**	Rounded Paddle/Smooth Face Gloss [1]
1L	Angular/Longline Serrations Gloss [1,12]	**7N**	Witch's Hat/Narrow [14]
2L	Long Smooth/Narrow [14]	**7P**	Witch's Hat/Wide [14]

3 ACTUATOR COLOR [9]

BL Black **WH** White **RD** Red

4 BRACKET STYLE [9]

A	Screw Mount [5]
B	Screw Mount [5,12]
C	Screw Mount [5]
H	Screw Mount [5]
NBL	Nylon Black
WBL	Water shedding Black [4]
MBL	Marine Style Black [4,6]
FN	Metal Snap-In [5]
FN BLK	Black Metal Snap-In [5]
FN SS	Stainless Steel Snap-In [5]
FW	Wide Stainless Steel Snap-In [5]

Notes:

1 NBL, FN, & FW brackets only.
2 For single pole switch in a single pole base, specify TIL with single pole circuitry/rating/termination.
3 NBL, WBL, & MBL brackets only. With 6M actuator, brackets also will be matte finish.
4 6M & 6S actuators only
5 Not available with 6M & 6S actuators.
6 Consists of WBL bracket, neoprene seal, and dummy rivets at open holes. Consult factory for agency approval status.
7 All ratings are appropriate for usage in low voltage applications.
8 For additional special circuits, see catalog.
9 Custom colors are available, consult factory.
10 .187 tab and PC terminations are also available. Consult factory for catalog number callout.
11 ( ) momentary
12 Not available with WBL or MBL style brackets.
13 Available with bracket A, C or H only.
14 Not available with MBL, WBL or H brackets. Can be supplied as a double rocker to control separate poles of a TIG,TIH or TII switch. Consult factory for details.

LTILA51 - 6M - BL - RC - MBL - 12V

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Lens Color | 5 Bracket | 6 Lamp Voltage

1 BASE PART NUMBER: SERIES / POLES / ILLUMINATION / CIRCUITRY [12] / RATING [10] / TERMINATION [14]

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 15A 15-28VDC

illuminated Single Pole in Double Pole base

solder lug	.250 tab	screw term.	wire leads	
LTILA50	**LTILA51**	**LTILA54**	**LTILA55**	On-None-Off
LTILA5A	**LTILA5B**	**LTILA5E**	**LTILA5F**	(On)-None-Off
LTILA5L	**LTILA5M**	**LTILA5S**	**LTILA5T**	On-None-(Off)
LTILB50	**LTILB51**	**LTILB54**	**LTILB55**	On-None-On
LTILB5A	**LTILB5B**	**LTILB5E**	**LTILB5F**	On-None-(On)
LTILC50	**LTILC51**	**LTILC54**	**LTILC55**	On-Off-On
LTILC5A	**LTILC5B**	**LTILC5E**	**LTILC5F**	On-Off-(On)
LTILC5L	**LTILC5M**	**LTILC5S**	**LTILC5T**	(On)-Off-(On)

illuminated Double Pole

solder lug	.250 tab	screw term	wire leads
LTIGK50	**LTIGK51**	**LTIGK54**	**LTIGK55**
LTIGK5A	**LTIGK5B**	**LTIGK5E**	**LTIGK5F**
LTIGK5L	**LTIGK5M**	**LTIGK5S**	**LTIGK5T**
LTIGL50	**LTIGL51**	**LTIGL54**	**LTIGL55**
LTIGL5A	**LTIGL5B**	**LTIGL5E**	**LTIGL5F**
LTIGM50	**LTIGM51**	**LTIGM54**	**LTIGM55**
LTIGM5A	**LTIGM5B**	**LTIGM5E**	**LTIGM5F**
LTIGM5L	**LTIGM5M**	**LTIGM5S**	**LTIGM5T**

Additional ratings up to 12A 250VAC, 17A 125 VAC, 3/4 HP 125 VAC, 1HP 250VAC are available.
Consult factory for specifics.
Three pole switch is also available: Substitute H for fourth digit of part number. ex. LTIHK51

2 ACTUATOR STYLE [4]

1S **Angular/Smooth Face Gloss** [1]
1C **Angular/Cross Serrations Gloss** [1]
1L **Angular/Longline Serrations Gloss** [1]
6M **Curved/Smooth Face Matte** [3]
6S **Curved/Smooth Face Gloss** [3]
7S **Rounded Paddle/Smooth Face Gloss** [2]

3 ACTUATOR COLOR [11]

BL Black **WH** White **RD** Red

4 LENS COLOR [13]

AM Amber **RC** Red **GN** Green [7]
LU Blue [7] **CL** Clear **WH** White

5 BRACKET STYLE [11]

NBL	Nylon Black
WBL	Water shedding Black [5]
MBL	Marine Style Black [5,8]
FN	Metal Snap-In [4,6]
FN BLK	Black Metal Snap-In [4,6]
FN SS	Stainless Steel Snap-In [4,6]

6 LAMP VOLTAGE

neon [9]
125N 125 volt **250N** 250 volt
incandescent
6V 6 volt **12V** 12 volt **18V** 18 volt
24V 24 volt **28V** 28 volt

Notes:

1 NBL, FN, & FW brackets only. Double pole circuits provided with 3 pole base.
2 LTIL-Series with NBL, FN, & FW brackets only.
3 NBL, WBL, & MBL brackets only. With 6M actuator, bracket will also be matte finish.
4 1S, 1C, 1L & 7S with NBL bracket only available with LTIL-Series.
5 6M, 6S actuators only.
6 Not available with 6M and 6S actuators.
7 Not recommended with neon lamps.
8 Consists of WBL bracket, neoprene seal, dummy rivets at open holes. Consult factory for agency approval status.
9 Not recommended with blue or green lenses.
10 All ratings are appropriate for usage in low voltage applications.
11 Custom colors and additional bracket styles are available, consult factory.
12 ( ) - momentary
13 All double throw circuits supplied with two lenses. To specify two different lens colors, specify second color, after first color. (ex. LTIGM51-6S-BL-RC/GN-WBL-12V)
14 .187 tab and PC terminations are also available. Consult factory for catalog number callout.

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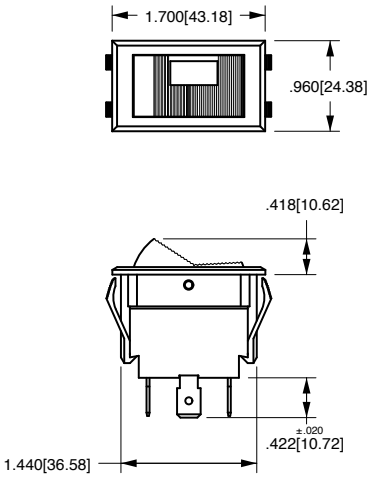
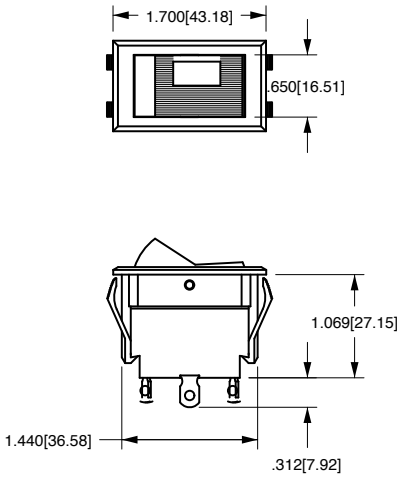
Dimensional Specifications: in. [mm]

1C
CROSS-LINE W/ONE LENS



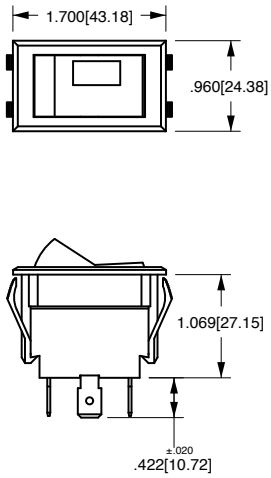
WITH.250 TAB
TERMINALS
AND NBL BRACKET

1L
LONG-LINE W/ONE LENS



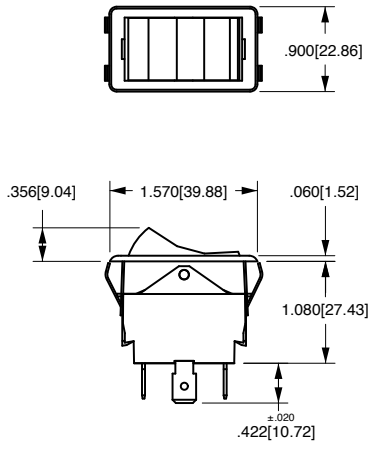
WITH SOLDER LUG
TERMINAL
AND NBL BRACKET

1S
SMOOTH W/ONE LENS



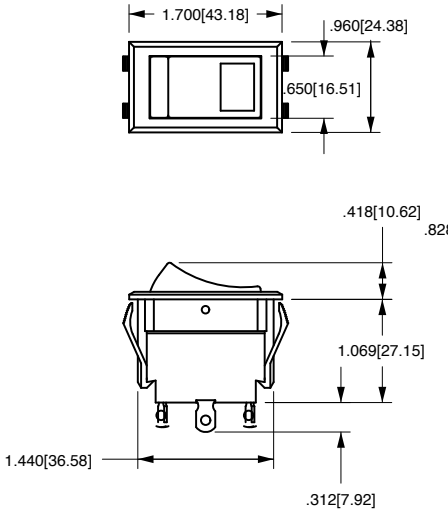
WITH.250 TAB
TERMINALS
AND NBL BRACKET

1F
FLATTED STYLE NO LENS



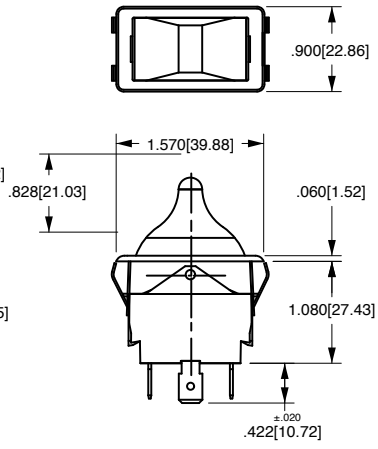
WITH.250 TAB
TERMINALS
AND FN BRACKET

6M, 6S
CURVED W/ONE LENS



WITH SOLDER LUG
TERMINALS
AND NBL BRACKET

7S
TOGGLE-STYLE W/ONE LENS



WITH.250 TAB
TERMINALS
AND FN BRACKET

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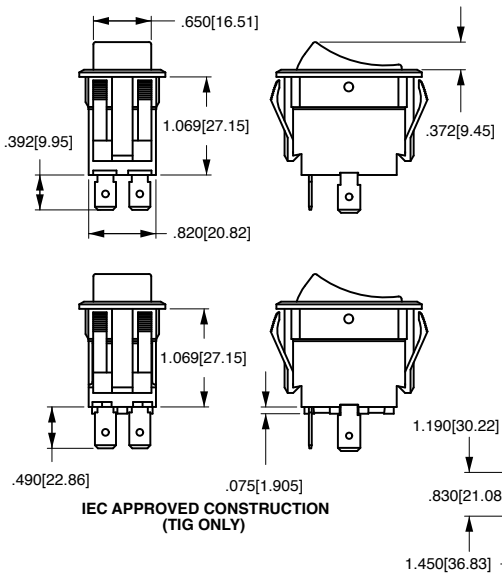
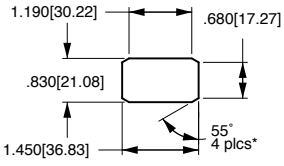
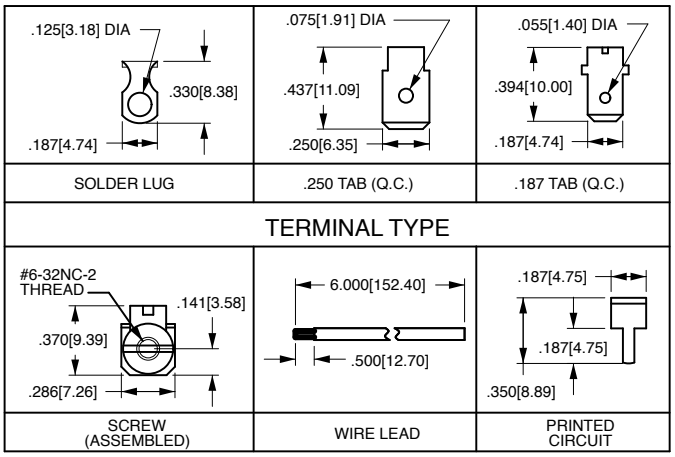


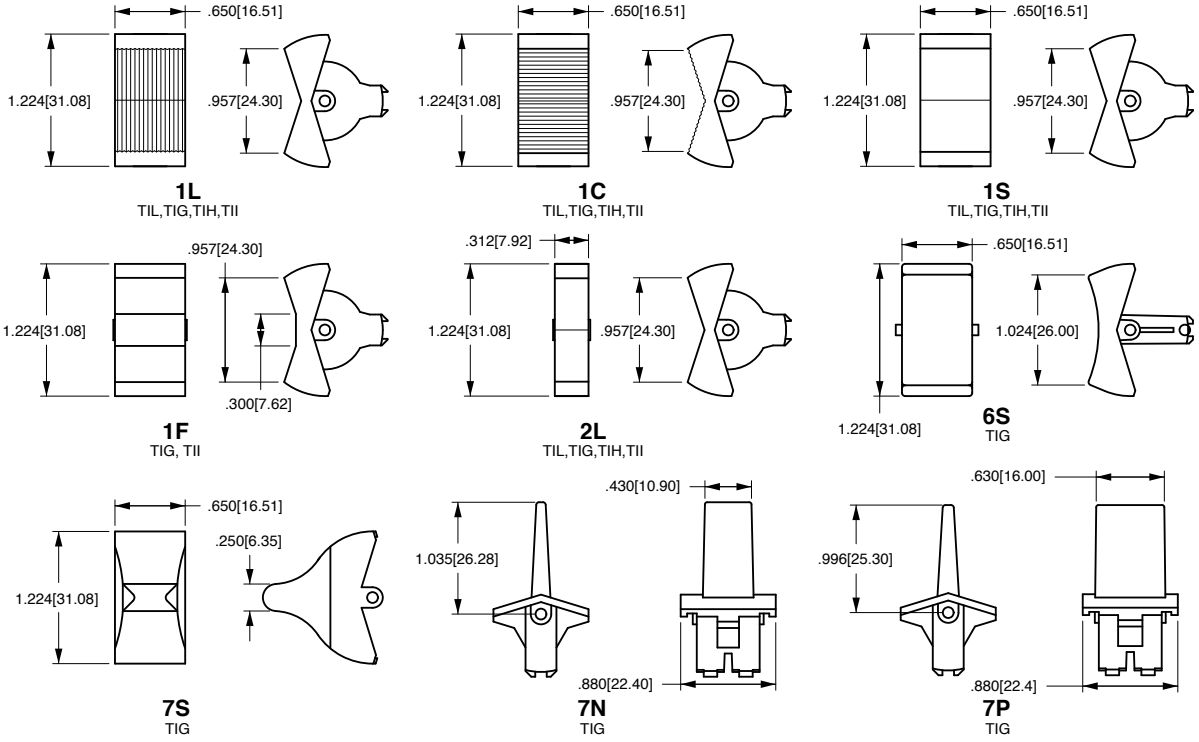
IEC APPROVED CONSTRUCTION (TIG ONLY)





MOUNTING HOLE
(Nylon Snap-in Brackets)
Panel Thickness:
.030 min. - .250 max.
Switch should be mounted at 90˚ for maximum water shedding (45˚ to 90˚ acceptable)

* Angled corners are suggested for optimum fit. Standard rectangular cutout is acceptable.



SPECIAL CIRCUITS FOR TIPPETTE ROCKER SWITCHES

Circuit	Position 1	Position 2	Position 3
Progressive Two Circuit			
GG	BOTH CIRCUITS ON	ONE CIRCUIT ON	OFF
GG	BOTH CIRCUITS (ON)	ONE CIRCUIT ON	OFF
Single Pole Triple Throw			
GE	ON	ON	ON
Two Circuit			
GH	CIRCUIT 1 ON	BOTH CIRCUITS ON	CIRCUIT 2 ON
GP	CIRCUIT 2 ON	CIRCUIT 1 ON	OFF
Reversing Double Pole Double Throw			
GO	ON	OFF	ON
GX	ON	NONE	ON

( ) Indicates momentary function.

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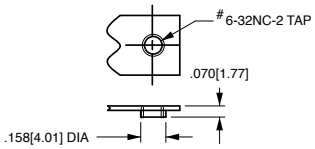
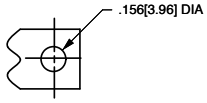
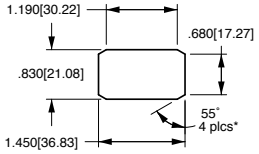
Dimensional Specifications: in. [mm]



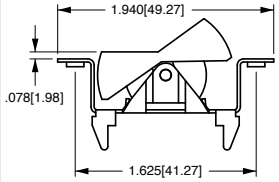
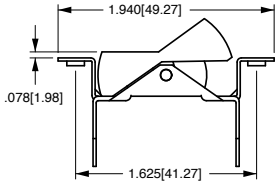
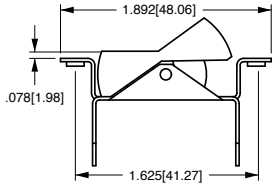
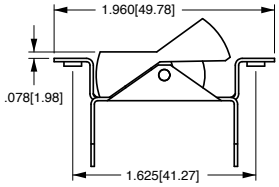
TAPPED HOLE
Standard with
A & B Brackets



CLEARANCE HOLE
Standard with
C Bracket



MOUNTING HOLE
(Nylon Snap-in Brackets)
Panel Thickness:
.030 min. - .250 max.
* Angled corners are suggested for optimum fit. Standard rectangular cutout is acceptable.

TIL	TIG	TII	TIH
			
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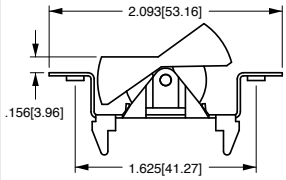
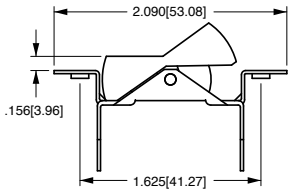
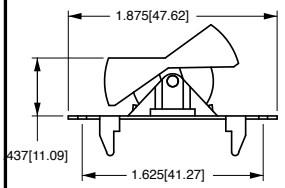
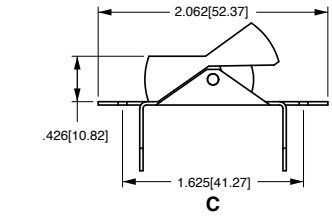
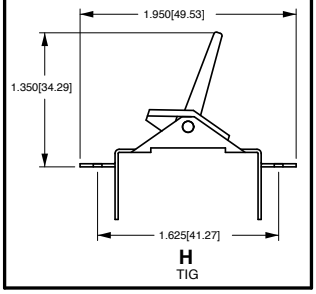
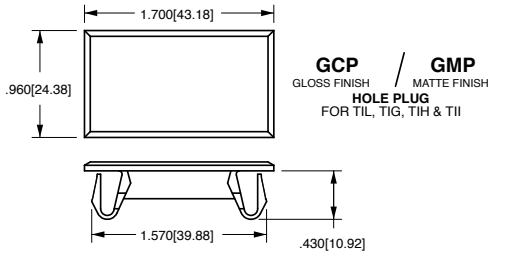
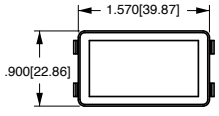
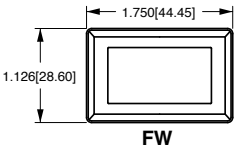
			
B TIL	**B** TII, TIG		
			
CX TIL	**C** TIG	**C** TIH, TII	
			
H TIG	**GCP** GLOSS FINISH / **GMP** MATTE FINISH **HOLE PLUG** FOR TIL, TIG, TIH & TII		

NARROW



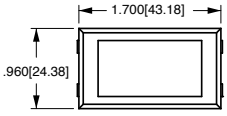
FN
TIL, TIG, TIH, TII
METAL, SNAP-IN

WIDE



FW
TIL, TIG, TIH, TII
METAL, SNAP-IN

MARINE / STD / WATERSHEDDING



MBL, NBL, WBL
TIG
BLACK NYLON, SNAP-IN

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LS-Series
ROCKER SWITCHES

The LS-Series Softspot illuminated rocker switches feature a three-color high brightness light sequence, from a single lamp. These switches are designed with a standard nylon snap-in bracket and "Drip-Dry" construction that protects the front panel from dust and moisture.

Product Highlights:
- Water Resistant Construction
- Independent or Dependent Illumination•
- Up to 3 Different Colors Under a Single Lens
- Multiple Termination Options

Typical Applications:
- Marine
- Transportation

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Dielectric Strength
1000V - live to dead metal parts

Mechanical Life
100,000 cycles

Electrical Life
50,000 cycles - maintained
25,000 cycles - momentary

Operating Temperature
0°F to 150°F (-17.8°C to +65.6°C)

LS1511 - 13 - BL - BL - 012

1 Base Part Number | 2 Lighting Sequence | 3 Actuator Color | 4 Base Color | 5 Lamp Voltage

1 BASE PART NUMBER: SERIES / POLES / ILLUMINATION / CIRCUITRY / RATING / TERMINATION [3]

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 15A 15-28VDC

Single Pole	Solder Lug	.250 Tab QC	Screw Terms	Wire Leads
On-None-Off	**LS1510**	**LS1511**	**LS1514**	**LS1515**
On-None-(Off)	**LS1520**	**LS1521**	**LS1524**	**LS1525**
(On)-None-Off	**LS1530**	**LS1531**	**LS1534**	**LS1535**
On-None-On	**LS1540**	**LS1541**	**LS1544**	**LS1545**
On-None-(On)	**LS1550**	**LS1551**	**LS1554**	**LS1555**
On-Off-On	**LS1560**	**LS1561**	**LS1564**	**LS1565**
On--Off-(On)	**LS1570**	**LS1571**	**LS1574**	**LS1575**
(On)-Off-(On)	**LS1580**	**LS1581**	**LS1584**	**LS1585**

2 LIGHTING SEQUENCE [1,2]

	position 1	position 2	position 3
01	red	red	red
02	amber	amber	amber
03	green	green	green
10	red	---	none
11	red	clear	red
12	red	clear	amber
13	red	clear	green
14	red	clear	blue
15	red	clear	clear
20	amber	---	none
21	amber	clear	red
22	amber	clear	amber
23	amber	clear	green
24	amber	clear	blue
25	amber	clear	clear
30	green	---	none
31	green	clear	red
32	green	clear	amber
33	green	clear	green
34	green	clear	blue
35	green	clear	clear
40	blue	---	none
41	blue	clear	red
42	blue	clear	amber
43	blue	clear	green
44	blue	clear	blue
45	blue	clear	clear
50	clear	---	none
51	clear	clear	red
52	clear	clear	amber
53	clear	clear	green
54	clear	clear	blue
55	clear	clear	clear

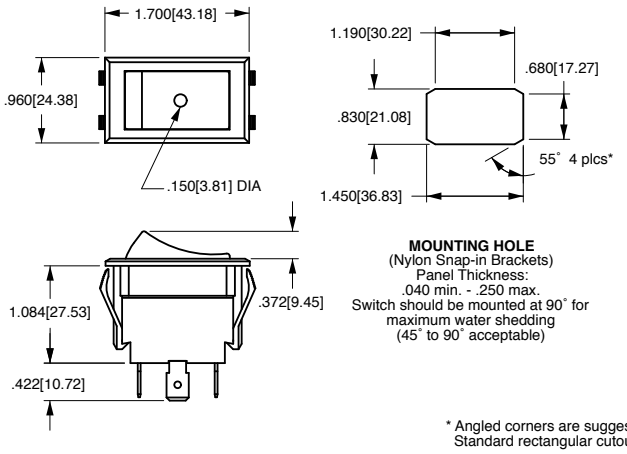
3 ACTUATOR COLOR [4]
BL Black
WH White

4 BASE COLOR [4]
BL Black
WH White

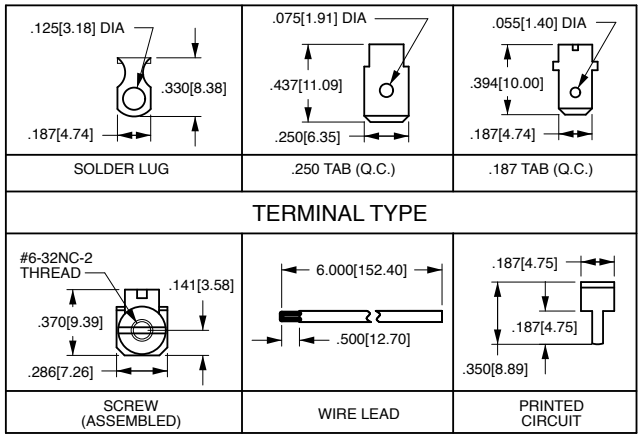
5 LAMP VOLTAGE [2]
incandescent
6V 6 volt
12V 12 volt
18V 18 volt
24V 24 volt
28V 28 volt

neon
125N 125 volt neon
250N 250 volt neon

Notes:
1 Independent lamp is standard. Dependent lamp with ON-OFF function (including momentary) is available with Lighting Sequences 10, 20, 30, 40 and 50. (No light in OFF position.)
2 Green and blue not recommended with 125 volt or 250 volt neon lamps.
3 Additional terminations available. Consult factory.
4 Custom colors available. Consult factory.
( ) Indicates momentary function.



MOUNTING HOLE
(Nylon Snap-in Brackets)
Panel Thickness:
.040 min. - .250 max.
Switch should be mounted at 90˚ for maximum water shedding
(45˚ to 90˚ acceptable)



* Angled corners are suggested for optimum fit.
Standard rectangular cutout is acceptable.

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

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S-Series
ROCKER SWITCHES

S-Series rocker switches are designed for use in the enclosed cabs of today's trucks, with special focus afforded to the vehicle operator. With features including abbreviated travel ½ throw actuation, ergonomic rockers, illumination in up to three detent switch positions, and a non-teasable snap action circuit, these switches provide the driver with easily recognizable and simple to operate controls. Designers will appreciate the 10A, 28VDC rating, space saving compact envelope, clean bezel-less design, integrated low insertion force connector and polarized switch base for quick installation. Most any illumination and switch circuitry is easily accommodated with the S-Series 10 terminal base.

Product Highlights:
- Abbreviated travel ½ throw actuation
- Ergonomic rockers
- Recognizable and simple to operate controls
- Compact Design

Typical Applications:
- On-Highway Transportation Equipment
- Agricultural Equipment
- Construction Equipment

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Electrical

Contact Rating	10A@ 28VDC
Dielectric Strength	1500 Volts RMS between pole to pole
Insulation Resistance	50 Megaohms
Contact Resistance	10 milliohms max. @ 4VDC
Contact Bounce	<20 milliseconds
Life	100,000 cycles maintained circuit,50,000 cycles momentary circuit at rated voltage and current gold plated
Circuitry	SP, DP 2 & 3 position, 1/2 or full throw
Terminals	.110 Tabs, Silver Plated Brass

Mechanical

Endurance	250,000 cycles minimum

Physical

Lighted	LED - rated 100,000 hours 1/2 life (LED is internally ballasted for voltages to 24VDC.)
Bracket	Acetal
Base	Nylon 66 GF
Rocker	Polycarbonate
Weight	25 gms max.

Connector

Amp/Tyco MCP 2.8 receptacle housing P/N 1418994-1 mates with Amp/Tyco MCP 2.8 flat type receptacle. Based on wire size, choose P/N below:

1-968880-1	20-24 awg wire
1-968849-1	17-20 awg wire
1-968851-1	13.5-17 awg wire

Actuator Travel (Angular Displacement)

2 position (1/2 throw)	12°
3 position (full throw)	12° from center

Environmental

Operating Temperature	-40°C to +85°C
Vibration	Per IEC 68-2.6 test Fc and 68-2.47 Test Criteria - no noise or contact chatter below 10ms.
Cold Test	Per IEC 68-2-1 -40°C for 72 hours Test Criteria - pre & post test contact resistance.
Dry Heat Test Criteria	Per IEC 68-2-2 + 85°C for 72 hours Test Criteria - no loss of circuit during test, pre & post test contact resistance.
Handling Shock	Drop from height of 1 meter, 3 times, 4 sides. Test criteria - No loss of circuit during test, pre & post test contact resistance.
Thermal Shock	Per IEC 68-2-14, -40°C to +85°C. Test criteria - pre & post test contact resistance.

Mounting Specifications

Snap in Mount	40mm x 20mm keyed hole (see dimensional specifications for details.)

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

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S	18	A	A	R	F	0	4	–	M	Z	Z	Z	00	–	1	00	00
1 Series	2 Circuit	3 Rating	4 Illumination	5 Lamp 1	6 Lamp 2	7 Lamp 3	8 Bracket Color		9 Actuator Color	10 Legend Color 1	11 Legend Color 2	12 Legend Color 3	13 Legend 1		14 Legend Orientation	15 Legend 2	16 Legend 3

1 SERIES
S

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:
1 - - 2
3, 5 & 7.
3 - - 4
3, 5, 7 & 4, 6, 8.
5 - - 6
7 - - 8
9 - - 10

( ) - momentary

SP - single pole uses terminals

DP - double pole uses terminals

Position:		1	2	3
SP	DP	5 & 7, 6 & 8	Connected Terminals	3 & 5, 4 & 6
16	**26**	ON	OFF	ON
18	**28**	(ON)	OFF	(ON)
SPECIAL CIRCUITS				
31		(6 & 8)	4, 5, 6, 7	OFF
41	**51**	ON	OFF	NONE [1]
42	**52**	(ON)	OFF	NONE [1]
43	**53**	(ON)	3 & 5	NONE [1]
44	**54**	ON	3 & 5	NONE [1]
45	**55**	(ON)	OFF	ON
46	**56**	NONE	5 & 7	ON
47	**57**	NONE	5 & 7	(ON)
	75	(5 & 7, 3 & 6)	5 & 7, 4 & 6	(3 & 5, 4 & 6)
	98 [2]	(5 & 7, 2 & 6)	5 & 7, 4 & 6	(5 & 9, 4 & 6)

3 RATING
1 0.4VA 28VDC Resistive
A [3] 10.5mA 1.5A 28VDC, 5A 28V 50A Inrush Lamp Load
B [4] 3.5A 28VDC, 18A Inrush
C [3] 10mA 10A 28VDC
D [3] 20mA 10A 14VDC

4 ILLUMINATION

	Lamps	Illumination Type	Lamp wired to Terminals
S	NONE	INDEPENDENT	–
A	1	INDEPENDENT	1 (+) 2 (–)
C	1	INDEPENDENT	1 (+) 2 (–)
	2	INDEPENDENT	9 (+) 2 (–)
D	1	INDEPENDENT	1 (+) 2 (–)
	2	INDEPENDENT	9 (+) 10 (–)
E	1 & 3	INDEPENDENT PARALLEL	1 (+) 2 (–)
F	1	INDEPENDENT SNAP	1 (+) 10 (–)
G	1 & 2	INDEPENDENT	1 (+) 10 (–)
		DEPENDENT	9 (+) 2 (–)
H	1 & 2	INDEPENDENT	1 (+) 2 (–)
		DEPENDENT	9 (+) 10 (–)
J	1, 2 & 3	INDEPENDENT	1 (+) 2 (–)
		DEPENDENT	5 (+) 10 (–)
		INDEPENDENT	1 (+) 2 (–)
K	1 & 2	INDEPENDENT	1 (+) 2 (–)
		INDEPENDENT	9 (+) 10 (–)
		3.3K RESISTOR IN PARALLEL	

5,6,7 LAMP (SAME CODING FOR ALL 3 SELECTIONS)
Selection 5: specifies lamp 1 located above terminals 1 (+) & 2 (-).
Selection 6: specifies lamp 2 located in center of rocker.
Selection 7: specifies lamp 3 located above terminals 9 (+) & 10 (-).

No lamp	**0**				
LED	Red	Orange	Yellow	Green	
12VDC	**A**	**C**	**E**	**H**	
24VDC	**B**	**D**	**F**	**J**	

8 BRACKET COLOR
1 Black
4 Dark Carbon

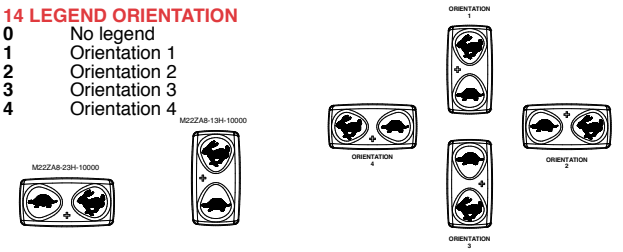
9 ACTUATOR

	Black	Titan Gray	Dark Carbon
Standard Rocker, Laser Etched	**M**	**N**	**R**

10, 11, 12 LEGEND COLOR
Z No Legend
1 Clear

13 LEGEND 1 [5]
00 No Legend

14 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



15,16 LEGEND 2,3 [6]
00 No legend

Notes:
1 Indicates 1/2 travel for actuator.
2 Snap-Action Contact Mechanism
3 Not available with circuit 98.
4 Available with circuit 98 only.
5 Located over T1-2.
6 Legend 2 located in center of rocker, Legend 3 located over T9-10. Legend 2 options are limited due to a very small marking area. Consult factory for specifics.

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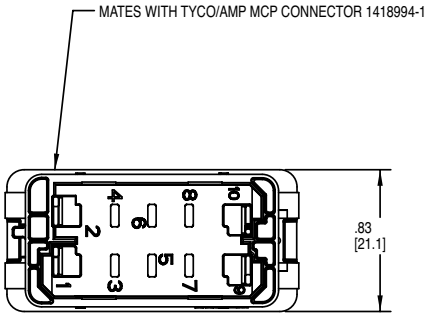
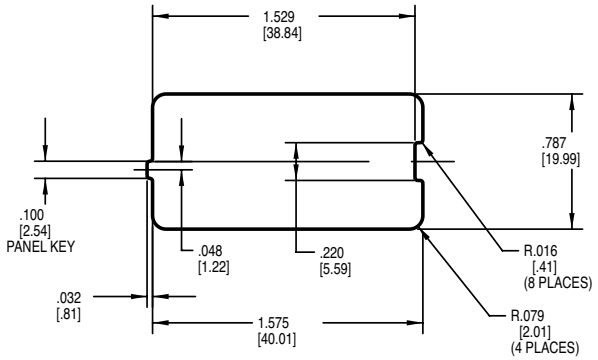
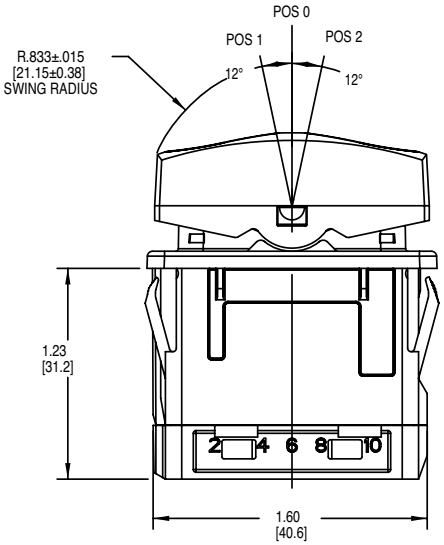
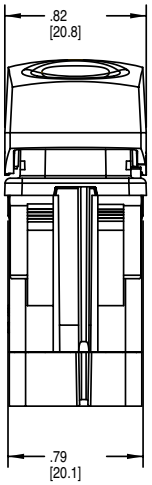
Dimensional Specifications: in. [mm]

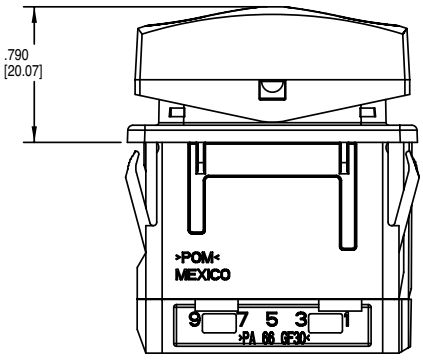




PANEL THICKNESS: 2.5±0.1mm
PANEL OPENING CLEARANCE: ±5°
SCALE 2.000







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MID-SIZED ROCKERS

Carling's Mid-sized Rocker Switches range from 5 to 20 amp illuminated and non-illuminated, one and two poles, with many styles of solid colored, translucent rockers. Illumination options include LED, neon, and incandescent lamps.

