Carling Technologies®
Innovative Designs. Powerful Solutions.

ON/OFF HIGHWAY

Switches and Controls

CATALOG

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

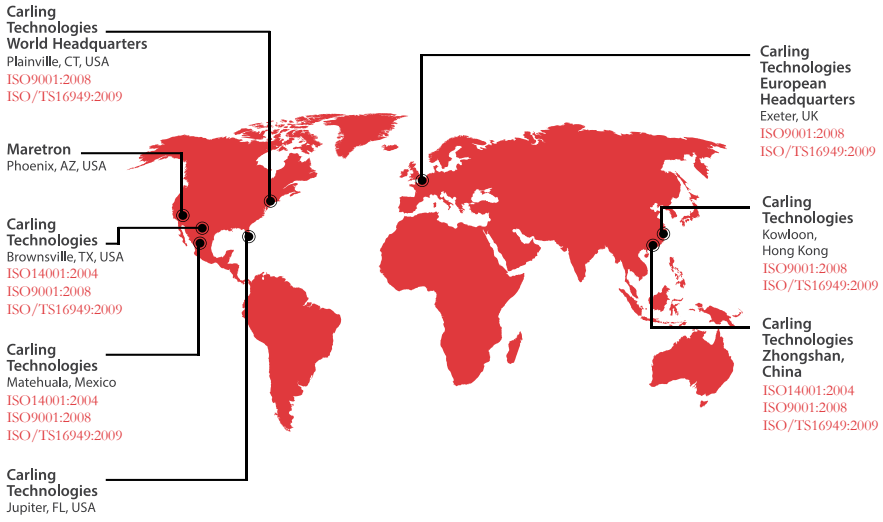
STRATEGIC MARKETS SERVED:

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:

2200+ EMPLOYEES

150+ ENGINEERS

70+ DISTRIBUTORS

50+ REP FIRMS

COMPETITIVE ADVANTAGES+

Vertical Integration | Reliable & On-Time Delivery | Excellent Customer Service | Innovative & Eco-Friendly Products

On/Off Highway

Switches and Controls

With years of design and manufacturing experience, Carling Technologies is the market leader in transportation application switches & control modules providing solutions to most all major OEMs. Carling's switches are widely used and the most recognizable switch brand in the industry with unmatched quality and aesthetics. By drawing upon over 90 years of design experience, Carling Technologies is also able to provide custom product solutions such as operator control modules and custom electronic controls, that are sure to meet the most stringent design requirements.

Within This Catalog, you will find comprehensive product information for each product series including applications, specifications and ordering schemes.

Available Online are tools such as part configurator, product selectors and stock checks. 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 **custservice@carlingtech.com**

Custom Design Solutions are available for OEMs that require specific product design and performance.

Other Circuit Protection Products such as thermal protection and ground fault circuit protection are also available. Please refer to **www.carlingtech.com** for a complete list of product offering.

Table of Contents

	SEALED ROCKERS				
	 *V-Series*	 *V-Series Rotary*	 *V-Charger*	 *W-Series*	 *L-Series*
Poles	1, 2	1, 2	1	1, 2	1, 2
Ratings	up to 15A 24VDC 15A 125VAC 10A 250VAC	up to 15A 24VDC 20A 12VDC	12V/24V DC	up to 10A 24VDC	up to 15A 125VAC 10A 250VAC 20A 18VDC
Actuator	rocker, paddle, locking rocker	ergonomic knob	sealed spring-loaded access doors	bezel-less rocker, paddle & locking rocker	IP67, rocker, paddle, locking rocker
Mounting Hole Specifications	.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	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount	.867" x 1.734" [22mm x 44mm] snap-in mount
Termination	.250 tabs solder lug wire leads	solder lugs .250 tabs wire leads	.250 tabs	.110 tabs	.187 tab .250 tabs
Sealing	IP66 above panel	IP67 above panel	IP64 above panel	IP68 above and below panel, fully submersible	IP67 above panel
Illumination	incandescent, LED, neon	incandescent, LED	LED	LED	incandescent, LED
Approvals	UL, CSA, VDE	pending	n/a	n/a	n/a

	ROCKER	CONTROL	L-SERIES CONTROLS		
	 *S-Series*	 *N-Series*	 *LD Dimmer*	 *LMR Mirror*	 *LW Wiper*
Poles	1, 2	1	multi-function	multi-function	multi-function
Ratings	up to 10A 28VDC	.4VA 28VDC	up to 10A 12VDC 5A 24VDC	up to 1A 14VDC .5A 28VDC	up to 8A 14VDC 4A 28VDC
Actuator	bezel-less rocker	rocker, paddle	rocker, paddle	joystick	rocker, paddle
Mounting Hole Specifications	.787" x 1.575" snap-in, keyed	.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	.867" x 1.734" [22mm x 44mm] snap-in mount
Termination	.110 Tabs	.187 tabs	.250 tabs	wire leads with connector	.187 tabs
Sealing	n/a	IP67 above panel	IP67 above panel	Water Resistant	n/a
Illumination	LED	LED	LED	n/a	LED
Approvals	n/a	n/a	n/a	n/a	n/a

*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.

	THERMAL CIRCUIT PROTECTION		
	 *CMB-Series*	 *CLB-Series*	 *CLBA/CMBA-Series*
Number of Poles	1	1	1
Actuator	pushbutton	pushbutton	n/a
Leakage Current Trip Level	n/a	n/a	n/a
Leakage Current Trip Time	n/a	n/a	n/a
Max Current & Voltage Ratings	3 to 20A, 125-250VAC, 32VDC	3 to 60A, 125-250VAC, 32VDC	3 to 40A, 125-250VAC, 32VDC
Max Interrupting Capacity	2500A@32 VDC	2500A@32 VDC	2500A@32 VDC
Available Circuits	series trip manual reset	series trip manual reset	series trip auto reset
Termination	.250 tab .250 tab with 90° bend screw terminal screw term with 90° bend	.250 tab .250 tab with 90° bend screw terminal screw term with 90° bend	.250" tab, .250" tab with 90° bend
Mounting Method	threaded bushing, front panel snap-in	threaded bushing, front panel snap-in	plug-in
Approvals	UL, CUL, CSA, TUV, CE, UL 1500 / ISO 8846 for ignition protection / marine	UL, CUL, CSA, TUV, CE, UL 1500 / ISO 8846 for ignition protection / marine	UL, CUL, TUV, UL 1500 / ISO 8846 for ignition protection / marine

	CUSTOM ELECTRONIC CONTROLS & POWER MANAGEMENT MODULES				
					
TOTAL VEHICLE CONTROL	*Cruise Control*	*Light Control Module*	*Horn Control*	*HVAC Motor Controller*	*Solid State Power Control*

	CUSTOM OPERATOR CONTROL MODULES & DISPLAYS			
				
TOTAL VEHICLE CONTROL	*Keypads*	*Multiplexed V-Series Rocker Modules*	*Control Interface*	*Multi-function Displays*

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

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 810C, 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:

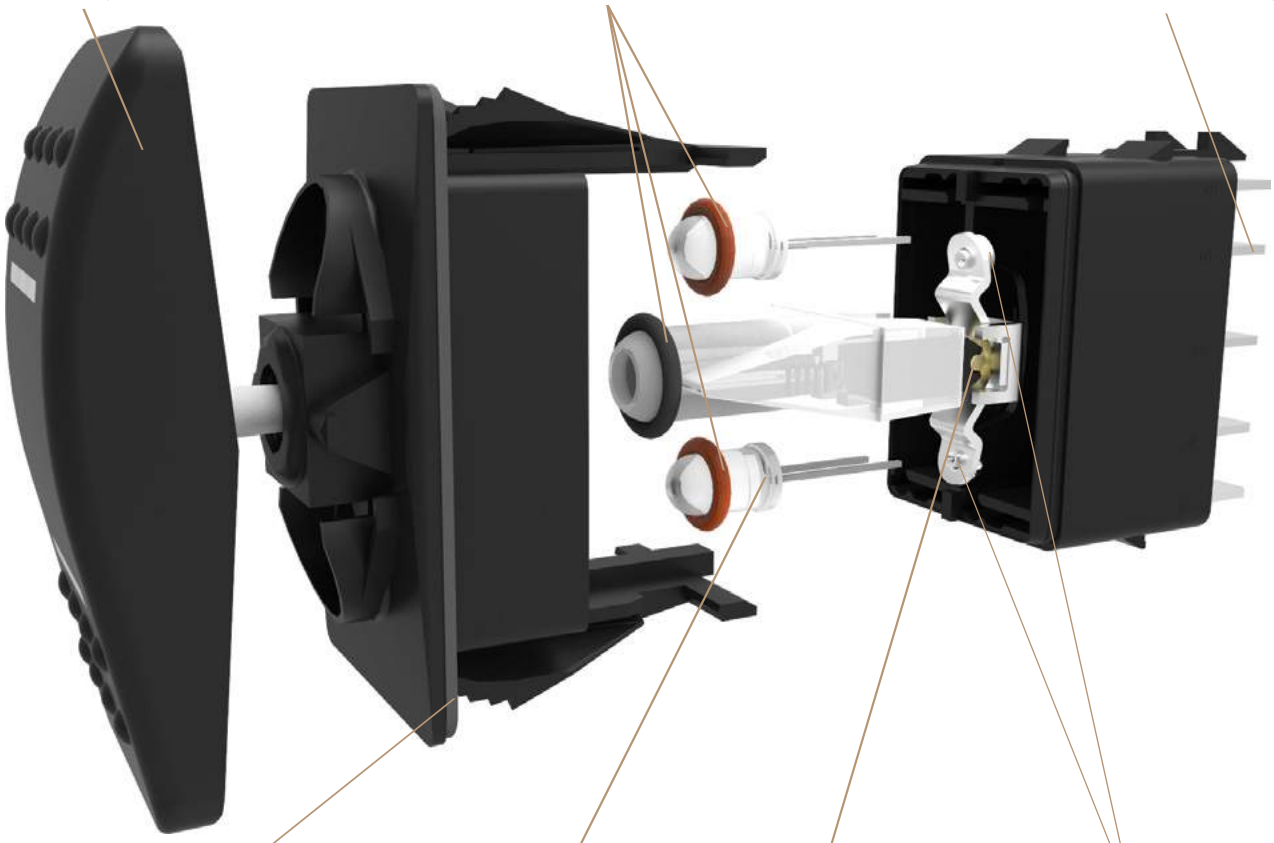
- Certified to IP66 with dual seals around lamps and rocker stem.
- Silver plated butt contact mechanism provides reliability up to and beyond 100K electrical cycles
- Greaseless construction withstands temperature extremes down to -40˚C
- The switch accommodates up to 10 terminals and endless illumination 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.

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 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
Prevents 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.

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

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)

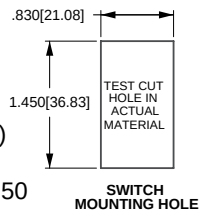
2 position	18°
3 positions	9° from center

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



SWITCH MOUNTING HOLE

Agency Certifications

Environmental

Sealing	Sealed version: IP66, 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	Per Mil-Std 810C, Method 510.2 Air Velocity 300 ±200 Feet/Min, Test Duration 16 Hrs.
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.

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.

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

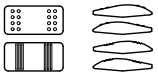
No lamp	**0**			
Neon	**1** 125VAC	**2** 250VAC		
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright Green	**7** 18V superbright Red	**8** 24V
LED*	Red	Amber		
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* 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 orientation above 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**	
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

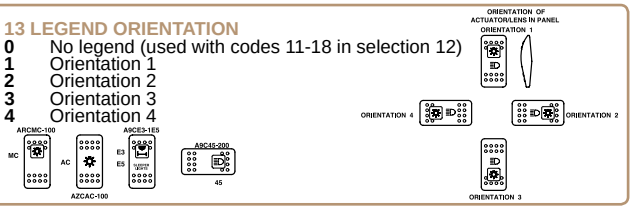
	Black	Gray	Red	White
Soft Surface	**B**	**G**	**R**	**W**
Hard Surface	**C**	**H**	**S**	**Y**

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.

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.
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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.

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	**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**	

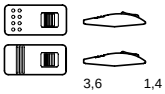
* Consult factory for “daylight bright” LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR [1], PANEL SEAL

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

9 HARD SURFACE ACTUATOR [1]

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



Actuator orientation above terminals:

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.

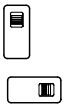
11 ACTUATOR LOCK FUNCTION AND COLOR [1]

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

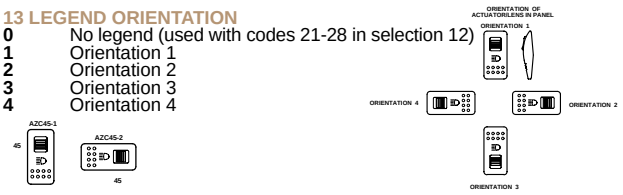
21 OFF **22** ON **23** O **24** I

25 OFF **26** ON **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.

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.

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	**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**	**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 above 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**	

E F

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

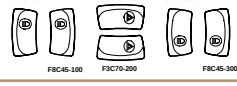
11 ACTUATOR COLOR [1,5,6]

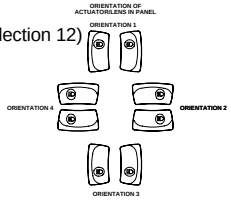
No Actuator	**0**	Black	**C**	Gray	**H**	Red	**S**
White	**Y**	Nickel	**D**	Pewter	**E**		

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.

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: 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.