SELECTOR GUIDE

T / LTA / TG / LTG / TLG / TTG	RR / LRR	R / LRA / RSC / RG / LRG	
1, 2	1	1, 2	**Poles**
up to 20A 125VAC 10A 250VAC	up to 12A 125VAC 10A 250VAC	up to 20A 125VAC 15A 250VAC	**Ratings**
rocker, lever, paddle, plunger, toggle (bat)	rocker	rocker, paddle	**Actuator**
.550" x 1.125" [13.97mm x 28.57mm] 1.00" x 1.125" [25.4mm x 28.57mm] snap-in mount	.795" [20.2mm] round snap-in mount	.480" x 1.072" [12.19mm x 27.23mm] .866" x 1.182" [22mm x 30mm] snap-in mount	**Mounting Hole Specifications**
.187 tab solder lug .250 tabs wire leads	.187 tab	solder lug .250 tabs wire leads PC terms	**Termination**
incandescent, neon	incandescent, neon	incandescent, neon	**Illumination**
UL, CSA	UL, cUL	UL, CSA, VDE	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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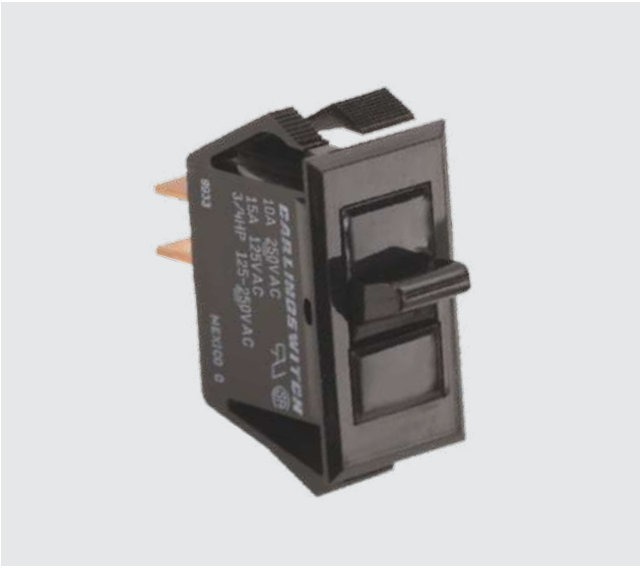
T-Series

SINGLE POLE ROCKER & PADDLE SWITCHES

The predecessor to the Curvette series whose versatility has allowed it to stand the test of time. Traditional styling coupled with self cleaning contacts, integrated wire leads, a multitude of circuits, ratings, and actuator choices has made the TA/LTA-Series appeal to a wide range of markets.



Product Highlights:

- Ratings Up To 20A
- Rocker, Paddle, Plunger or Door Interlock Actuators
- Integrated Wire Lead Construction
- Self-Cleaning Wiping Style Contacts

Typical Applications:

- Appliance
- HVAC
- Food Service
- Transportation

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Dielectric Strength
UL/CSA:
1000V - live to dead metal parts

Electrical Life
100,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

TA201 - T B - B

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bezel Color/Style

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [4] / TERMINATION

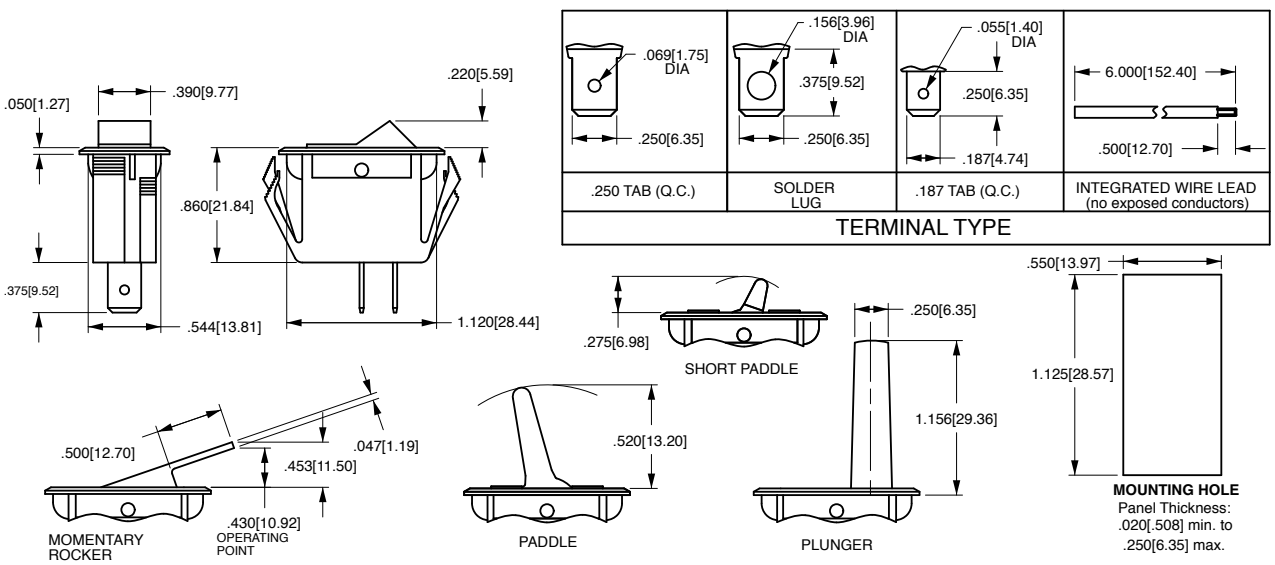
	Solder Lugs	.250 Tabs	Wire Leads
10A 250 VAC, 15A 125 VAC, 3/4 HP 125-250 VAC			
Standard Base			
ON-NONE-OFF	**TA200**	**TA201**	**TA205**
ON-NONE-ON	**TB200**	**TB201**	**TB205**
ON-OFF-ON	**TC200**	**TC201**	**TC205**
5A 250 VAC, 10A 125 VAC, 1/2 HP 125-250 VAC			
(ON)-NONE-OFF	**TA10A**	**TA10B**	**TA10F**
ON-NONE-(OFF)	**TA10L**	**TA10M**	**TA10T**
ON-NONE-(ON)	**TB10A**	**TB10B**	**TB10F**
T-SERIES WITH PLUNGER ACTUATOR[1,2]			
10A 250 VAC, 16A 125 VAC, 1/2 HP 125-250 VAC			
OFF-NONE-(ON)	-	**TA25B-PLB-B**	**TA25F-PLB-B**
ON-NONE-(OFF)	-	-	**TA25T-PLB-B**
T SERIES WITH MOMENTARY ROCKER ACTUATOR			
10A 250 VAC, 15A 125 VAC, 20A 125-250 VAC "H", 3/4 HP 125-250 VAC			
(ON)-NONE-OFF	-	**TA22B-TLB-B**	-
ON-NONE-(OFF)	-	**TA22M-TLB-B**	-

2 ACTUATOR STYLE
T Rocker
P Paddle
PS Short Paddle

3 ACTUATOR COLOR [5]
B Black
W White

4 BEZEL COLOR [5]
B Black
W White

Notes:
Imprinting is available. Consult factory.
1 Optional plunger support option is available for applications requiring extensive lateral travel, consult factory for details.
2 Maintained circuit not available with TA22 and TA25 Series.
3 .187 tab terminals also available. Consult factory for catalog number callout.
4 Additional ratings are available. Consult factory.
5 Additional colors are available. Consult factory.
( ) Indicates momentary function.



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

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LTA-Series

SINGLE POLE LIGHTED ROCKER SWITCHES

The illuminated predecessor to the Curvette series whose versatility has allowed it to stand the test of time. Traditional styling coupled with self cleaning contacts, integrated wire leads, and various actuator choices has made the LTA-Series appeal to a wide range of markets.

Product Highlights:

- Neon or Incandescent Illumination
- Long Paddle, Short Paddle or Rocker Actuators
- Good for 125/250VAC or Low Voltage DC Applications
- Integrated Wire Lead Construction

Typical Applications:

- Appliance
- HVAC
- Food Service
- Transportation

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Dielectric Strength

UL/CSA:
1000V - live to dead metal parts
750V - across open contacts

Electrical Life

100,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

LTA201 - P R - B -A / 125N

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bezel Color/Style | 5 Lens Color | 6 Lamp Voltage

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [1] / TERMINATION

10A 250VAC; 15A 125VAC; 3/4 HP 125-250VAC

	Solder Lugs	.250 Tabs	.187 Tabs	Wire Leads
OFF-NONE-ON	**LTA200**	**LTA201**	**LTA203**	**LTA205**

2 ACTUATOR STYLE [3]

T	Rocker	**PS**	Short Paddle
P	Paddle		

3 ACTUATOR COLOR [1]

A	Amber	**B**	Black [4]
C	Clear	**W**	White [4]
R	Red		
G	Green [2]		

4 BEZEL COLOR [1]

B	Black	**W**	White

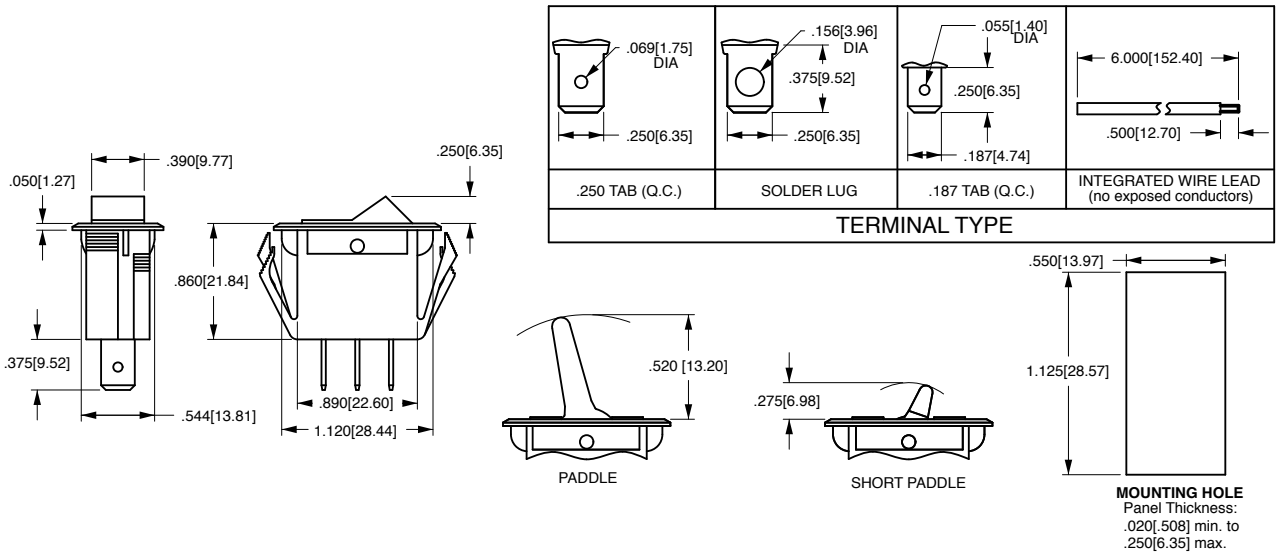
5 LENS COLOR [2,3]

Blank	No Lens	**-G**	Green
-A	Amber	**-R**	Red
-C	Clear	**-LU**	Blue

6 LAMP VOLTAGE [2]

006V	6V incandescent	**024V**	24V incandescent
012V	12V incandescent	**125N**	125V neon
018V	18V incandescent	**250N**	250V neon

Notes:
1 Additional ratings and colors are available. Consult factory for details.
2 Neon lamps not recommended with green or blue rocker/lenses.
3 Lens color is specified only if actuator style is P or PS. If style is T (rocker), then leave position 5 blank.
4 Available with paddle ("P & PS") style actuators only.



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TG/LTG-Series

ROCKER SWITCHES

The TG-Series Mid-Sized Tippette rocker switches are single or double pole and feature an all nylon double-insulated construction. These switches are designed with snap-in mounting for fast, low cost assembly. The illuminated version (LTG) is available with either a paddle or rocker actuator. These AC rated switches are also suitable for low-voltage DC applications assuring compatibility for a wide range of markets.

Product Highlights:

- Single or Double Pole
- Gloss Finish Surfaces
- Illuminated or Non-Illuminated
- 20 Available Circuit Options

Typical Applications:

- Appliance
- HVAC
- Food Service
- Transportation

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Dielectric Strength
UL/CSA:
1000V - live to dead metal parts

Electrical Life
50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

LTG	G	O	50	1	-	T	B	-	B	-	R	/	125
1 Base Part Number	2 Circuit	3 Center Position	4 Rating	5 Termination		6 Actuator Style	7 Actuator Color		8 Base Color		9 Lens Color		10 Lamp Voltage

1 BASE PART NUMBER: SERIES
TG Double Pole, Non-Lighted
LTG Double Pole with Indicator Lights

2 CIRCUIT [1]
See Circuit Designation Chart

3 CENTER POSITION
C Center OFF, Three position
O No Center OFF, Two position

4 RATING
40 5A 250VAC, 10A 125VAC, 1/2HP 125-250VAC
41 5A 250VAC, 10A 125VAC
50 10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC
51 10A 250VAC, 15A 125VAC

5 TERMINATION / FUNCTION

	Solder Lug	.250 Tab QC	.187 Tab QC	Wire Leads
On-None-Off	**0**	**1**	**3**	**5**
(On)-None-Off	**A**	**B**	**D**	**F**
On-None-(Off)	**L**	**M**	**R**	**T**
On-None-On	**0**	**1**	**3**	**5**
On-None-(On)	**A**	**B**	**D**	**F**
On-Off-On	**0**	**1**	**3**	**5**

6 ACTUATOR STYLE
P Paddle **T** Rocker

7 ACTUATOR COLOR [2]
B Black **W** White

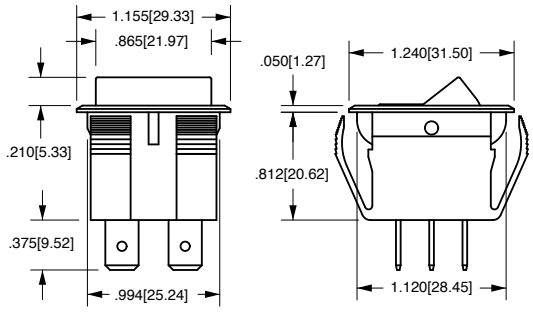
8 BASE COLOR [2]
B Black **W** White

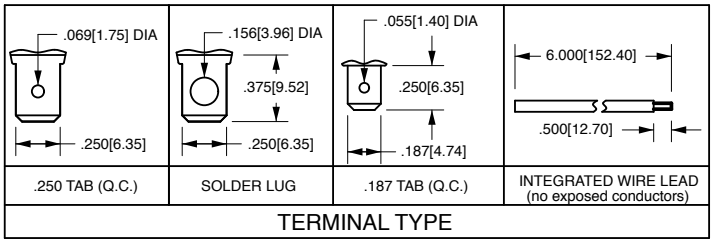
9 LENS COLOR [3]
A Amber **C** Clear **R** Red

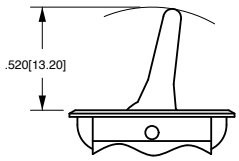
10 LAMP VOLTAGE

incandescent		*neon*	
6V	6 volt	**125N**	125 volt neon
12V	12 volt	**250N**	250 volt neon
18V	18 volt		
24V	24 volt		
28V	28 volt		

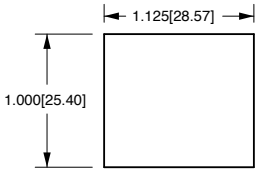
Notes:
Imprinting is available. Consult factory.
Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
1 TG available with circuits A, B, C, D, E, F ; LTG available with circuits G, H, I, J, M, N, P, Q, R, T, U, V, Y, Z.
2 Custom colors are available. Consult factory.
3 Specify lens color for LTG-Series only.
( ) Indicates momentary function.







PADDLE



MOUNTING HOLE
Panel Thickness:
.030[.762] min. to
.250[6.35] max.

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TTG-Series
ROCKER SWITCHES

The TTG-Series Mid-Sized Tippette snap-in rocker switches consist of two single pole illuminated or non-illuminated switches in a common base. Each pole can have the same or different switch function. These switches are AC rated up to 20 amps and are also suitable for low-voltage DC applications, in a wide range of markets.

Product Highlights:
- Independent or Dependent Illumination
- Ratings up to 20 Amps
- Diamond or Long Line Lens Options
- Self-Cleaning Wiping Style Contacts

Typical Applications:
- Appliance
- HVAC
- Food Service
- Transportation

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Dielectric Strength

UL/CSA:
1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

TTG	T	-	TA	20	1	-	T	B	-	B			
			LTA	20	1	-	P	B	-	B	R	/	125N
1 Base Part Number	2 Circuit		3 Center Position	4 Rating	5 Termination		6 Actuator Style	7 Actuator Color		8 Base Color	9 Lens Color		10 Lamp Voltage

1 BASE PART NUMBER: SERIES
TTG Two Single Pole switches in one base

2 CIRCUIT [1]
See Circuit Designation Chart

3 BASIC SWITCH NUMBER

TA	On-None-Off	**TC**	On-Off-On
TB	On-None-On	**LTA**	On-None-Off, Lighted

4 RATING

10	5A 250VAC, 10A 125VAC, 1/2HP 125-250VAC
11	5A 250VAC, 10A 125VAC, 5A 125VAC L
20	10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC
21	10A 250VAC, 15A 125VAC
22	10A 250VAC, 15A 125VAC, 20A 125-250VAC H, 3/4HP 125-250VAC

5 TERMINATION / FUNCTION

	Solder Lug	.250 Tab QC	.187 Tab QC	Wire Leads
On-None-Off	**0**	**1**	**3**	**5**
(On)-None-Off	**A**	**B**	**D**	**F**
On-None-(Off)	**L**	**M**	**R**	**T**
On-None-On	**0**	**1**	**3**	**5**
On-None-(On)	**A**	**B**	**D**	**F**
On-Off-On	**0**	**1**	**3**	**5**

6 ACTUATOR STYLE

P	Paddle	**PS**	Short Paddle
		T	Rocker

7 ACTUATOR COLOR

unlighted [2]		*lighted* [3]	
B	Black	**A**	Amber
W	White	**C**	Clear
		G	Green
		LU	Blue
		R	Red

8 BASE COLOR [2]

B	Black	**W**	White

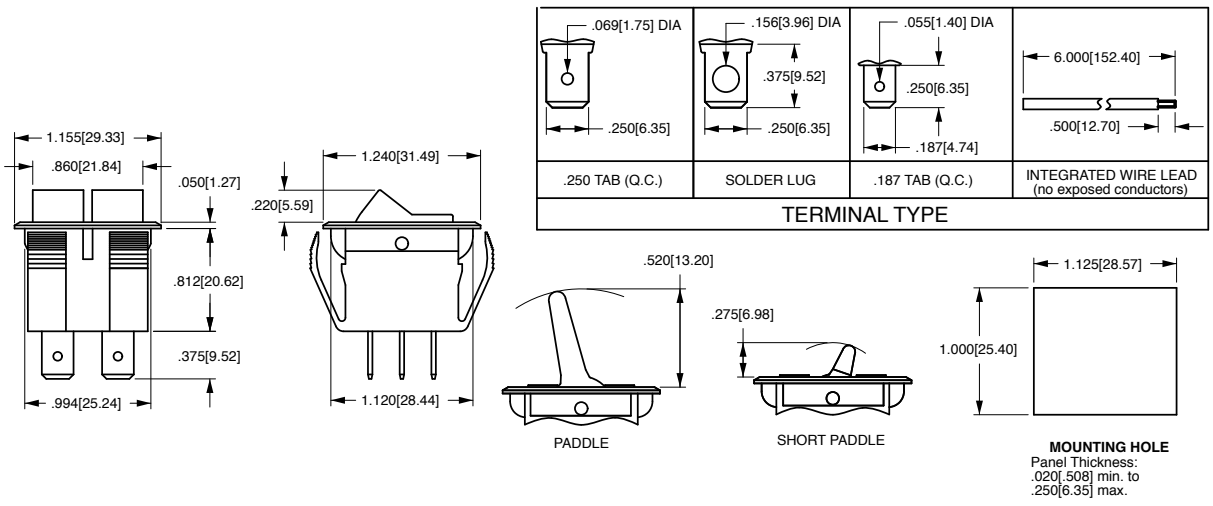
9 LENS COLOR [4]

A	Amber	**G**	Green	**R**	Red
C	Clear	**LU**	Blue	**W**	White

10 LAMP VOLTAGE

incandescent		*neon*	
6V	6 volt	**125N**	125 volt neon
12V	12 volt	**250N**	250 volt neon
18V	18 volt		
24V	24 volt		
28V	28 volt		

Notes:
Imprinting is available. Consult factory.
Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
1 TG available with circuits A, B, C, D, E, F, L, T, U G, H, I, J, M, N, P, Q, R, T, U, V, Y, Z.
2 Custom colors are available. Consult factory.
3 Specify lens color for LTA with rocker only.
4 Specify lens color for LTA with paddle actuators only.
( ) Indicates momentary function.



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TLG-Series
ROCKER SWITCHES

The TLG-Series Mid-Sized Tippette snap-in rocker switches are single pole, rocker or paddle actuated with an adjacent indicator light. These single-actuator-switches are AC rated to 20 amps and are also suitable for low voltage DC applications.

Product Highlights:
- Maintained or Momentary Circuitry
- Rocker Paddle or mixed Rocker/Paddle actuators
- Illuminated or Non-Illuminated
- Integrated wire lead construction

Typical Applications:
- Appliance
- HVAC
- Food Service
- Transportation

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Dielectric Strength

UL/CSA:
1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

TLG	G	-	D	R	-	TA	20	1	-	T	B	-	B		/	125N
1 Base Part Number	2 Circuit		3 Lens Design	4 Lens Color		5 Center Position	6 Rating	7 Termination		8 Actuator Style	9 Actuator Color		10 Base Color	11 Lens Color		12 Lamp Voltage

1 BASE PART NUMBER: SERIES
TLG Single Pole with adjacent Indicator Light

2 CIRCUIT [4]
See Circuit Designation Chart.

3 LENS DESIGN
D Diamond
L Long Line

4 LENS COLOR
A Amber
C Clear
G Green
R Red
W White

5 BASIC SWITCH NUMBER
TA On-None-Off
TB On-None-On
TC On-Off-On
LTA On-None-Off, Lighted

6 RATING
10 5A 250VAC, 10A 125VAC, 1/2HP 125-250VAC
11 5A 250VAC, 10A 125VAC, 5A 125VAC L
20 10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC
21 10A 250VAC, 15A 125VAC
22 10A 250VAC, 15A 125VAC, 20A 125-250VAC H, 3/4HP 125-250VAC

7 TERMINATION / FUNCTION

	Solder Lug	.250 Tab QC	.187 Tab QC	Wire Leads
On-None-Off	**0**	**1**	**3**	**5**
(On)-None-Off	**A**	**B**	**D**	**F**
On-None-(Off)	**L**	**M**	**R**	**T**
On-None-On	**0**	**1**	**3**	**5**
On-None-(On)	**A**	**B**	**D**	**F**
On-Off-On	**0**	**1**	**3**	**5**

8 ACTUATOR STYLE [2]
P Paddle
PS Short Paddle
T Rocker

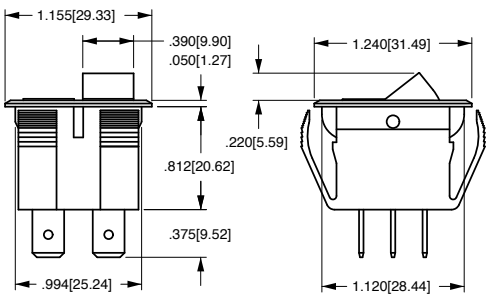
9 ACTUATOR COLOR
unlighted [2]
B Black
W White
lighted
A Amber
C Clear
G Green
LU Blue
R Red

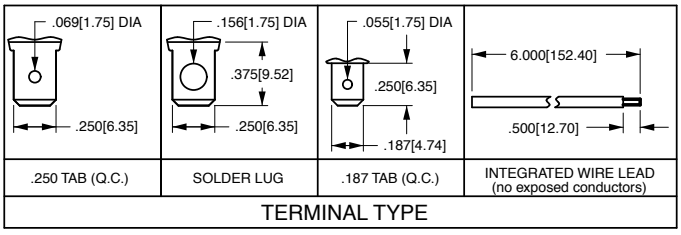
10 BASE COLOR [2]
B Black
W White

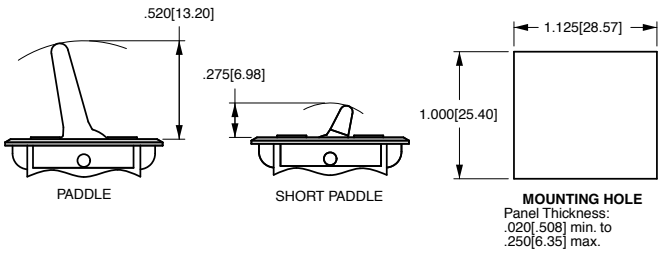
9 LENS COLOR [1,3]
A Amber
C Clear
G Green
LU Blue
R Red
W White

10 LAMP VOLTAGE [1]
incandescent
6V 6 volt
12V 12 volt
18V 18 volt
24V 24 volt
28V 28 volt
neon
125N 125 volt neon
250N 250 volt neon

Notes:
Imprinting is available. Consult factory.
Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
1 Neon Lamps not recommended with green or blue actuators and lenses.
2 Custom colors are available. Consult factory.
3 Specify lens color only if actuator is lighted paddle.
4 Available with circuits G, H, I, J, K only.
( ) Indicates momentary function.







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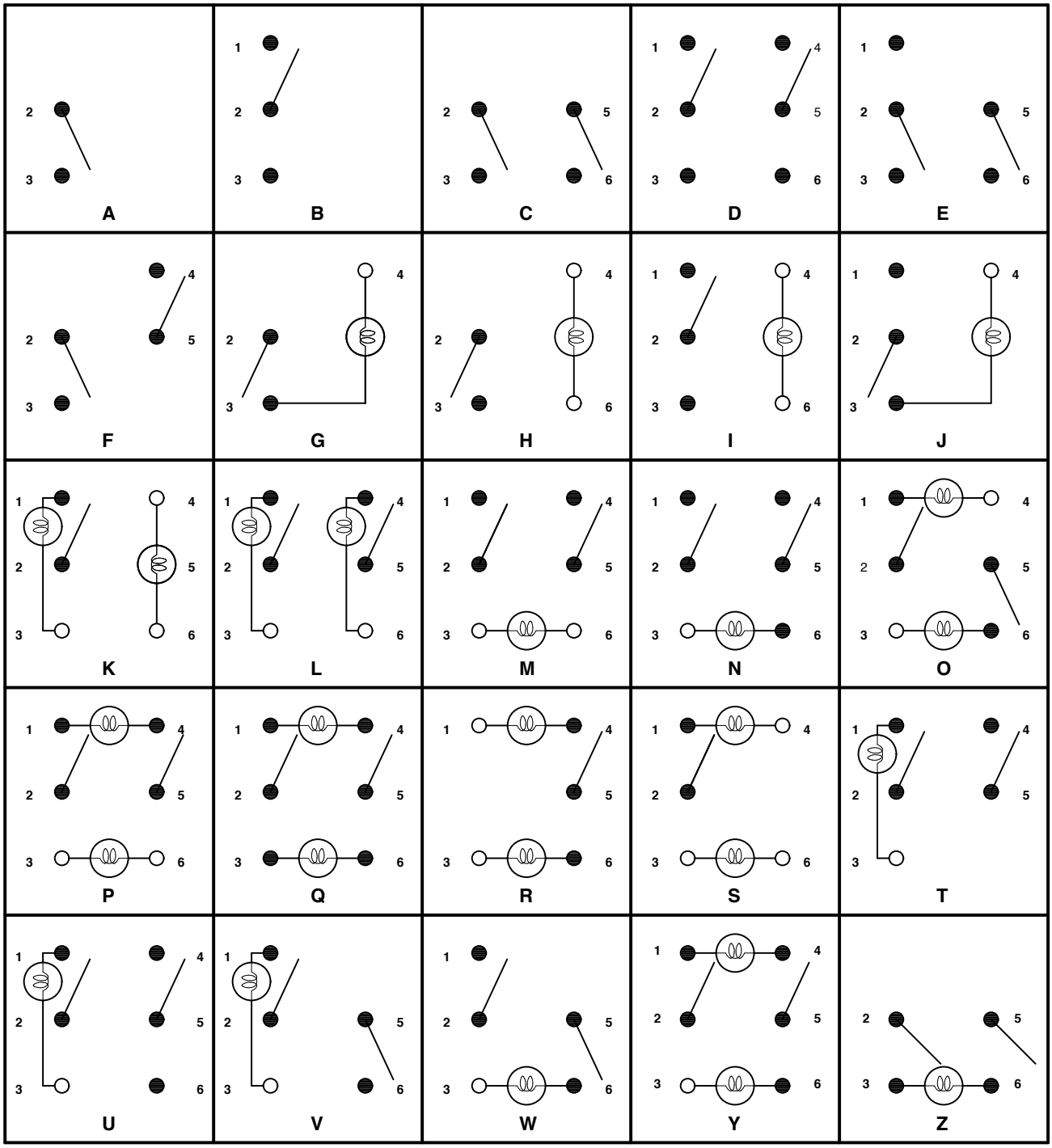
Circuit Designation Chart:



CONTACT TERMINAL
Will make contact with switching lever

CONTACT TERMINAL AND SWITCH LEVER

ISOLATED TERMINAL
Does not make contact with switching lever

BULB

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RR/LRR-Series

ROUNDED ROCKER SWITCHES

Carling Technologies' RR and LRR-Series round rocker switches feature a uniquely sculpted rocker design with electrical ratings of up to 12A 125VAC, 10A 250VAC and fit an industry standard cutout, making installation a snap. The lighted LRR-Series can be wired to accommodate dependent or independent, illumination, neon or incandescent lamps with red, green, amber or white translucent rockers. Standard or custom actuator legends are available.

Product Highlights:

- 125/250VAC or low voltage 12/24VDC
- Neon or Incandescent Illumination
- Industry Std. 20.2mm mounting hole
- Maintained or momentary circuitry

Typical Applications:

- Appliance
- Vacuum Cleaners
- Office Automation
- Food Service
- Audio Visual
- Test & Measurement

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Dielectric Strength
UL/CUL:
1000V-live to dead metal parts
& opposite polarity

Electrical Life
50,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

RR	1	1	2	-	B	B	-	N	N
1 Series	2 Circuit	3 Rating	4 Termination		5 Actuator Color	6 Base Color		7 Lamp Voltage	8 Legend

1 SERIES
RR Rocker
LRR Lighted Rocker

2 CIRCUIT
1 On-None-Off
2 (On)-None-Off
3 On-None-(Off)
4 On-None-On
5 On-None-(On)
6 On-Off-On

3 RATING
1 [1] 10A, 125-250VAC; 12A 125 VAC
1/4 HP 125-250 VAC
3 6A, 28 VDC
4 12A, 12 VDC
5 12A, 6 VDC

4 TERMINATION
2 .187 Tab

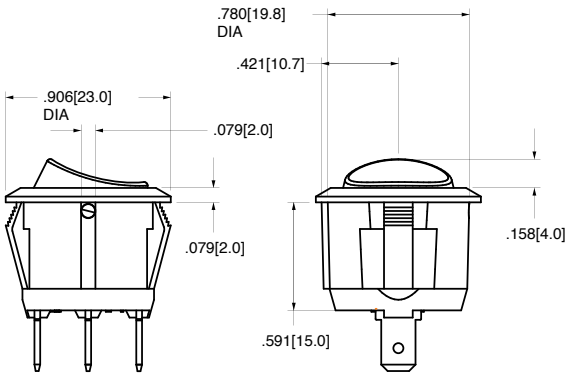
Notes:
1 Rating Code "1" has UL and cUL approval.
2 Neon Lamps (125 or 250 Volts) not recommended with green or blue actuators.

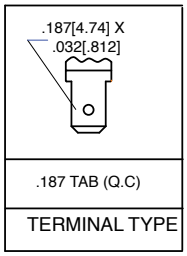
5 ACTUATOR COLOR
RR-Series (Non-Illuminated) Solid Color
B Black
W White
R Red
LRR-Series (Illuminated) Transparent Color
1 Amber
2 Red
3 Blue
4 Green
5 Clear

6 BASE COLOR
B Black
W White
R Red

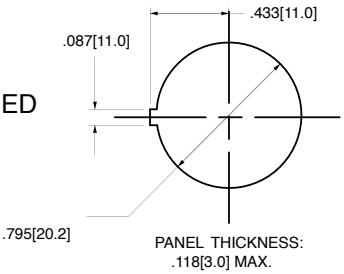
7 LAMP VOLTAGE
N None
A 6V Incandescent
B 12V Incandescent
C 28V Incandescent
J [2] 125V Neon
K [2] 250V Neon

8 ROCKER FACE LEGEND
N No imprinting
A On-Off (vertical)
B On-Off (horizontal)
D I-O (horizontal)
E I-O (vertical)
F O (on rocker end)
G II-O-I (vertical)
H II-O-I (horizontal)
J Off-On (vertical)
K Off-On (horizontal)





RECOMMENDED PANEL OPENING



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R/RSC-Series

SINGLE POLE ROCKER & PADDLE SWITCHES

Since its introduction, the Curvette switch has become the barometer for versatility and performance in the switch market. Self cleaning contacts, international approvals, along with a wide variety of circuits, ratings, and actuator options make the Curvette the switch of choice for many markets.

Product Highlights:

- Two color visi rocker to indicate “on” function
- Ratings to 20A
- Oval or rectangular bezels
- Patented mounting wings accommodate a wide range of panel openings

Typical Applications:

- Appliance
- HVAC
- Food Service
- On Highway

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Dielectric Strength

UL/CSA:
1000V - live to dead metal parts
VDE:
4000V - live to dead metal parts;
750V - across open contacts

Electrical Life

100,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

RA901	-	V	B	-	B	-	9	-	V
1 Base Part Number		*2 Actuator Style*	*3 Actuator Color*		*4 Bezel Color/Style*		*5 Rocker Legend*		*6 Visi-Rocker End/Legend Color*

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [1] / TERMINATION

10A 250 VAC; 16A 125 VAC; 3/4 HP 125-250 VAC; 10(4) A 250 VACu T85

	Solder Lugs	.250 Tabs	Wire Leads
OFF-NONE-ON	**RA900**	**RA901**	**RA905**
ON-NONE-ON	**RB900**	**RB901**	**RB905**
ON-OFF-ON [3]	**RC910**	**RC911**	**RC915**
OFF-NONE-(ON) [2]	**RD220**	**RD221**	**RD225**

15A 250 VAC; 20A 125 VAC; 3/4 HP 125-250 VAC

	Solder Lugs	.250 Tabs
OFF-NONE-ON	**RSCA200**	**RSCA201**
ON-NONE-ON	**RSCB200**	**RSCB201**

2 ACTUATOR STYLE

M	Momentary Rocker	**R**	Rocker
P	Paddle	**V**	Visi-rocker (2 color)

3 ACTUATOR COLOR

1	Black (gloss)	**B**	Black (matte)
2	White (gloss)	**W**	White (matte)

4 BEZEL COLOR / STYLE

STANDARD
B Black (matte)
W White (matte)

OVAL
1 Black (gloss)
2 White (gloss)

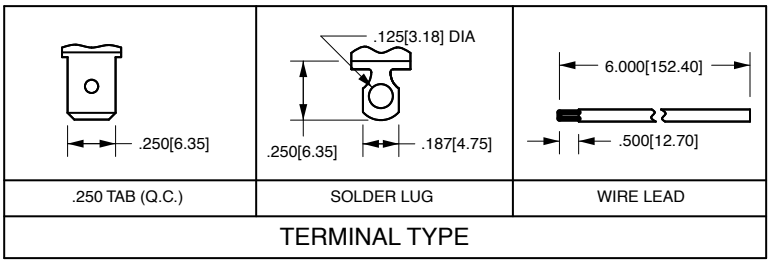
5 ROCKER LEGEND

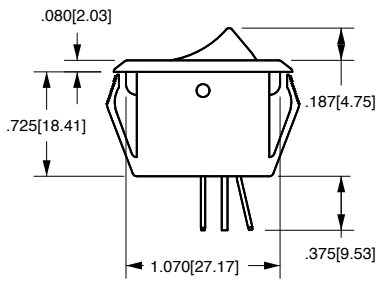
	molded in	hot stamp
NO LEGEND	**0**	**0**
Off-On vertical	**1**	**A**
Off-On horizontal	**2**	**B**
O-I horizontal	**8**	**D**
O-I vertical	**9**	**E**
dual OFF-ON/O-I	n/a	**H**

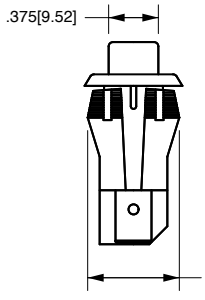
6 VISI-ROCKER END / LEGEND COLOR

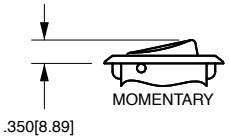
N N/A
B Black
V Visi-red
W White

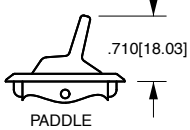
Notes:
PC Terminals also available, consult factory for details.
1 For additional ratings, consult factory.
2 Rating is 8A 250 VAC, 12A 125 VAC, 1/2 HP 125-250 VAC, and must specify M actuator style.
3 Not rated at 3/4 HP 125-250 VAC
( ) indicates momentary function.

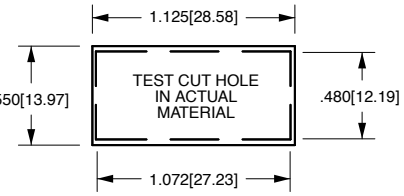












MOUNTING HOLE
Panel Thickness: .025 min - .187 max.
Specific cutout dimension range dependent on panel thickness and material. Consult factory.

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

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CURVETTE

LRA-Series

SINGLE POLE LIGHTED ROCKER & PADDLE SWITCHES

Since its introduction, the Curvette switch has become the barometer for versatility and performance in the miniature switch market. This lighted version features the very same self cleaning contacts, international approvals, along with a wide variety of circuits, ratings, and actuator options that make the Curvette the switch of choice for various applications.

Product Highlights:

- Clear or translucent style rockers
- Neon or Incandescent illumination
- Self-cleaning wiping style contacts
- UL, CSA and VDE approved

Typical Applications:

- HVAC
- Office Lighting
- Transportation
- Commercial Food
- Lawn & Garden
- Power Strip

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Dielectric Strength

UL/CSA:
1000V-live to dead metal parts
VDE:
4000V - live to dead metal parts;
750V - across open contacts

Electrical Life

100,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

LRA911 - R S - B / 250N

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bezel Color/Style | 5 Lamp Voltage

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [2] / TERMINATION

125 neon lamp (use 125N in Selection 5 Lamp Voltage)
10A 250VAC; 16A 125VAC; 10(4)A 125VACu

	Solder Lugs	.250 Tabs	Wire Leads
OFF-NONE-ON	**LRA210**	**LRA211**	**LRA215**

250 neon lamp (select 250N in selection 5 Lamp Voltage)
15A 250 VAC; 10A 250VAC; 16A 125VAC; 10(4)A 250 T85

	Solder Lugs	.250 Tabs	
OFF-NONE-ON	**LRA910**	**LRA911**	**LRA915**

Incandescent lamp (select 006V-024V in selection 5 Lamp Voltage)
10A 30V

	Solder Lugs	.250 Tabs	Wire Leads
OFF-NONE-ON	**LRA510**	**LRA511**	**LRA515**

2 ACTUATOR STYLE

P Paddle
R Rocker translucent
C Rocker Clear

3 ACTUATOR COLOR

translucent		*clear*	
A	Amber	**A**	Amber
C	White	**C**	Clear
P	Yellow	**G** [1]	Green
S	Red	**B** [1]	Blue
W	Pale Red	**R**	Red

4 BEZEL COLOR/STYLE

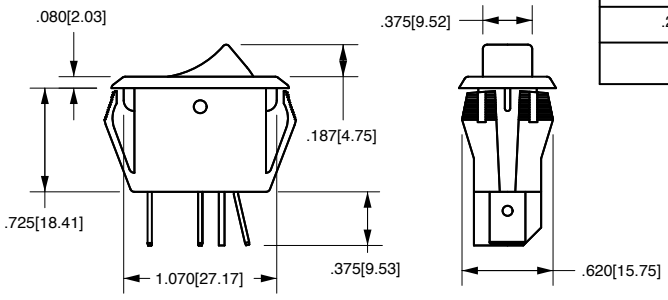
STANDARD
B Black (matte)
W White (matte)

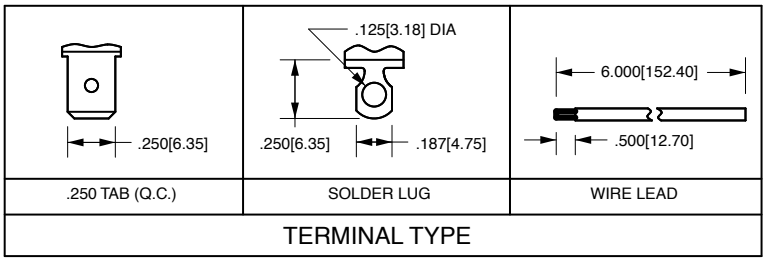
OVAL
1 Black (gloss)
2 White (gloss)

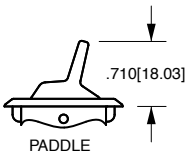
5 LAMP VOLTAGE

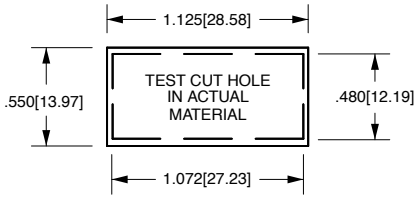
006V 6 volts incandescent
012V 12 volts incandescent
018V 18 volts incandescent
024V 24 volts incandescent
125N [1] 125 volts neon
250N [1] 250 volts neon

Notes:
LED illumination, PC terminals, independent lamps, and additional color options are available. Consult factory.
1 Neon lamps not available with blue or green actuators.
2 Consult factory for additional ratings.









MOUNTING HOLE
Panel Thickness: .025 min. - .187 max.
Specific cutout dimension range dependent on panel thickness and material.
Consult factory.

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

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RG-Series

SINGLE/DOUBLE POLE ROCKER & PADDLE SWITCHES

The double pole version of the R-Series incorporates the same sleek lines as the original Curvette, in a double pole envelope. Features include silver-plated butt-action contacts which afford ratings to 20A/125, 15A 250VAC and withstand peak inrush currents up to 100 amps. Paddle or rocker actuators and a choice of solder lug, .250 Tab and wire lead terminations enable this switch to adapt to high current applications.

Product Highlights:

- Ratings to 20A
- UL, CSA and VDE approved
- Rocker or Paddle actuators
- Fits Euro or American standard mounting holes

Typical Applications:

- Power Supply
- Appliance
- Exercise Equipment
- Music Equipment

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Dielectric Strength

UL/CSA:
1000V - live to dead metal parts & opposite polarity
VDE:
4000V - live to dead metal parts;
1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

-40°F to 185°F (-40°C to 85°C)

RGSCA901 - R - B - B - A

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bezel Color | 5 Rocker Legend

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [1] / TERMINATION

15A 250 VAC, 20A 125 VAC, 3/4 HP 125-250 VAC, 14(6)A 250 VAC

	Solder Lugs	.250 Tabs	Wire Leads
Standard Base			
OFF-NONE-ON (Single Pole)	**RGSCA900**	**RGSCA901**	**RGSCA905**
ON-NONE-ON (Single Pole)	**RGSCB900**	**RGSCB901**	**RGSCB905**
OFF-NONE-ON (Double Pole)	**RGSCC900**	**RGSCC901**	**RGSCC905**
ON-NONE-ON (Double Pole)	**RGSCD900**	**RGSCD901**	**RGSCD905**
European Base (22 x 30 mm cutout)			
OFF-NONE-ON (Single Pole)	**RGSEA900**	**RGSEA901**	**RGSEA905**
ON-NONE-ON (Single Pole)	**RGSEB900**	**RGSEB901**	**RGSEB905**
OFF-NONE-ON (Double Pole)	**RGSEC900**	**RGSEC901**	**RGSEC905**
ON-NONE-ON (Double Pole)	**RGSED900**	**RGSED901**	**RGSED905**

2 ACTUATOR STYLE

P	Paddle	**R**	Rocker

3 ACTUATOR COLOR [1]

B	Black	**W**	White

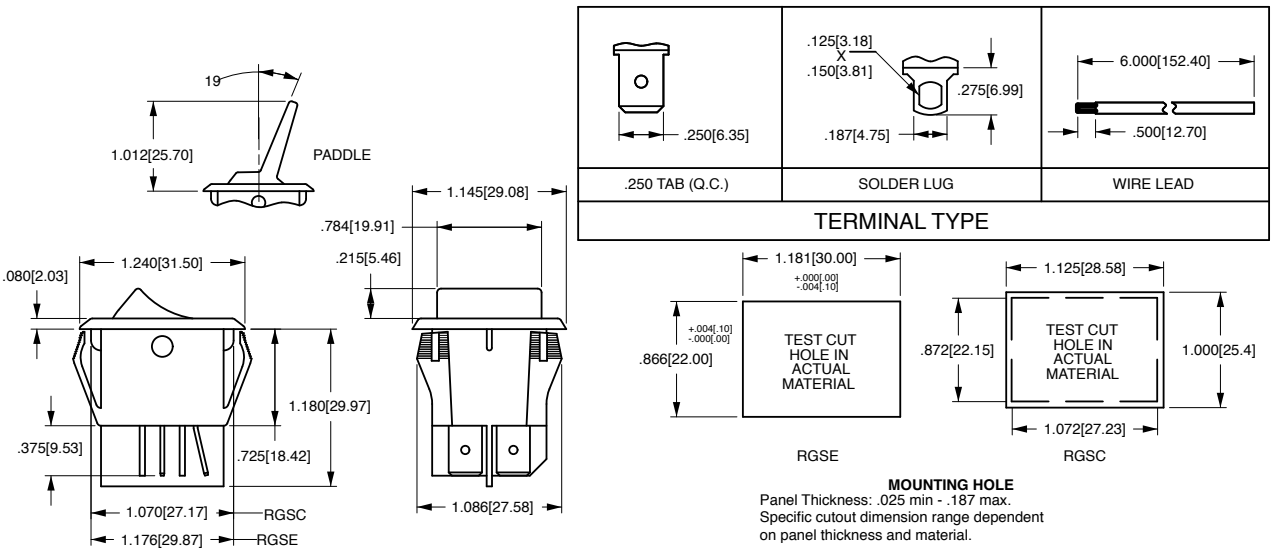
4 BEZEL COLOR [1]

B	Black	**W**	White

5 ROCKER LEGEND

	hot stamp
NO LEGEND	**0**
OFF-ON vertical	**A**
OFF-ON horizontal	**B**
O-I horizontal	**D**
O-I vertical	**E**
Dual OFF-ON, O-I vertical	**H**
Dual OFF-ON, O-I horizontal	**J**

Notes:
1 Additional ratings, colors and clear style actuators are available. Consult factory.



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

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LRG-Series

ILLUMINATED DOUBLE POLE ROCKER & PADDLE SWITCHES

The double pole lighted version of the R-Series incorporates the same sleek lines as the original Curvette, in a double pole envelope. This illuminated version features silver-plated butt-action contacts with ratings to 20A/125, 15A 250VAC and withstand peak inrush currents up to 100 amps. Clear or translucent style rocker actuators and a choice of solder lug, .250 Tab and wire lead terminations enable this switch to adapt to high current applications.

Product Highlights:

- Ratings to 20A
- Neon or Incandescent Illumination
- Silver Plated Butt-contact mechanism
- Clear or translucent style rockers

Typical Applications:

- Power Supply
- Appliance
- Exercise Equipment
- Music Equipment

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Dielectric Strength
UL/CSA:
1000V - live to dead metal parts & opposite polarity

Electrical Life
50,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
-40°F to 185°F (-40°C to 85°C)

LRGSCK611 - R S - B - B / 250N

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bezel Color | 5 Rocker Legend | 6 Lamp Voltage

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [1] / TERMINATION
15A 250 VAC, 20A 125 VAC, 3/4 HP 125-250 VAC

	Solder Lugs	.250 Tabs	Wire Leads
Standard Base			
OFF-NONE-ON	**LRGSCK610**	**LRGSCK611**	**LRGSCK615**
European Base (22 x 30 mm cutout)			
OFF-NONE-ON (Single Pole)	**LRGSEK610**	**LRGSEK611**	**LRGSEK615**
15A 6-24 V [3]			
Standard Base			
OFF-NONE-ON	**LRGSCK510**	**LRGSCK511**	**LRGSCK515**
European Base (22 x 30 mm cutout)			
OFF-NONE-ON (Single Pole)	**LRGSEK510**	**LRGSEK511**	**LRGSEK515**

2 ACTUATOR STYLE
R	Rocker (translucent)	**C**	Rocker (clear)

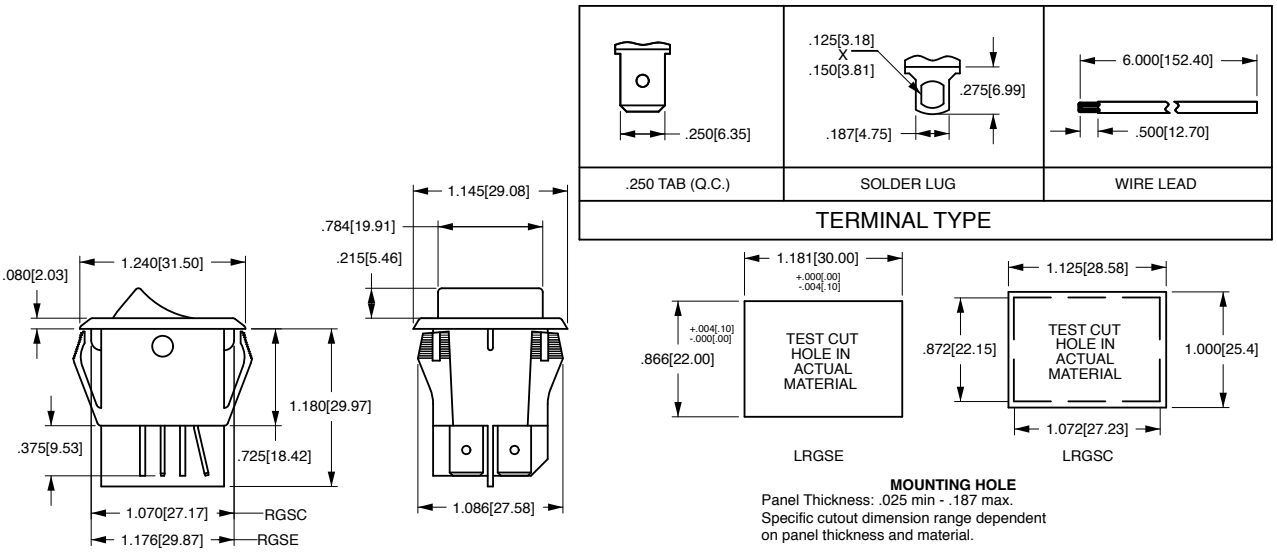
3 ACTUATOR COLOR
A	Amber	**L** [3]	Lime Green
B [3,5]	Blue	**P**	Yellow
C [4]	White/Clear	**R**	Red (clear)
G [5]	Green	**S**	Red
		W	Pale Red

4 BEZEL COLOR [1]
B	Black	**W**	White

5 ROCKER LEGEND
	hot stamp
NO LEGEND	**0**
OFF-ON vertical	**A**
OFF-ON horizontal	**B**
O-I horizontal	**D**
O-I vertical	**E**
Dual OFF-ON, O-I vertical	**H**
Dual OFF-ON, O-I horizontal	**J**

6 LAMP VOLTAGE [2]
006V	6V incandescent	**024V**	24V incandescent
012V	12V incandescent	**125N**	125V neon
018V	18V incandescent	**250N**	250V neon

Notes:
1 Additional ratings, colors and clear style actuators are available. Consult factory.
2 Incandescent lamps must specify 15A 24V rating only.
3 Available with incandescent lamps only.
4 Clear color provided where specified with clear style rocker.
5 Available with clear style rocker only.



MOUNTING HOLE
Panel Thickness: .025 min - .187 max.
Specific cutout dimension range dependent on panel thickness and material.

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

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SMALL-SIZED ROCKERS

Carling's Small-Sized Rocker Switches range from .4VA to 12 amp illuminated and non-illuminated, single and double pole, with many styles of solid colored and two-color Visi-Rockers. Illumination options include LED, neon, and incandescent lamps.

SELECTOR GUIDE

610 / 620	611 / 621	622 / 632	651 / 652	
1, 2	1, 2	1, 2	1	**Poles**
up to 8A 125VAC 4A 250VAC	up to 8A 125VAC 4A 250VAC	up to 12A 125VAC 8A 250VAC 1/2 HP 125-250VAC	up to 10A 125VAC 10A 250VAC 1/4 HP 125-250VAC	**Ratings**
rocker, paddle	rocker, paddle	rocker	rocker, paddle	**Actuator**
.508" x .756" [12.9mm x 19.2mm] snap-in mount	.508" x .756" [12.9mm x 19.2mm] snap-in mount	.508" x .756" [12.9mm x 19.2mm] snap-in mount	.508" x .756" [12.9mm x 19.2mm] snap-in mount	**Mounting Hole Specifications**
solder lug PC terms	.187 tab solder lug wire leads PC terms	.187 tab solder lug	.187 tab solder lug wire leads PC terms	**Termination**
n/a	n/a	incandescent, LED, neon	n/a	**Illumination**
UL, CSA	UL, CSA, VDE	UL, CSA	UL, CSA	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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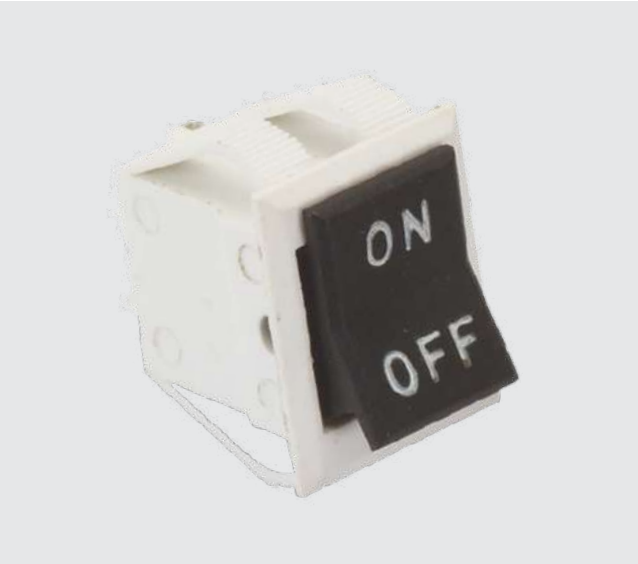
610/620-Series

SMALL-SIZED ROCKER SWITCHES

The 610/620-Series switches are double insulated and available in single or double pole configurations. These snap-in mounted switches are offered with either a paddle or rocker actuator and with ratings up to 8 amps.



Product Highlights:

- Single or double pole
- Paddle rocker actuator options
- Snap-In mounting method

Typical Applications:

- Handheld Appliance
- Audio-Visual
- Power Supplies
- Computers

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Dielectric Strength

UL/CSA:
1000V - live to dead metal parts & opposite polarity

Mechanical Life

100,000 cycles

Electrical Life

50,000 cycles- single pole
50,000 cycles- double pole

Operating Temperature

32°F to 185°F (0°C to 85°C)

62012421 - 0 - 0

1 Base Part Number | 2 Terminal Sealing | 3 Legend

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [1] / TERMINATION [1]

4A 250VAC; 8A 125VAC

	Solder Lugs	PC Term
Single Pole		
On-none-On	**62011421**	**62012422**
On-none-(On)	**62011431**	**62011432**
On-off-On	**62011461**	**62011462**
On-off-(On)	**62011471**	**62011472**
(On)-off-(On)	**62011481**	**62011482**
Double Pole		
On-none-On	**62012421**	**62012422**
On-none-(On)	**62012431**	**62012432**
On-off-On	**62012461**	**62012462**
On-off-(On)	**62012471**	**62012472**
(On)-off-(On)	**62012481**	**62012482**

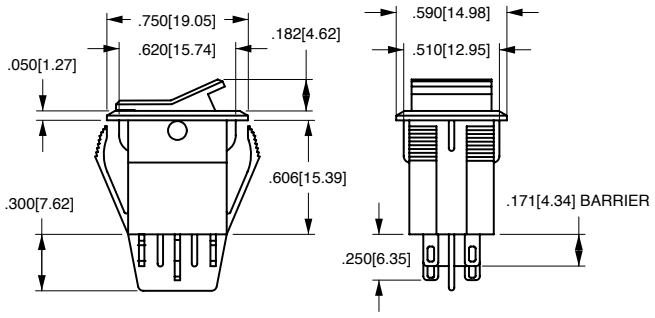
2 TERMINAL SEALING

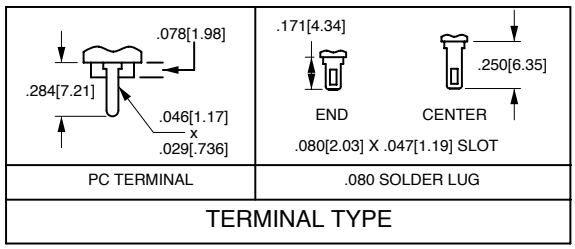
0 None
E Epoxy sealed terminals

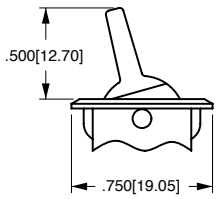
3 LEGEND

	hot stamp
NO LEGEND	**0**
On-OFF vertical	**A**
On-OFF horizontal	**B**
I-O horizontal	**D**
I-O vertical	**G**

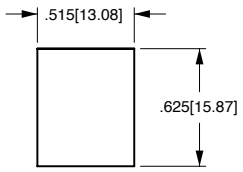
Notes:
1 Base part number specifies black rocker and bezel. To specify paddle actuator, change 2nd digit of part number from 2 to 1 (ex. 61012421) For additional ratings and colors, consult factory.
( ) indicates momentary function.







PADDLE



MOUNTING HOLE
Panel Thickness:
.030[.762] min. to
.093[2.36] max.

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

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611/621-Series

SMALL-SIZED ROCKER SWITCHES

The 611/621-Series small-size, sleek styling, actuator and termination choices make this switch a cost effective solution to most any switching need. International approvals, single or double pole circuitry, and ratings to 11A 125VAC further the broad appeal of this product family.

Product Highlights:

- Single or double pole
- Paddle and single color or dual color visi-rocker options
- UL, CSA and VDE approvals for select circuits
- Choice of 7 termination options

Typical Applications:

- Appliance
- Audio-Visual
- Power Supplies

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Dielectric Strength

UL/CSA:
1000V - live to dead metal parts & opposite polarity
VDE: 4000V - live to dead metal parts; 1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles- single pole
50,000 cycles- double pole

Operating Temperature

32°F to 185°F (0°C to 85°C)

Mechanical Life

100,000 cycles

62116919 - 0 - 9 - V

1 Base Part Number | 2 Epoxy Sealing | 3 Rocker Legend | 4 Visi-Rocker End Color

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [2] / TERMINATION

	187 Tabs [4]	.080 Solder Lugs	PC Terms	Wire Leads	PC Front Mount	PC Back Mount	.187 Solder Lugs
Single Pole; 4A 250VAC; 8A 125VAC; 6(4) A 250V [4]							
ON-NONE-OFF	**62116919**	-	-	**62111914**	**62111918** [6]	**62111917** [6]	**62111916**
ON-NONE-ON	**62116929**	**62116421**	**62111422**	**62111924**	**62111928** [6]	**62111927** [6]	**62111926**
ON-OFF-ON [3]	-	**62111461**	**62111462**	**62111263** [7]	-	-	-
ON-NONE-(ON) [3]	-	**62111431**	**62111432**	**62111233** [7]	-	-	-
ON-OFF-(ON) [3]	-	**62111471**	**62111472**	**62111273** [7]	-	-	-
(ON)-OFF-(ON) [3]	-	**62111481**	**62111482**	**62111283** [7]	-	-	-
Double Pole; 4A 250VAC; 8A 125VAC; 6(4) A 250V [4]							
ON-NONE-OFF	**62115919**	-	-	**62112914**	**62112918** [6]	**62112917** [6]	**62112916**
ON-NONE-ON	**62115929**	**62112421**	**62112422**	**62112924**	**62112928** [6]	**62112927** [6]	**62112926**
ON-OFF-ON [3]	-	**62112461**	**62112462**	**62112263** [7]	-	-	-
ON-NONE-(ON) [3]	-	**62112431**	**62112432**	**62112233** [7]	-	-	-
ON-OFF-(ON) [3]	-	**62112471**	**62112472**	**62112273** [7]	-	-	-
(ON)-OFF-(ON) [3]	-	**62112481**	**62112482**	**62112283** [7]	-	-	-

2 TERMINAL SEALING

0	None	**E**	Epoxy sealed terminals

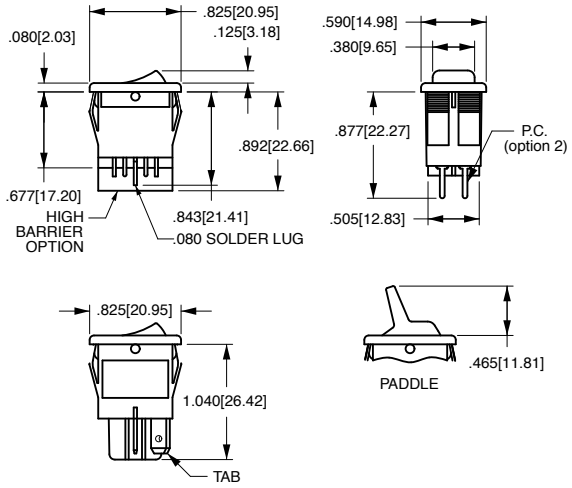
3 ROCKER LEGEND

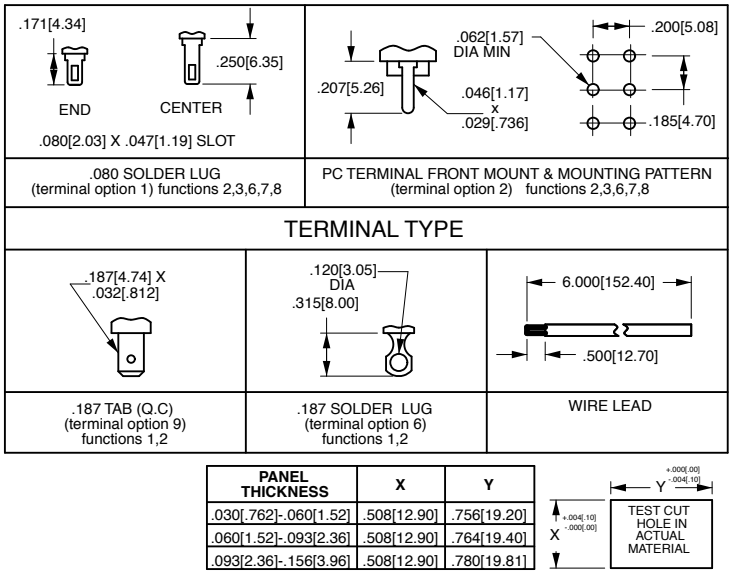
	molded in [5]	hot stamp
NO LEGEND	**0**	**0**
Off-On vertical	n/a	**A**
Off-On horizontal	n/a	**B**
I-O horizontal	**8**	**D**
I-O vertical	**9**	**E**
O on rocker radius	n/a	**F** (Indicates ON)

4 VISI-ROCKER END COLOR

N	n/a
V	visi-red
W	visi-white

Notes:
1 Base part number specifies black rocker with black bezel. To specify paddle actuator change 2nd digit from 2 to 1. ex.: 61115919 = black paddle with black bezel. For additional ratings & colors, consult factory.
2 Dry circuit rating is available, consult factory.
3 Not available with 6(4) A 250 V rating or VDE approval.
4 6(4)A 250V VDE approved rating available with On-none-Off and On-none-On circuits only.
5 Available with visi-rocker option only.
6 Consult factory for PC footprint.
7 Rated 2A 250VAC, 5A 125 VAC resistive.
( ) Indicates momentary function.





PANEL THICKNESS	X	Y
.030[.762]-.060[1.52]	.508[12.90]	.756[19.20]
.060[1.52]-.093[2.36]	.508[12.90]	.764[19.40]
.093[2.36]-.156[3.96]	.508[12.90]	.780[19.81]

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

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

622/632-Series

SMALL-SIZED ROCKER SWITCHES

A high powered offering packed into a small-sized envelope, the 622/632-Series is a staple of numerous markets. With its silver-alloy butt contacts, the 622/632 will handle inrush spikes up to 100 amps and steady state current to 12A 125VAC. The lighted 632-Series features a multitude of illumination circuit options available with LED, incandescent and neon style lamps.

Product Highlights:

- Illuminated or Non-Illuminated
- Silver Plated Butt contacts that handle high Inrush spikes
- Independent or Dependent lamp circuitry
- Industry standard size mounting hole

Typical Applications:

- Appliance
- Food Service
- Transportation
- General Purpose

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Dielectric Strength

UL/CSA:
1000V-live to dead metal parts
& opposite polarity

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

632121	-	1	B	-	K	N
1 Base Part Number		*2 Actuator Color*	*3 Base Color*		*4 Lamp*	*5 Legend*

BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION

8A 250VAC; 12A 125VAC; 1/2 HP 125-250VAC
622-SERIES NON-ILLUMINATED ROCKER

	Solder Lugs	.187 Tabs
ON-none-OFF (Single Pole)	**622121**	**622122**
ON-none-OFF (Double Pole)	**622221**	**622222**
632-SERIES ILLUMINATED ROCKER		
ON-none-OFF (Single Pole, dependent lamp) schematic 1	**632121**	**632122**
ON-none-OFF (Single Pole, independent lamp) schematic 3	**632321**	**632322**
ON-none-OFF (Single Pole, independent lamp unballasted) schematic 5	**632521**	**632522**
ON-none-OFF (Double Pole, dependent lamp with 5 terms.) schematic 2	**632221**	**632222**
ON-none-OFF (Double Pole, dependent lamp with 4 terms.) schematic 4	**632421**	**632422**

2 ACTUATOR COLOR [3]

622 (non illuminated)		***632 (illuminated)***	
B	Black	**1**	Clear Amber
W	White	**2**	Clear Red
		3	Clear Blue [2]
		4	Clear Green
		5	Clear

3 BASE COLOR [3]

B	Black	**W**	White

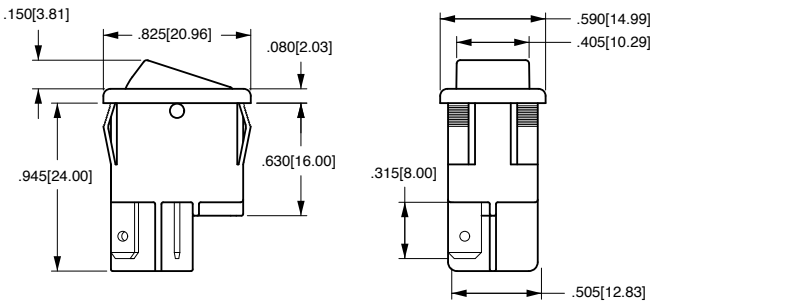
4 LAMP VOLTAGE / STYLE [1]

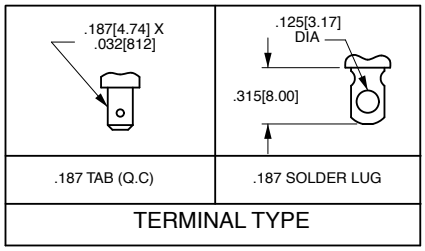
N	622 (non illuminated)	**A**	6V incandescent
1	unballasted LED	**C**	12V incandescent
2	6V LED	**E**	18V incandescent
3	12V LED	**H**	24V incandescent
4	24V LED	**J**	125V neon
		K	250V neon

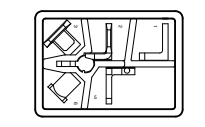
5 ROCKER LEGEND

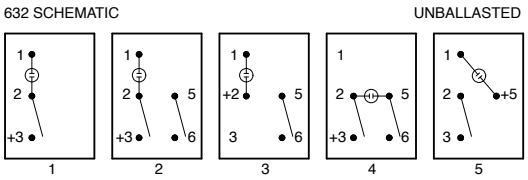
N	NO Legend
A	OFF-ON vertical
B	OFF-ON horizontal
D	I-O horizontal
E	I-O vertical
F	O on rocker radius

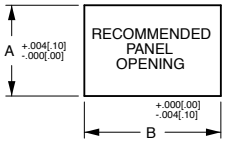
Notes:
1 For all incandescent or LED lamps specify 5 in 5th digit of part number. Example 632151-1B-CN
2 Available with incandescent lamps only.
3 Additional colors available. Consult factory for details.






BOTTOM VIEW OF TERMINAL ARRANGEMENT





PANEL THICKNESS	A	B
.030[.76]-.050[1.27]	.508[12.90]	.756[19.20]
.050[1.27]-.078[1.98]	.508[12.90]	.764[19.40]
.078[1.98]-.125[3.17]	.508[12.90]	.780[19.81]

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

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651/652-Series

SMALL-SIZED ROCKER SWITCHES

This switch is ideal for applications with back panel size constraints. It fits in a standard rectangular cutout and is designed to provide ease of insertion along with superior panel retention qualities. A high profile rocker and butt-action contacts provide the user with a crisp positive-type feel and electrical ratings to 12A 125VAC 10A 250VAC. A variety of ratings, circuitry and termination choices will appeal to many market segments.