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	**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
G Contura V
P Contura V, laser etched

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

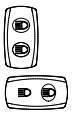
Clear	White	Amber	Green	Red	Blue	
1	**6**	**8**	**G**	**M**	**T**	bar
2	**7**	**C**	**H**	**N**	**U**	bar/bar
3	**8**	**D**	**J**	**P**	**V**	oval
4	**9**	**E**	**K**	**R**	**W**	oval/bar
5	**A**	**F**	**L**	**S**	**Y**	oval/oval

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]

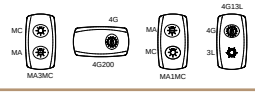
No Actuator	**0**	Black	**C**	Gray	**H**	Red	**S**
White	**Y**	Nickel	**D**	Pewter	**E**		

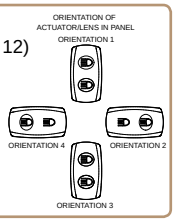
12 ACTUATOR LENS OR BODY LEGENDS [2,6]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



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.

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: 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

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.

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

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*	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 HARD SURFACE ACTUATOR
CONTURA IV:

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

Actuator orientation above terminals: 3,6 1,4

CONTURA V:

Orientation	Black	Gray	Red	White
	U	V	W	Y

Actuator orientation above 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

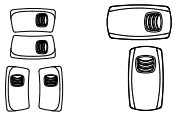
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.

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**

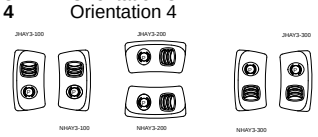
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend

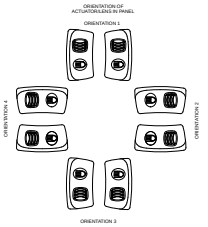
21	**22**	**23**	**24**
OFF	ON	O	I
25 O F F	**26** O N	**27** O	**28** I



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

13 LEGEND ORIENTATION
0 No legend
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.
5 Located at T3-6 end of switch.
6 Contura V style only.

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: 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.

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 (–)

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 [4]
0 - No Actuator **Z** - No Lens

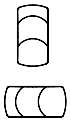
Clear	White	Amber	Green	Red	Blue	
–	**7**	**C**	**H**	**N**	**U**	Bar Lens Translucent
3	**–**	**D**	**J**	**P**	**V**	Bar Lens Transparent
4	**–**	**E**	**K**	**R**	**W**	Oval Lens Transparent
–	**A**	**F**	**L**	**S**	**Y**	Oval Lens Translucent

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

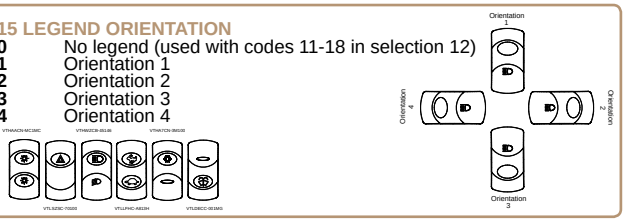
13 INSERT COLOR
B Black
C Bright Chrome Plated
D Satin Chrome Painted
N Bright Nickel Plated
S Satin Chrome Plated
T Satin Nickel Plated
W White

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 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.

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 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.

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

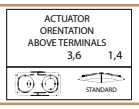
No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent	**4** 3V	**5** 6V	**6** 12V superbright	**7** 18V superbright	**8** 24V
LED*	Red	Amber	Green	Red	
2VDC	**A**	**L**	**F**	**R**	
6VDC	**B**	**M**	**G**	**S**	
12VDC	**C**	**N**	**H**	**T**	
24VDC	**D**	**P**	**J**	**V**	

* 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 ACTUATOR
0 No Actuator
Z Contura VII



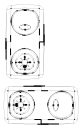
10 LENS
Lens color for LEDs must be clear, white, or match color of LED.
Green or blue lenses are not recommended with Neon lamps.
0 - No Actuator **Z** - No Lens

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]

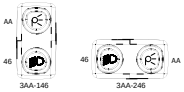
O	N/A - No Actuator	**C**	Black/Black
H	Grey/Black	**S**	Red/Black
Y	White/Black		

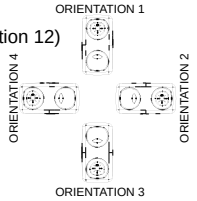
14 ACTUATOR LENS OR BODY LEGENDS [2]
11 ON OFF **12** OFF ON **13** I O **14** O I
15 O O F N F **16** O O N F F **17** O I **18** I O



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

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.

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	**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 [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 above terminals:

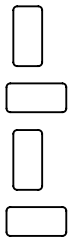
10 LENS - ABOVE LAMP #1 TERMINALS [1,4]
11 LENS - ABOVE LAMP #2 TERMINALS [3,6]
0 - No Actuator **Z** - No Lens

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.

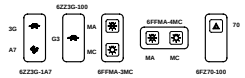
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location/No actuator

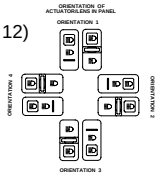
11	ON OFF	**12**	OFF ON	**13**	I O	**14**	O I		
15	O F N F	**16**	O N O F F	**17**	O I	**18**	I O		
21	OFF	**22**	ON	**23**	O	**24**	I		
25	O F N F	**26**	O N	**27**	O	**28**	I		



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.

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: 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
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.

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

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	Grey	Red	White
	1	**2**	**3**	**4**

Actuator orientation above terminals: 3,6 1,4

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**

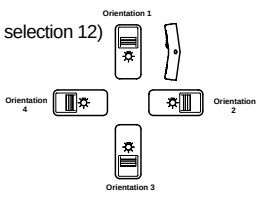
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend

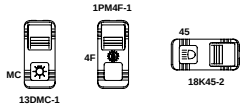
21 OFF **22** ON **23** O **24** I

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





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.

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.

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**	PAD Printed
5	**A**	**N/A**	**N/A**	**N/A**	**N/A**	Laser-Etched

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

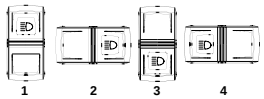
11 ACTUATOR COLOR [1]
O N/A - No Actuator
C Black
S Red
Y White

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



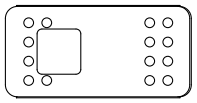
14 ACTUATOR / LENS LEGEND
00 No legend this location / no actuator
(used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection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

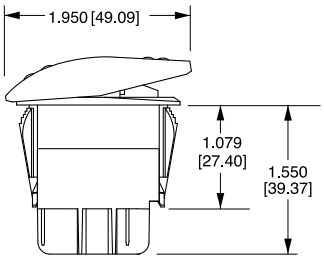
Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators.
3 Additional ratings available. See V-Series Switch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

Dimensional Specifications: in. [mm]

CONTURA II

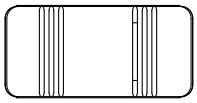
SHOWN WITH SQUARE LENS

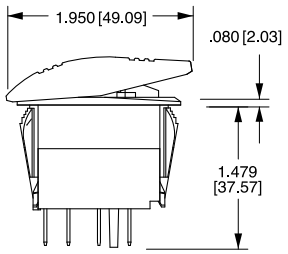




8 TERMINAL BASE W/BARRIERS

CONTURA III

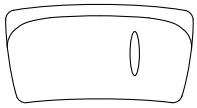


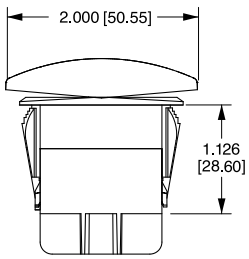


8 TERMINAL BASE W/O BARRIERS

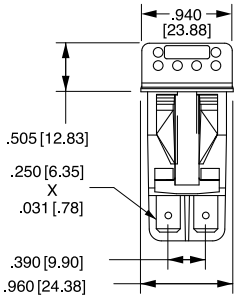
CONTURA IV

SHOWN WITH BAR LENS





10 TERMINAL BASE W/BARRIERS



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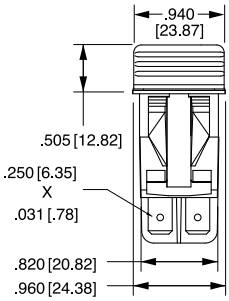

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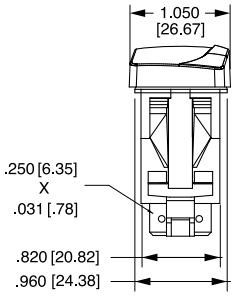
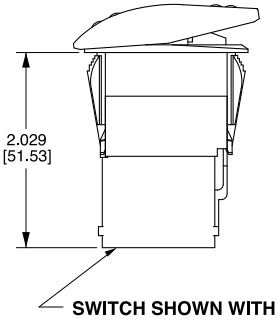
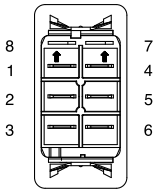


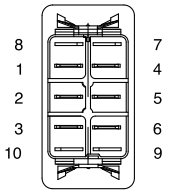
10 TERMINAL BASE W/O BARRIERS



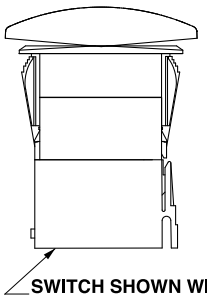
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL



BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE

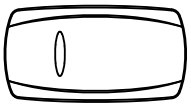


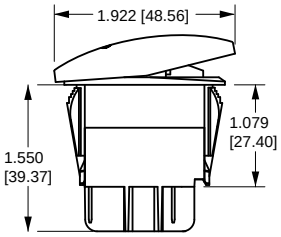
SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

Dimensional Specifications: in. [mm]

CONTURA V

SHOWN WITH BAR LENS

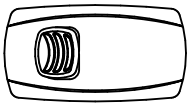


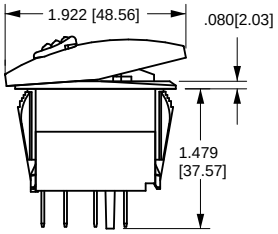


8 TERMINAL BASE W/BARRIERS

CONTURA V

SHOWN WITH LOW PROFILE LOCK

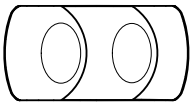


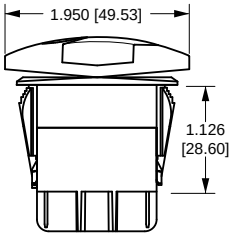


8 TERMINAL BASE W/O BARRIERS

CONTURA VI

SHOWN WITH OVAL LENS

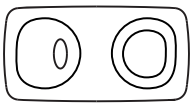


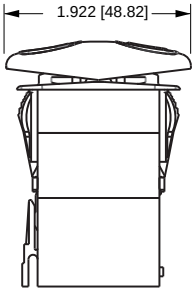


10 TERMINAL BASE W/BARRIER AND LAMP TERMINAL

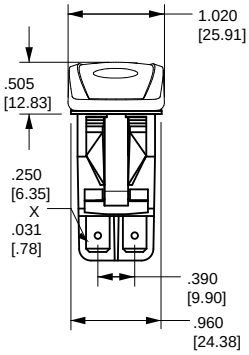
CONTURA VII

SHOWN WITH LARGE LENS AND BAR LENS

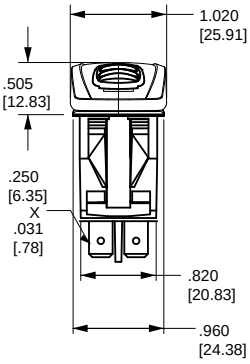




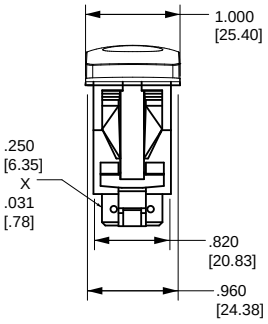
10 TERMINAL BASE W/O BARRIERS



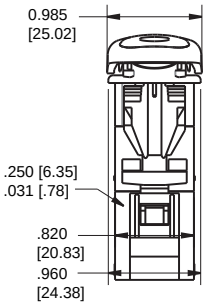
8 TERMINAL BASE W/BARRIERS



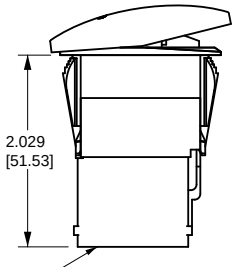
8 TERMINAL BASE W/O BARRIERS



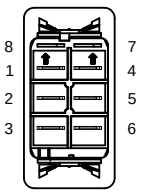
10 TERMINAL BASE W/O BARRIERS



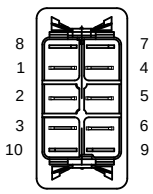
10 TERMINAL BASE W/O BARRIERS



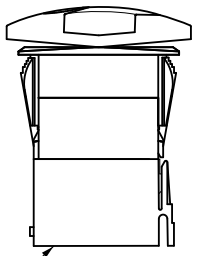
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL



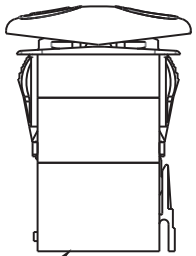
BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE



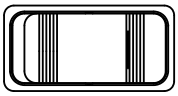
SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

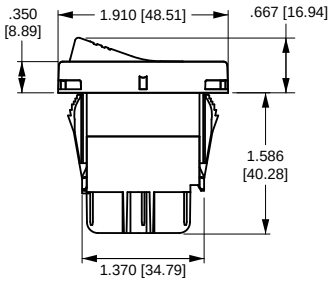


SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

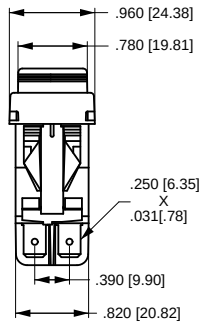
Dimensional Specifications: in. [mm]

CONTURA X
SHOWN WITH RAISED BRACKET

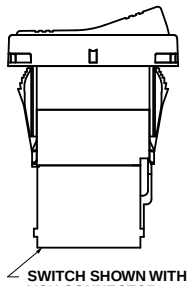




8 TERMINAL BASE W/BARRIERS

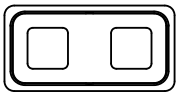


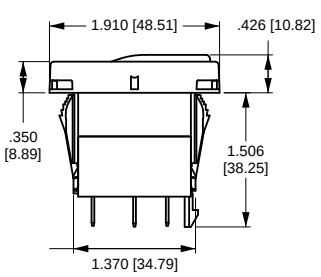
8 TERMINAL BASE W/BARRIERS



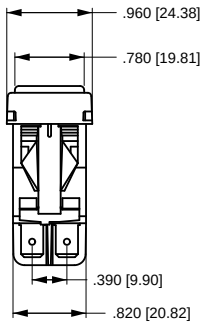
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL

CONTURA XI
SHOWN WITH RAISED BRACKET AND TWO SQUARE LENSES

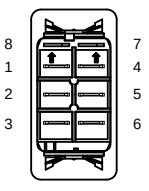




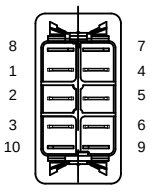
10 TERMINAL BASE W/O BARRIERS



10 TERMINAL BASE W/BARRIERS

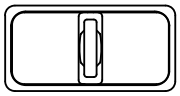


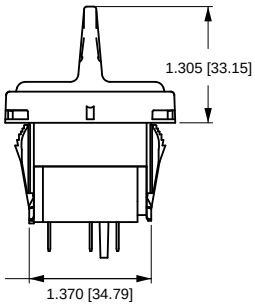
BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



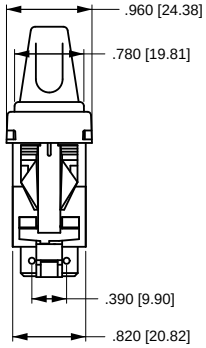
BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE

CONTURA XII
SHOWN WITH PADDLE ACTUATOR

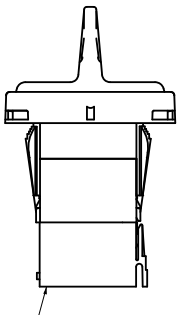


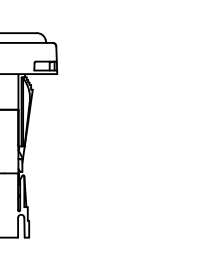


8 TERMINAL BASE W/O BARRIERS



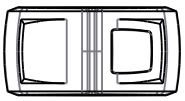
10 TERMINAL BASE W/O BARRIERS

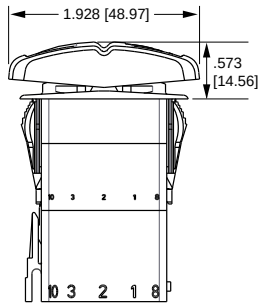




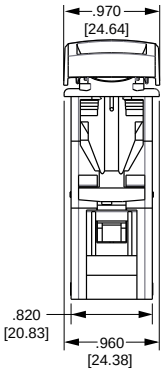
SWITCHES SHOWN WITH VC1 CONNECTOR 10 TERMINAL

CONTURA XIV
SHOWN WITH LARGE LENS

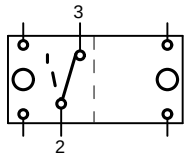
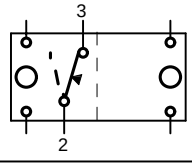
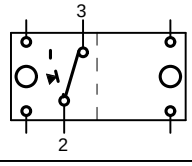
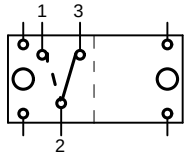
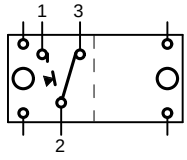
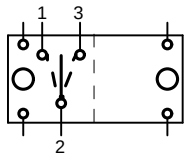
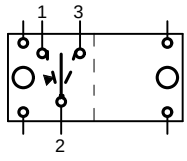
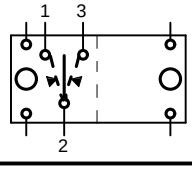


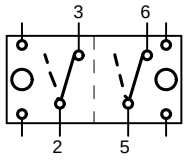
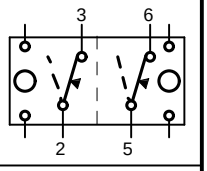
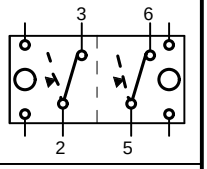
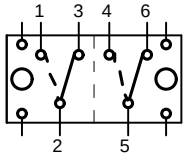
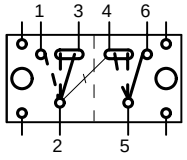
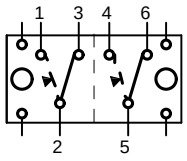
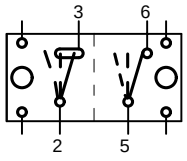
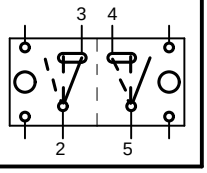


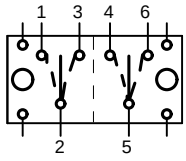
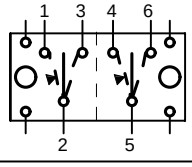
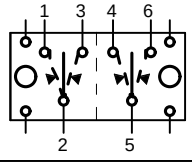
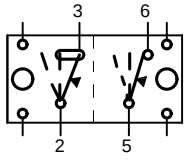
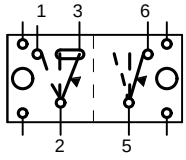
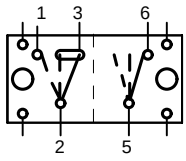
10 TERMINAL BASE W/O BARRIERS



Circuit Diagrams:

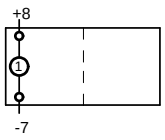
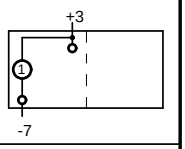
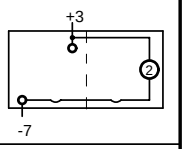
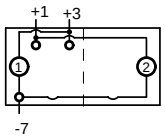
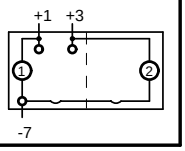
CIRCUIT	CIRCUIT DIAGRAM
1	
2	
3	
4	
5	
6	
7	
8	

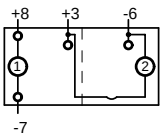
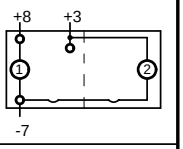
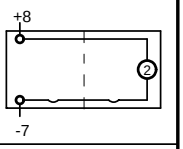
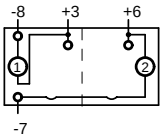
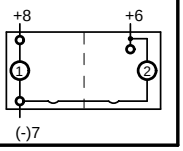
CIRCUIT	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	

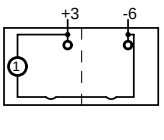
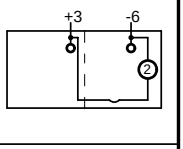
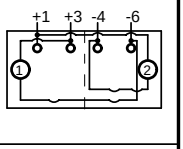
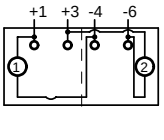
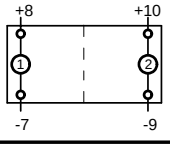
CIRCUIT	CIRCUIT DIAGRAM
J	
K	
L	
M	
R	
S	

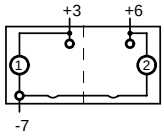
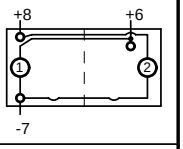
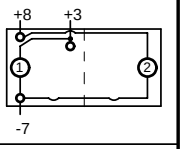
SYMBOL LEGEND	
SYM.	DEFINITION
	DESIGNATES TERMINALS AND CONTACTS
	DESIGNATES LAMP LOCATION
	DESIGNATES MAINTAINED CIRCUITS
	DESIGNATES OTHER POSITION
	DESIGNATES MOMENTARY CIRCUITS
	DESIGNATES TWO POSITION CONNECTION
	DESIGNATES EXTERNAL JUMPER PROVIDED BY CUSTOMER

Lamp Circuit Diagrams:

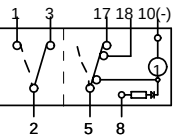
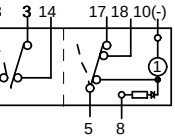
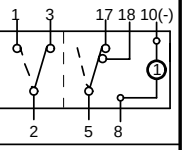
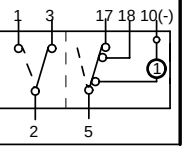
LAMP CIRCUIT	CIRCUIT DIAGRAM
A/1	
B/2	
C/3	
D/4	
E/5	

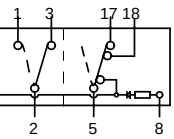
LAMP CIRCUIT	CIRCUIT DIAGRAM
F/6	
G/7	
H/Z	
J/8	
K/W	

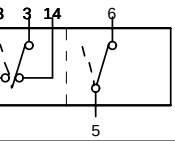
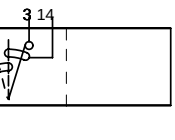
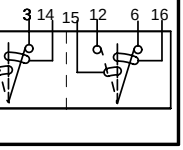
LAMP CIRCUIT	CIRCUIT DIAGRAM
L/9	
M/R	
N/T	
P/V	
U/Y	

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

Hazard Warning Circuit Diagrams:

CIRCUIT	CIRCUIT DIAGRAM
J1	
J2	
J3	
J4	

CIRCUIT	CIRCUIT DIAGRAM
J5	

CIRCUIT	CIRCUIT DIAGRAM
JA	
JJ	
JK	

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

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

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

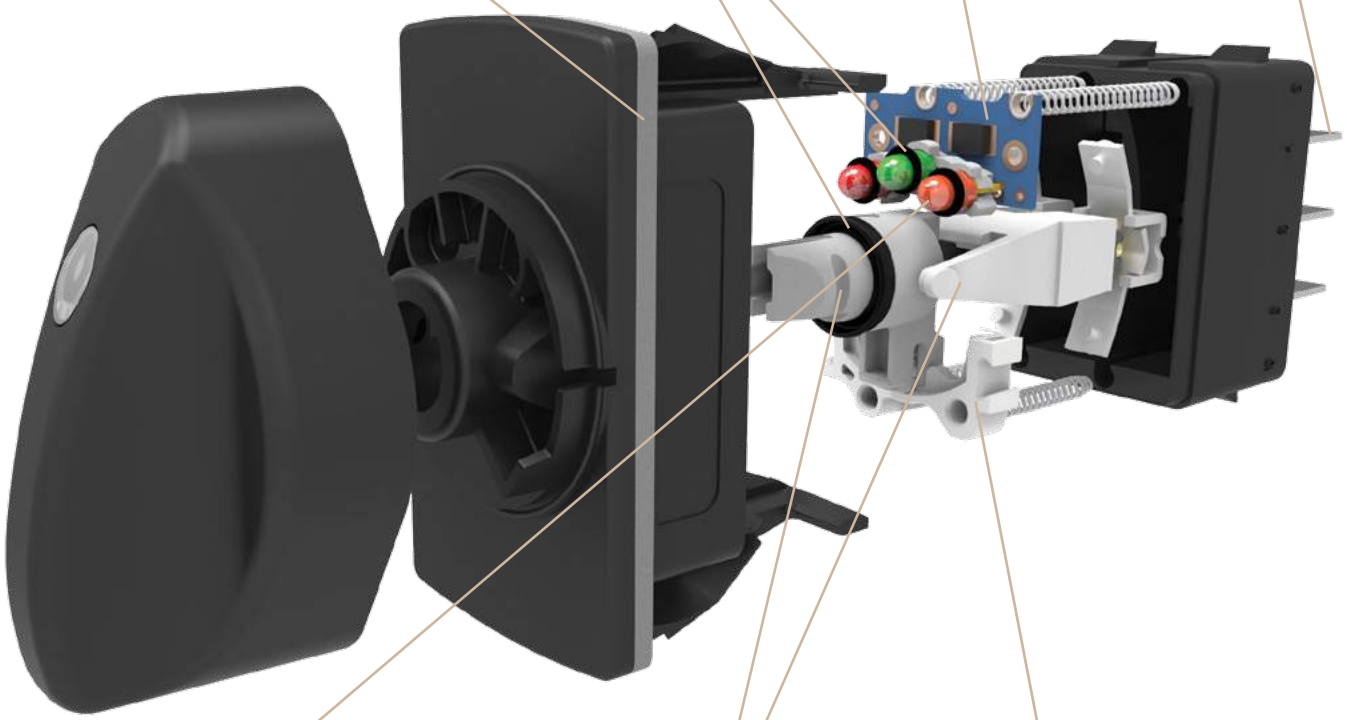
V-Series Rotary Switch
DESIGN FEATURES

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

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

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

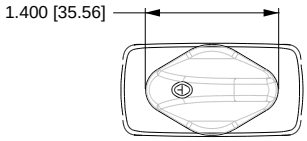
11 LENS COLOR [8]

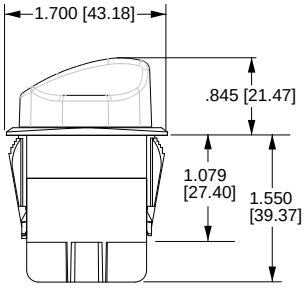
No Lens	**Z**				
Clear	White	Amber	Green	Red	Blue
4	**9**	**E**	**K**	**R**	**W**

12 KNOB COLOR

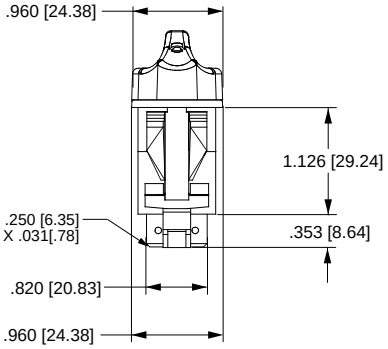
Black	Gray	Red	White
C	**H**	**S**	**Y**