Product Highlights:

- Ratings to 12A 125VAC, 6A 250VAC
- Suitable for low voltage 12/24V DC
- Solid or 2 color visi-rocker options
- 5 choices of termination

Typical Applications:

- Handheld Appliance
- Audio-Visual
- Power Supplies

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Dielectric Strength

UL/CSA:
1000V-live to dead metal parts

Electrical Life

100,000 cycles- maintained
50,000 cycles- momentary
50,000 cycles- T-rating

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

651	122	-	B	B	-	A	N
1 Series	*2 Circuit/Rating/ Termination*		*3 Actuator Color*	*4 Base Color*		*5 Legend*	*6 Visi-Rocker End/ Legend Color*

1 SERIES

651 Matte Finish **652** Gloss Finish

2 CIRCUITRY / RATING / TERMINATION

10A 250VAC, 10A 125VAC, 1/4 HP, 125-250 VAC

	.187 Solder Lugs	.187 Tabs	PC Terms	PC Rt. Angle	Wire Leads
ON-NONE-OFF	**121**	**122**	**123**	**124**	**125**
(ON)-NONE-OFF	**261**[1]	**262**	**263**	**264**	**265**
ON-NONE-(OFF)	**361**[1]	**362**	**363**	**364**	**365**
ON-NONE-ON	**421**	**422**	**423**	**424**	**425**
ON-NONE-(ON)	**561**[1]	**562**	**563**	**564**	**565**
ON-OFF-ON	**681**[2]	**682**	**683**	**684**	**686**
ON-OFF-(ON)	**781**[2]	**782**	**783**	**784**	**785**
(ON)-OFF-(ON)	**881**[2]	**882**	**883**	**884**	**885**

3 ACTUATOR COLOR

B Black **W** White

4 BASE COLOR

B Black **W** White

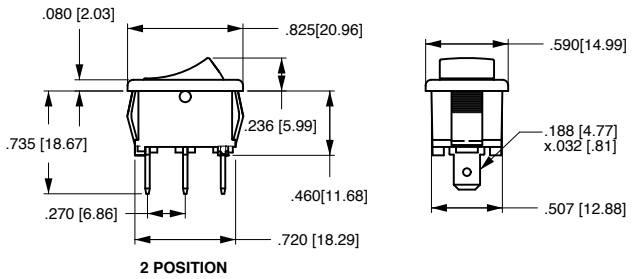
5 ROCKER LEGEND

	molded in[4]	hot stamp
NO LEGEND	**0**	**0**
Off-On vertical	**1**	**A**
Off-On horizontal	–	**B**
I-O horizontal	**8**	**D**
I-O vertical	**9**	**E**
O on rocker end	–	**F**
II-O-I vertical	–	**G**
II-O-I horizontal	–	**H**

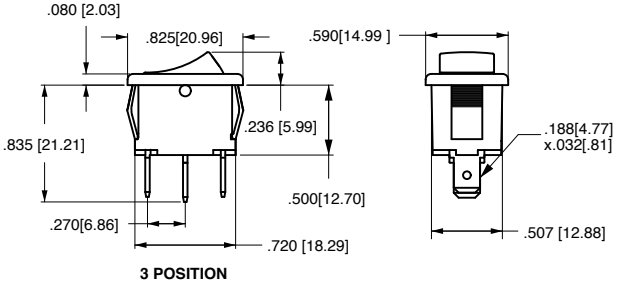
6 VISI-ROCKER END / LEGEND COLOR

N N/A
B Black
V Visi-red
W White

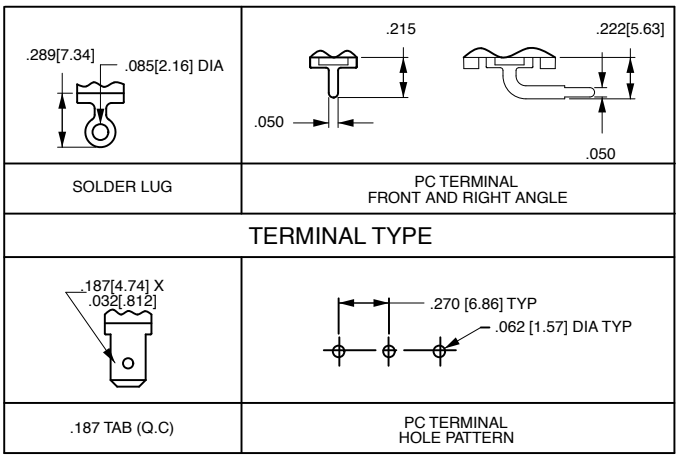
Notes:
Additional ratings (including 14V T) & color options are available; Consult factory.
1 Rated 12A 125VAC, 6A 250 VAC, 1/4HP 125-250VAC.
2 Rated 8A 125-250VAC, 1/4HP 125-250VAC.
3 Additional colors available. Consult factory for details.
4 Available with Visi-Rocker option only.
( ) Indicates momentary function.



2 POSITION

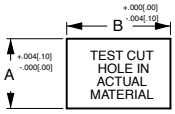


3 POSITION



RECOMMENDED PANEL OPENING

PANEL THICKNESS	A	B
.030[.76]-.050[1.27]	.508[12.90]	.756[19.20]
.050[1.27]-.078[1.98]	.508[12.90]	.764[19.40]
.078[1.98]-.125[3.17]	.508[12.90]	.780[19.81]



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

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TOGGLE SWITCHES

Carling bushing mount toggle switches range from 1 to 4 poles, 1 to 20 amps. They offer a variety of nylon and metal toggle styles, as well as illuminated toggles. Several families of heavy-duty toggle switches are available, as well as a high-temperature snap-in toggle switch series.

SELECTOR GUIDE

ST-Series	LT-Series	F / G / H / I	C / D	110-Series	DK / EK	MAAOA / 215	
1, 2	1, 2	1, 2, 3, 4	1	1, 2	1, 2	1	**Poles**
10A 250VAC 15A 125VAC 16A 12/24VDC	up to 15A 125VAC 10A 250VAC 15A 12-28VDC	up to 20A 125VAC 20A 277VAC 2 HP 250VAC	up to 20A 125VAC 10A 250VAC	up to 6A 125VAC/DC 3A 250VAC/DC	up to 20A 125VAC/DC 10A 250VAC/DC	up to 20A 125VAC 10A 250VAC 1/2HP 125-250VAC	**Ratings**
IP68, bat, paddle	paddle, toggle (bat)	paddle, toggle (bat)	paddle, toggle (bat)	toggle (bat), toggle (ball)	toggle (bat), toggle (ball)	toggle (bat)	**Actuator**
.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.656" x 1.218" [16.66mm x 30.54mm] snap-in mount	**Mounting Hole Specifications**
.250 tabs Screw Terminals with cage clamps	.187 tabs solder lug .250 tabs screw terms wire leads PC terms	.187 tabs solder lug .250 tabs screw terms wire leads PC terms	solder lug .250 tabs screw terms wire leads	solder lug .250 tabs screw terms wire leads	screw terms	.250 tabs screw terms wire leads	**Termination**
n/a	incandescent, neon	n/a	n/a	n/a	n/a	n/a	**Illumination**
UL60079-15, cUL	n/a	UL, CSA, VDE	UL, CSA	UL, CSA	UL, CSA	UL, CSA	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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ST-Series

SEALED TOGGLE SWITCHES

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, Carling Technologies® ST-Series Sealed Toggle Switch features innovative design and performance principles sure to withstand the most demanding applications.

The ST-Series features a toggle seal composed of dynamic silicone material that bonds to the metal toggle, pin, and bushing, providing ideal sealing and protection against the environment, vibration and shock, while withstanding extreme temperature variations. It also utilizes up to three terminal seals per pole and an optional o-ring assures additional under panel sealing protection. All silicone seals on the ST-Series comply with A-A-59588 for silicone rubber performance specifications and together, these features meet the international IEC 60529 standard for sealing performance to an IP68 level.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing ›

Watch Product Video

Product Highlights:

- Complies with UL 60079-15
- IEC 60529 IP68 sealing performance
- Toggle seal bonds to toggle, pin and bushing
- UL 61058-1 and cUL recognized

Typical Applications:

- Off-Highway Vehicles
- Armored / Law Enforcement Vehicles
- Commercial Food & Refrigeration Equipment
- Military Equipment
- Applications requiring stringent sealing in explosive environments

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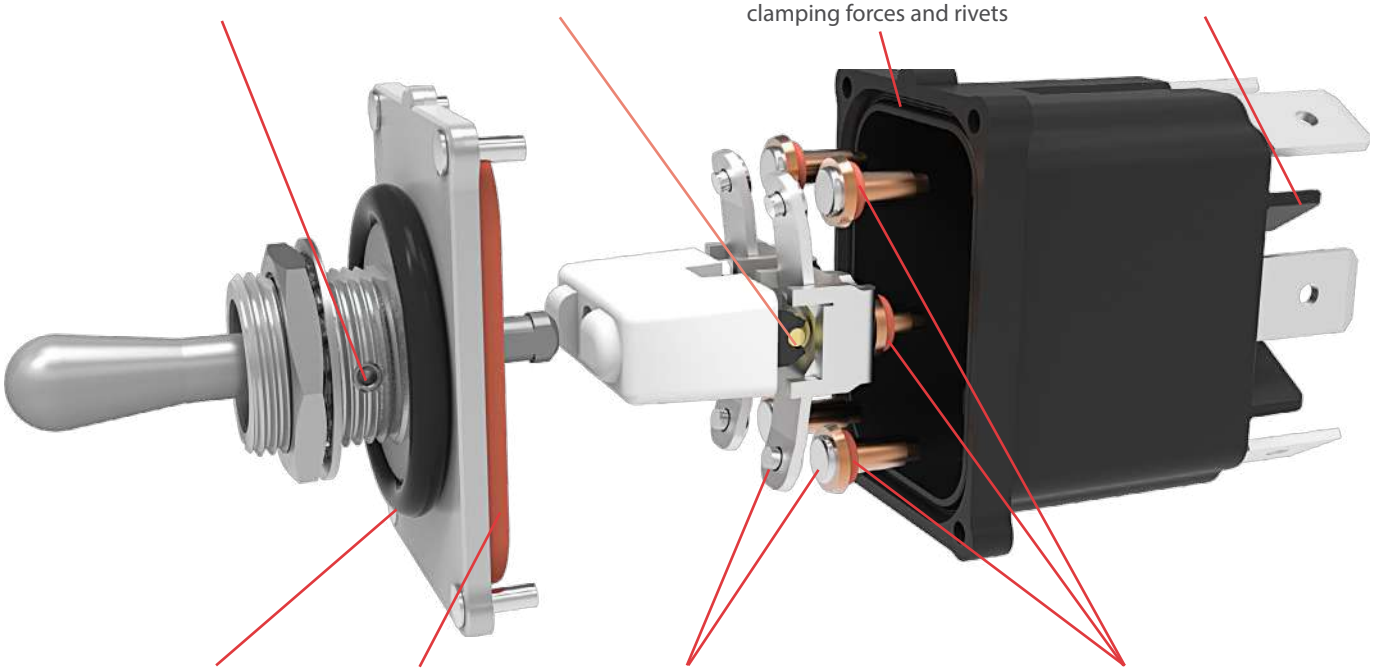
ST-Series Switch
DESIGN FEATURES

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

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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.)
Electrical Life	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.
Ignition Protection	UL-1500 Ignition-Protection Test for Marine Products
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.

Physical

Function, Operation, Circuits	Single Pole/ Double Pole with 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

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	MIL-STD-202G, Method 110 (sand and dust) IEC 60529, IP68 (dust-tight, 1 meter immersion in water for 1 hour)
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%

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.

*Manufacturer reserves the right to change product specification without prior notice.
GPS-0004 Rev: D

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ST	A	2	E	1	-	53
1 Series	*2 Circuit*	*3 Poles*	*4 Rating*	*5 Termination*		*6 Actuator Style*

1 SERIES [1]

ST Sealed Toggle

2 CIRCUIT

	2 & 3, 5 & 6 Connected 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.

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

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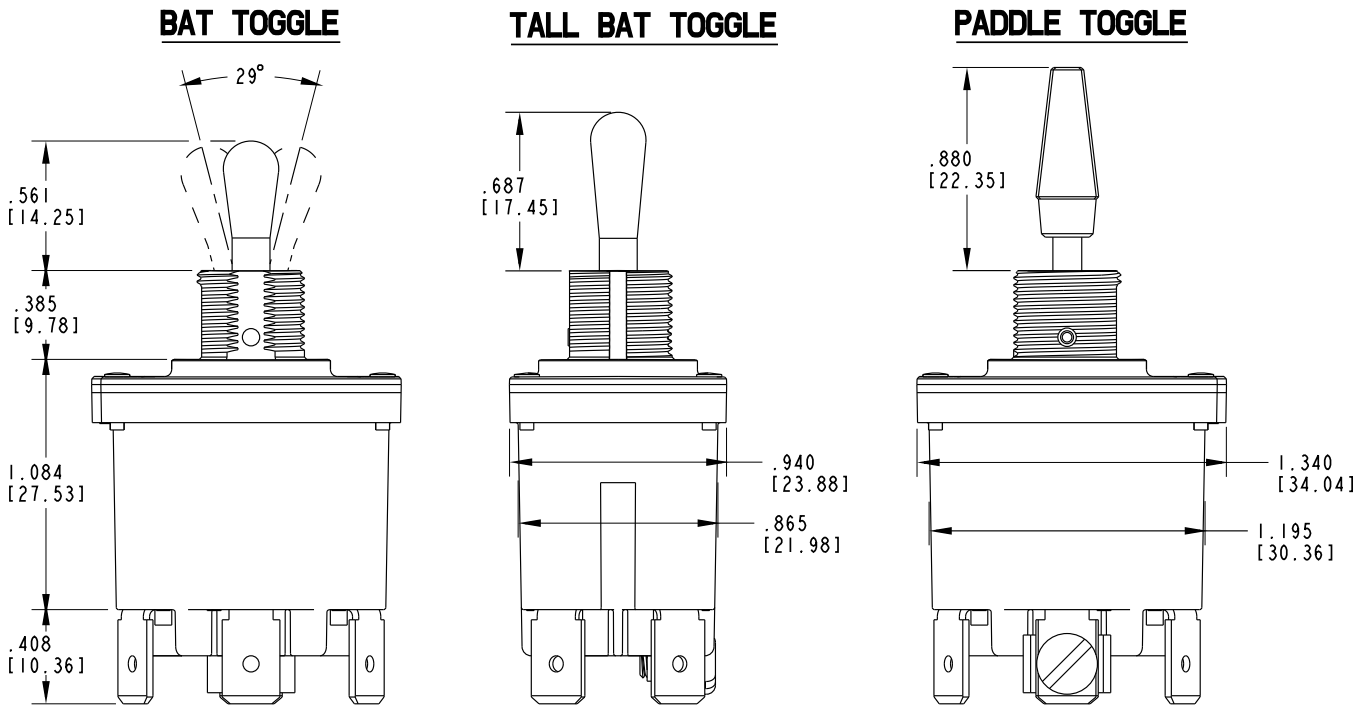
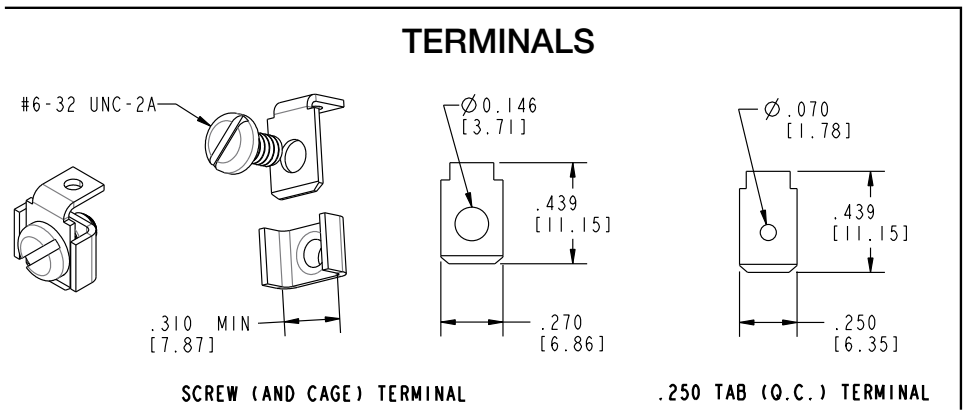
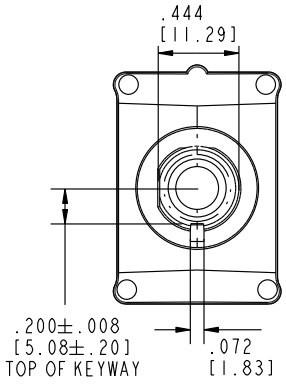
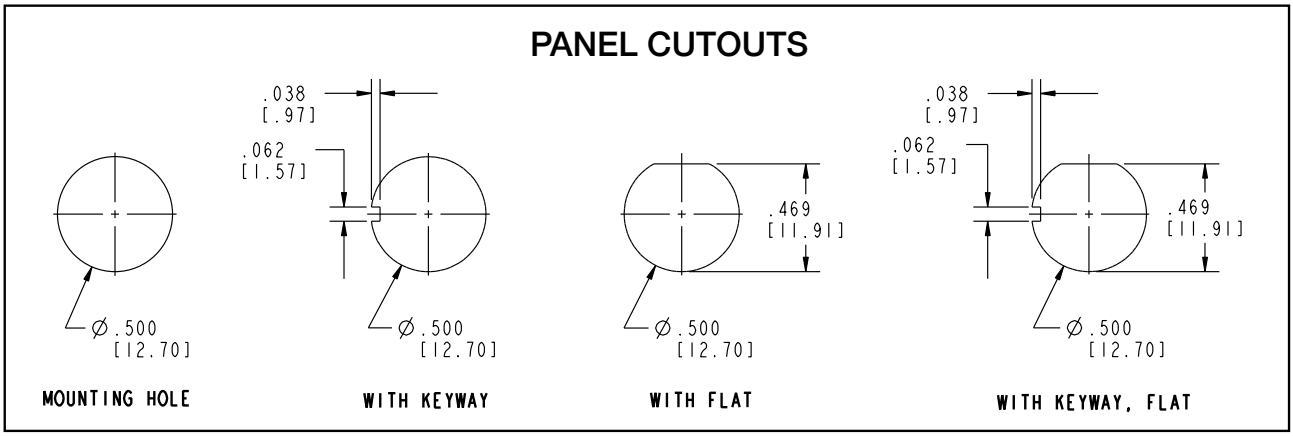
Dimensional Specifications: in. [mm]









CLA-0133 Rev: F

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LT-Series
TOGGLE SWITCHES

The LT-Series illuminated toggle switches feature up to a three-color lighting sequence from a single lamp. These lighted toggles contain neoprene bushing seals for dust and moisture protection. A variety of circuits and terminations are available.

Product Highlights:
- 1 or 2 Pole
- Independent or Dependent Illumination
- Choice of 5 Actuator Styles
- Up to 3 different colors under a single lens

Typical Applications:
- Marine
- Transportation

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Dielectric Strength
1000V - live to dead metal parts

Mechanical Life
100,000 cycles

Electrical Life
50,000 cycles - maintained
25,000 cycles - momentary

Operating Temperature
32°F to 185°F (0°C to 85°C)

LT-1561 - 1 30 - 012

1 Base Part Number | 2 Actuator Style | 3 Lighting Sequence | 4 Lamp Voltage

1 BASE PART NUMBER: SERIES / POLES / ILLUMINATION / CIRCUITRY / RATING / TERMINATION [5]

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 15A 12-28VDC

Single Pole	Solder Lug	.250 Tab QC	Screw Terms	Wire Leads
On-None-Off	**LT-1510**	**LT-1511**	**LT-1514**	**LT-1515**
On-None-(Off)	**LT-1520**	**LT-1521**	**LT-1524**	**LT-1525**
(On)-None-Off	**LT-1530**	**LT-1531**	**LT-1534**	**LT-1535**
On-None-On	**LT-1540**	**LT-1541**	**LT-1544**	**LT-1545**
On-None-(On)	**LT-1550**	**LT-1551**	**LT-1554**	**LT-1555**
On-Off-On	**LT-1560**	**LT-1561**	**LT-1564**	**LT-1565**
On-Off-(On)	**LT-1570**	**LT-1571**	**LT-1574**	**LT-1575**
(On)-Off-(On)	**LT-1580**	**LT-1581**	**LT-1584**	**LT-1585**
Double Pole	Solder Lug	.250 Tab QC	Screw Terms	Wire Leads
On-None-Off	**LT-2510**	**LT-2511**	**LT-2514**	**LT-2515**
On-None-(Off)	**LT-2520**	**LT-2521**	**LT-2524**	**LT-2525**
(On)-None-Off	**LT-2530**	**LT-2531**	**LT-2534**	**LT-2535**
On-None-On	**LT-2540**	**LT-2541**	**LT-2544**	**LT-2545**
On-None-(On)	**LT-2550**	**LT-2551**	**LT-2554**	**LT-2555**
On-Off-On	**LT-2560**	**LT-2561**	**LT-2564**	**LT-2565**
On-Off-(On)	**LT-2570**	**LT-2571**	**LT-2574**	**LT-2575**
(On)-Off-(On)	**LT-2580**	**LT-2581**	**LT-2584**	**LT-2585**

2 ACTUATOR STYLE

Paddle [1]

1	Clear Paddle
4	Solid Color Paddle

Snapkap Style [2]

5	Bright Chrome
6	Satin Chrome
7	Black Molded

3 LIGHTING SEQUENCE [3,4]

	position 1	position 2	position 3
01	red	red	red
02	amber	amber	amber
03	green	green	green
10	red	---	none
11	red	clear	red
12	red	clear	amber
13	red	clear	green
14	red	clear	blue
15	red	clear	clear
20	amber	---	none
21	amber	clear	red
22	amber	clear	amber
23	amber	clear	green
24	amber	clear	blue
25	amber	clear	clear
30	green	---	none
31	green	clear	red
32	green	clear	amber
33	green	clear	green
34	green	clear	blue
35	green	clear	clear
40	blue	---	none
41	blue	clear	red
42	blue	clear	amber
43	blue	clear	green
44	blue	clear	blue
45	blue	clear	clear
50	clear	---	none
51	clear	clear	red
52	clear	clear	amber
53	clear	clear	green
54	clear	clear	blue
55	clear	clear	clear

4 LAMP VOLTAGE [4]

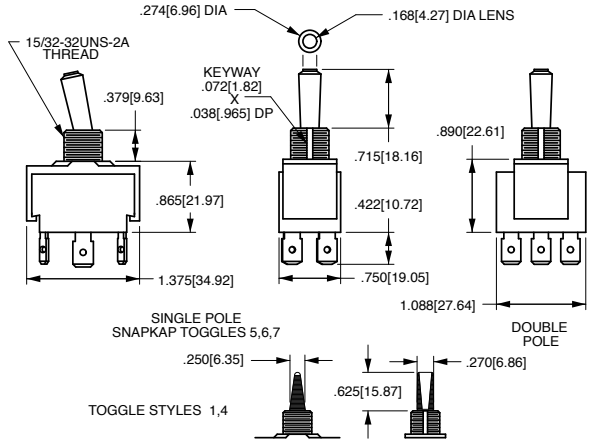
incandescent

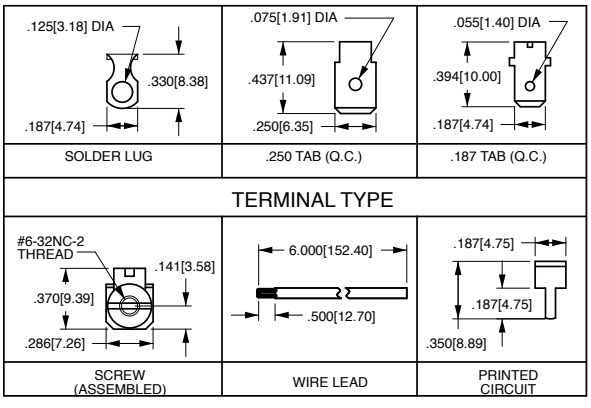
006 6 volt **012** 12 volt **018** 18 volt **024** 24 volt

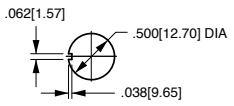
neon

125N 125 volt neon **250N** 250 volt neon

Notes:
1. Solid color paddle available with lighting sequence 01, 02, 10 or 20.
2. SnapKap Toggle Lenses are available separately. Consult factory.
3. Independent lamp is standard. Dependent lamp with ON-OFF function (including momentary) is available with Lighting Sequences 10, 20, 30, 40 and 50. (No light in OFF position.)
4. Green and blue not recommended with 125 volt or 250 volt neon lamps.
5. Additional terminations available. Consult factory for details.
6. Ignition protected (UL 1500) construction is available, consult factory for details.
( ) Indicates momentary function.







MOUNTING HOLE
Keyway should point down for maximum water resistance

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F-Series

SINGLE POLE TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 20A 277VAC, various actuator, bushing, termination, and circuit choices allow this versatile switch to easily integrate into a variety of different applications. The F-Series is appropriate for usage in low voltage DC applications.

Resources:

Download 3D CAD Files

IGS > STP >

Product Highlights:

- Ratings to 20A
- Suitable for low voltage 12/24V DC
- Variety of termination options
- Consult factory for large choice of bushing/toggle length combinations

Typical Applications:

- Marine
- Food Service
- Generator
- Industrial Control
- Office Automation

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Dielectric Strength
1000V - live to dead metal parts

Mechanical Life
100,000 cycles

Electrical Life
50,000 cycles - maintained
25,000 cycles - momentary

Operating Temperature
0°F to 150°F (-17.8°C to +65.6°C)

2FA54 - 73 / TABS

1 Base Part Number | 2 Actuator Style | 3 Tab Terminals

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION [1]

10A 250VAC; 15A 125VAC; 3/4 HP 125-250VAC

	Solder Lug	.250 Tab QC	Screw Terminals
On-None-Off	**2FA53**	**2FA53- . . . /TABS**	**2FA54**
(On)-None-Off	**6FA53**	**6FA53- . . . /TABS**	**6FA54**
On-None-(Off)	**6FA57**	**6FA57- . . . /TABS**	**6FA58**
On-None-On	**2FB53**	**2FB53- . . . /TABS**	**2FB54**
On-None-(On)	**6FB53**	**6FB53- . . . /TABS**	**6FB54**
On-Off-On	**2FC53**	**2FC53- . . . /TABS**	**2FC54**
On-Off-(On)	**6FC57**	**6FC57- . . . /TABS**	**6FC58**
(On)-Off-(On)	**6FC53**	**6FC53- . . . /TABS**	**6FC54**

Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

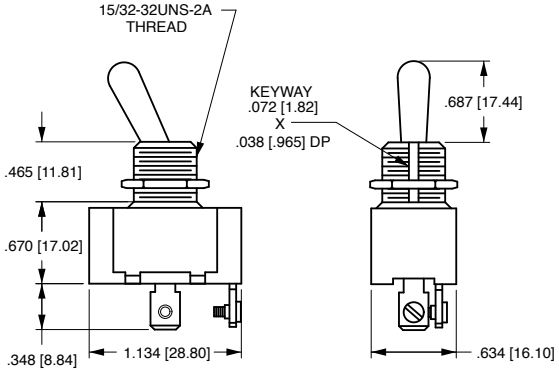
2 ACTUATOR STYLE
BAT STYLE TOGGLE [2]

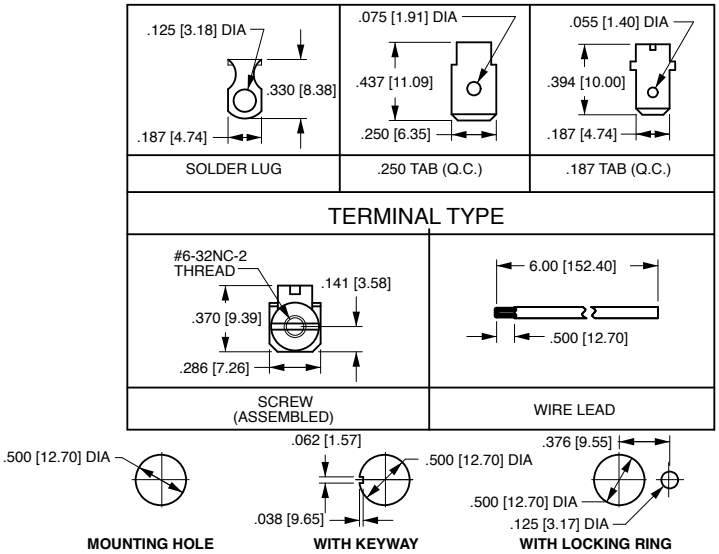
unsealed	sealed	toggle length	bushing length
73	**78**	0.687	0.465
E3	**E8**	2.000	0.465

3 TAB TERMINALS

/TABS	Tab Terminals
(blank)	Leave blank if tab terminals not required.

Notes:
1 Consult factory for .187 tab, wire lead and combination screw/tab/solder lug termination callouts.
2 Additional toggle options are available. Consult factory.
( ) indicates momentary function.





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G-Series
TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 20A 277VAC, international approvals, various actuator, bushing, termination, and circuit choices allow this toggle switch to easily integrate into a variety of different applications. The G-Series is appropriate for usage in low voltage DC applications.

Resources:

Download 3D CAD Files

IGS > STP >

Product Highlights:

- Ratings to 20A 277VAC available
- Metal bat or nylon bat/paddle actuator styles
- UL, CSA and VDE approvals for select circuits
- Suitable for low voltage 12/24V DC

Typical Applications:

- Marine
- Food Service
- Generator
- Industrial Control
- Office Automation

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Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

VDE: 4000V - live to dead metal parts; 1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0° to 85°C)

2GM51 - 73

1 Base Part Number *2 Actuator Style*

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION [3]

Single Pole in Double Pole base ***Double Pole***

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC

solder lug	.250 tab	screw term.		solder lug	.250 tab	screw term.
2GA50	**2GA51**	**2GA54**	On-None-Off	**2GK50**	**2GK51**	**2GK54**
6GA5A	**6GA5B**	**6GA5E**	(On)-None-Off	**6GK5A**	**6GK5B**	**6GK5E**
6GA5L	**6GA5M**	**6GA5S**	On-None-(Off)	**6GK5L**	**6GK5M**	**6GK5S**
2GB50	**2GB51**	**2GB54**	On-None-On	**2GL50**	**2GL51**	**2GL54**
6GB5A	**6GB5B**	**6GB5E**	On-None-(On)	**6GL5A**	**6GL5B**	**6GL5E**
2GC50	**2GC51**	**2GC54**	On-Off-On	**2GM50**	**2GM51**	**2GM54**
6GC5A	**6GC5B**	**6GC5E**	On-Off-(On)	**6GM5A**	**6GM5B**	**6GM5E**
6GC5L	**6GC5M**	**6GC5S**	(On)-Off-(On)	**6GM5L**	**6GM5M**	**6GM5S**

10A 250VAC, 15A 125VAC, 12 (6)A 250VAC T85/55 ENEC/VDE Approved [1]

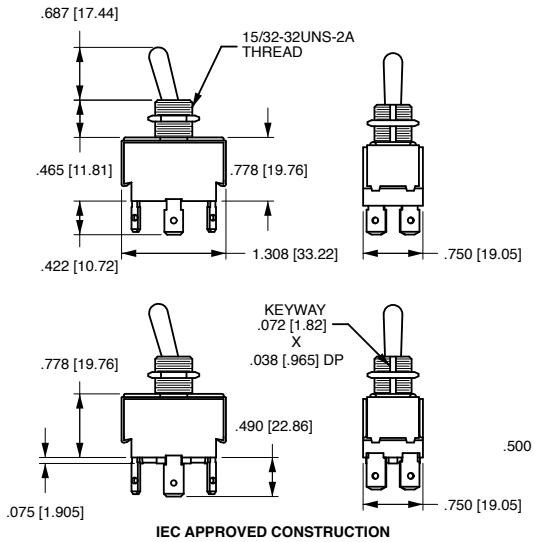
2GA90	**2GA91**	-	On-None-Off	**2GK90**	**2GK91**
2GB90	**2GB91**	-	On-None-On	**2GL90**	**2GL91**
2GC90	**2GC91**	-	On-Off-On	**2GM90**	**2GM91**

Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

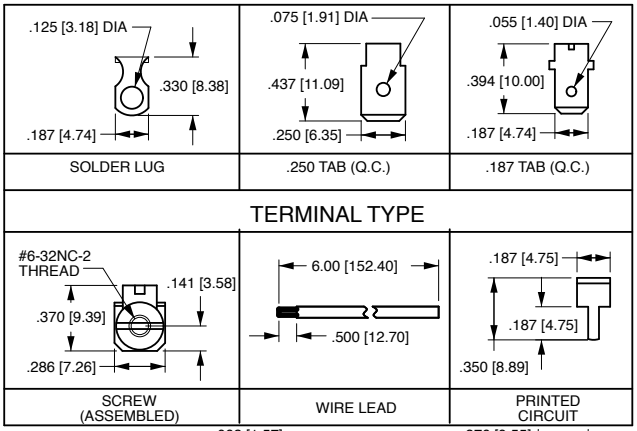
2 ACTUATOR STYLE [4]

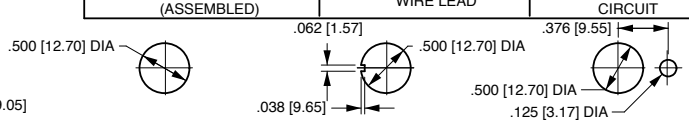
	unsealed	sealed	toggle length	bushing length
BAT	**73**	**78**	0.687	0.465
PADDLE [5]	**NBL3**	**NBL8**	0.687	0.465
BAT [2]	**D-3B-B**	-	0.687	0.379
PADDLE [2]	-	**D-4B-B**	0.687	0.379

Notes:
1 Not available with 73 or NBL3 style toggles, T55 with 78 and NBL8 style toggles.
2 All nylon bushing and toggle.
3 Consult factory for .187 tab, wire lead and combination screw/tab/solder lug termination callouts.
4 Additional actuator options available. Consult factory.
5 Nylon toggle with black ebanol plated bushing.
( ) Indicates momentary function.



IEC APPROVED CONSTRUCTION





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H/I-Series
TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 17A 125VAC, various actuator, bushing, termination, and circuit choices allow this toggle to easily integrate into a variety of different applications. The H/I-Series is appropriate for usage in low voltage DC applications.