Dimensional Specifications: in. [mm]

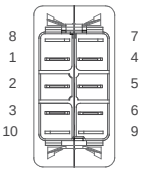




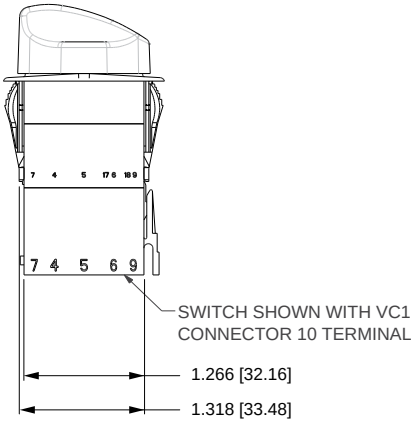
10 TERMINAL BASE W/ BARRIERS



10 TERMINAL BASE W/O BARRIERS



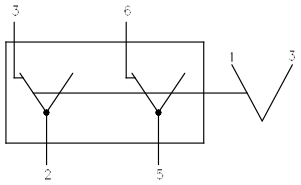
BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE



Circuits Diagrams:

KNOB POSITIONS

CKT CODE 21



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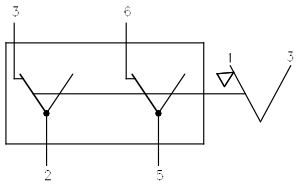

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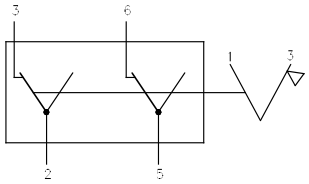

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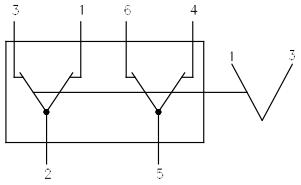

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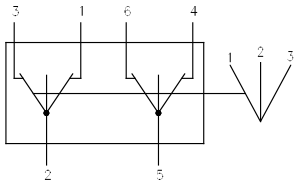

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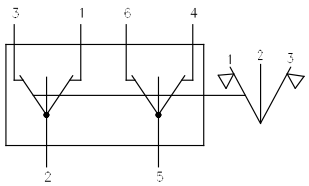

KNOB POSITIONS

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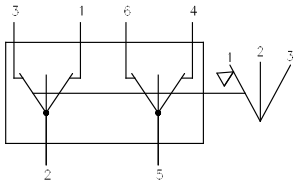

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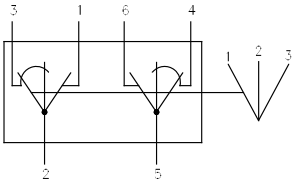

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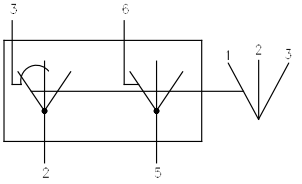

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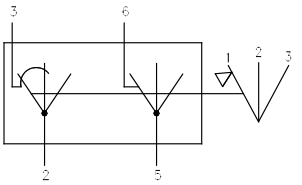
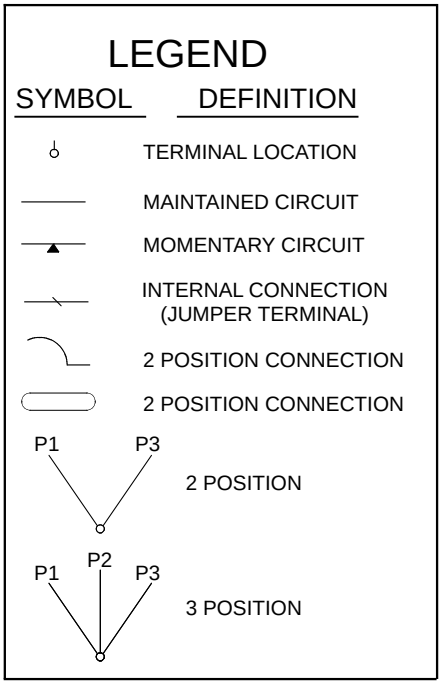
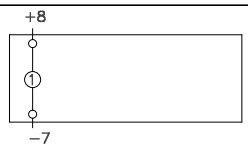
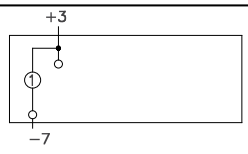
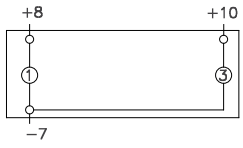
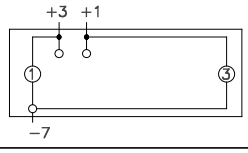
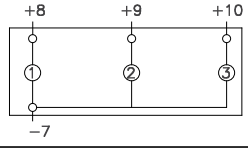
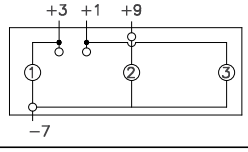
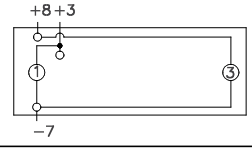
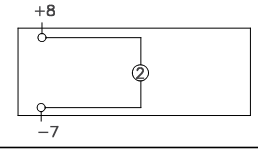
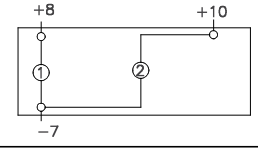
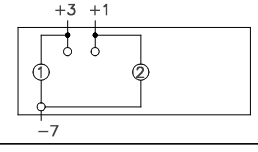




Lamp Circuit Diagrams:

LAMP CIRCUIT	CIRCUIT DIAGRAM
A	
B	
C	
D	
E	
F	
G	
H	
J	
K	

LAMP CIRCUIT	CIRCUIT DIAGRAM
L	
M	
N	
P	
R	
T	

V-Charger

V-SERIES DUAL PORT USB 2.0 CHARGERS

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 effortless IP64 sealing protection with precision-fit silicone rubber seals.

Resources:

Download 3D CAD Files

IGS › STP ›

Watch Product Video

Product Highlights:

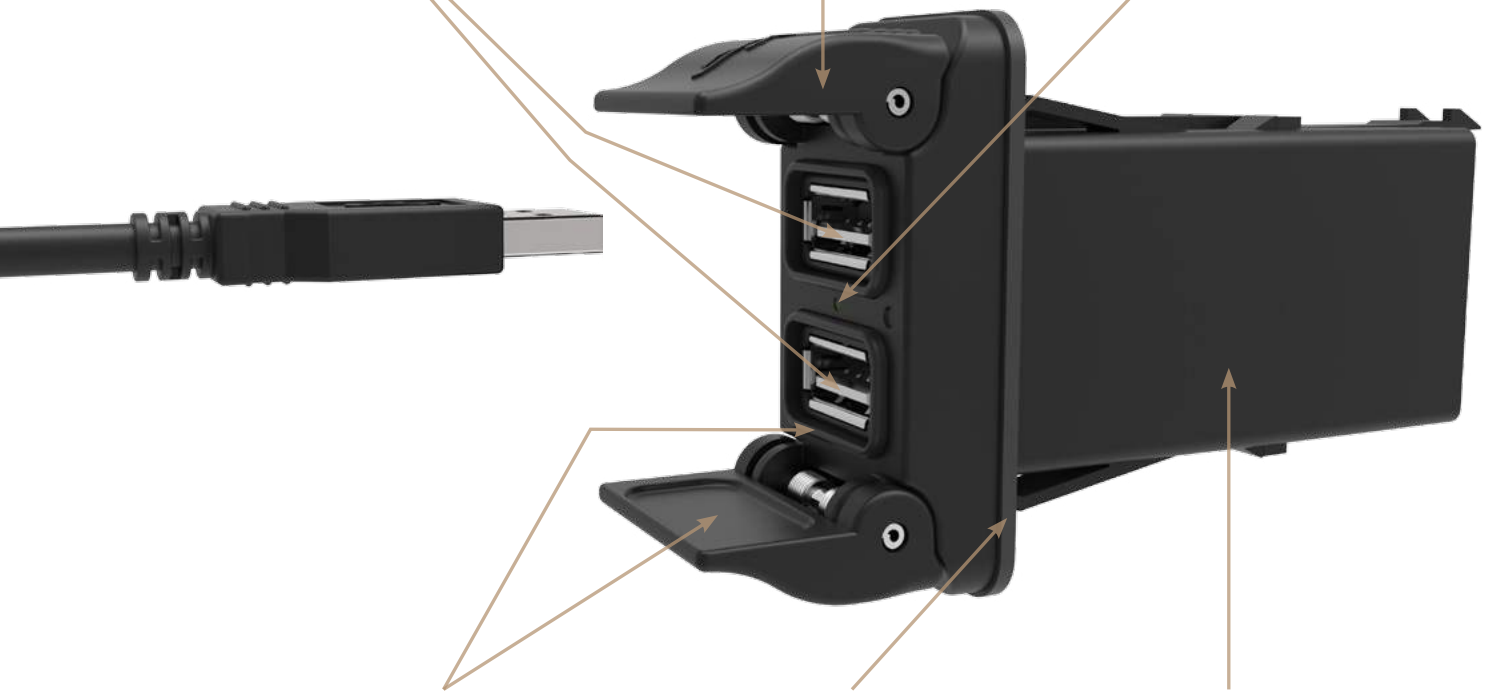
- Dual USB Charging Ports
- 3.15 Amps for Faster Charging
- 10,000 Operating Cycles per Port
- IP64 Sealing Protection
- 12-24 V Operating Voltage
- Protection for Internal Components

V-Charger
DESIGN FEATURES

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

SPRING LOADED DOORS
Stylish, wing-shaped 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 IP64 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"

Electrical

USB Type	2.0
Number of USB Ports	2
Operating Voltage	12V/24V DC power systems (9 to 29 VDC)
Output Voltage	5 VDC ± 5%
Max Output Current	3.15A DC Total
Current Draw (No Load)	12V: 0.8 mA, 24V: 1.9 mA
LED Indicator	Green LED brightens when charging is in progress.
Compatibility	Charges mobile devices including iPad, iPhone, iPod, HTC, Galaxy, Blackberry, MP3 Players, Digital Cameras and PDA's
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
ESD	15kV air, 8 kV touch
Overcurrent Protection	Short Circuit
Thermal Overload Protection	Operation will cease if internal temperature reaches 125°C. Charging will resume after sufficient heat loss

Physical

Panel Opening	1.450" x .830"
Panel Thickness	.030 - .156 inches
Panel Mounting Method	Front Panel Insertion
Seals	Silicone and Poron
Depth Behind Panel	See Figures 1 and 2
Connection	VC1, VC2
Weight	55g (0.12 lbs)
Styling	Curved USB port doors
Port Protection	Twin, self-closing doors

Environmental

Sealing	IP64 for front panel components when USB Ports are covered
Operating Temperature	-40° to +60°C at 3.15A -40° to +70°C at 2.4A -40° to +80°C at 2.1A
Vibration 1 Test	Mil-Std 202G, Method 204D, Condition A. 0.06DA or 10G, 10-500 Hz
Shock Test	Mil-Std 202G, Method 213B, Condition K @ 30-G. No loss of circuit during test.
Chemical Splash	Brush method with USB doors closed: diesel, gasoline, brake fluid, Windex, Armor All
Thermal Shock	MIL-Std 202F, Method 107D, Test Condition A, -55° 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
Dust	Mil-Std 841C Method 510.2 Air Velocity 300 ± 200 Ft/min, test duration: 16 Hr

Mechanical

Endurance	10,000 door cycles minimum

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

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

5 CIRCUIT PROTECTION
1 Reverse Polarity, Thermal Overload & Overcurrent

6 TERMINATION
1 .250 Tab

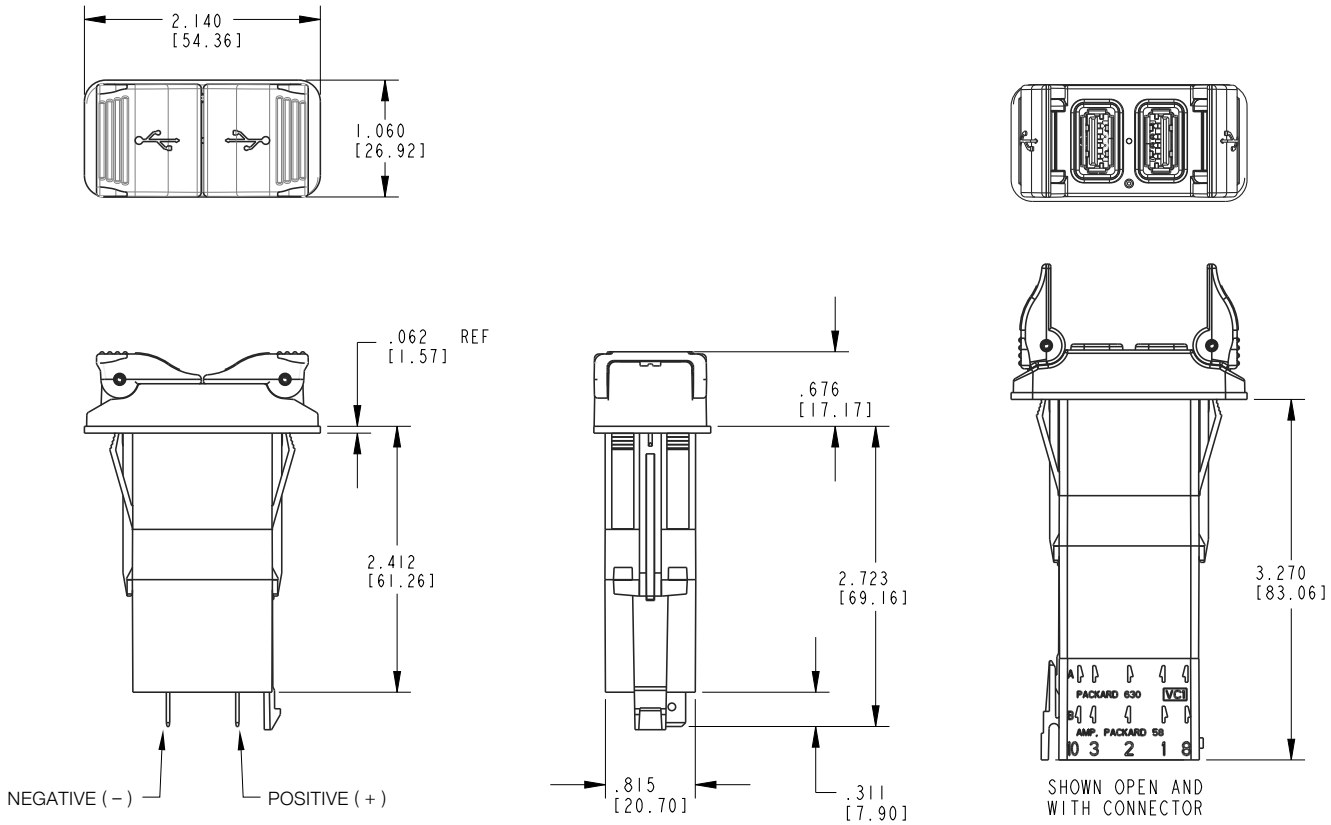
7 DOOR STYLE
1 Curved

8 DOOR COLOR
B Black

9 FRAME COLOR
B Black

10 PANEL SEAL
1 Yes

Dimensional Specifications: in. [mm]



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

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

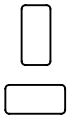
1 CONTURA X & XI ACTUATOR SEPARATELY
VVR

2 ACTUATOR STYLE & COLOR

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

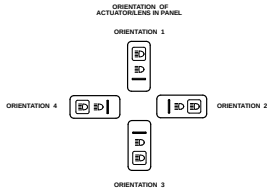
3 LENS OPENING FOR [1]
1 One bar lens
2 One bar lenses
3 One square lens
4 two square lens
5 square lens on top/ bar lens on bottom (Contura X only)

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:

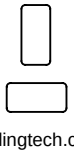
VVP	J	1	Z	21	1	00
1 Actuator	2 Style & Color	3 Lens Opening	4 Lens Opening	5 Legend	6 Legend Orientation	7 Legend

1 CONTURA XII ACTUATOR SEPARATELY
VVP

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

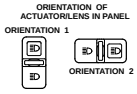
3,4 LENS OPENING FOR
Z No lens **1** Bar lens **2** Square lens

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:

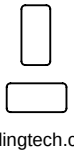
VVL	2	1	00	0
1 Lens Separately	2 Lens Style	3 Lens Color	4 Legend	5 Legend Orientation

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]

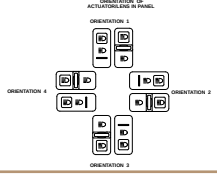
3 TRANSLUCENT LENS COLOR
1 Clear **2** White **3** Amber **4** Green [4] **5** Red **6** Blue [4]

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.

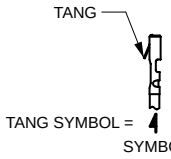
5 LEGEND ORIENTATION [3]
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



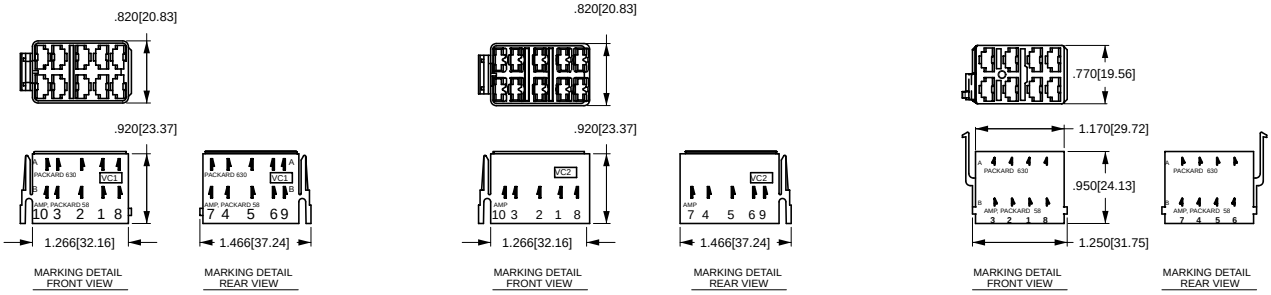
Easily integrate Contura products into your system, with Contura Accessories

Contura Connectors

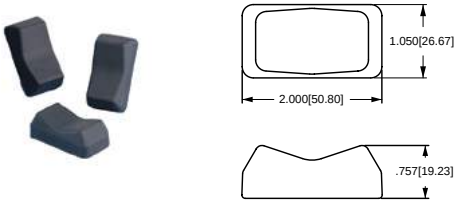
Q.C. SELECTION GUIDE					
COMPANY SERIES	PART NO		WIRE RANGE		ORIEN-TATION
	PLAIN BRASS	TIN PLATED BRASS	AWG	MM 2 (REF)	
PACKARD 58 SERIES	02965580		12	3.0	B
	02965471	12010601	(2)16-14	(2)1.0-2.0	
	02965470		16-14	1.0-2.0	
	02965469	06288318	20-18	.5-.8	
PACKARD METRI-PACK 630 SERIES		12084590	10	5.0	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	



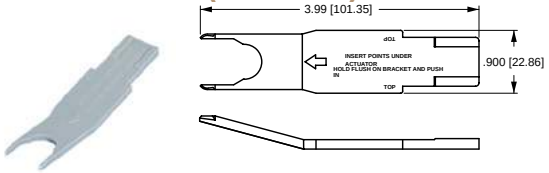
NOTE: Consult Delphi Packard and/or Amp on actual part numbers and availability.
AMP is a registered trademark of AMP Inc. Harrisburg, PA
Delphi Packard is a registered trademark of Delphi-Packard Electrical Systems Warren, Ohio



Contura X Boot (P/N VB1-01)



Contura II, III, IV & V 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
6[2]	15A 125VAC 1/2 HP, 12(2)A 125 VAC µ T85
7[2]	15A 125VAC 1/2 HP, 12(6)A 125 VAC T85
8[2]	10A 250VAC, 15A 125VAC, 1/2 HP 125-250VAC, 12(2)A 250 VAC µ T85
9[2]	10A 250VAC, 15A 125VAC, 1/2 HP 125-250VAC, 12(6)A 250 VAC T85
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	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 avaiable with Contura 7 or 14 rocker styles.
2. Ratings 6 - 9 are UL, CSA & VDE certified, require terminations A or B for double pole circuits, & are not available with illumination circuits 4, 8, D, J, N, & T or with wire lead or solder lug terminations.

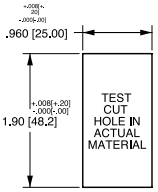
Circuits 1, 4, A, D, H, M & E are not available with rating 6 & 8. Rating 7 & 9 only available with circuits 1, 4, A & D. Circuits 2, 3, 5, 7, 8, K, L are 1/2 HP 250VAC only with rating 8. Ratings 6 & 7 must specify lamp code 1 (125VAC neon). Ratings 8 & 9 must specify lamp code 2 (250VAC neon). Rating L available with circuits 1, 4, A & D only.

Contura Mounting Panels
Dimensional Specifications: in. [mm]

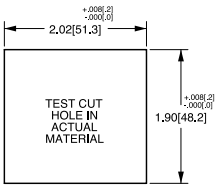
MOUNTING PANEL
For additional units, add 1.03[26.2] per unit. For more than 2 V-Series Switches, add middle section. Available in Panel Thicknesses listed below. Consult factory.

MOUNTING PANEL THICKNESS

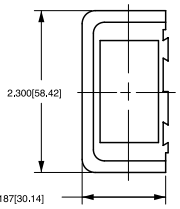
.062[1.57]	.187[4.75]
.093[2.36]	.250[6.35]
.125[3.17]	.375[9.52]



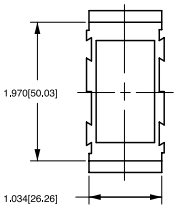
VMS MOUNTING PANEL HOLE



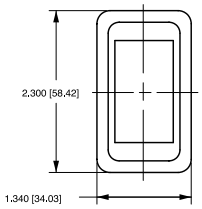
MOUNTING PANEL OPENING (2) UNITS



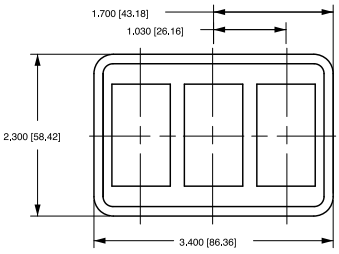
VME MOUNTING PANEL END



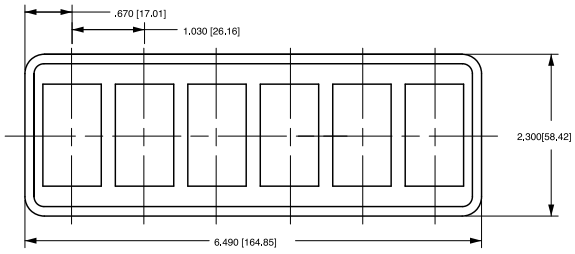
VMM MOUNTING PANEL MIDDLE



VMS MOUNTING PANEL

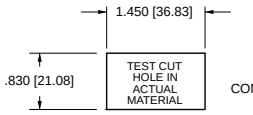


VM3 MOUNTING PANEL

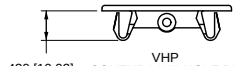


VM6 MOUNTING PANEL

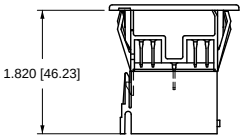
Contura Hole Plug
Dimensional Specifications: in. [mm]



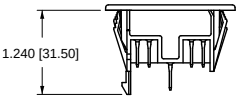
VHP CONTURA II,III HOLE PLUG



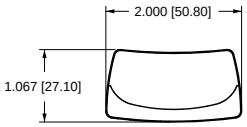
VHP CONTURA II,III HOLE PLUG

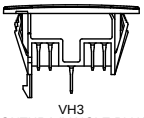


VH1
STANDARD HOLE PLUG
(No wing serrations)
(With VC1 connector attached)

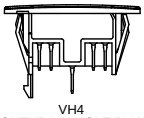


VH2
STANDARD HOLE PLUG
(With wing serrations)



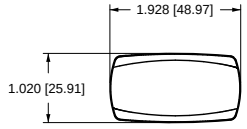


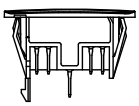
VH3
CONTURA IV HOLE PLUG
(No wing serrations)



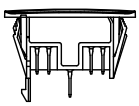
VH4
CONTURA IV HOLE PLUG
(With wing serrations)

DETAIL VIEW
VH1,VH3 & VH5
HOLE PLUGS
(No wing serrations
for ease of removal)





VH5
CONTURA V HOLE PLUG
(No wing serrations)



VH6
CONTURA V HOLE PLUG
(With wing serrations)

DETAIL VIEW
VH2,VH4 & VH6
HOLE PLUGS
(With wing serrations)

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

VP	1	6	6	–	B	1	1	K	K	–	00	0	00
1 Series	2 Termination	3 Lamp	4 Lamp		5 Housing Color	6 Lens Design	7 Lens Design	8 Lens Color	9 Lens Color		10 Legend	11 Legend Orientation	12 Actuator Legend

1 SERIES

VP	Illuminated plug
H2 [1]	Housing only
H3 [2]	Lamp module only
HP1-01	VP connector for oval and flush bezel only
VC1-01	VP connector for raised bezel only

2 TERMINATION

1 .250 TAB

3,4 LAMP (same coding for both selections) [4,5,6,8,9,12]

No lamp	**0**				
Neon	**1** 125VAC	**2** 250VAC			
Incandescent			**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 HOUSING COLOR

	flush bracket	raised bracket [13]	oval bezel (Contura V)
Black	**B**	**6**	**1**
Gray	**W**	–	**2**
White	**R**	**5**	**3**
Red	**G**	–	**4**

6,7 SQUARE LENS DESIGN (same coding for both selections) [4,5,6,11,12]

Z	no lens
1	transparent diamond square [10]
2	translucent square [7]
3	laser etched [10]
4	transparent oval
5	translucent oval

8, 9 LENS (same coding for both selections) [3,4,5,6,9]

Z No Lens

Clear	White	Amber	Green	Red	Blue	Lens Style
4	**9**	**E**	**K**	**R**	**W**	One piece Square/Oval [11]
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.