Product Highlights:
- Ratings up to 600VAC
- Available reversing and progressive switch circuits
- Variety of termination options
- Consult factory for large choice of bushing/toggle length combinations

Typical Applications:
- Food Service
- Generator
- Industrial Control
- Office Automation

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Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0° to 85°C)

HK251 - 73

1 Base Part Number *2 Actuator Style*

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION [2]

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 1, 2 or 3 phase

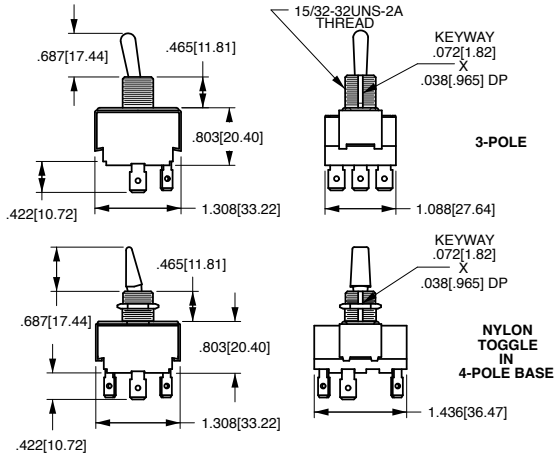
Three Pole solder lug	.250 tab tab	screw term.	wire leads		***Four Pole*** solder lug	.250 tab tab	screw term.	wire leads
HK250	**HK251**	**HK254**	**HK255**	Off-None-On	**IK250**	**IK251**	**IK254**	**IK255**
HK25A	**HK25B**	**HK25E**	**HK25F**	Off-None-(On)	**IK25A**	**IK25B**	**IK25E**	**IK25F**
HK25L	**HK25M**	**HK25S**	**HK25S**	On-None-(Off)	**IK25L**	**IK25M**	**IK25S**	**IK25T**
HL250	**HL251**	**HL254**	**HL25E**	On-None-On	**IL250**	**IL251**	**IL254**	**IL255**
HL25A	**HL25B**	**HL25E**	**HL25F**	On-None-(On)	**IL25A**	**IL25B**	**IL25E**	**IL25F**
HM250	**HM251**	**HM254**	**HM255**	On-Off-On	**IM250**	**IM251**	**IM254**	**IM255**
HM25A	**HM25B**	**HM25E**	**HM25F**	On-Off-(On)	**IM25A**	**IM25B**	**IM25E**	**IM25F**
HM25L	**HM25M**	**HM25S**	**HM25T**	(On)-Off-(On)	**IM25L**	**IM25M**	**IM25S**	**IM25T**

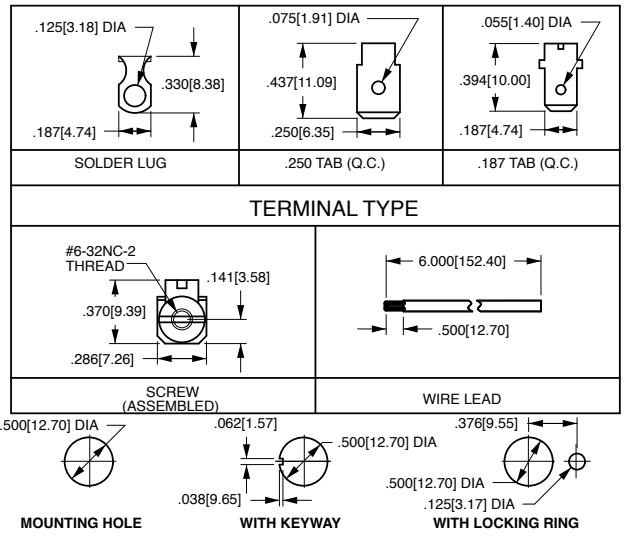
Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

2 ACTUATOR STYLE [1]

	unsealed	sealed	toggle length	bushing length
BAT	**73**	**78**	0.687	0.465
	E3	**E8**	2.000	0.465
PADDLE[3]	**NBL3**	**NBL8**	0.687	0.465

Notes:
1 Additional actuator options available. Consult factory for details.
2 Consult factory for .187 tab and combination screw/tab/solder lug termination callouts.
3 Nylon toggle with black ebanol plated bushing.
( ) Indicates momentary function.





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C-Series

SINGLE POLE TOGGLE SWITCHES

The C-Series single pole compact high current toggle switches are ideal for applications with back panel size constraints. These switches feature self-cleaning contacts and ratings up to 20A 125VAC, 10A 250VAC, 1 1/2 HP 125-250VAC. With a rugged metal construction, these switches figure prominently in markets with stringent current carrying requirements.

Product Highlights:

- Ratings to 20A 125VAC and 1.5HP 125-250VAC
- Compact size
- Self-cleaning wiping style contacts
- 4 termination choices

Typical Applications:

- Environmental Controls
- Marine
- Food Service
- Vacuum Cleaners

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Dielectric Strength
1000V - live to dead metal parts and opposite polarity.

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

CA201 - **73**

1 Base Part Number *2 Actuator Style*

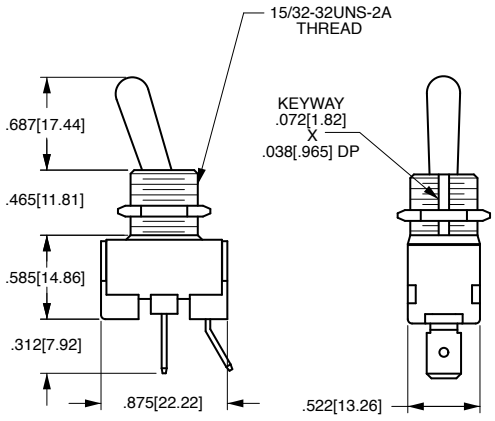
1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION
10A 250VAC, 20A 125VAC, 1 1/2 HP 125-250VAC

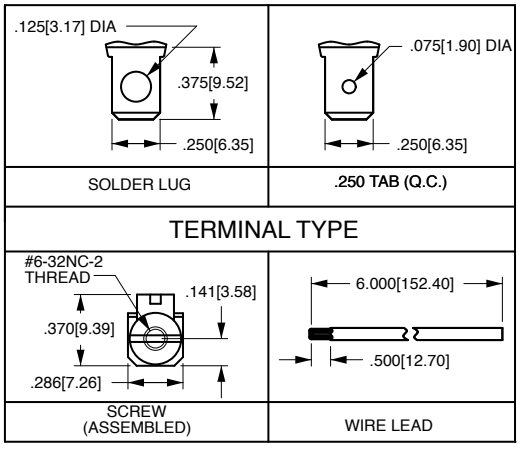
Single Pole	Solder Lug	.250 Tab	Screw Term.	Wire Leads
On-None-Off	**CA200**	**CA201**	**CA204**	**CA205**
On-None-On	**CB200**	**CB201**	**CB204**	**CB205**

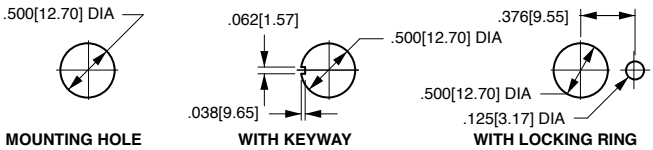
2 ACTUATOR STYLE [1]

	unsealed	sealed	toggle length	bushing length
BAT	**73**	**78**	0.687	0.465

Notes:
1 Additional toggle styles available. Consult factory.







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

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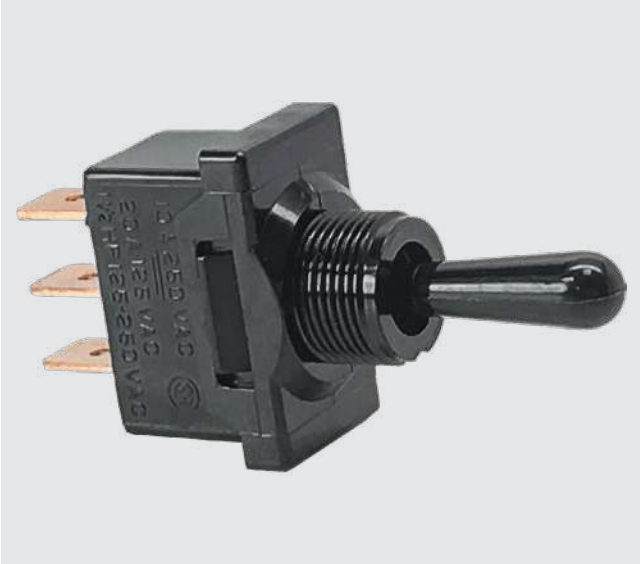
D-Series

SINGLE POLE TOGGLE SWITCHES

The D-Series single pole compact high current toggle switches are ideal for applications with back panel size constraints. These switches feature self-cleaning contacts and ratings up to 20A 125VAC, 10A 250VAC, 1 1/2 HP 125-250VAC. With an economical double insulated all nylon construction, these switches figure prominently in markets with stringent current carrying requirements.



Product Highlights:

- Compact all nylon double insulated construction
- Ratings to 20A 125VAC, 1.5 HP 125-250VAC
- Integrated wire lead construction
- Paddle of Bat style actuators

Typical Applications:

- Environmental Controls
- Marine
- Food Service
- Vacuum Cleaners

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Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity
TUV: 4000V - live to dead metal parts; 750V - across open contacts

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0° to 85°C)

DA221 - P - B - B

1 Base Part Number | 2 Actuator Style | 3 Actuator Color | 4 Bushing Color

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING [1] / TERMINATION

10A 250VAC, 20A 125VAC, 1 1/2 HP 125-250VAC

	Solder Lug	.250 Tab	Wire Leads
On-None-Off	**DA220**	**DA221**	**DA225**
On-None-On	**DB220**	**DB221**	**DB225**
On-Off-On	**DC220**	**DC221**	**DC225**

5A 250VAC, 10A 125VAC, 1/2 HP 125-250VAC, 4(4) 250VACμ TUV approved

	Wire Leads	Solder Lugs	.250 Tabs
On-None-Off	**DA945**	**DA940**	**DA941**

2 ACTUATOR STYLE

B Bat — **P** Paddle

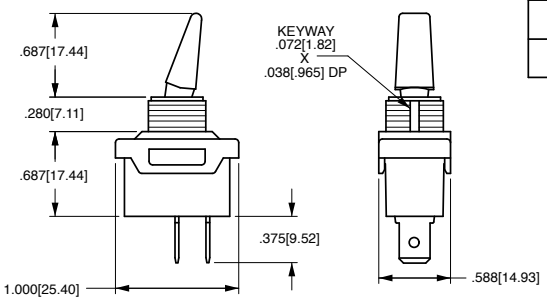
3 ACTUATOR COLOR [2]

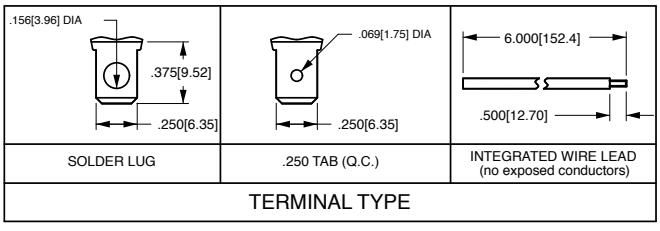
B Black — **W** White

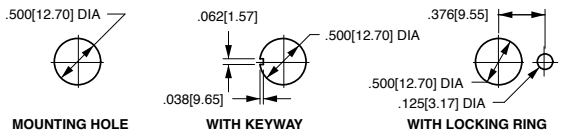
4 BUSHING COLOR [2]

B Black — **W** White

Notes:
1 DA945 available with wire leads and ON-OFF circuit only.
2 Additional colors available. Please consult factory.







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110/216-Series

HEAVY ACTION TOGGLE SWITCHES

The 110/216-Series is a compactly designed, versatile metal construction toggle switch which is appropriate for a variety of uses. Features include single or double pole options, maintained or momentary construction with termination choices including solder lug end or bottom, wire leads and .250 tab terminals. The quick make/quick break contact mechanism makes the switch suitable for high voltage (125-250 volt) applications.

Product Highlights:

- 125/250V AC or DC rated
- Compact space saving envelope
- Single or double pole
- 2 position Maintained or Momentary circuits

Typical Applications:

- Small Appliance
- Floor Maintenance
- Lighting

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
0°F to 150°F (-17.8°C to +65.6°C)

110-S - **73**

1 Base Part Number *2 Actuator Style*

1 BASE PART NUMBER: SERIES / CIRCUITRY [1] / RATING / TERMINATION [2]

	Solder Lug (end)	Solder Lug (bottom)	Screw Terminals	Wire Leads
3A 250V, 6A 125V, AC/DC				
Single Pole				
On-None-Off	**110**	**110-B**	**110-S**	**111-16**
Off-None-(On)	**110-M-NO**	**110-BM-NO**	**110-SM-NO**	**111-16M-NO**
On-None-(Off)	**110-M-NC**	**110-BM-NC**	**110-SM-NC**	**111-16M-NC**
Double Pole				
On-None-Off	**2BK62**	-	-	**2BK65**
On-None-On	**2BL62**	-	-	**2BL65**
1A 250V, 3A 125V, AC/DC				
Single Pole				
On-None-On	**112**	-	-	**112-A**
On-None-(On)	**112-M**	-	-	**112-M-A**
Double Pole				
On-None-Off	**216**	-	-	**216A**
Off-None-(On)	**216-M-NO**	-	-	**216A-M-ANO**
On-None-(Off)	**216-M-NC**	-	-	**216A-M-ANC**
On-None-On	**316**	**316-B**	-	-
On-None-(On)	**316-M**	**316-BM**	-	-
2 circuit				
1 On - 1 Off	**516**	**516-B**	-	**516-A**
1 (On) - 1 (Off)	**516-M**	**516-BM**	-	**516-AM**
6A 120VAC				
Single Pole				
On-None-On	**2BB62**	-	-	**2BB65**
5A 250V, 10A 125V, 1/4HP, 125V				
Single Pole				
On-None-Off	**160H**	**160H-B**	**160H-S**	**160H-A**

2 ACTUATOR STYLE

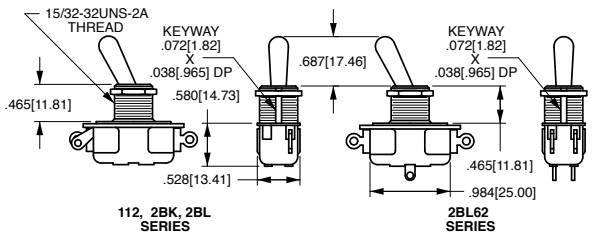
BAT STYLE TOGGLE

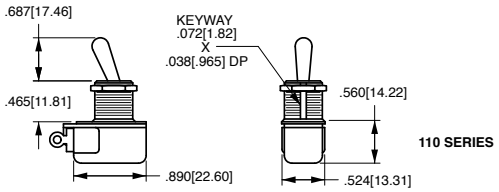
unsealed	sealed	toggle length	bushing length
52	**57**	0.375	0.343
63	**68**	0.500	0.465
73	**78**	0.687	0.46555

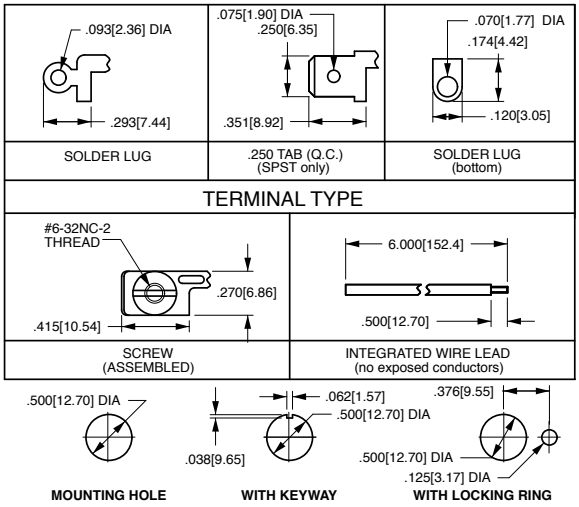
BALL STYLE TOGGLE

unsealed	sealed	toggle length	bushing length
21	-	0.375	0.250
22	-	0.375	0.343
25	-	0.375	0.875

Notes:
1 Momentary function only available with 73 toggles.
2 160H and 110-Series are available with .250 tab terminals. Add suffix /TABS to end of part number. ex. 110-73/TABS
( ) Indicates momentary function.







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DK/EK-Series

HEAVY DUTY TOGGLE SWITCHES

The switch that can handle your heavy duty requirements. Single or double pole with wire lead or screw terminations, and ratings to 20A 125V 10A 250V, the ac/dc DK/EK-Series is the most heavy duty toggle switch in the Carling line. Its sturdy metal construction and stiff actuation force will withstand the abuses of virtually any stringent application. The quick make/quick break contact mechanism is ideal for high voltage DC applications.

Product Highlights:

- Ratings up to 20A 125V AC or DC
- Screw Term or Wire Lead terminations
- Quick Make / Quick Break contact mechanism
- Bat or Ball style toggle options

Typical Applications:

- Industrial Motor Control
- General Purpose

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
0°F to 150°F (-17.8°C to +65.6°C)

DK284 - **73**

1 Base Part Number *2 Actuator Style*

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

8A 250V, 16A 125V, 1 HP 125-250V

	Screw Terminals	Wire Leads
Single Pole On-None-Off	**DA284**	**DA285**
Double Pole On-None-Off	**DK284**	**DK285**

10A 250V, 20A 125V, 1 1/2 HP 125-250V

	Screw Terminals	Wire Leads
Single Pole On-None-Off	**EA204**	**EA205**
Double Pole On-None-Off	**EK204**	**EK205**

2 ACTUATOR STYLE [1]

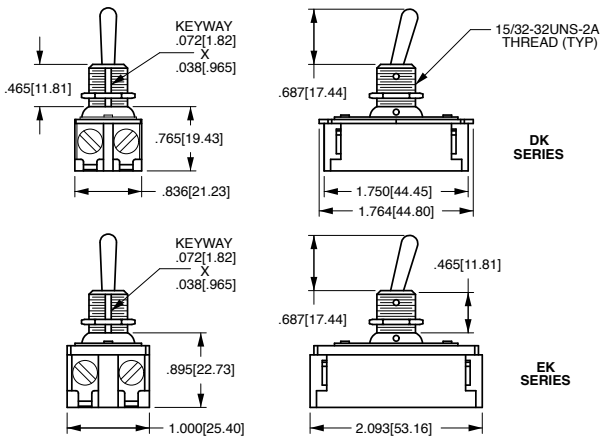
BAT STYLE TOGGLE

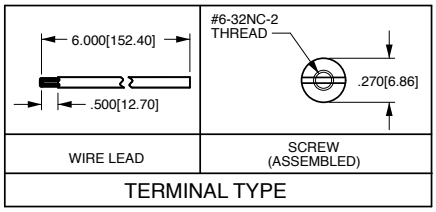
unsealed	toggle length	bushing length
73	0.687	0.465

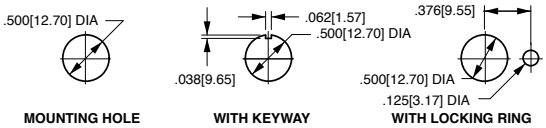
BALL STYLE TOGGLE

unsealed	toggle length	bushing length
32	0.500	0.343

Notes:
1 Additional toggle lengths available. Consult factory for details.







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

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MAAOA/215-Series
TOGGLE SWITCHES

The MAAOA/215-Series toggle switches are single pole, AC rated at 20 amps and 125 VAC. These switches are snap-in mounted, with a phenolic toggle and base, and are suitable for high ambient temperature applications.

Product Highlights:
- High temperature Phenolic base and toggle
- Ratings to 125VAC
- Optional embossed On-Off legend
- Choice of screw, .250 Tab or integrated wire lead connections

Typical Applications:
- Coffee Makers
- Food Warmers

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

MAAOA – **BL** / **ON-OFF**

1 Base Part Number *2 Color* *3 Legend*

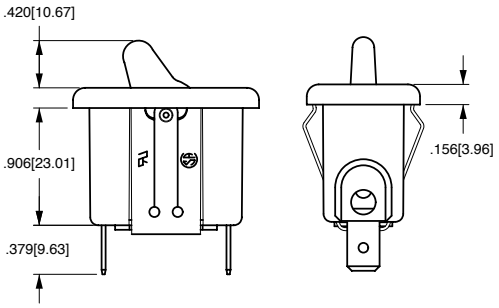
1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION
10A 250 VAC, 20A 125 VAC, 1/2 HP 125-250 VAC

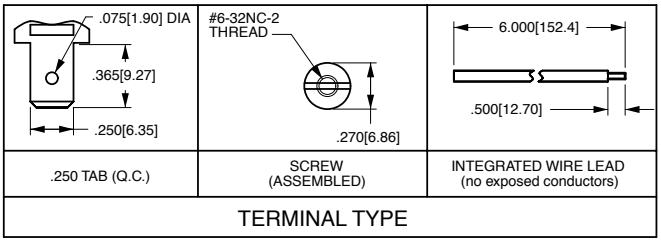
	.250 Tabs	Screw Terms.	Wire Leads
Single Pole			
On-Off	**MAAOA**	**215**	**215A**
(On)-Off	**MM-021**	**-**	**-**

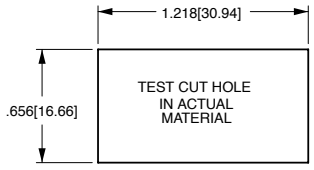
2 BASE & ACTUATOR COLOR
BL Black **BN** Brown

3 LEGEND [1]
On-Off

Notes:
Panel Cut-Out recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
1 Imprinting is available. ON-OFF legend is not standard and must be specified after color. If not specified, switch will be manufactured with no legend.
( ) Indicates momentary function.







MOUNTING HOLE
Panel Thickness: .030[.762] min - .090 [2.28] max.
Specific cutout dimension range dependent on panel thickness and material.

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Carling Technologies full or half hexboot is the perfect complement to Carling's line of toggle switches. The boot is compatible with 15/32" threaded bushings and will provide extra protection against the elements in harsh environments.

Product Highlights:

- Flexible tear-resistant silicone rubber overmolded onto a 15/32" brass hexnut
- Full hexboot completely covers toggle actuator and bushing
- Meets ROHS 2011/65/EU directive
- Inhibits the rotation of switches subjected to low frequency vibration
- Complementary, cost effective addition to Carling's toggle switches
- Suitable for toggle models: F-Series, G-Series, 110-Series, C-Series, D-Series, DK/EK-Series, H/I-Series, LT-Series

Full Hexboot

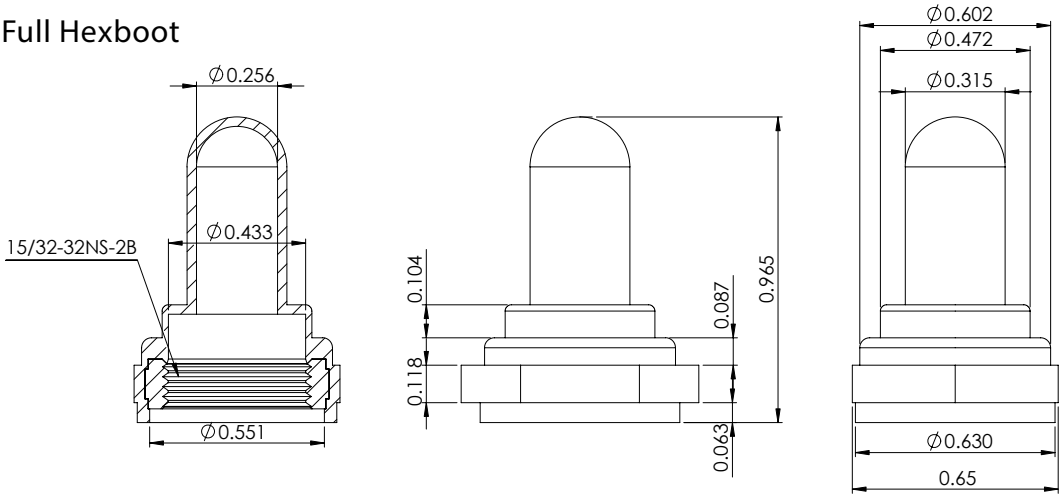
Part #: 999-37246-001

Half Hexboot

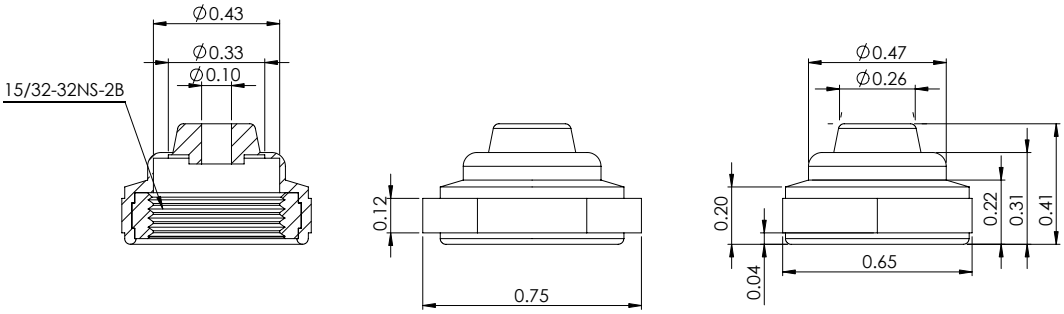
Part #: 999-37245-001

Dimensional Specifications: in. [mm]

Full Hexboot



Half Hexboot



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

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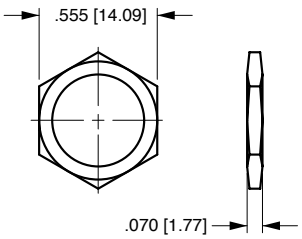
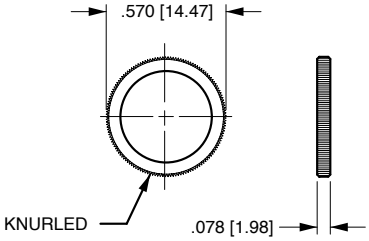
Bushing Accessories

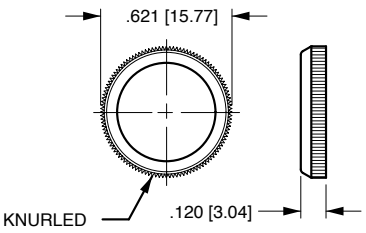
The hardware options and accessories listed below were specifically designed to be used with toggle and pushbutton switches. The drawings are representative of the actual products. When other hardware options are required, please consult factory.



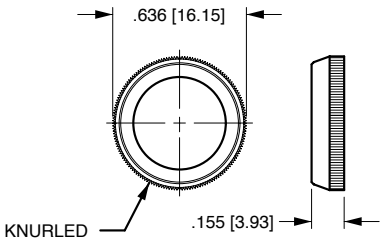
STANDARD HEXNUT
.562 in. [14.27 mm] X .076 in. [1.93 mm]
NICKEL: 380-08602
BLACK: 380-08606



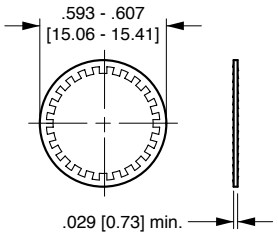
STANDARD FACENUT
.570 in. [14.47 mm] X .078 in. [1.98 mm]
NICKEL: 380-08693
BLACK: 380-08694



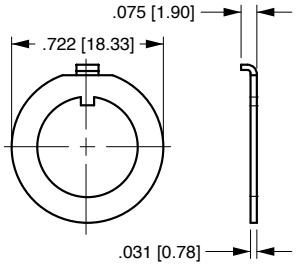
PLASTIC FACENUT
(Wrench Supplied N/C)
.625 in. [15.87 mm] X .120 in. [3.04 mm]
BLACK: 384-17126-001
RED: 384-17126-002
WHITE: 384-17126-003



DRESS FACENUT
.636 in. [16.15 mm] X .155 in. [3.93 mm]
NICKEL: 380-08810
BLACK: 380-08811

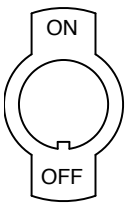


LOCKWASHER
NICKEL-PLATED: 728-15907

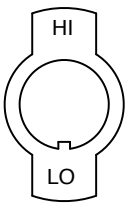


LOCKING RING
ZINC: 728-15946
BLACK:728-15947

All indicator plates are nickel-plated steel. Odd keyway locations, alternate imprints and plating available on special order. Contact factory for minimum quantities and specifications.



Y01
272-06747



Y02
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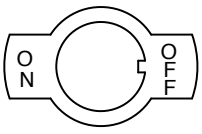

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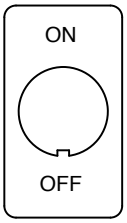

Y1O1
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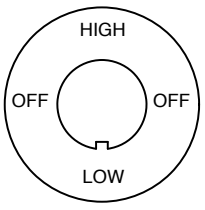
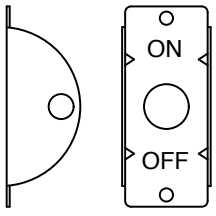


Y311
272-07258



Y500
272-07293

ALL PLATES SHOWN FIT 15/32" (.465 [11.81]) BUSHINGS

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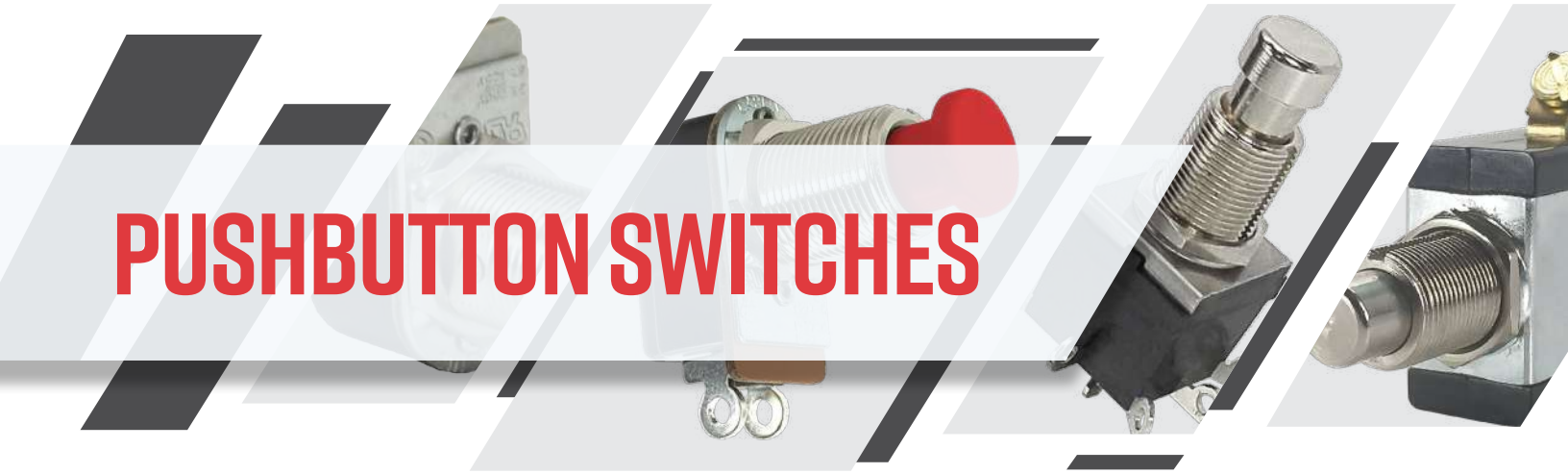
PUSHBUTTON SWITCHES



Carling bushing mount, single and double pole push button switches range from 1 to 20 amps. They offer a variety of nylon and metal push button styles with actuation force ranging from light action 0.4 oz to heavy- duty 8 lbs. UL & CSA certified.

SELECTOR GUIDE

16-3P	170 / 172	P26 / P27	641 / 110	P / PP	
1	1	1	1, 2, 3	1	**Poles**
up to 3A 125VAC	up to 15A 125VAC 10A 250VAC	up to 6A 125VAC 3A 277VAC	up to 5A 125VAC 2A 250VAC	up to 20A 125VAC 10A 250VAC	**Ratings**
.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	**Mounting Hole Specifications**
solder lug wire leads	solder lug screw terms wire leads	.250 tabs solder lug wire leads	solder lug wire leads PC terms	.250 tabs screw terms wire leads	**Termination**
UL, CSA	UL, CSA	UL, CSA	UL, CSA	UL, CSA, TUV	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

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16-3P-Series
PUSHBUTTON SWITCHES

The 16-3P-Series pushbutton switches are single pole and AC rated up to 3 amps. These momentary action switches have a slow-make, slow-break contact mechanism and require only light actuation force (4 oz. - 1 lb.). These switches are typically used in general purpose applications requiring finger actuation.

Product Highlights:

- Maintained, Momentary and 2 circuit function choices
- Available with optional overtravel plunger action
- Light 4 oz – 1 lb actuation force
- Metal plunger available with optional colored plastic cap

Typical Applications:

- Test & Measurement
- Audio Visual

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

16-3POFF - **4** - **CBL**

1 Base Part Number *2 Bushing* *3 Actuator Style*

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

Single Pole	Solder Lug	Wire Leads
3A 125VAC		
Off-(On)	16-3P Off	16-3AP Off
Off-(On) with overtravel [1]	16-3P Off-Ov	16-3AP Off-Ov
On-(Off)	16-3P On	16-3AP On
1A 125VAC		
On-On	116-P	116-AP
On-On with overtravel [1]	116-P-OV	116-AP-OV
1 On-1 Off (2 circuit)	516-P	516-AP
1 On-1 Off with overtravel [1] (2 circuit)	516-P-OV	516-AP-OV

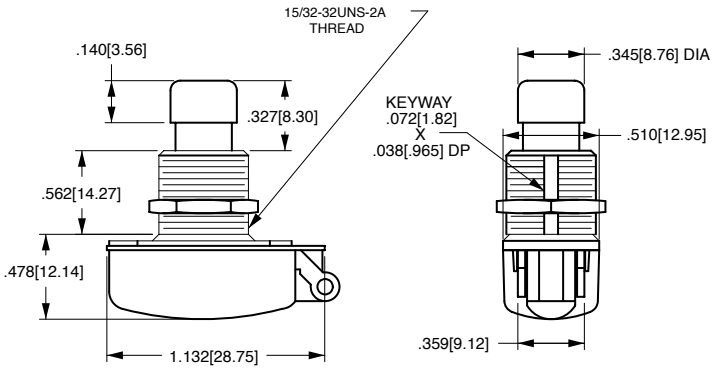
2 BUSHING STYLE

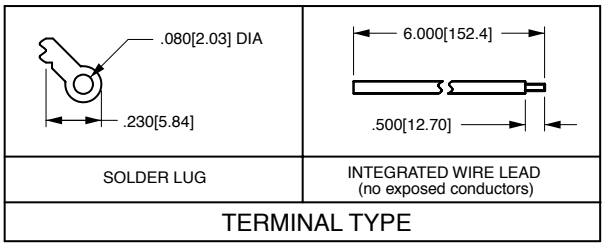
2	.312 length
4	.562 length

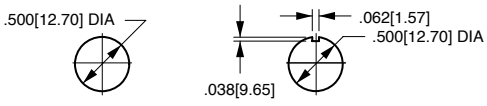
3 ACTUATOR STYLE [2]

CBL	black plastic color cap
CRD	red plastic color cap

Notes:
1 Overtravel only available with #4 bushing.
2 When selection 3 is left blank, a standard nickel plated plunger is supplied.
( ) Indicates momentary function.







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

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170/172-Series
PUSHBUTTON SWITCHES

The 170/172-Series pushbutton switches are single pole, high amperage switches suitable for shallow back panel applications. These switches are momentary action and require an actuation force of 2.5 lbs. The 170/172-Series switches are equipped with a slow-make, slow-break contact mechanism and are rated at 15 amps at 125VAC.