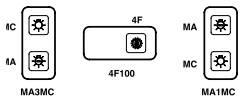
10 LAMP #1 LENS OR BODY LEGEND [5]

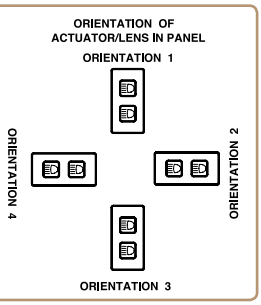
00 No legend

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 LAMP #2 LENS OR BODY LEGEND [5]

00 No legend

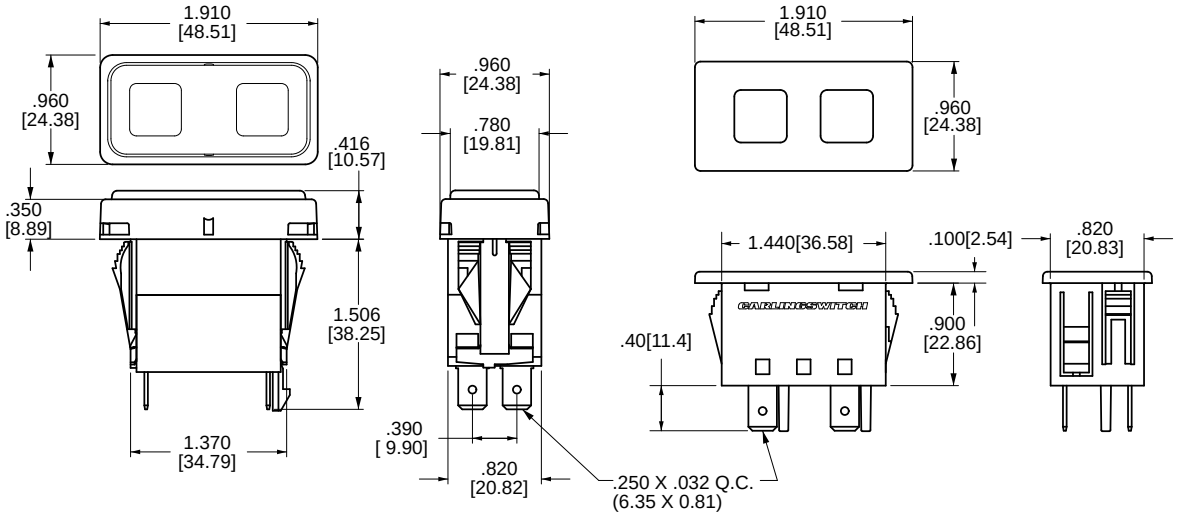
For legend options, visit us at carlingtech.com

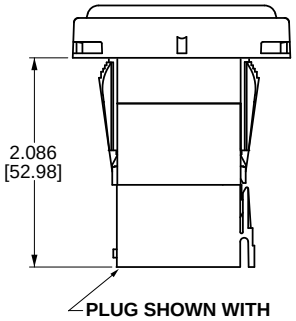
Notes:

1 To order housing with lenses only, specify H2 followed by fields 5-12. (flush bezel only)
2 To order lamp module only, specify H3 followed by fields 2-3. (flush bezel only)
3 Two piece lens not available with oval bezel.
4 If only 1 lamp, specify 0 in selection 4 and Z in selections 7 & 9.
5 Lamp and lens #1 located over terminals 1A and 1B for flush & oval bezel.
6 Lamp and lens #2 located over terminals 2A and 2B for flush & oval bezel.
7 Available with 2 piece lens option only.
8 Neon lamps not recommended with blue or green lenses.
9 Green or blue lenses not recommended with neon lamps.
10 Available with one piece lens option only.
11 Oval bezel available with oval lens only. Oval lens available with oval bezel only.
12 Lamp & lens #1 located over terminals 7 & 8, & #2 located over 9 & 10 for raised bezel option.
13 Both bracket and insert will be same color. For white bracket with black insert, specify 7. For black bracket with white insert, specify 8.

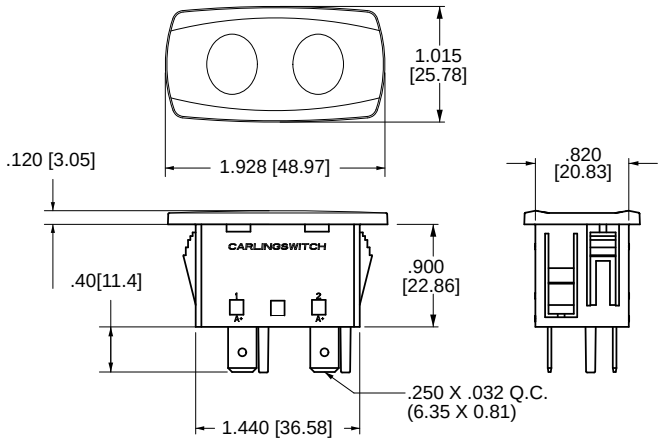
*Manufacturer reserves the right to change product specification without prior notice.

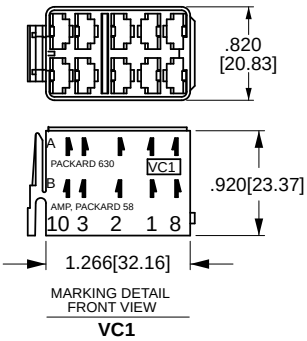
Dimensional Specifications: in. [mm]





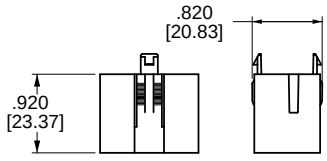
PLUG SHOWN WITH
VC1 CONNECTOR



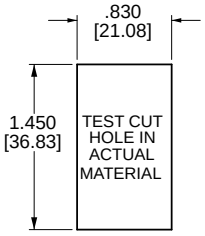


MARKING DETAIL
FRONT VIEW

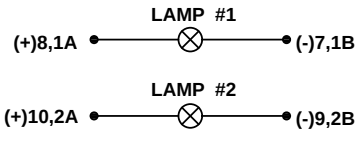
VC1
CONNECTOR HOUSING



HP1-01
ILLUMINATED PLUG CONNECTOR



ILLUMINATED PLUG
MOUNTING HOLE
(OVAL, FLUSH AND RAISED BEZELS)



CIRCUIT
DIAGRAM

(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.

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.

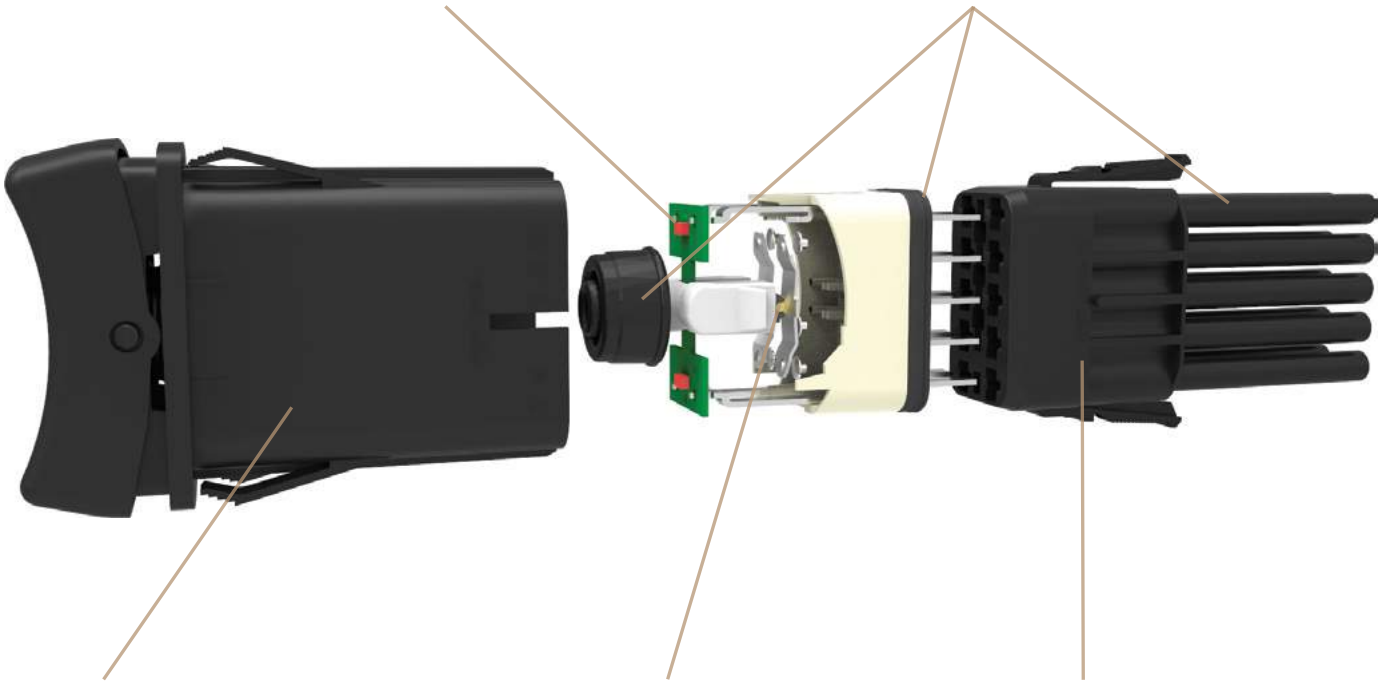
Product Highlights:

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

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.

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

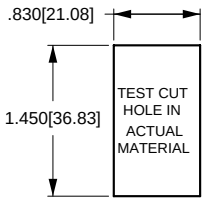
Environmental

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

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
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
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)
-	**49**	ON	ON	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			
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 Witches 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*				superbright
	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]
3 Black with Laser Etched
A Black

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	
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.

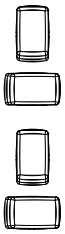
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location/No actuator

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

15 O O F F **16** O O N 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

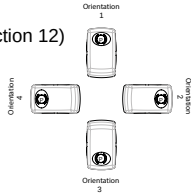


For additional legend options & codes, visit us at carlingtech.com

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


AY3-200

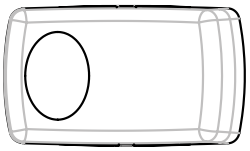

AY3-100

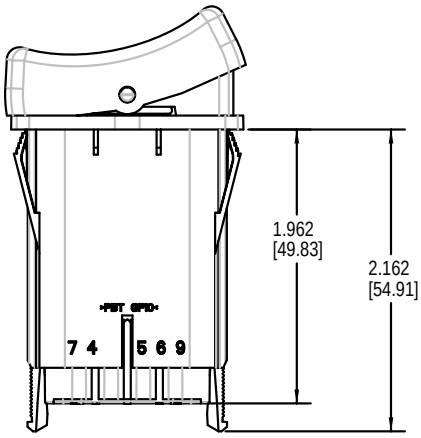


14 ACTUATOR LENS LEGEND [2]
00 No legend this location/no actuator (used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens & one body legend, lens legend must be specified in selection 12; body legend specified in selection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

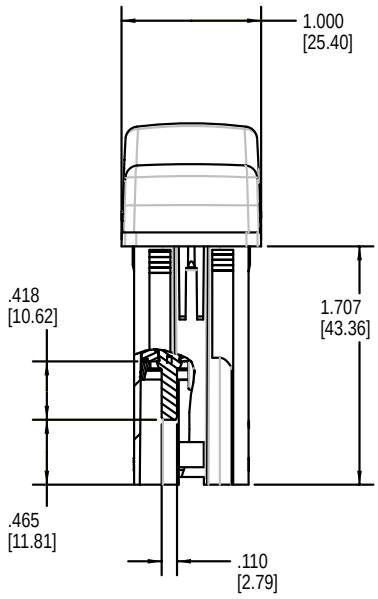
Notes:
1 Custom colors are available. Consult factory.
2 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.
3 Locking rocker version is also available, consult factory for details.

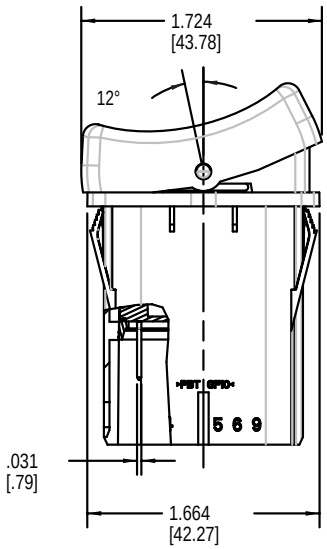
Dimensional Specifications: in. [mm]

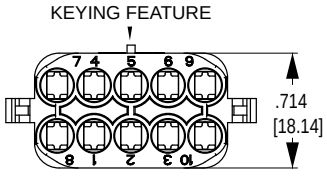




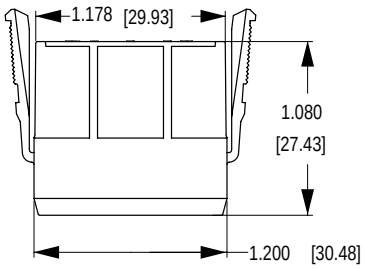
SWITCH SHOWN WITH
CONNECTOR INSTALLED







WCH CONNECTOR
(190-31214-001)



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.

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:

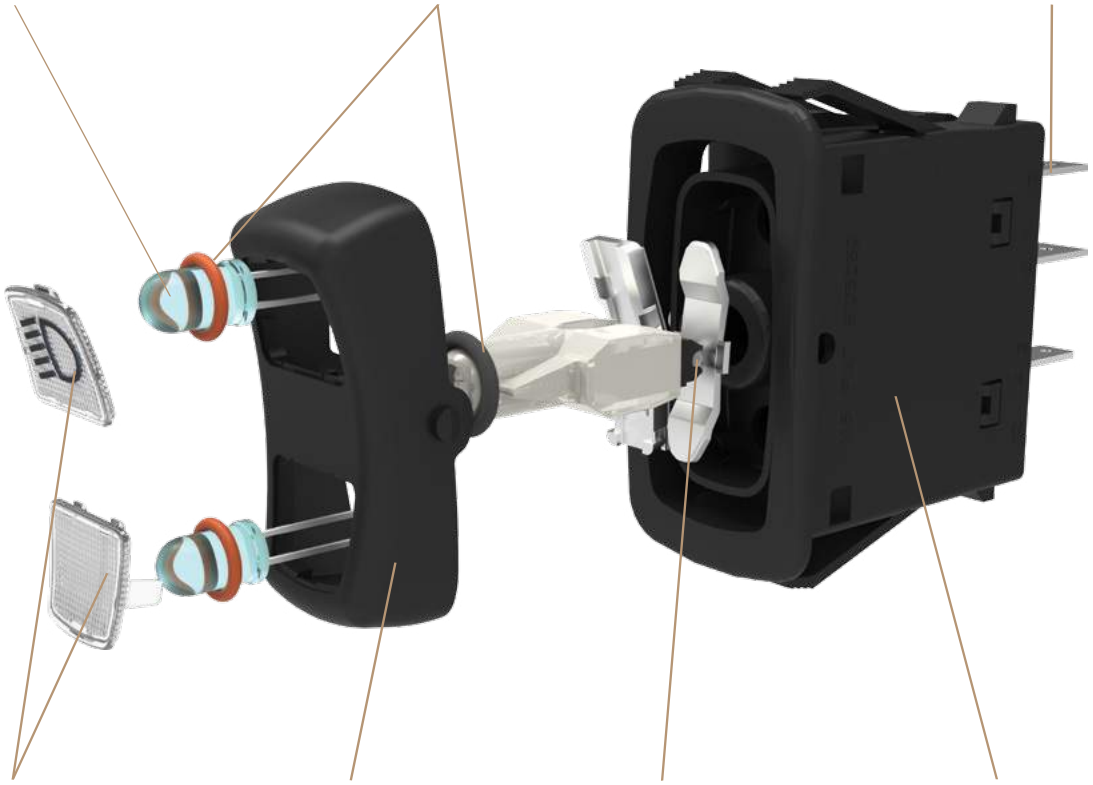
- IP67 certified sealed front panel components
- Withstands temperatures from -40°C to +85°C
- Vibration, shock, thermoshock, moisture and salt spray resistant

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].

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

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.

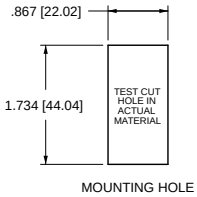
Actuator Travel (Angular Displacement)

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 VCH	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with 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



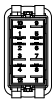
MOUNTING HOLE

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

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:		1	2	3
SP	DP	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)

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]

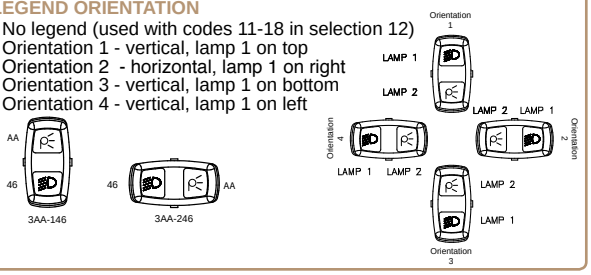
	Black	White	Gray	Red	Laser Etched
Rocker	**A**	**B**	**C**	**D**	**3**
Paddle	**J**	**N**	**K**	**M**	**4**

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

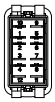


14 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

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:		1	2	3
SP	DP	2 & 4, 6 & 8	Connected Terminals	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)

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-

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
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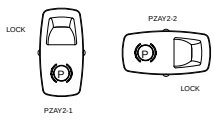
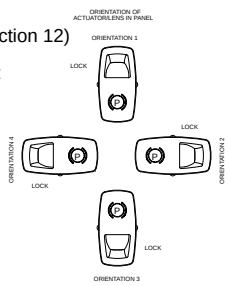
3 Orientation 3 - vertical, lamp 1 on bottom
4 Orientation 4 - vertical, lamp 1 on left

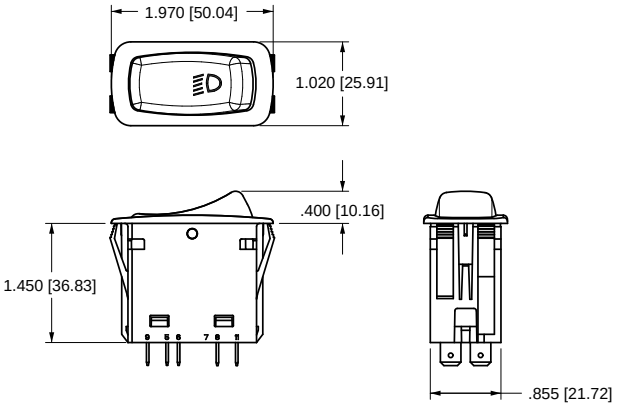




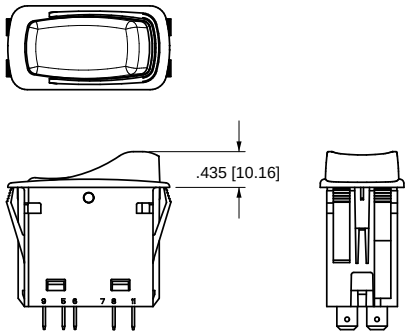
Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Additional lamp circuits available. Consult factory.
3 Available only with 3 position circuits.
4 Termination 3 only available with ratings 1, B and E.
5 Circuits 30,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

Dimensional Specifications: in. [mm]

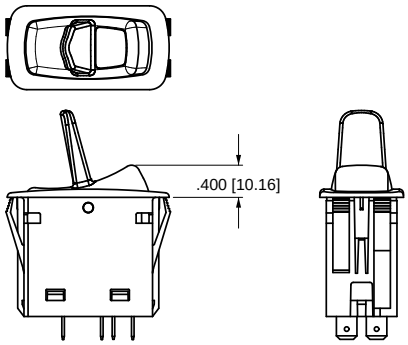
L-SERIES
SHOWN WITH LASER ETCHED ACTUATOR



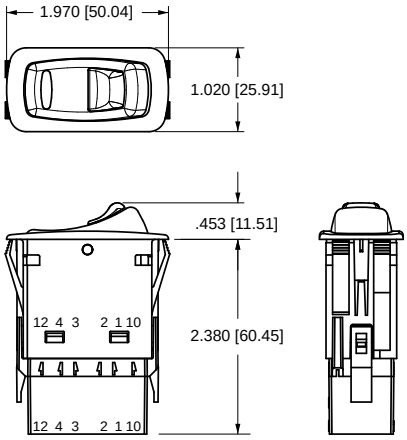
L-SERIES
SHOWN WITH ROCKER GUARD



L-SERIES
SHOWN WITH LARGE LENS AND PADDLE ACTUATOR



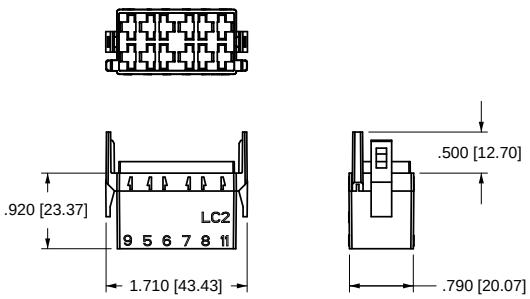
L-SERIES
SHOWN WITH BAR LENS, LOCK AND CONNECTOR



Connector

L-SERIES
CONNECTOR

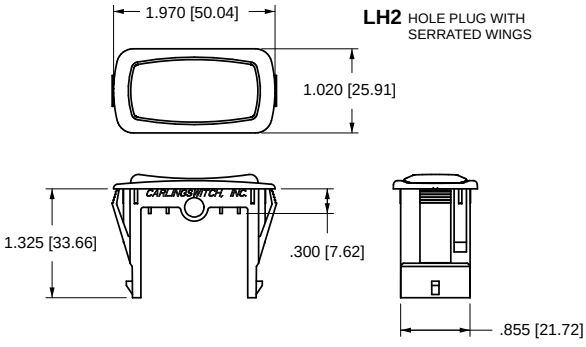
LC1-01 BLACK .250 TAB CONNECTOR (PACKARD 630 SERIES)
LC2-01 BLACK .187 TAB CONNECTOR (PACKARD 480 SERIES)
LC3-01 BLACK .250 TAB CONNECTOR (AMP ONLY)



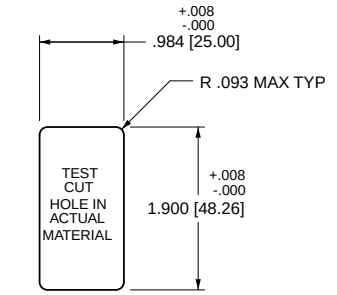
Hole Plug

L-SERIES
HOLE PLUG

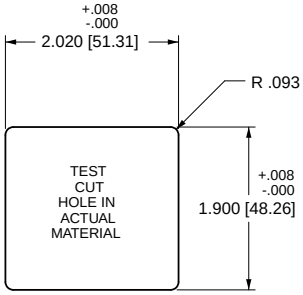
LH1 REMOVABLE HOLE PLUG WITH NON-SERRATED WINGS
LH2 HOLE PLUG WITH SERRATED WINGS



Dimensional Specifications: in. [mm]



LMS
MOUNTING PANEL
HOLE



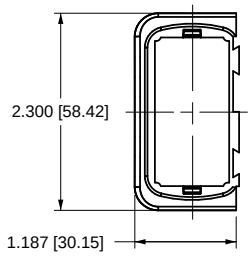
MOUNTING PANEL
OPENING
(2) UNITS

MOUNTING PANEL

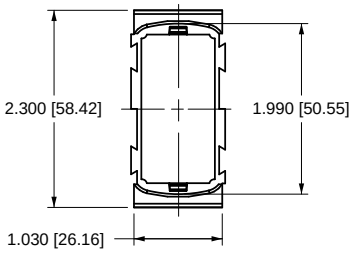
FOR ADDITIONAL UNITS, ADD 1.03 [26.2] PER UNIT.
FOR MORE THAN 2 L-SERIES SWITCHES, ADD MIDDLE SECTION. AVAILABLE IN PANEL THICKNESSES LISTED BELOW. CONSULT FACTORY

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

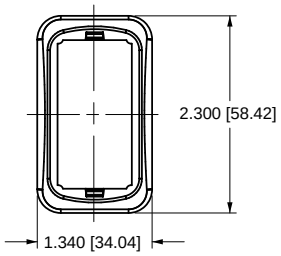
MOUNTING PANEL THICKNESS
.062 [1.57]
.093 [2.36]
.125 [3.17]
.156 [3.96]



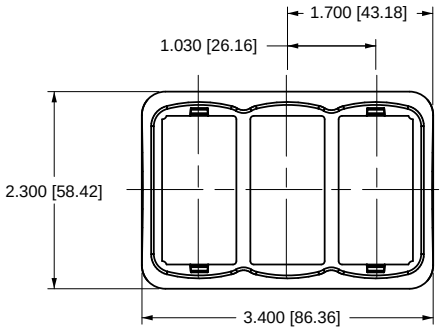
LME MOUNTING PANEL
END



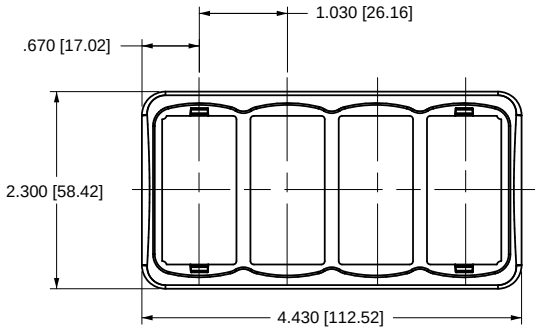
LMM MOUNTING PANEL
MIDDLE



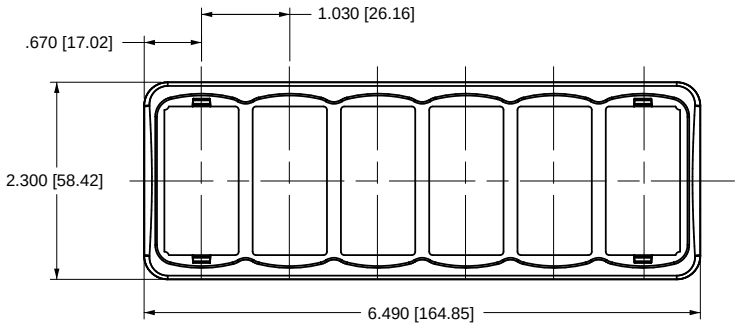
LMS
MOUNTING PANEL



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

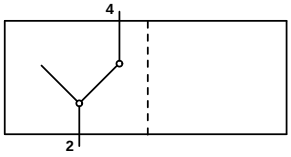
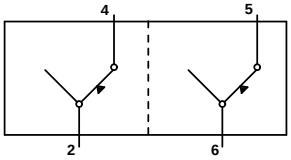
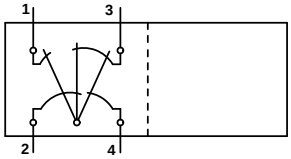
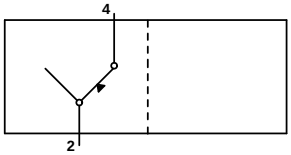
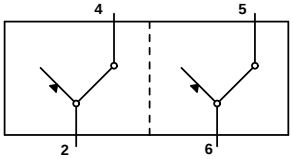
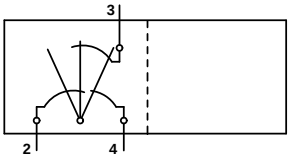
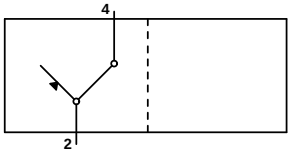
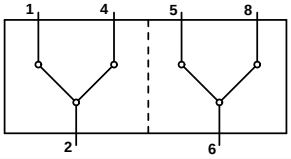
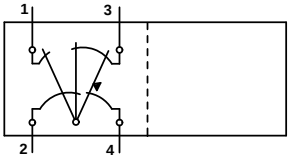
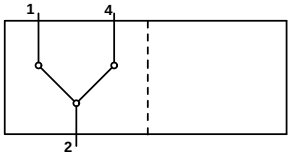
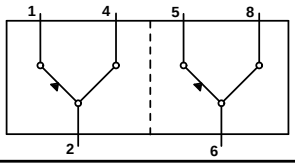
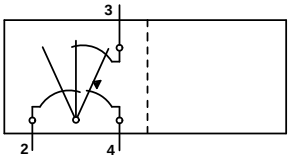
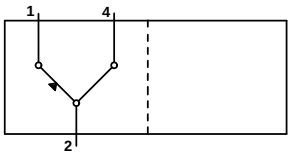
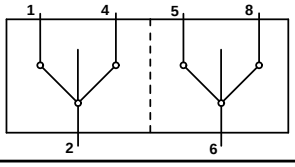
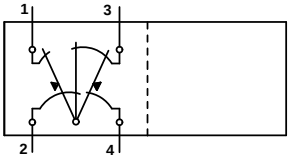
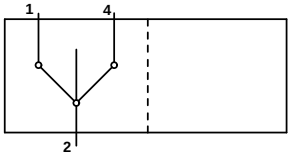
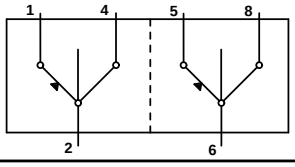
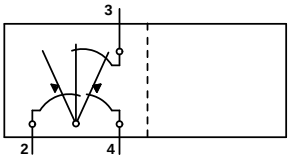
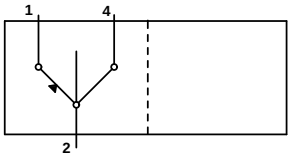
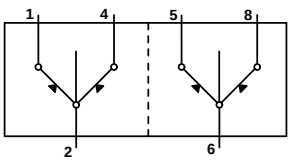
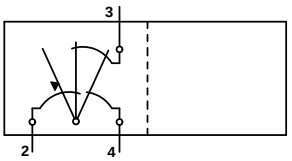
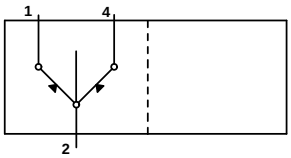
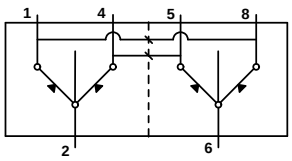
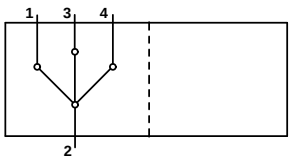
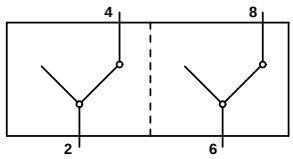
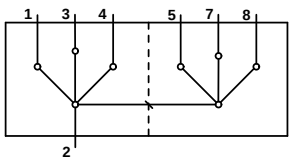
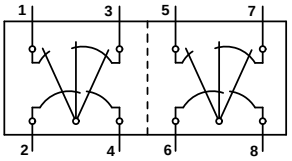