Product Highlights:
- Rated to 15A 125VAC
- Sturdy metal clad construction
- Metal plunger available with optional colored plastic cap
- Momentary On or Momentary Off circuitry

Typical Applications:
- Test & Measurement
- Meters
- Horns

Courtesy of Steven Engineering, Inc - (800) 258-9200 - sales@steveneng.com - www.stevenengineering.com

Dielectric Strength
UL/CSA: 1000V - live to dead metal parts

Electrical Life
25,000 cycles - Momentary

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

---

172 - CBL

1 Base Part Number *2 Cap Style/Color*

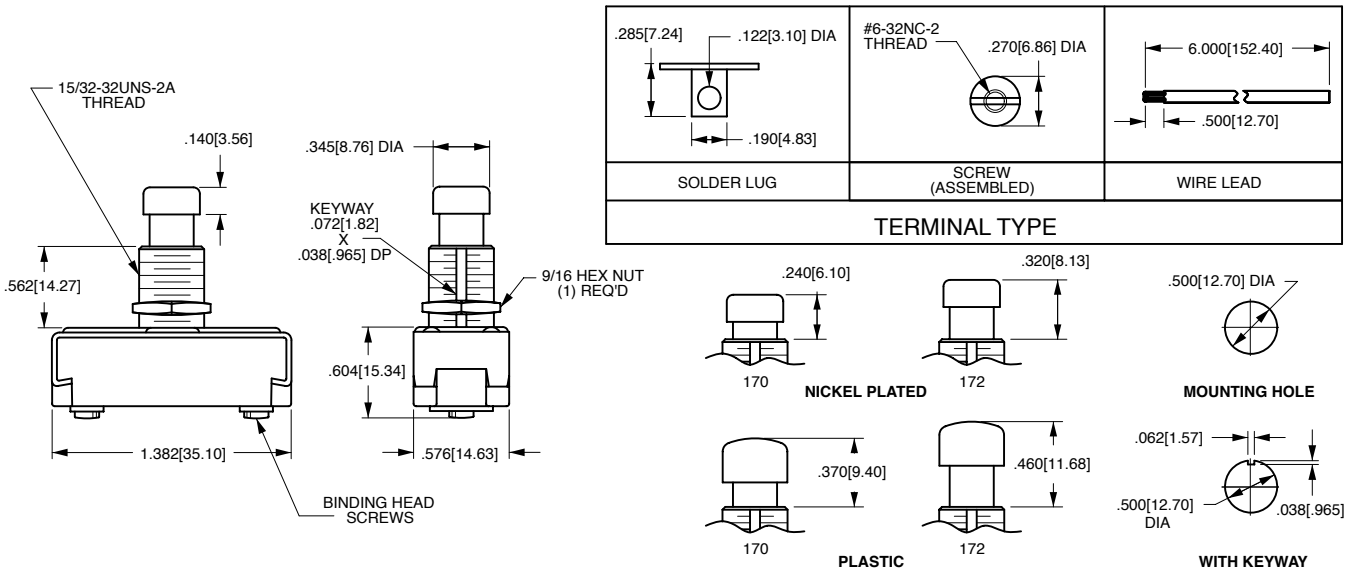
1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION
10A 250VAC; 15A 125VAC

Single Pole	Solder Lug	Wire Leads	Screw Terms.
On-(Off)	**170-B**	**170-A**	**170**
Off-(On)	**172-B**	**172-A**	**172**

2 CAP STYLE / COLOR [1]

CBL	Black Plastic
CGN	Green Plastic
CRD	Red Plastic
CWH	White Plastic

Notes:
1 When selection 2 is left blank, a standard nickel plated plunger is supplied.
( ) Indicates momentary function.



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

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P26-Series
PUSHBUTTON SWITCHES

The P26-Series pushbutton switches are single pole, AC rated for 6 amps at 125 VAC and suitable for shallow back panel applications. These switches are momentary action with a medium actuation force (13 oz. typical). The P26-Series switch is equipped with a slow-make, slow-break contact mechanism.

Product Highlights:
- 6A 125VAC, 3A 277VAC rated
- Momentary On or Momentary Off circuitry
- 4 bushing size combinations
- Round Metal, Concave Metal and Nylon Style Actuators

Typical Applications:
- Intercoms
- Security System
- Electronic Signs
- Marine
- Lighting

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

P26L - 1D - BL

1 Base Part Number *2 Bushing Style* *3 Button Style/Color*

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

Single Pole	Solder Lug	.250 Tab	Wire Leads
3A 250VAC, 6A 125 VAC, 3/4A 125V			
Off - (On)	**P26A**	**P26B**	**P26F**
On - (Off)	**P26L**	**-**	**P26T**
3A 277VAC, 6A 125 VAC [1]			
Off - (On)	**P267A**	**P267B**	**P267F**
On - (Off)	**P267L**	**-**	**P267T**

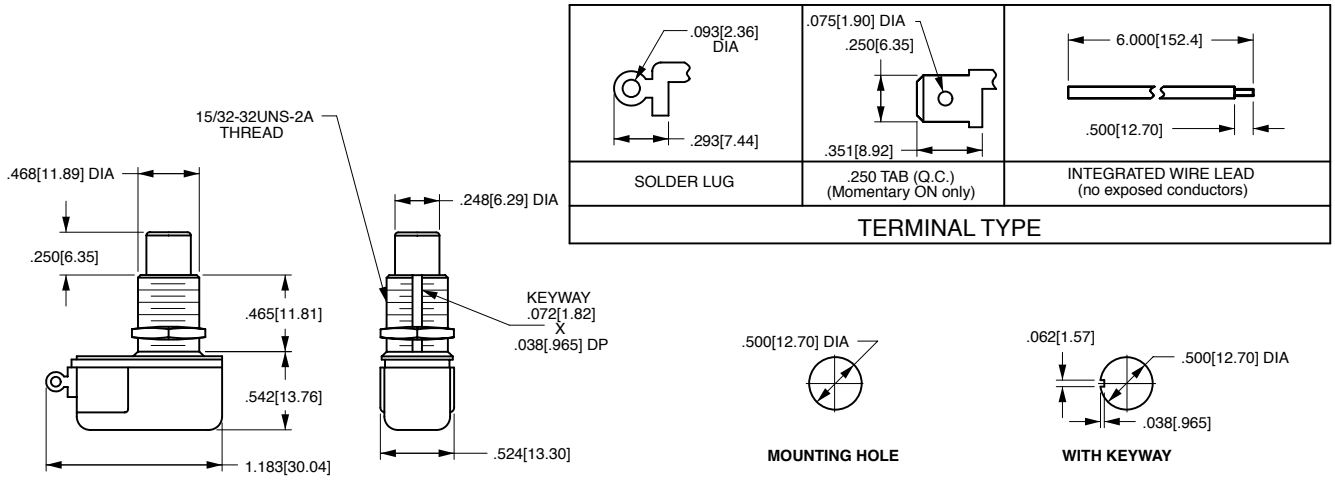
2 BUSHING STYLE

	length	*diameter*
1A	.406	.375
1B	.406	.468
1C	.465	.375
1D [3]	.465	.468

3 BUTTON STYLE / COLOR

BL	Black Nylon
RD	Red Nylon
RND MTL [2]	Round Metal
CON MTL [2]	Concave Metal

Notes:
1 Additional ratings available. Consult factory for details
2 Only available with 1D bushing in .562 length
3 Length is .562 for RND MTL and CON MTL buttons
( ) Indicates momentary function.



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P27-Series
PUSHBUTTON SWITCHES

The P27-Series pushbutton switches are single pole, AC rated switches suitable for general purpose applications with a shallow back panel. These switches are momentary action with a medium actuation force (26 oz. typical). The P27-Series switch is equipped with a slow-make, slow-break contact mechanism, rated at 6 amps with a nylon concave pushbutton.

Product Highlights:
- Ratings to 6A 125VAC 3A 250VAC
- Momentary On or Momentary Off circuitry
- .250 Tab, Solder Lug or Wire Lead terminations
- Shallow space saving envelope

Typical Applications:
- Intercoms
- Security System
- Electronic Signs
- Marine

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

P27A - **BL**

1 Base Part Number *2 Button Color*

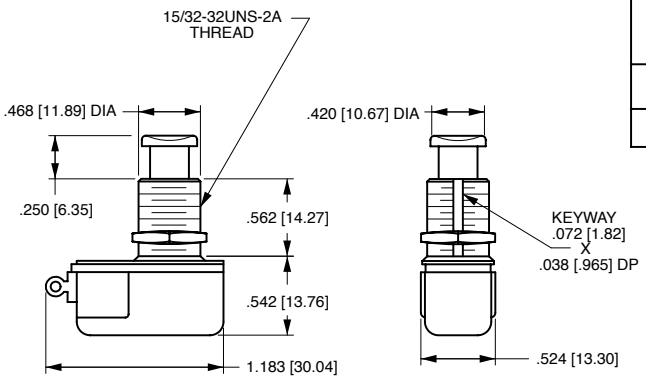
1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

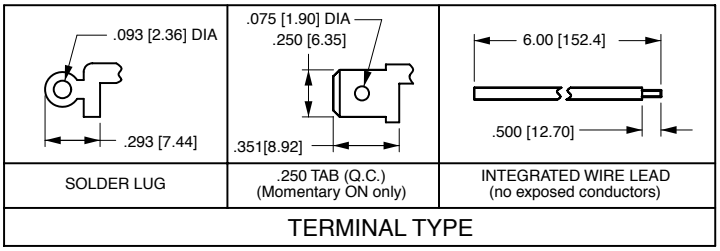
Single Pole 3A 250VAC, 6A 125 VAC, 3/4A 125V	Solder Lug	.250 Tab	Wire Leads
Off - (On)	**P27A**	**P27B**	**P27F**
On - (Off)	**P27L**	**-**	**P27T**

3 BUTTON STYLE / COLOR

BL	Black
RD	Red
WH	White

Notes:
( ) Indicates momentary function.





MOUNTING HOLE

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641-Series

PUSHBUTTON SWITCHES

The single, double and triple pole 641-Series represents the most compact offerings of the Carling's pushbutton switch line. These switches are UL approved and meet ENEC spacing requirements. Additionally, the new 3-pole switch affords the versatility to control an extra function or indicator light. Rugged metal construction, self-cleaning contacts and stiff actuation force (3-3 1/2 lbs. typical) have made these switches ideal for most "foot pedal" type applications. These alternate action switches fit a standard .500" mounting hole with options of solder lug, wire lead and PC terminals.

Resources:

Download 3D CAD Files

IGS > STP >

Product Highlights:

- Available in 1-3 poles
- 3+ lbs. actuation force ideal for Foot pedal applications
- Solder Lug, Wire Lead or PC Terminal options
- Self-cleaning wiping style contacts

Typical Applications:

- Music Equipment
- Test & Measurement Devices
- Audio-Visual Equipment
- Appliances

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Electrical

Rating	5A 125VAC, 2A 250VAC
Dielectric Strength	1500V RMS
Insulation Resistance	50 Megohms
Initial Contact Resistance	10 Milli Ohm max @ 4Vdc
Electrical Life	50,000 Cycles
Terminals	Solder Lug, Wire Leads and PC

Mechanical

Mechanical Life	100,000 Cycles

Environmental

Vibration Sinusoidal	Mil STD 202G, Method 204D, Test Condition A 0.06DA or 10G's 10-500Hz
Shock	MIL-STD 2020G, Method 213B Test Condition K, 30G's
Handling Shock	1 Meter Drop onto Hard Surface, all surfaces and planes
Thermal Shock	MIL-STD 2020G, Method 107G Test Condition A -55 C to 85 C
Moisture Resistance	MIL-STD 2020G, Method 106F 10 25 C to 65 C Cycles 95% RH
Thermal Cycling	25 Cycles -40 C to 85 C
Operating Temperature	32°F to 185°F (0°C to +85°C)

Physical

Function Circuits	Three Pole Single Throw, TPST Three Pole Double Throw, TPDT
Operation	Alternate Action, Push ON, Push OFF
Button Travel	0.19 (4.83mm)
Actuation Force	3 to 5 LB, 1360 to 2268 g
Base	Polyester, PBT Glass Filled
Button	Brass, Nickel Plated
Bushing	Brass, Nickel Plated
Plunger	Brass, Nickel Plated
Top Plate	Stainless Steel
Actuator (Internal)	Nylon 6/6
Pin (Internal)[1]	Nylon 6/6
Driver	Cold Rolled Steel
Springs	Music Wire
Movable Contact	Copper
Terminals	Brass (tin plated)
Mounting	½" Dia. Hole, with and without keyway, or with locking ring

Safety & Regulation

Agency	UL 61058, EN 61058 (3 Pole Version) UL 1054 (1 & 2 Pole Version)
Materials	RoHS, REACH

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64111210

1
Part Number

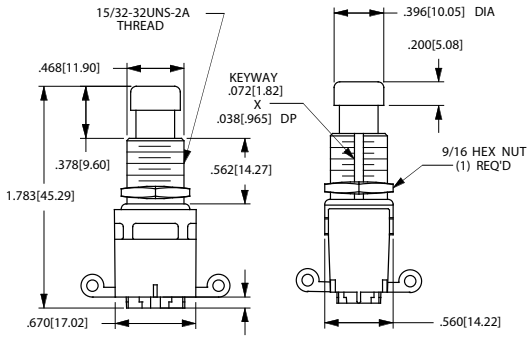
1 PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION [1]

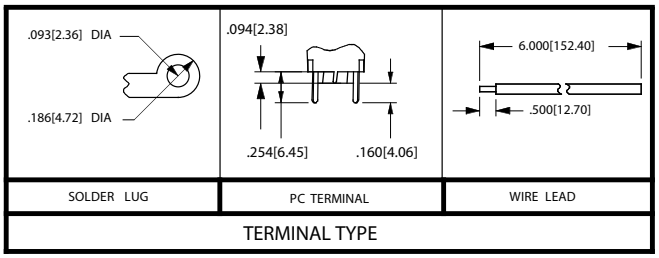
One Pole 2A 250VAC, 5A 125VAC				Two Pole			Three Pole		
solder lug	PC term.	wire leads.		solder lug	PC term.	wire leads	solder lug	PC term.	wire leads
64111210	**64111212**	**64111215**	ON-OFF	**64112210**	**64112212**	**64112215**	**64113210**	**64113212**	**64113215**
64111220	**64111222**	**64111225**	ON-ON	**64112220**	**64112222**	**64112225**	**64113220**	**64113222**	**64113225**

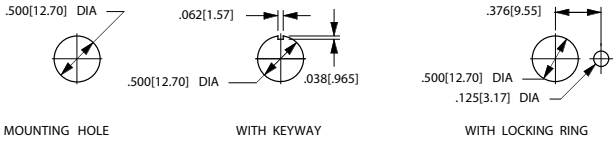
Notes:
1 For 1 and 2 pole only. 3 Pole switches use brass Pin

---

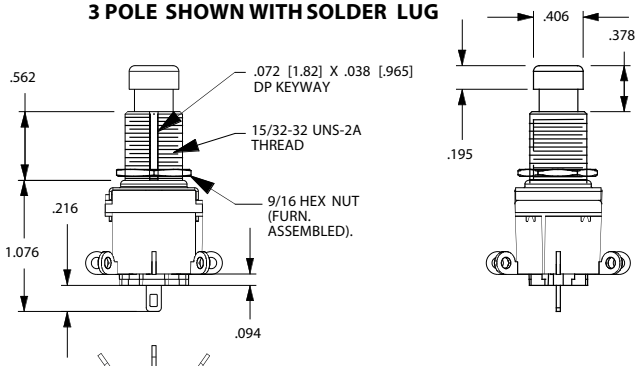
1 OR 2 POLE SHOWN WITH SOLDER LUG



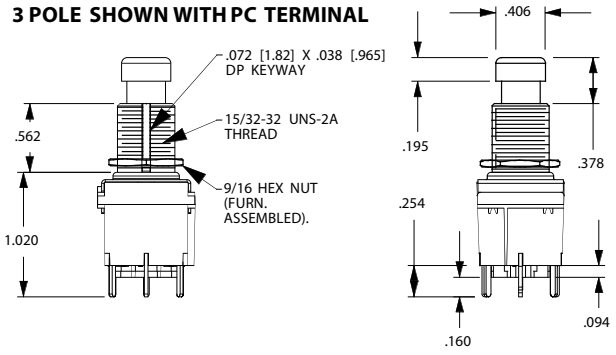


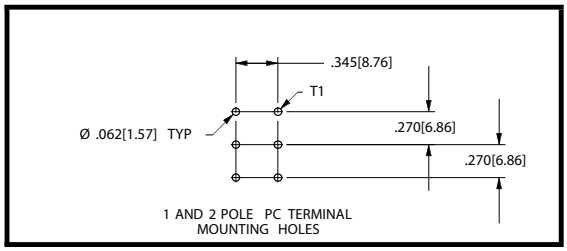


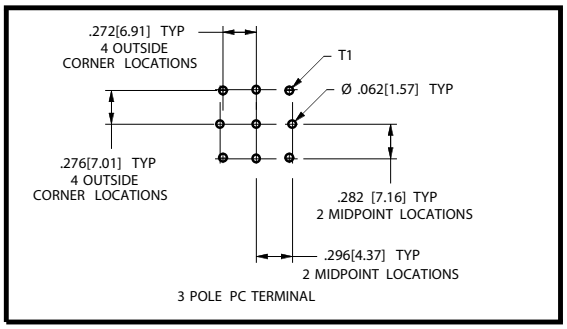
3 POLE SHOWN WITH SOLDER LUG



3 POLE SHOWN WITH PC TERMINAL







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110/316P-Series
PUSHBUTTON SWITCHES

The 110/316P-Series provides a compact yet rugged solution to general purpose switch needs. Alternate action, metal construction and stiff (6-8 lb) actuation force have combined to make this switch a pillar in a variety of markets. This versatile switch is available in maintained and momentary circuits with a variety of termination and rating options.

Product Highlights:
- Ratings to 5A 250V, 10A 125V AC or DC
- Maintained or momentary circuitry
- On-Off, On-On and 2 circuit function options
- Choice of 4 different termination options

Typical Applications:
- Music Industry
- Audio/Visual
- Electronic Road Signs

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life
25,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

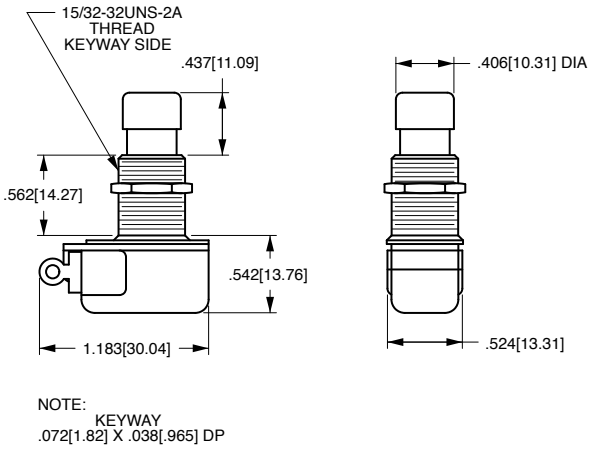
110-P

1
Part Number

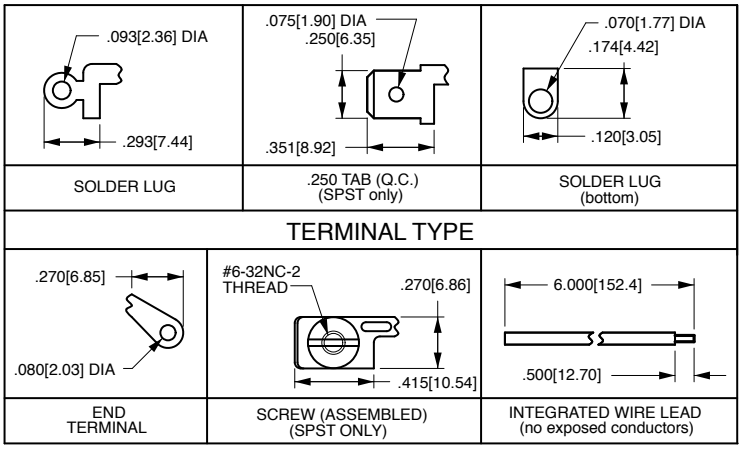
1 PART NUMBER: SERIES / ACTUATOR / CIRCUITRY / RATING / TERMINATION

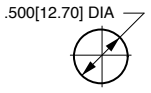
	solder lug (end)	solder lug (bottom)	screw terminals	wire leads
Single Pole				
3A 250V, 6A 125V				
OFF-ON	**110-P**	**110-BP**	**110-SP**	**111-16-P**
OFF-(ON)	**110-PM-OFF**	**110-PBM-OFF**	**110-SPM-OFF**	**111-PM-OFF**
ON-(OFF)	**110-PM-ON**	**110-PBM-ON**	**110-SPM-ON**	**111-PM-ON**
5A 250V, 10A 125V, 1/4 HP 125V				
OFF-ON	**160H-P**	**160H-BP**	**160H-SP**	**160H-AP**
1A 250V, 3A 125V				
ON-ON	**112-P**	-	-	**112-PA**
ON-(ON)	**112-PM**	-	-	**112-PAM**
Double Pole				
1A 250V, 3A 125V				
OFF-ON	**216-PP**	-	-	**216-PPA**
OFF-(ON)	**216-PM-OFF**	-	-	**216-PAM-OFF**
ON-(OFF)	**216-PM-ON**	-	-	**216-PAM-ON**
ON-ON	**316-PP**	**316-B-PP**	-	**316-PPA**
ON-(ON)	**316-PM**	**316-B-PM**	-	**316-PAM**
1 ON - 1 OFF (2 circuit)	**516-PP**	-	-	**516-PPA**
1 (ON) - 1 (OFF) (2 circuit)	**516-PM**	-	-	**516-PAM**

Notes:
( ) Indicates momentary function.

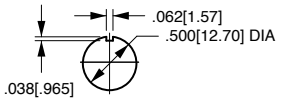


NOTE:
KEYWAY
.072[1.82] X .038[.965] DP





MOUNTING HOLE



WITH KEYWAY

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P-Series
PUSHBUTTON SWITCHES

These rugged pushbutton-type switches feature international approvals, ratings to 20A 125VAC and a heavy actuation force (3-5 lbs. typical) which makes this switch ideal for use as a "foot-pedal" switch. The metal bushing and plunger construction enables this alternate action switch to withstand the rigors of most any stringent pushbutton application.

Product Highlights:
- Rugged metal clad construction ideal for foot pedal applications
- Ratings to 20A 125VAC
- UL, CSA and TUV approvals
- Maintained On-Off or On-ON circuitry

Typical Applications:
- Vacuum Cleaners

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Dielectric Strength

UL/CSA: 1000 - live to dead metal parts & opposite polarity
TUV: 4000V - live to dead metal parts; 1250V - opposite polarity across open contacts

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

0°F to 85°F (32°C to 85°C)

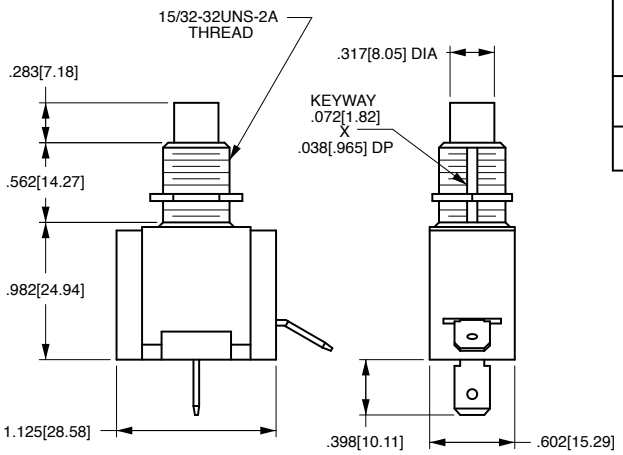
PA341

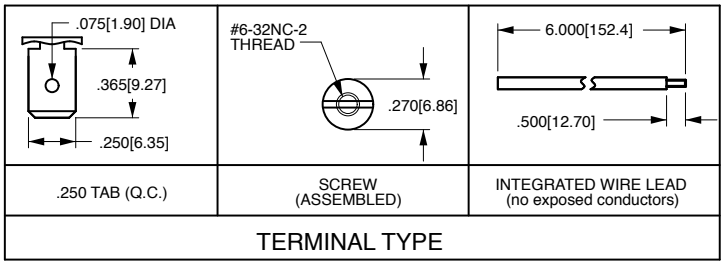
1
Part Number

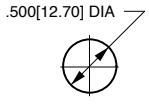
1 PART NUMBER: SERIES / ACTUATOR / CIRCUITRY / RATING / TERMINATION

	.250 Tab	Screw Terms.	Wire Leads
10A 250VAC, 15A 125VAC, 3/4 HP 120-240 VAC [1]			
On-Off	PA341	PA344	PA345
On-On	PB341	PB344	PB345
10A 250VAC, 20A 125VAC, 1 1/2 HP 120-240 VAC [1]			
On-Off	PA301	PA304	PA305
On-On	PB301	PB304	PB305
10A 250VAC, 15A 125VAC, 10(6)a 250 VACu, T85 [2]			
On-Off	PA951	PA954	PA955

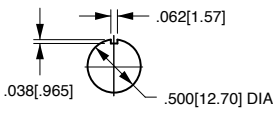
Notes:
1 Additional ratings available. Consult factory.
2 UL, CSA & TUV approved.







MOUNTING HOLE



WITH KEYWAY

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PP-Series
PUSHBUTTON SWITCHES

The PP-Series plastic pushbutton switches are heavy duty, single pole switches with wire leads. They are alternate action, available in single throw construction, with AC ratings up to 15 amps. Both bushing and bracket are made out of nylon. These high current switches are popular within the Appliance market.

Product Highlights:
- Ratings to 15A 125VAC
- All nylon construction
- Stiff actuation force suitable for foot pedal applications
- Integrated wire lead termination

Typical Applications:
- Vacuum Cleaners

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life
50,000 cycles

Mechanical Life
100,000 cycles

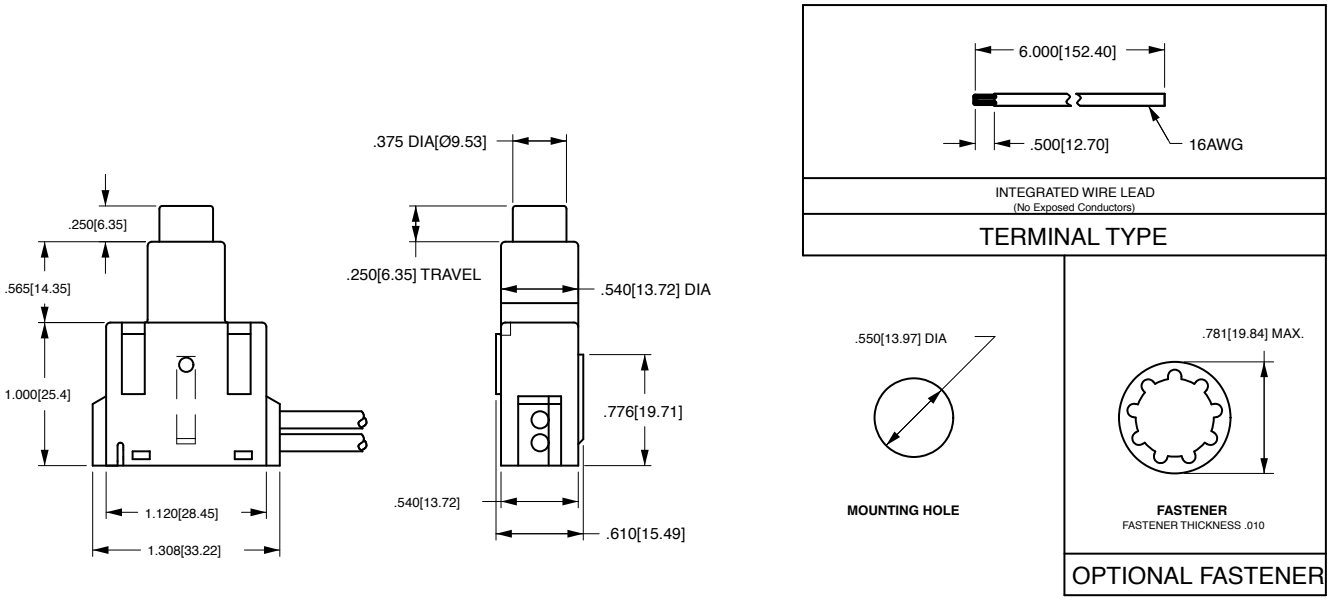
Operating Temperature
32°F to 185°F (0°C to 85°C)

PPA525-AC

1
Part Number

1 PART NUMBER: SERIES / ACTUATOR / CIRCUITRY / RATING / TERMINATION

	Wire Leads
10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC On-Off	PPA525-AC
10A 250VAC, 15A 125VAC On-Off	PAA515-AC



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

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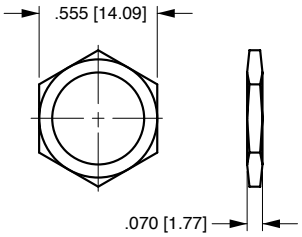
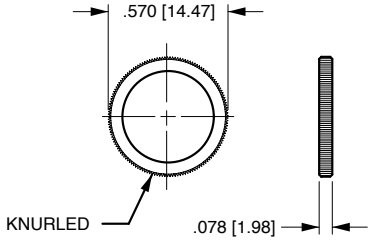
Bushing Accessories

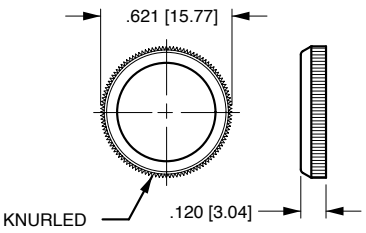
The hardware options and accessories listed below were specifically designed to be used with toggle and pushbutton switches. The drawings are representative of the actual products. When other hardware options are required, please consult factory.



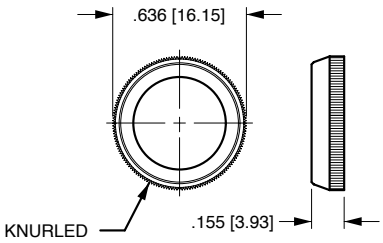
STANDARD HEXNUT
.562 in. [14.27 mm] X .076 in. [1.93 mm]
NICKEL: 380-08602
BLACK: 380-08606



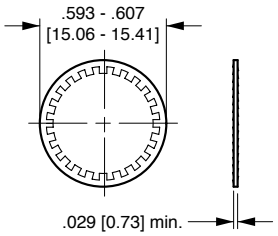
STANDARD FACENUT
.570 in. [14.47 mm] X .078 in. [1.98 mm]
NICKEL: 380-08693
BLACK: 380-08694



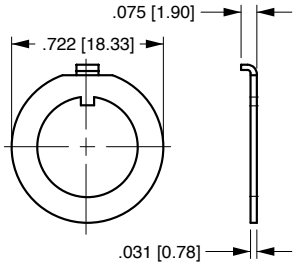
PLASTIC FACENUT
(Wrench Supplied N/C)
.625 in. [15.87 mm] X .120 in. [3.04 mm]
BLACK: 384-17126-001
RED: 384-17126-002
WHITE: 384-17126-003



DRESS FACENUT
.636 in. [16.15 mm] X .155 in. [3.93 mm]
NICKEL: 380-08810
BLACK: 380-08811

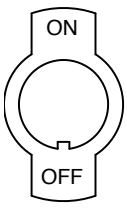


LOCKWASHER
NICKEL-PLATED: 728-15907



LOCKING RING
ZINC: 728-15946
BLACK:728-15947

All indicator plates are nickel-plated steel. Odd keyway locations, alternate imprints and plating available on special order. Contact factory for minimum quantities and specifications.



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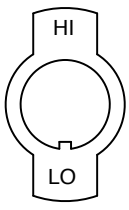
272-06747



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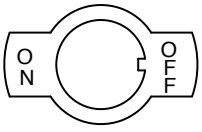

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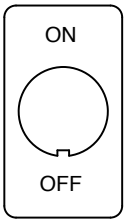
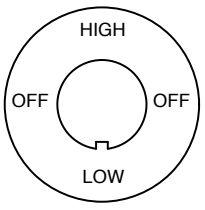
272-06842



Y1O1
272-06935



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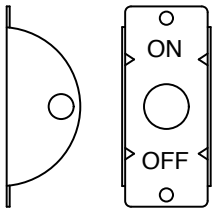
272-07258



Y500
272-07293

ALL PLATES SHOWN FIT 15/32" (.465 [11.81]) BUSHINGS

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

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ROTARY SWITCHES

Carling offers four-position, eight-position, and repeating action single pole rotary switches ranging from 1 to 20 amps. UL & CSA certified.

SELECTOR GUIDE

V-Rotary	*R135*	*700 / 800*	
1, 2	1	1	**Poles**
up to 15A 24VDC 20A 12VDC	1.5A 250VAC 3A 125VAC 5A 12VDC	up to 3A 250VAC 6A 125VAC	**Ratings**
IP67, ergonomic knob	round	asymmetrical	**Sealing / Actuator**
.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.375" dia [9.52mm] bushing mount .500" dia [12.7mm] snap-in mount	.500" dia [12.7mm] bushing mount	**Mounting Hole Specifications**
solder lug .250 tabs wire leads	wire leads	.125 tabs solder lug .250 tabs	**Termination**
incandescent, LED	n/a	n/a	**Illumination**
pending	UL, CSA	UL, CSA	**Approvals**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

Manufacturer reserves the right to change product specifications without prior notice.

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Rotary

V-Series

CONTURA ROTARY SWITCHES

The V-Series Contura Rotary Switch was designed for maximum performance and reliability leveraging the features of the widely popular V-series Contura Rocker Switches. Available in maintained and momentary circuit options, the V-Series Rotary features a sturdy knob construction, up to three separate LEDs, and fits in an industry standard panel opening.

Internally, the V-Series Contura Rotary uses a patented mechanism that translates rotary to linear motion. This allows for common switch functionality and terminal connections with the V-Series rocker version and requires no harness change. A secondary CAM, which helps drive the mechanism, provides definitive detent positions and prevents the switch from stopping between positions, while improving tactile feel.

The V-Series Rotary also features an innovative PC board that supports the LED and surface mount resistors; and IP67 sealing protection above panel by utilizing LED and actuator stem seals. Together, these features make the V-Series Contura Rotary switch the best choice available in the market today.

Resources:

Download 3D CAD Files

IGS > STP >

Watch Product Video

Product Highlights:

- Accommodates up to three separate LEDs
- Patented mechanism translates rotary into linear motion
- Secondary CAM for definitive detent positions
- PC Board supports LED and surface mount resistors
- IP67 sealing protection above panel
- Common terminal & circuit functionality with V-Series Rocker switches, with no harness change required

Typical Applications:

- On/Off Highway Equipment
- Marine
- Test & Measurement
- Instrumentation
- Speed Control

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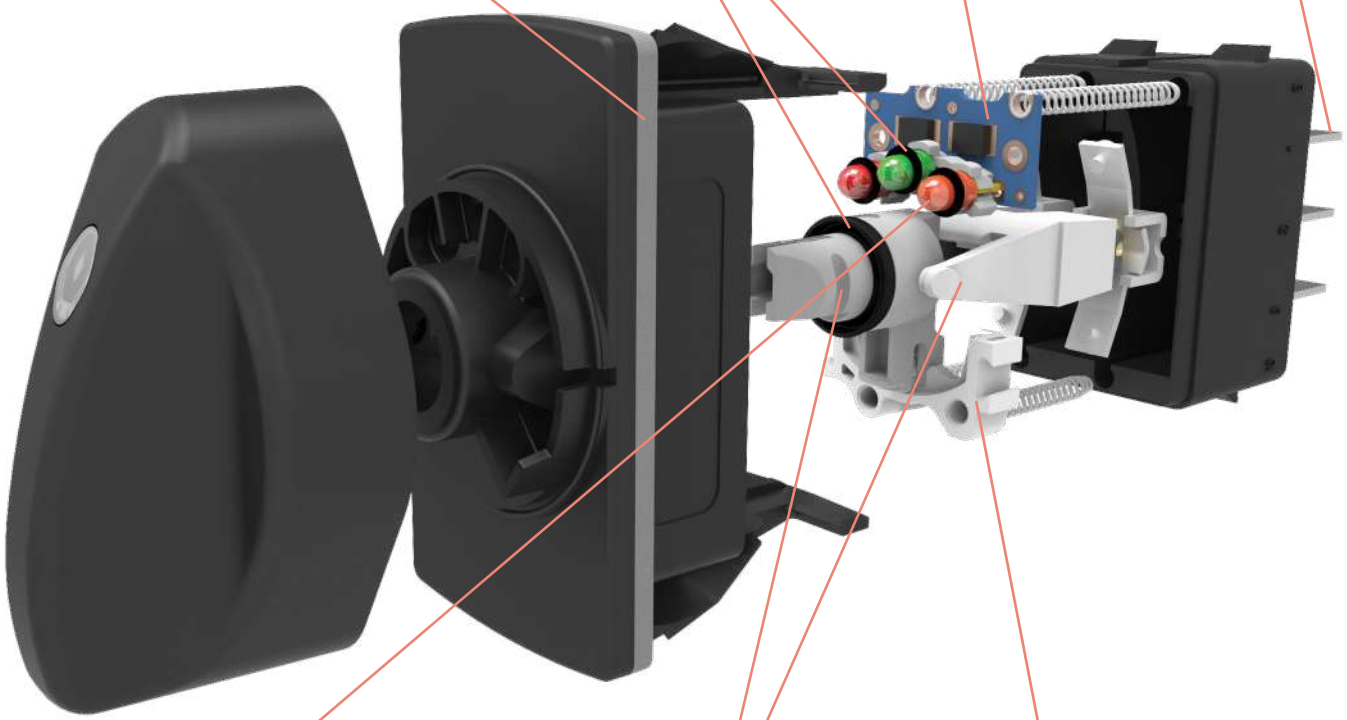
V-Series Rotary Switch
DESIGN FEATURES

OPTIONAL PANEL SEAL
Prevents water/dust ingress behind panel

SEALS
LED and stem seals provide IP67 protection above panel

PC BOARD
Supports LEDs and surface mount resistors

TERMINALS
Same pinout as V-Series Rocker Switches, requiring no harness change



LEDS
Up to three separate LEDs

ROTARY & LINEAR ACTUATOR
Patented mechanism that translates rotary to linear motion

SECONDARY CAM
Provides definitive detent positions with ball & spring located in rotary actuator

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Electrical

Rating

Circuit	Voltage	Max Current Resistive
2 Position Maintain	12	20
2 Position Momentary	12	20
3 Position All	12	20
2 Position Maintain	24	15
2 Position Momentary	24	15
3 Position All	24	15

Dielectric Strength	1500 Volts RMS
Insulation Resistance	50 Megohms
Initial Contact Resistance	10 Milli Ohm max @ 4VDC
Life	50,000 Cycles Two Position 25,000 Cycles Two Position Momentary and All Three position
Terminals	0.250" (6.3mm) Quick Connect

Physical

Function Circuits	Double Pole Single Throw, DPST Double Pole Double Throw, DPDT
Operation	Two and Three Position Maintained and Momentary
Knob Rotation	Two Position 60 Degrees Three Position 30 Degrees from Center
Illumination	LED; Red, Green, Amber, Yellow, White, Blue
Seals	LED O-ring(s) – Silicone, Bezel gasket – Neoprene, Knob seal - NBR
Flammability	Exceeds FVMSS 302 Requirements, Exterior Components, UL 94 V-2 or Better Interior Components, UL 94 HB or Better
Base	Polyester, PBT
Bracket	Nylon 66, PA
Knob	Polybutylene Terephthalate, PBT 6.5%GF
Lens	Polycarbonate, PC
Connector	Nylon 66, PA
Mounting	Front Panel Snap In, 1.450" (36.83mm) X 0.830" (21.08mm) Panel Thickness, 0.030" – 0.187" (0.76 – 4.75mm)

Mechanical

Mechanical Life	100,000 Cycles Maintained Circuits 50,000 Cycles Momentary Circuits
Knob Impact	50 Gram weight dropped from a height of 18 inches on Top & Sides

Environmental

Sealing	IP67, in accordance with IEC 60529, BS 5490, DIN 40050 & NFC 20 010. This rating applies to front panel components of the actual switch only, and signifies protection against dust and the prolonged effects of immersion under pressure.
Dust	Mil STD 810, Method 510.2 Air Velocity 300 Ft/Min Duration 16Hr
Corrosion	IEC 68-2-60 Mixed Flowing Gas (MFG) 14 Days
Chemical Splash	Gasoline, Diesel, Motor Oil, Brake Fluid, Ammonia, Armour All
Salt Spray	Mil STD 202G, Method 101, Test Condition A 96 Hr
Vibration Random	Mil STD 202G, Method 214 test Condition C 10G's RMS
Vibration Sinusoidal	Mil STD 202G, Method 204D, Test Condition A 0.06DA or 10G's 10-500Hz
Shock	MIL-STD 202G, Method 213B Test Condition K, 30G's
Handling Shock	1 Meter Drop onto Hard Surface
Thermal Shock	MIL-STD 202G, Method 107G Test Condition A -55 C to 85 C
Moisture Resistance	MIL-STD 202G, Method 106F 10, 25 C to 65 C Cycles 95% RH
Thermal Cycling	25 Cycles -40 C to 85 C
Ignition Protection	ISO 8846 with EC Directive 94/25/EC for Marine Products
UV Protection	300 hr Xenon Arc, 1.4W/m2 wavelength 420 nm
ESD	Human Static Discharge, +/- 15KV applied during normal operation Shipping/Handling, frequency range 200-2000 MHz applied voltage is +8KV to +15KV and -8KV to -15KV 3 discharge cycles

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RV	21	D	2	B	6	0	0	B	-	K	R	C
1 Series	2 Circuit	3 Rating	4 Termination	5 Illumination	6 Lamp 1	7 Lamp 2	8 Lamp 3	9 Bracket		10 Actuator	11 Lens	12 Knob Color

1 SERIES
RV Rotary Contura

2 CIRCUIT [1]
Terminal Connections as viewed from bottom of switch:
8 - - 7
1 - - 4
2 - - 5
3 - - 6
10 - - 9

( ) - momentary

DP - double pole uses 1, 2, 3 and 4, 5, 6.

Position:	1	2	3
DP	2 & 3, 5 & 6	Connected Terminals	1 & 2, 4 & 5
21	ON	NONE	OFF
22	(ON)	NONE	OFF
23	ON	NONE	(OFF)
24	ON	NONE	ON
26	ON	OFF	ON
28	(ON)	OFF	(ON)
SPECIAL CIRCUITS			
55	(ON)	OFF	ON
61	2 & 3, 5 & 6	2 & 3, 4 & 5	1 & 2, 4 & 5
62	2 & 3, 5 & 6	2 & 3	OFF
64	(2 & 3, 5 & 6)	2 & 3	OFF

3 RATING
1 .4VA 28VDC Resistive
B 15A 24V
D 20A 12V

4 TERMINATION / BASE STYLE

8 Term	10 Term	Termination	Jumper
1	**2**	.250 TAB (QC) - no barriers	No
A	**B**	.250 TAB (QC) - with barriers	No
J [4, 5]	**K** [4, 5]	.250 TAB (QC) - no barriers	Yes (T2 to T5)

Notes:
1 Switch circuit uses terminals 1,2,3,4,5 & 6. Terminals 7,8,9 & 10 are for lamp circuit only.
2 Jumper between terminals 2 & 5 for Circuits 61, 62, & 64 to be specified in the Termination & Jumper selection.
3 Circuit 61 may be used for SP, OFF-ON-ON circuit.
4 Base will not have terminal insulating barriers when connector and/or jumpers are used.
5 Code J,K are optional for circuits 62 and 64. Customer may provide externally wired jumper to connect terminals 2 and 5.
6 Lamp #1 located at top end of switch, above terminal 4.
Lamp #2 located at top end of switch between terminals 1 & 4.
Lamp #3 located at top end of switch, above terminal
Positive (+) and negative (-) symbols apply to L.E.D. lamps only.
7 Mounting hole size is 1.450" (36.83mm) by 0.830" (21.08mm). To mount multiple switches in single panel cut-out order optional interlocking mounting panels.
8 Lens color for L.E.D.s must be clear, white, or match color of L.E.D.

5 ILLUMINATION [6, 8]

Sealed	Lamps	when illuminated	Terminals
S	NONE		
A	# 1	Independent	8+ 7-
B	# 1	Dependent	3+ 7-
C	# 1	Independent	8+ 7-
	& # 3	Independent	10+ 7-
D	# 1	Dependent	3+ 7-
	& # 3	Dependent	1+ 7-
E	# 1	Independent	8+ 7-
	# 2	Independent	9+ 7-
	# 3	Independent	10+ 7-
F	# 1	Dependent	3+ 7-
	# 2	Independent	9+ 7-
	# 3	Dependent	1+ 7-
G	# 1	Dependent	3+ 7-
	# 3	Independent	8+ 7-
H	# 2	Independent	8+ 7-
J	# 1	Independent	8+ 7-
	# 2	Independent	10+ 7-
K	# 1	Dependent	3+ 7-
	# 2	Dependent	1+ 7-
L	# 1	Dependent	3+ 7-
	# 2	Independent	8+ 7-
M	# 2	Independent	8+ 7-
	# 3	Independent	10+ 7-
N	# 2	Dependent	3+ 7-
	# 3	Dependent	1+ 7-
P	# 2	Independent	10+ 7-
	# 3	Dependent	1+ 7-
R	# 3	Independent	8+ 7-
T	# 3	Dependent	1+ 7-

6, 7, 8 LAMP #1, 2 AND OR LAMP #3 [6, 8]
Selection 6: above terminal 7; Selection 8: above terminal 8
No lamp **0**

LED	Red	Amber	Green	Blue	White
12VDC	**C**	**N**	**H**	**E**	**6**
24VDC	**D**	**P**	**J**	**K**	**8**

9 BRACKET COLOR & PANEL SEAL [7]

Color	No Gasket	1 Gasket	2 Gasket
Black	**B**	**C**	**D**
Gray	**G**	**H**	**J**
White	**W**	**Y**	**Z**

10 ACTUATOR STYLE
K Rotary Knob (Standard)

ACTUATOR ORIENTATION
ABOVE TERMINALS

11 LENS COLOR [8]
No Lens **Z**

Clear	White	Amber	Green	Red	Blue
4	**9**	**E**	**K**	**R**	**W**

12 KNOB COLOR

Black	Gray	Red	White
C	**H**	**S**	**Y**

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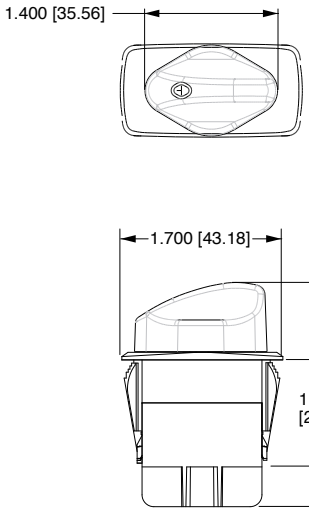
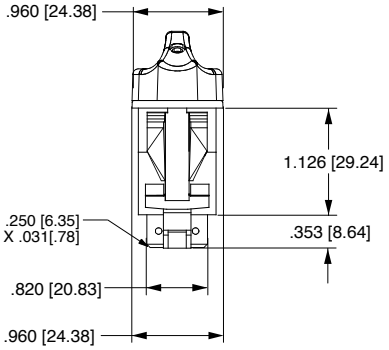
Dimensional Specifications: in. [mm]



10 TERMINAL BASE
W/ BARRIERS



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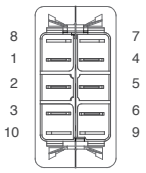
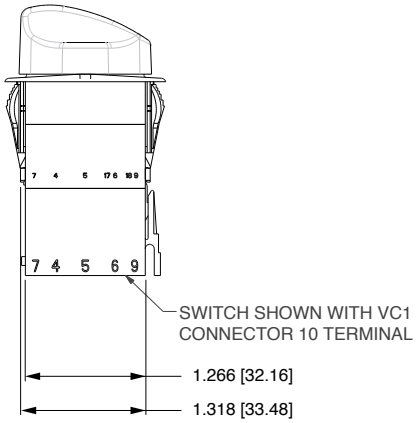
W/O BARRIERS



BOTTOM VIEW
TERMINAL ARRANGEMENT
10 TERMINAL BASE



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Circuits Diagrams:

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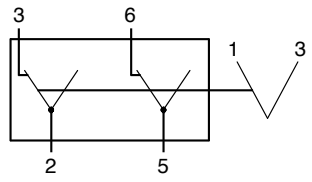
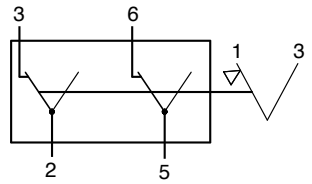
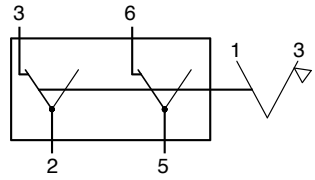
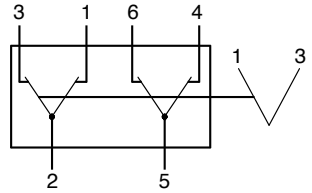
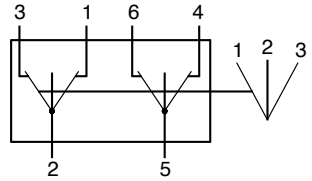
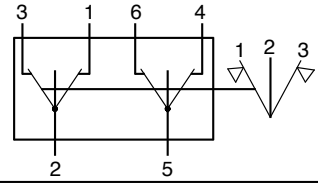
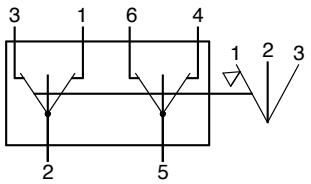
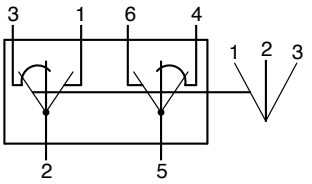
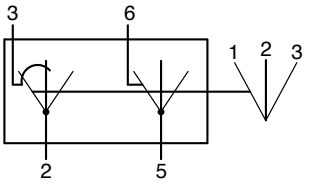
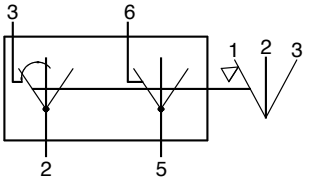
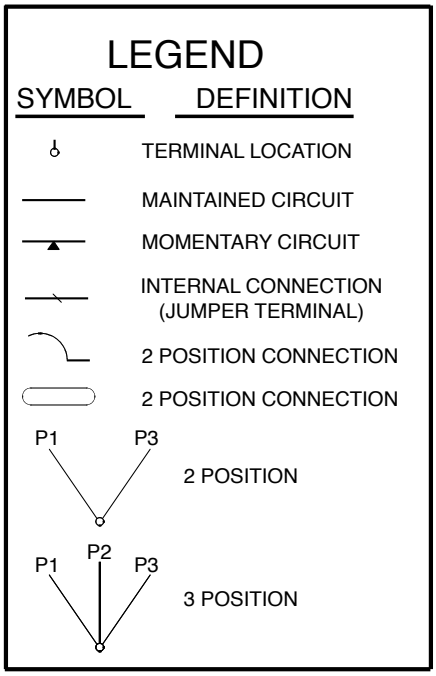
21		
22		
23		
24		
26		
28		

CIRCUIT CODE	CIRCUIT DIAGRAM	KNOB POSITION
55		
61		
62		
64		



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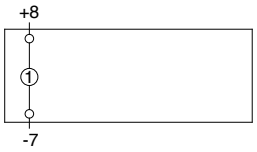
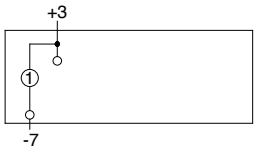
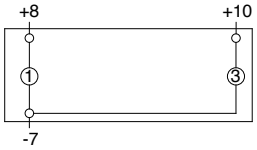
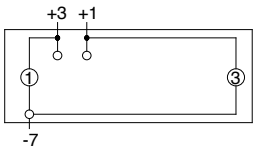
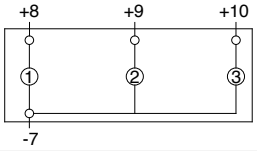
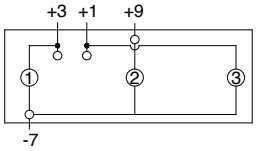
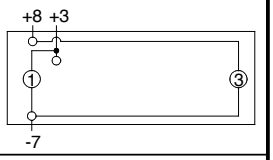
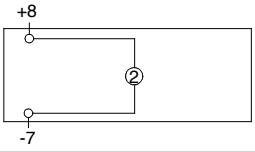
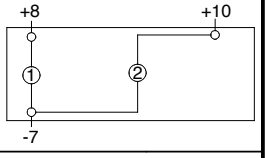
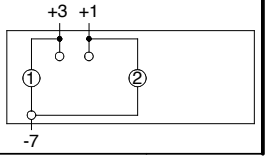
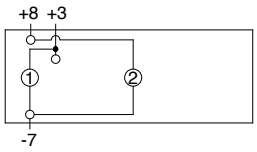
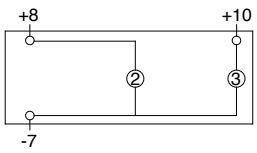
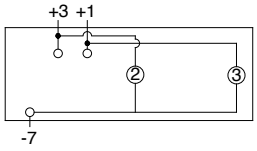
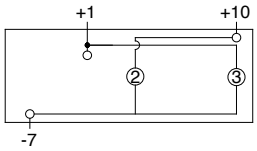
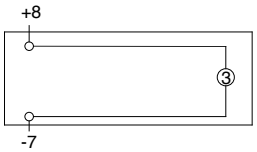
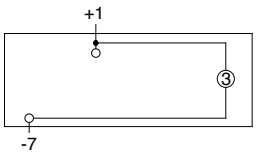
Lamp Circuit Diagrams:

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	
J	
K	

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
L	
M	
N	
P	
R	
T	

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R135-Series
ROTARY SWITCHES

The R135 and R135A-Series rotary switches are single pole, single throw "L" rated up to 3A, feature an ON-OFF repeating action, and are available with a nylon actuating knob; nylon snap-in bracket or nickel-plated brass bushing. These switches are typically used to control lighting functions.

Product Highlights:
- 3A 125VAC "L" rating to control lighting
- Off-On repeating action circuitry
- Integrated wire lead termination
- Bushing or snap in mounting styles

Typical Applications:
- Appliance
- HVAC

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Dielectric Strength
UL/CSA: 1000V - live to dead metal parts

Electrical Life
100,000 cycles

Mechanical Life
100,000 cycles

Operating Temperature
32°F to 185°F (0°C to 85°C)

R135-A – **BL**

1 Base Part Number *2 Knob Color*

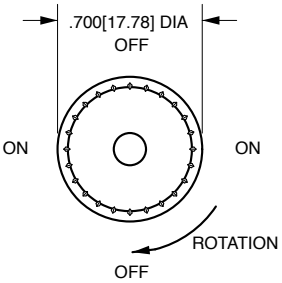
1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION

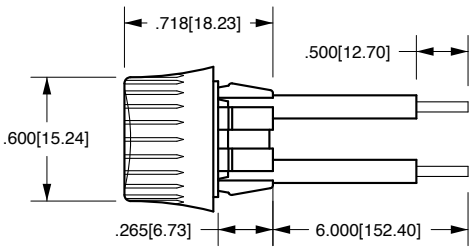
		Wire Leads
1.5A 250 VAC; 3A 125 VAC L; 5A 12 VDC		
OFF-ON repeating	.375 threaded bushing	**R135**
OFF-ON repeating	nylon snap-in bezel	**R135-A**

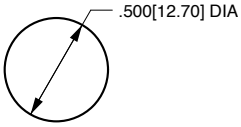
2 KNOB COLOR [1]

BL	Black
WH	White

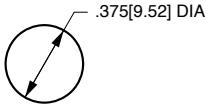
Notes:
Standard Wire Leads are 6" long, stripped 1/2" black. If different length required, please specify at the end of the part number. ex. R135-A-BL/20". Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. Burr on bottom. Test cut hole in actual material.
1 Custom colors available. Consult factory.







NYLON BEZEL MOUNTING HOLE
Snaps into .500[12.70] Dia. hole
Panel Thickness: .020[.508] to .078[1.98]



THREADED BUSHING MOUNTING HOLE
Fits into .375[9.52] Dia. hole
Bushing Length: .312[7.92]

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

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700/800-Series
ROTARY SWITCHES

The 700 and 800-Series are single pole multi-position, general purpose rotary switches. These switches feature a nylon actuator in a metal clad construction along with a self-cleaning silver plated contact design. The 700 and 800-Series are typically used in applications requiring multi-position speed controls, such as electric fans.

Product Highlights:
- Ratings to 3A 250VAC, 6A 125VAC
- Up to 8 available detent positions
- Double “D” bushing mount
- Sturdy metal clad construction

Typical Applications:
- Small Appliance
- Industrial Control
- Marine

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Dielectric Strength
UL/CSA: 1000V (minimum)

Insulation Resistance
100 Megohms (minimum)

Base Material
Steel/Zinc Plate

Actuator Material
Brass/Nickel Plate

700-1A - **BL**

1 Base Part Number *2 Knob Color*

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY [1] / RATING / TERMINATION [2]

2A 250VAC; 4A 125VAC; 1A 125V

Solder Lugs	.250 Tabs	Position 1	Position 2	Position 3	Position 4	
-	**700-A**	OFF	ON	ON	ON	
700-1	**700-1A**	OFF	ON	-	-	
700-2	**700-2A**	OFF	ON	ON	ON	repeating for 8 positions
700-3	**700-3A**	OFF	ON	ON	OFF	
700-4	**700-4A**	OFF	ON	ON	-	
700-5	**700-5A**	OFF	ON	OFF	-	
700-6	**700-6A**	-	ON	OFF	ON	
700-7	**700-7A**	-	ON	ON	-	
700-8	**700-8A**	-	ON	ON	ON	
700-9	**700-9A**	OFF	ON	OFF	ON	

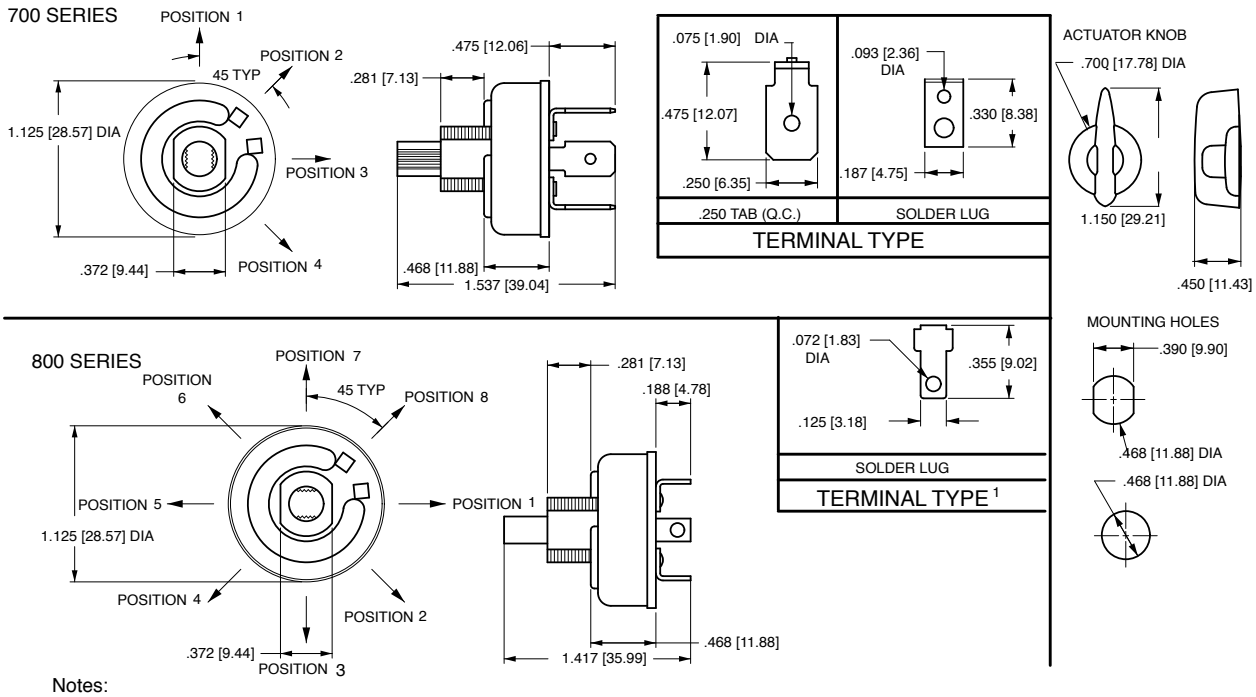
3A 250VAC; 6A 125VAC

Switch Positions		OFF Position	
800-2	2 positions	**800-A**	1st position
800-3	3 positions	**800-A2**	2nd position
800-4	4 positions	**800-A3**	3rd position
800-5	5 positions	**800-A4**	4th position
800-6	6 positions	**800-A5**	5th position
800-7	7 positions	**800-A6**	6th position
800-8	8 positions	**800-A7**	7th position
		800-A8	8th position

2 ACTUATOR COLOR

BL Black

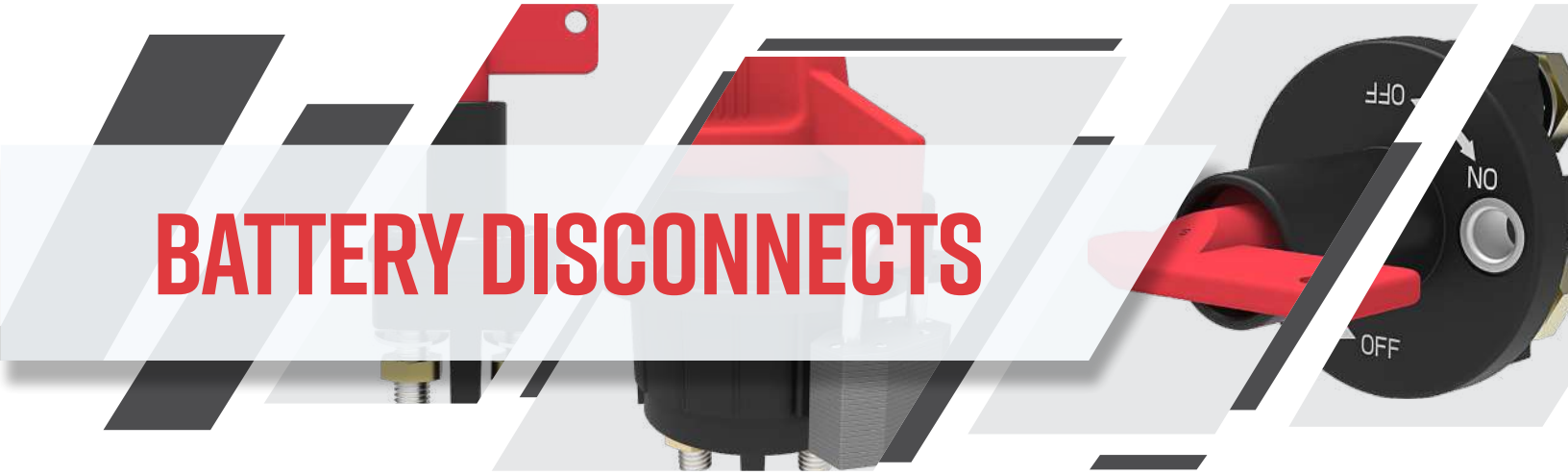
Notes:
1 700-2 and 700-2A feature 8 detent positions.
2 800-Series terminal is a combination solder lug and quick connect.



Notes:
1. Terminal is combination solder lug and quick connect.

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

BATTERY DISCONNECTS



Carling Technologies battery disconnect switches are designed to minimize battery drain, ensure maintenance personnel safety, and when used in conjunction with a padlock, provide vehicle theft protection.

SELECTOR GUIDE

BD-Series	BD1-Series	
1	1	**Poles**
100-300 Amps 12VDC/24VDC	250 Amps 12VDC/24VDC	**Ratings**
ergonomic knob	ergonomic knob; removable option available	**Actuator**
M8 Bolt and Nut	M6/M7 Bolt and Nut	**Mounting Hole Specifications**
M10 Stud M14 Stud	M10 Stud; 19 and 27mm length	**Termination**

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

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BD-Series

BATTERY DISCONNECT POWER SWITCH

Carling Technologies BD-Series battery disconnect switch is designed to minimize battery drain, ensure maintenance personnel safety, and when used in conjunction with a padlock, provide vehicle theft protection.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing ›

Watch Product Video

Product Highlights:

- Single Pole, 100-300 Amps
- 12VDC/24VDC
- IP67 Sealing Protection
- Red, Yellow or Black Ergonomic Knob
- Lock Compatible

Typical Applications:

- On/Off-Highway Equipment
- Military
- Marine

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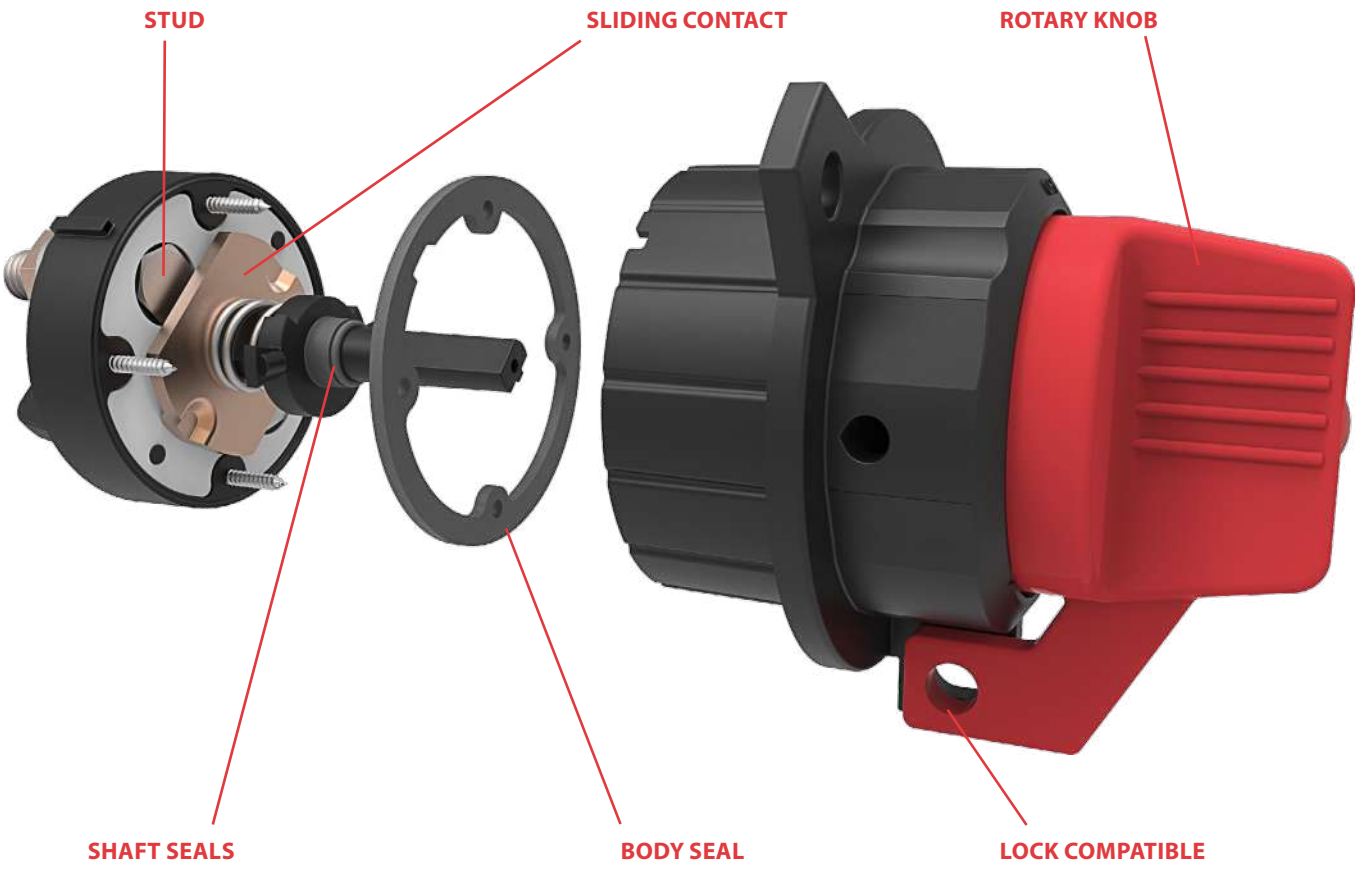
BD-Series
DESIGN FEATURES



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Electrical

Application Voltage	DC Rated voltage: 12VDC / 24VDC Range of operating voltage: 12VDC: min 9VDC, max 16VDC; 24VDC: min 18VDC, max 32VDC
Current Ratings	12VDC/24VDC: rated 100A, max 300A (M10 Studs); 12VDC/24VDC: rated 300A (M14 Studs)
Intermittent Current	24VDC/1500A, 3 seconds on, 60 seconds off, 10 cycles: voltage drop should not exceed 400mV between main terminals. 28V/1500A/30 seconds: voltage drop should not exceed 400mV 28V/2000A/5 seconds followed by 28V/750A/30 seconds followed by 28V/250A/24 hours: voltage drop should not exceed 100mV
Dielectric Strength	50HZ, 550VAC for 1 minute between electrically / isolated terminals in main circuit; between terminals of main circuit, knob and enclosure.
Insulation Resistance	Minimum of 100 Megohms 1 min @ 500VDC
Temperature Rise	Terminal should not exceed 60°C above ambient.
Endurance	**For M10 Studs:** 2 seconds ON and 2 seconds OFF per operation, load with rated current & voltage. 12V test @14V±0.1V; 24V test @28V±0.2V. 50,000 cycles: 100A current; 20,000 cycles: 200A current; 3,000 cycles: 250A current 2 seconds ON and 6 seconds OFF per operation, load with rated current & voltage. 12V test @14V±0.1V; 24V test @28V±0.2V 3,000 cycles: 300A current **For M14 Studs:** 2 seconds ON and 6 seconds OFF per operation, load with rated current & voltage. 12V test @14V±0.1V; 24V test @28V±0.2V 3,000 cycles: 300A current

Mechanical

Handling Shock	Fully functional after 3 drops from 1000 mm height. Surface damage may occur.
Endurance	More than 100,000 cycles without load

Environmental

Operating Temp.	-40 ºC to +85 ºC.
Moisture Resistance	IEC 60068-2-38 or G/T 2423.34, Test Z/AD: Composite temperature/humidity cycle test, ten 24-hour cycles @ -10ºC to +65ºC, ≤80-96% RH.
Thermal Cycling	IEC 60068-2-14 or GB/T 2423.22, Test Nb, 25 Cycles -40˚C to +85˚C
Thermal Shock	IEC 60068-2-14 or GB/T 2423.22, Test Na (5 cycles @ -55ºC to +25ºC to +85ºC to +25ºC)
Thermal Resistance	IEC 60068-2-1 or GB/T 2423.1 Cold: Test A, operate 8 hours @ -40°C IEC 60068-2-2 or GB/T 2423.2 Heat: Test B, operate 8 hours @ +85°C
Vibration	IEC 60068-2-34 or GB/ T 2423.11, 10-500 Hz, Random vibration test for 8 hours in each of the 3 mutually perpendicular axes. 25Gs @ Z axes, 12.5Gs @ X/Y axes. powered.
Salt Spray	IEC 60068-2-11 or GB/T 2423.17, 48 hours
Fire and Smoke	IEC 60695-11-10 or GB/T 2408, HB
Dust / Waterproof	IEC 60529 or GB4208, IP67
Chemical Splash	Gasoline, Diesel, Motor Oil, Brake Fluid, Ammonia, Armor All
UV Protection	ASTM G155-05a, cycle 11, 300 hr Xenon Arc, 1.4W / (m2 Nm), wavelength 420 Nm

Physical

Number of Poles	1 pole
Wiring Terminals	Line / Load terminal: M10 brass nuts Torque value: M10 (6-8 Nm); M14 (10-14 Nm)
Mounting	M8 Iron nut, torque value: (10-15 Nm)
Torque Operation	1.0-3.0 Nm
Body Color	Black
Actuator Color	Handle color optional, with white color “Arrow” legends.
Weight	(M10 Studs): 340±10 g / set; (M14 Studs): 385±10 g / set
Material	Base (PBT glass filled), Bracket & Knob (nylon glass filled), Studs (Copper + Tin plating), Nuts (Brass)

*Manufacturer reserves the right to change product specification without prior notice.
GPS-0001 Rev: D

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BD	A	10	-	R	A
1 Series	2 Rating	3 Termination		4 Knob Color	5 Legend

1 SERIES
BD Battery Disconnect Power Switch

2 RATING / CYCLES
A 100A @ 24VDC: 50,000 Cycles
200A @ 24VDC: 20,000 Cycles
250A @ 24VDC: 3,000 Cycles
B 300A @ 24VDC: 3,000 Cycles

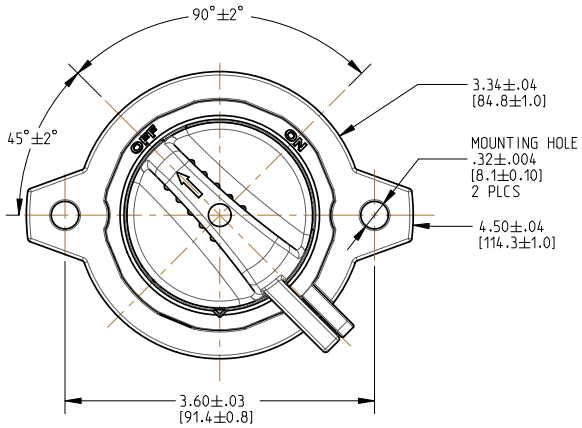
Note: Refer to General Specifications for test parameters.

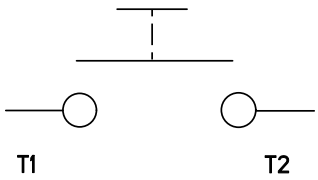
3 TERMINATION
10 M10 Stud
14 M14 Stud

4 KNOB COLOR
R Red
Y Yellow
B Black

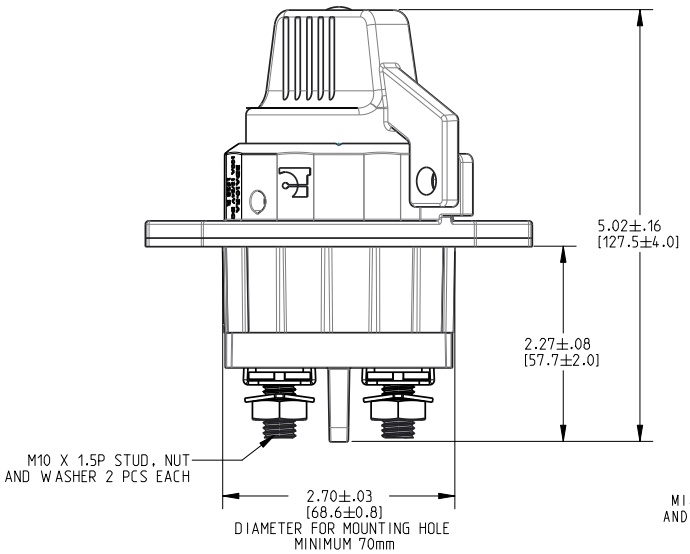
5 LEGEND
A Arrow Legend, White Color

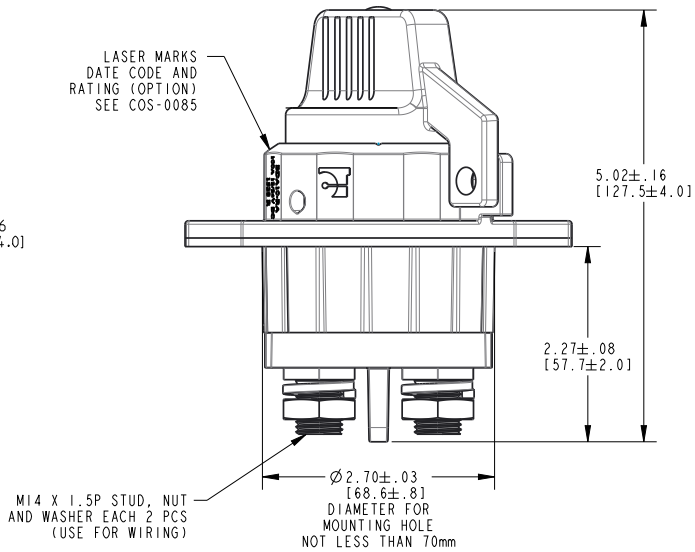
Dimensional Specifications: in. [mm]





"ON/OFF" SINGLE POLE SINGLE THROW SWITCH
CIRCUIT DIAGRAM





COS-0085 Rev: E
CLA-0141 Rev: C

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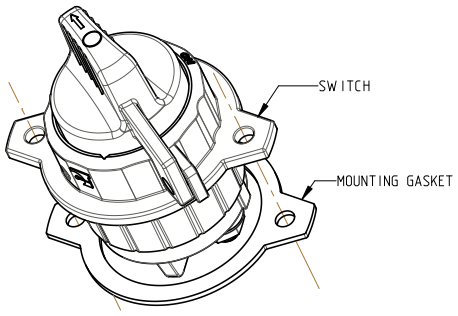
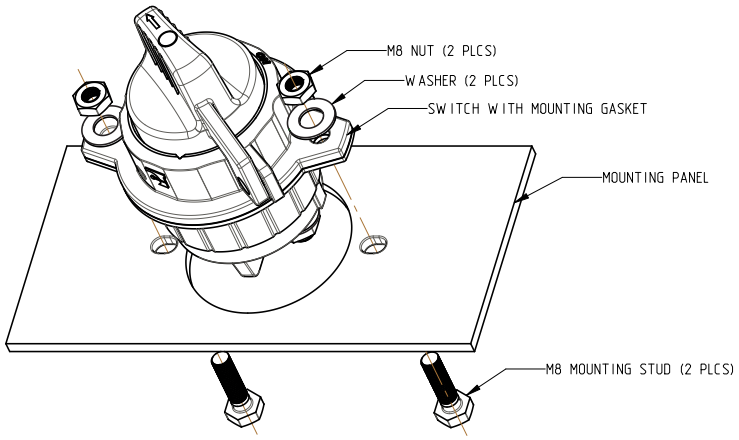
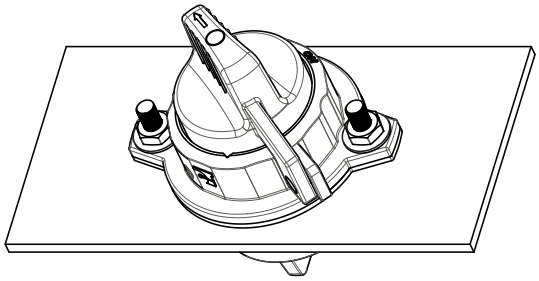
Mounting Method 1: in. [mm]



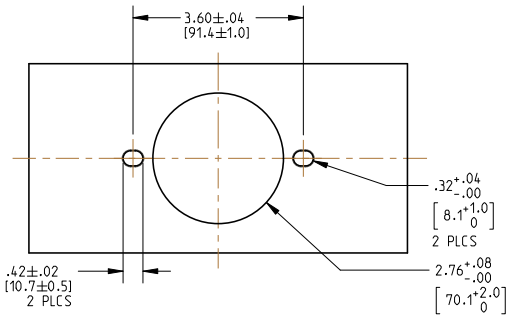
MOUNTING STEP 1: ATTACH MOUNTING GASKET WITH THE SWITCH ORIENTATION AS SHOWN



MOUNTING STEP 2: ORIENT AS SHOWN AND INSTALL THE SWITCH IN MOUNTING PANEL HOLE; THEN INSERT STUDS AND WASHERS



MOUNTING STEP 3: TIGHTEN 2PCS M8 NUTS (REC. TORQUE [10-15Nm])



MOUNTING PANEL

Notes:
1 Switch can be mounted horizontally or vertically.

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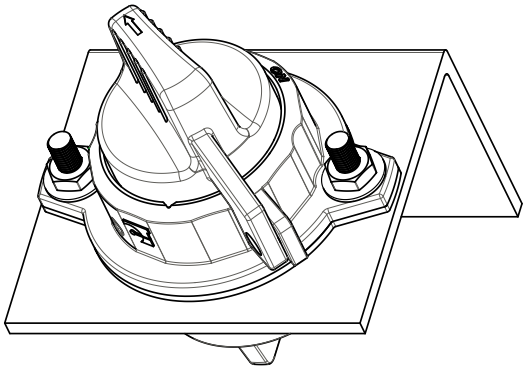
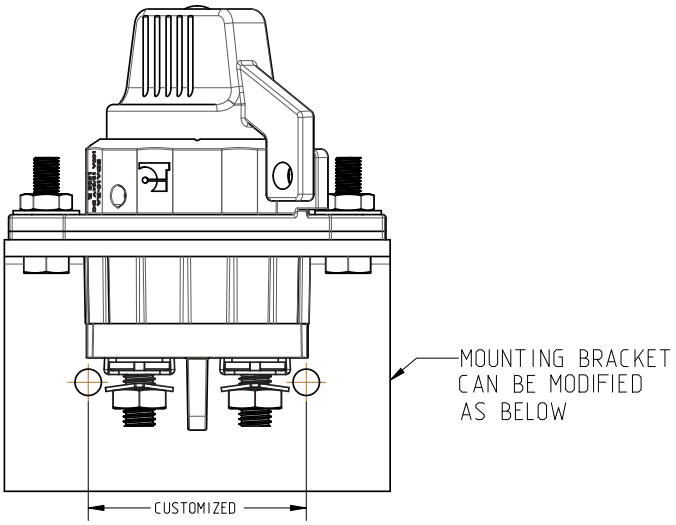
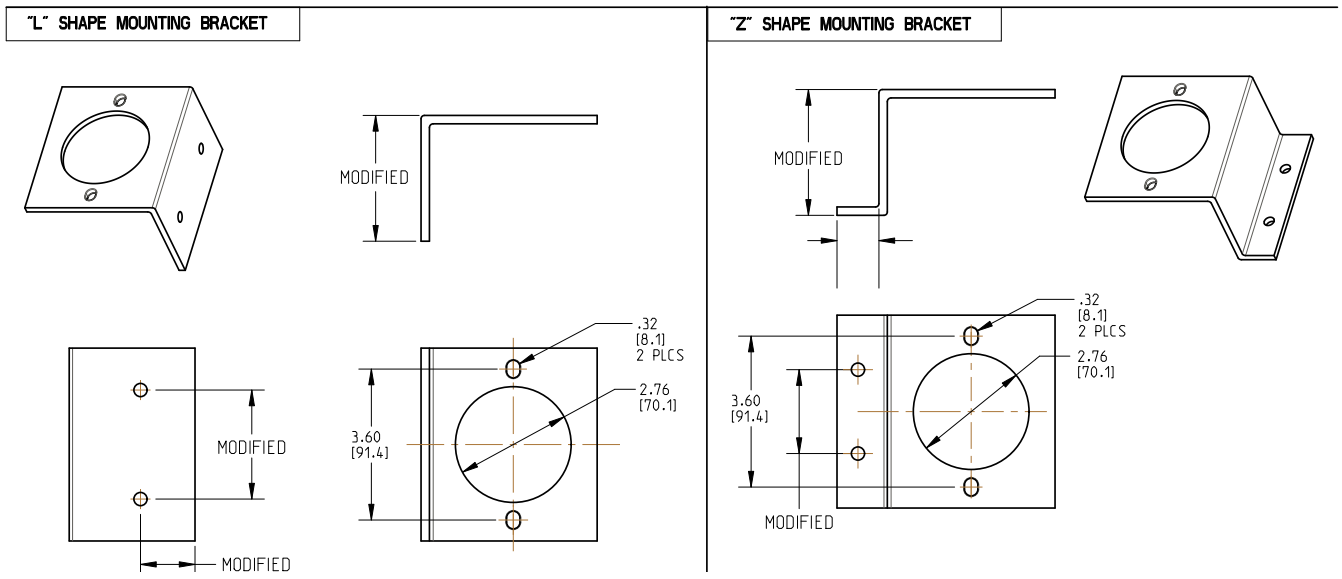
Mounting Method 2: in. [mm]



MOUNTING STEP 1: INSTALL SWITCH WITH MOUNTING BRACKET ORIENTATION AS SHOWN



MOUNTING STEP 2: ORIENT AS SHOWN AND INSTALL THE SWITCH IN CUSTOMER PANEL.



Notes:
1 Switch can be mounted horizontally or vertically.

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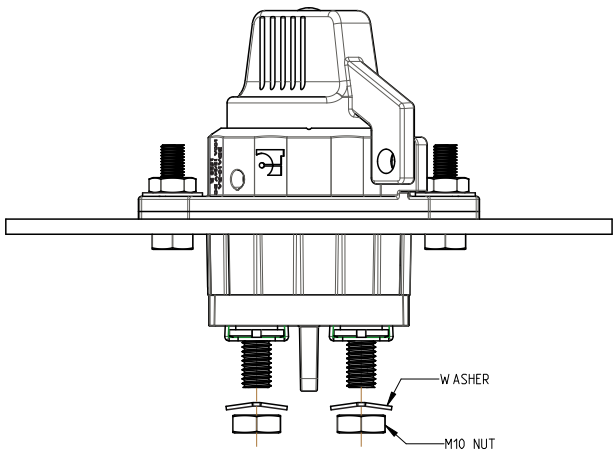
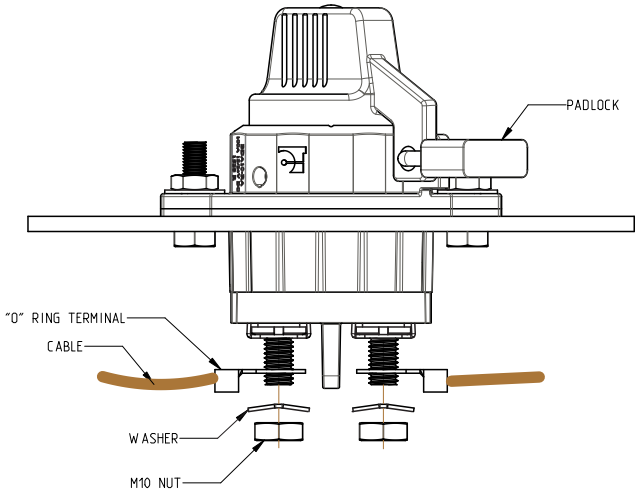
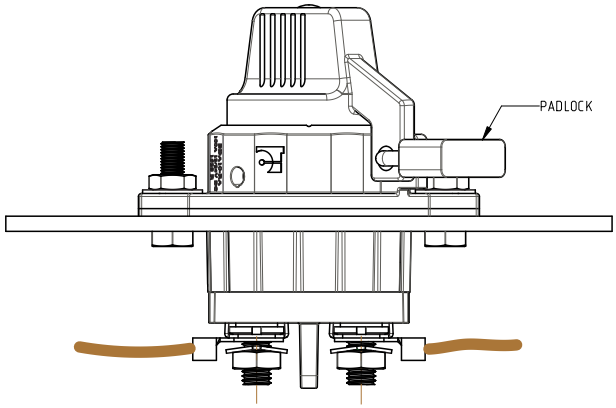
Wiring: in. [mm]



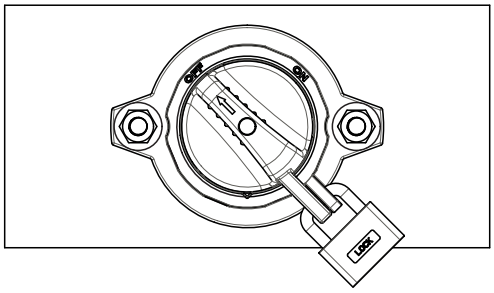
WIRING 1: DISCONNECT WASHERS AND NUTS



WIRING 2: ATTACH 2PCS M10 "O" RING TERMINALS AS SHOWN, THEN RE-FASTEN WASHERS AND NUTS



WIRING 3: TIGHTEN 2PCS BRASS M10 NUTS (REC. TORQUE [6-8Nm])



WHEN USED IN CONJUNCTION WITH A PAD LOCK, SWITCH CAN BE LOCKED IN THE "OFF" POSITION AS A SAFETY MEASURE

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BD1-Series

BATTERY DISCONNECT POWER SWITCH

Carling Technologies BD1-Series battery disconnect switch is designed to minimize battery drain, ensure maintenance personnel safety. Additionally, the optional, removable key adds an extra layer of security to protect against vehicle theft.

Resources:

Configure a Complete Part

Download CAD & Sales Drawing ›

Watch Product Video

Product Highlights:

- 250 Amps
- 12 or 24VDC
- Permanent or Removable Key Options
- IP67 Sealing Protection (when key is assembled)
- Choice of 19mm or 27 mm Length Studs

Typical Applications:

- On/Off-Highway Equipment
- Military
- Marine

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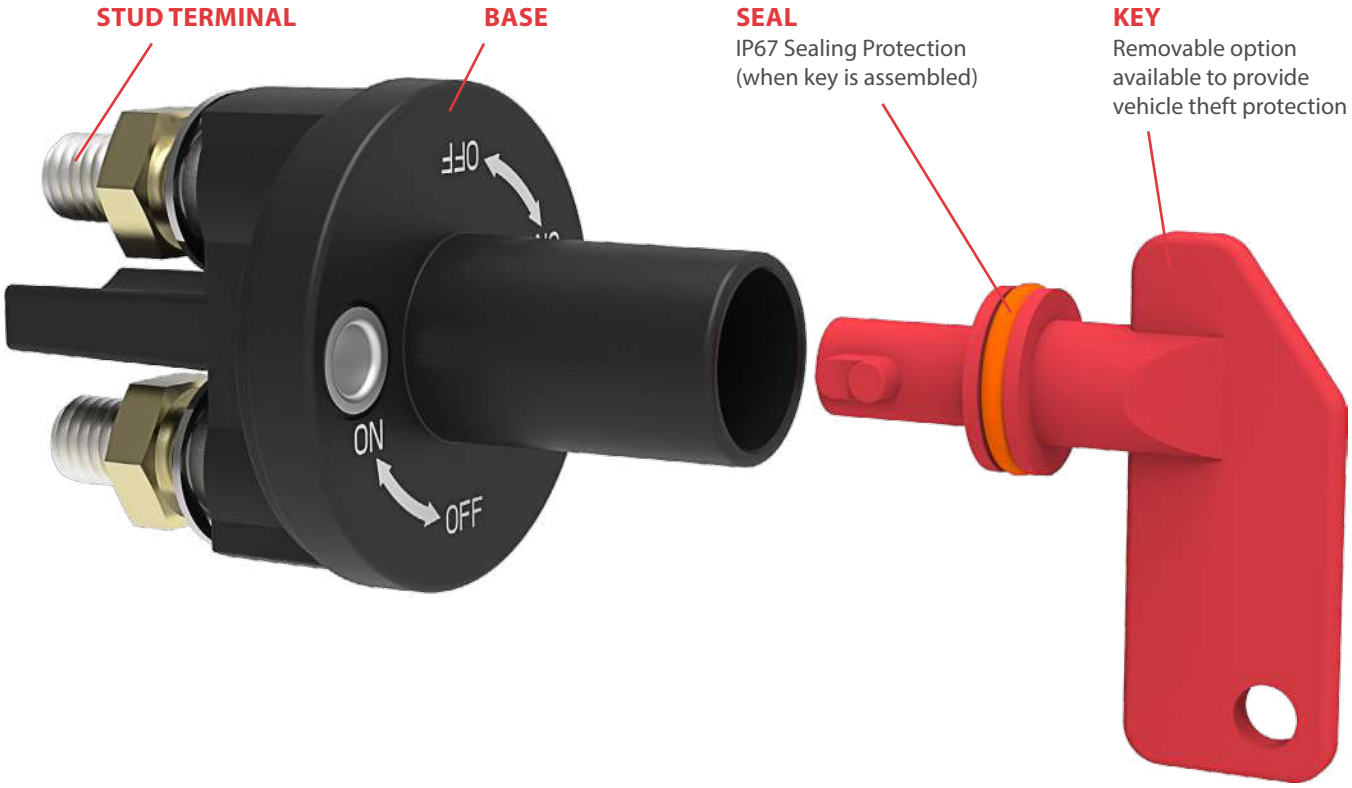
BD1-Series
DESIGN FEATURES

OFF POSITION

ON POSITION

OFF POSITION WITH KEY REMOVED



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Electrical

Application Voltage	DC Rated voltage: 12VDC / 24VDC Range of operating voltage: 12VDC: min 9VDC, max 16VDC; 24VDC: min 18VDC, max 32VDC
Current Ratings	250A@ 12VDC/24VDC
Contact Voltage Drop	Voltage drop≤100mV after 300 sec. ON at 200% rated current prior to endurance test; Voltage drop≤500mV after 5 msec. ON at 1600A max. current prior to endurance test.
Dielectric Strength	50HZ, 1200VAC for 1 minute between electrically / isolated terminals in main circuit; between terminals of main circuit, knob and enclosure.
Insulation Resistance	Minimum of 100 Megohms 1 min @ 500VDC.
Temperature Rise	Terminal should not exceed 90°C above ambient at rated current after endurance test.
Endurance	2 seconds ON and 3 seconds OFF per operation, load with rated current & voltage. 12V test @14V; 24V test @28V. Total 20,000 cycles: 250A current ratings, including 4,000 cycles respectively at -40 ºC±2 and +85 ºC±2; 12,000 cycles at 23 ºC±2.
Overload	500A: 300 seconds ON; 1600A: 30 seconds ON.

Environmental

Operating Temp.	-40 ºC to +85 ºC.
Moisture Resistance	IEC 60068-2-38 or G/T 2423.34, Test Z/AD: Composite temperature/humidity cycle test, ten 24-hour cycles @ -10ºC to +65ºC, ≤80-96% RH.
Thermal Cycling	IEC 60068-2-14 or GB/T 2423.22, Test Nb, 25 Cycles -40˚C to +85˚C.
Thermal Shock	GB/T 28046.4-2011, 5.3.2, Test Na (100 cycles@ -40ºC to +25ºC to +85ºC to +25ºC).
Thermal Resistance	ISO 16750-4 or GB/T 28046.4 Cold: Test A, work 24 hours @ -40°C ISO 16750-4 or GB/T 28046.4 Heat: Test B, work 48 hours @ +85°C.
Vibration	IEC 60068-2-34 or GB/ T 2423.11, 10-500 Hz, Random vibration test for 8 hours in each of the 3 mutually perpendicular axes. 25Gs @ Z axes, 12.5Gs @ X/Y axes, powered.
Salt Spray	IEC 60068-2-11 or GB/T 2423.17, 48 hours.
Fire and Smoke	IEC 60695-11-10 or GB/T 2408, HB (horizontal burning) and V0 (vertical burning).
Sealing	IEC 60529 or GB4208, IP 67
Chemical Splash	Gasoline, Diesel, Motor Oil, Brake Fluid, Ammonia, Mixture of previous five chemicals.
UV Protection	ASTM G155-05a, cycle 11, 300 hr Xenon Arc, 1.4W / (m2 Nm), wavelength 420 Nm.

Mechanical

Handling Shock	Fully functional after 3 drops from 1000 mm height. Surface damage may occur.
Endurance	Minimum 50,000 cycles without load.

Physical

Number of Poles	1 pole
Wiring Terminals	Line / Load terminal: brass nuts Torque value: M10 (10-15 Nm).
Mounting	M6/M7 bolt and nut, torque value: 4-5 Nm.
Torque Operation	0.5-1.0 Nm.
Body Color	Black
Actuator Color	Red
Weight	Approximately 165g
Material	Base & Bracket & Key (glass filled nylon), Studs (Tin plated brass), Nuts (Brass) Locking Washers (SUS304).

*Manufacturer reserves the right to change product specification without prior notice.
GPS-0010 Rev: B

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BD1	-	1	A	2
1 Series		*2 Rating*	*3 Key Style*	*4 Termination*

1 SERIES
BD1 Battery Disconnect Power Switch (1 Pole)

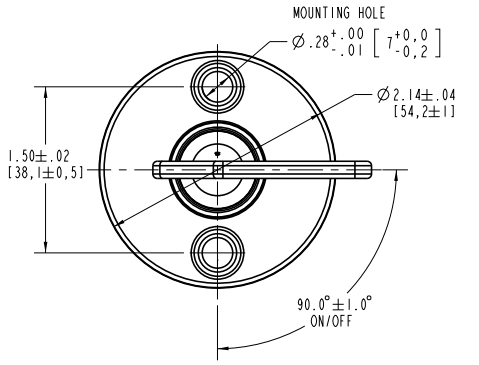
2 RATING / CYCLES
1 250A @ 12/24VDC

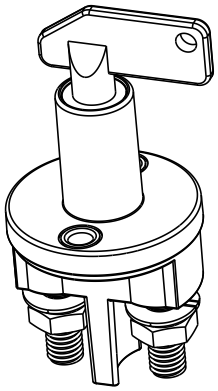
3 KEY STYLE
A Removable[1]
B Non-Removable

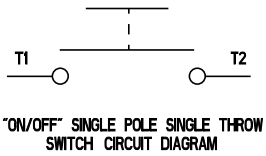
4 TERMINATION
1 M10 Stud 19 mm length
2 M10 Stud 27 mm length

Notes:
1 Individual Keys separately available, reference part number 308-39943-001.

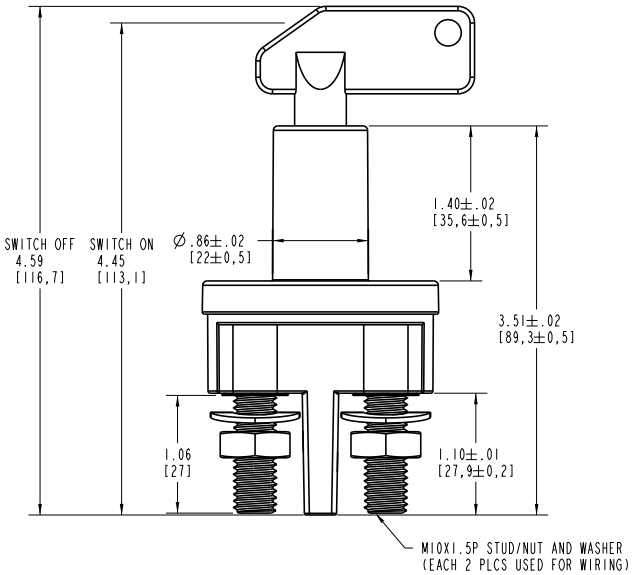
Dimensional Specifications: in. [mm]

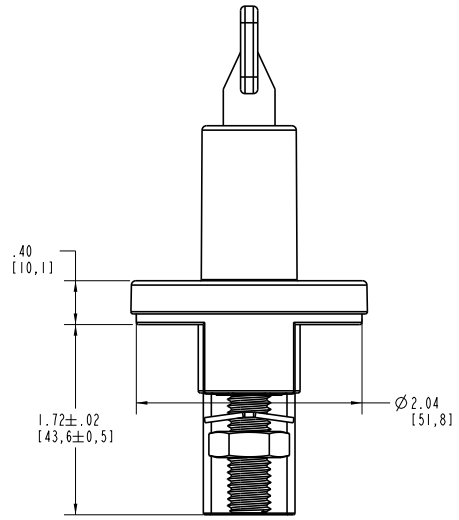


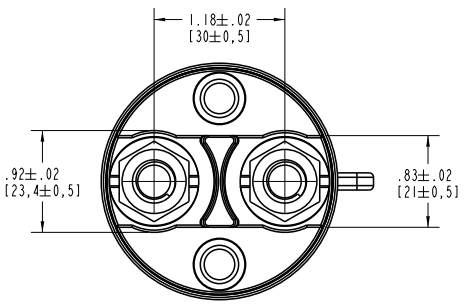


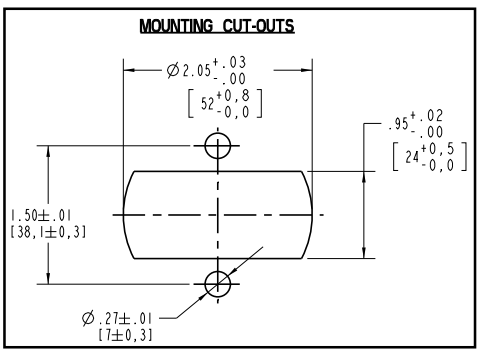


"ON/OFF" SINGLE POLE SINGLE THROW SWITCH CIRCUIT DIAGRAM









Notes:
1 Torque for mounting nut: M6 or M7 (4-5 nm)
2 Torque for wiring nut: M10 (10-15 nm)
3 Switch can be mounted vertically or horizontally

COS-0099 Rev: A
CLA-0154 Rev: A

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Terminology

Agency data	UL File #E7560 CSA File # LR9280
Single Pole (SP)	A switch device that opens, closes or changes connection of a single conductor in an electrical circuit.
Double Pole (DP)	A switch device that opens, closes or changes connection of two conductors in an electrical circuit.
Single Throw (ST)	A switch that opens, closes or completes a circuit at only one of the extreme positions of its actuator.
Double Throw (DT)	A switch that opens, closes or completes a circuit at both extreme positions of its actuator.
Normally Open (NO)	A momentary switch where one or more circuits are open when the switch actuator is at rest (the normal position.)
Normally Closed (NC)	A momentary switch where one or more circuits are closed when the switch actuator is at rest (the normal position.)
Power Rating	A switches current handling capability measured in amperes, horsepower, lamp loads or combinations thereof, in conjunction with applicable voltage levels.
L Rating	Denotes the ability of a switch to handle the initial high inrush of a Tungsten Filament Lamp on AC voltage only.
T Rating	Denotes the ability of a switch to handle the initial high inrush of a tungsten filament lamp on AC or DC voltage.
Typical European Rating	16 resistive load amperage (4) motor load amperage A amperage 250V voltage ~ AC T85 max. operating temp. in centigrade μ micro-gap (<3mm) approved
Microgap (μ)	European marking required for contact separation of less than 3mm. Switches with microgap (μ) approval are not acceptable as the safety disconnect of equipment from the main power source. The equipment requires an additional means for safe disconnection from the main power source such as a cord and plug.
Bulb Life	Neon 25,000 hours Incandescent 25,000+ hours LED 100,000 hours
Lamp Characteristics	Neon (120-240V) .002A Current Draw Incandescent 6V .20A Current Draw 12-14V .08A Current Draw 18V .04A Current Draw 24-28V .04A Current Draw

Agency Approvals

These marks are granted by national certification bodies for use on products which comply with their specifications.

Agency	Country	Mark
UL	USA	
UL	Canada	
UL	USA & Canada	
BEAB	United Kingdom	
CSA	Canada	
VDE	Germany	
TUV	Germany	
SEMKO	Sweden	
NEMKO	Norway	
KEMA	Netherlands	
DEMKO	Denmark	
UTE(USE)	France	
SEV	Switzerland	
OVE	Austria	
IMQ	Italy	
CCC	China	
FIMKO	Finland	

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Standard Legend Imprinting Codes:

YK	UA	UB	US	UV	UW	UX	UY	MP	MR	PX	MS	MT
VU	MW	NZ	NX	NY	YM	VW	PS	PW	PZ	WG	WM	RN
RP	YG	TX	NAV LIGHTS VD	COURT LIGHTS VE	PANEL LIGHTS VF	ANCH LIGHTS VG	HEAD LIGHTS SH	FOG LIGHTS SM	DASH LIGHTS SN	DOCK LIGHTS SP	BEACON SR	LIGHT SY
DIM WY	BRIGHT WZ	UH	UJ	PD	PE	PF	BILGE PUMP VC	BILGE VJ	UF	UG	MU	TN
NS	PB	WIPER SE	VZ	YE	NN	RW	PU	WA	YN	UE	NM	RJ
NR	YD	TL	VR	ENG FAN SL	BLWR VA	UC	VN	PK	VY	HORN UZ	RH	NU
NV	RB	RC	RK	RL	MZ	RG	UP WS	DOWN WT	UD	UR	WD	TY
PA	UK	WATER PUMP WR	UU	UT	ANCHOR YR	PM	VV	WB	TB	TC	TD	TE
MY	PV	TA	TZ	WC	PT	PN	PH	RA	TU	TT	ENG HATCH YL	ENG BRAKE SK
VS	UL	UM	WK	TS	VT	TCS WL	VP	YJ	PJ	RY	UP	NW
NP	RE	RF	PP	PR	TV	PC	YT	YU	PL	WJ	MV	RR
STOP TK	RT	SEAT SZ	VX	WF	WH	PG	CRUISE SJ	YA	YB	RM	TM	RD
RS	UN	TP	TR	NT	MX	YC	TW	TJ	YF	TH	TF	TG
YS	YH	AUX SX	ON OFF RZ	OFF ON YP	I O WN	O I WP	OFF ON WW	ON WX	OFF SA	I SB	O SC	II SD
RAISE ST	LOWER SU	HIGH WU	LOW WV	FWD SV	REV SW	DEPTH VB	TRIM TAB VH	ACC VK	NAV ANCH VL	WIND LASS UP/DN VM	LIVE WELL WE	REAR SF
PARK SG	AUTO SS	RU	RV	RX								

Notes:
1 ISO compliant symbols. Consult factory for custom icons.
2 New legend codes recommended for new part set ups. Previous codes still valid for existing customers.

Below is a list of useful product catalogs.
Please scan the QR codes below or visit ***carlingtech.com/onthego*** for complete details.

WEBSITE

Product Selector, Resources, Configurit, Find Rep, Product Materials and Videos.

carlingtech.com */onthego*

SWITCHES AND CONTROLS

Rocker, toggle, pushbutton, rotary, battery disconnects and controls.

catalog

MINI & SUB-MINI SWITCHES

Sealed and non-sealed rocker, toggle, pushbutton and slide options.

catalog

HYDRAULIC-MAGNETIC CIRCUIT PROTECTION

1-6 poles from .02 to 700A with CSA, VDE, TUV, UL489, UL489A, UL1500 approvals.

catalog

THERMAL CIRCUIT PROTECTION

1 pole from 3 to 60A with UL, cUL, CE, UL1500/ISO 8846 approvals.

catalog

GFCI/ELCI CIRCUIT PROTECTION

1-3 poles from 0.10 to 50A with CSA, UL489, UL1077, UL1053, UL1500 approvals.

catalog

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Below is a list of useful market specific catalogs and brochures.
Please scan the QR codes below or visit ***carlingtech.com/onthego*** for complete details.

ON-OFF HIGHWAY
Switches, Controls and Custom Solutions

brochure

MARINE
Circuit Protection and Switches

brochure

RENEWABLE ENERGY
Circuit Breakers and Disconnect products

brochure

MILITARY
COTS Switches and Circuits Breakers

brochure

TELECOM/DATACOM
Hydraulic-Magnetic Circuit Breakers

brochure

INDUSTRIAL AUTOMATION
Switches and Circuit Breakers

brochure

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Authorized Sales Representatives and Distributors

Click on a region of the map below to find your local representatives and distributors or visit ***www.carlingtech.com/findarep***.

About Carling

Founded in 1920, Carling Technologies is a leading manufacturer of electrical and electronic switches and assemblies, circuit breakers, electronic controls, power distribution units, and multiplexed power distribution systems. With four ISO registered manufacturing facilities and technical sales offices worldwide, Carling Technologies Sales, Service and Engineering teams do much more than manufacture electrical components, they engineer powerful solutions! To learn more about Carling please visit **www.carlingtech.com/company-profile.**

To view all of Carling's environmental, quality, health & safety certifications please visit **www.carlingtech.com/environmental-certifications**

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