LM4 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 4.09 [48.3mm X 103.9mm]

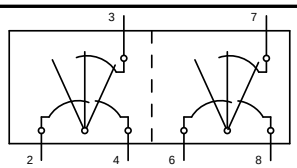
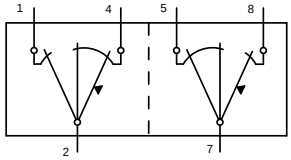
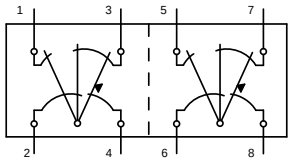
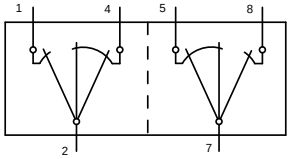
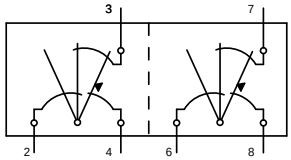
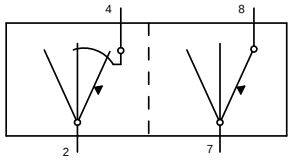
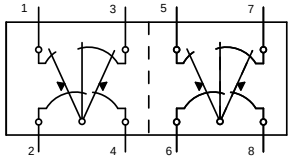
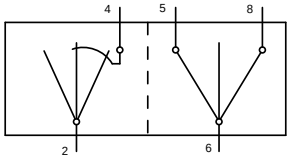
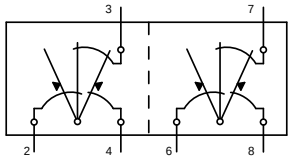
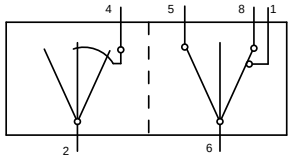
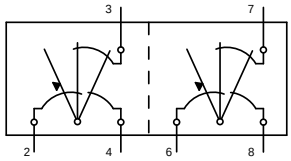
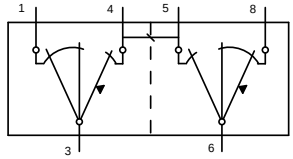
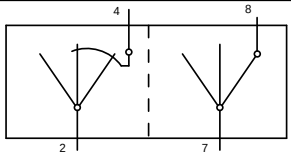
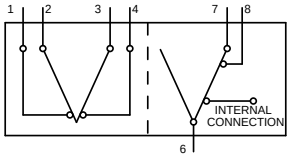
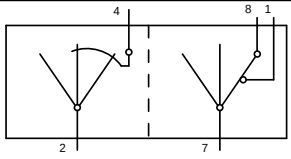
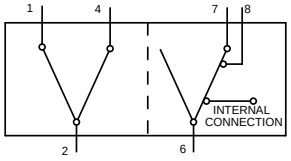
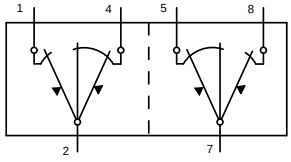


LM6 MOUNTING PANEL
PANEL OPENING SIZE: 1.90 X 6.15 [48.3mm X 156.2mm]

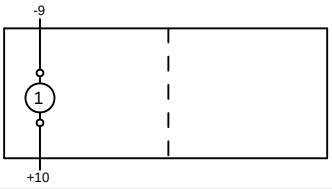
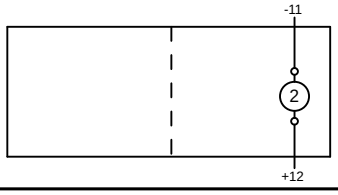
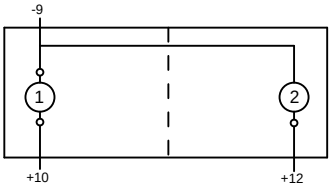
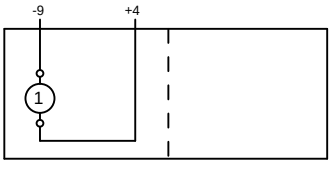
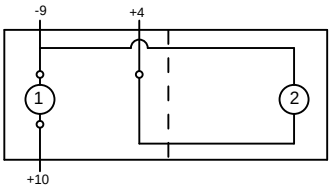
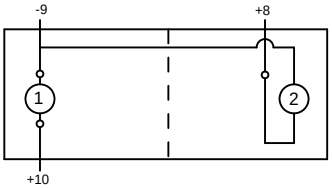
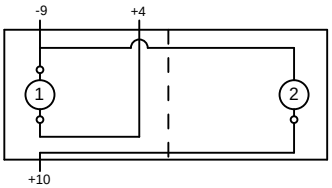
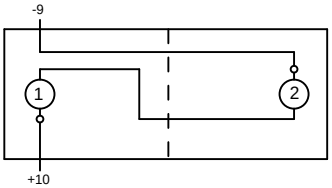
Circuit Diagrams:

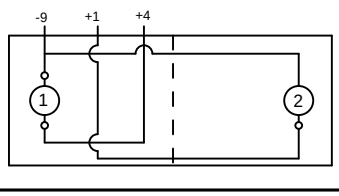
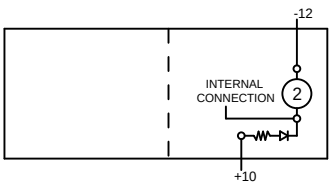
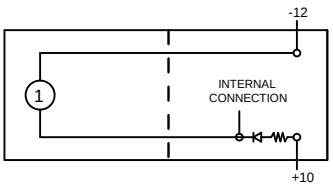
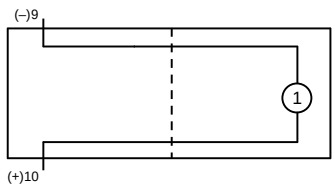
CIRCUIT CODE	SCHEMATIC	CIRCUIT CODE	SCHEMATIC	CIRCUIT CODE	SCHEMATIC
11		22		51	
12		23		52	
13		24		53	
14		25		54	
15		26		55	
16		27		56	
17		28		57	
18		30		58	
21		31		61	

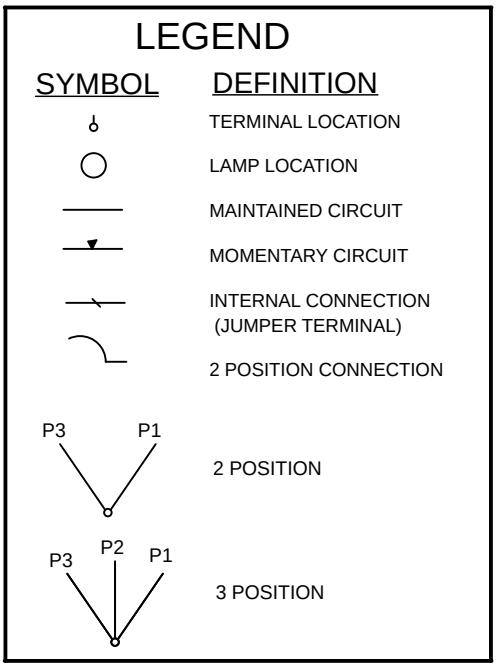
Circuit Diagrams:

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

Lamp Circuit Diagrams:

ILLUMIN. CODE	SCHEMATIC
A	
B	
C	
D	
E	
F	
G	
H	

ILLUMIN. CODE	SCHEMATIC
J	
1	
2	
K	



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

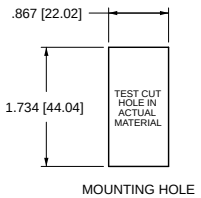
Electrical

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



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.

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 (+) 8 (–)
B	1	–	10 (+) 8 (–)
	2	–	12 (+) 11 (–)
C	1	–	10 (+) 8 (–)
	2	–	12 (+) 8 (–)
E	1 & 2	Parallel	10 (+) 8 (–)
H	1 & 2	Series	10 (+) 8 (–)

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**		

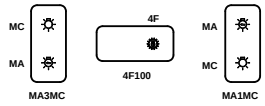
6 BRACKET COLOR
5 Black

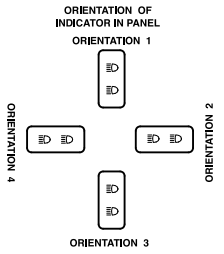
7 INSERT COLOR [1, 2]
9 Painted Black - Laser Etch
A Clear (Transparent)
B White (Translucent)
C Red (Translucent)
D Amber (Translucent)
E Green (Translucent)
F Blue (Translucent)

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

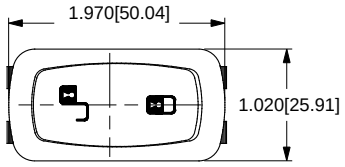
11 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



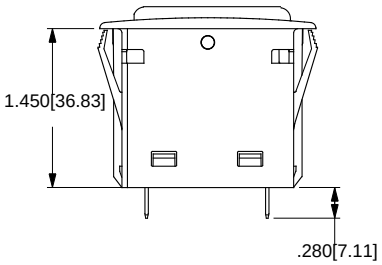


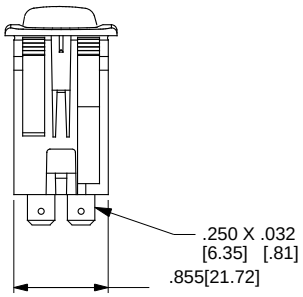
12 LEGEND OVER LAMP [2]
00 No legend
__ Laser Etched or Body Legends
For legend options, visit us at carlingtech.com

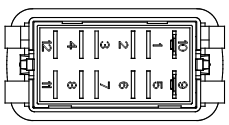
Notes:
1 To order separately, specify LPC and selection 7 code. Ex LPC-9
2 For LEDs, insert color must be clear, white or match color of LED.
3 For connector, specify part number LC2-01 (.187 tabs), LC3-01 (.250 tabs).



POS 3 POS 2 POS 1







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, 24VDC 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

Electrical

Contact Rating	10A@ 24VDC
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.

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

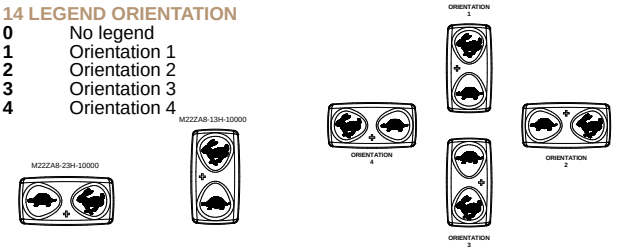
9 ACTUATOR

	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

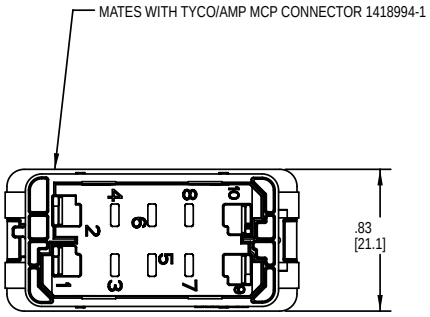
14 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4

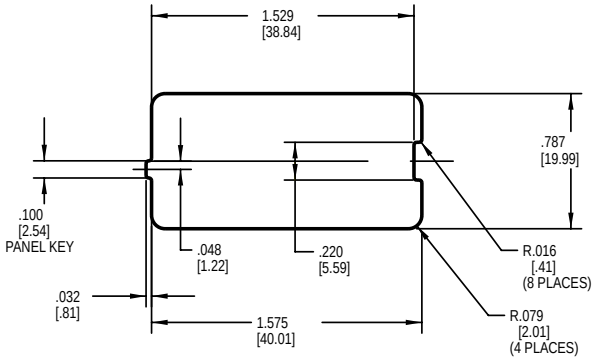


15,16 LEGEND 2,3 [6]
00 No legend

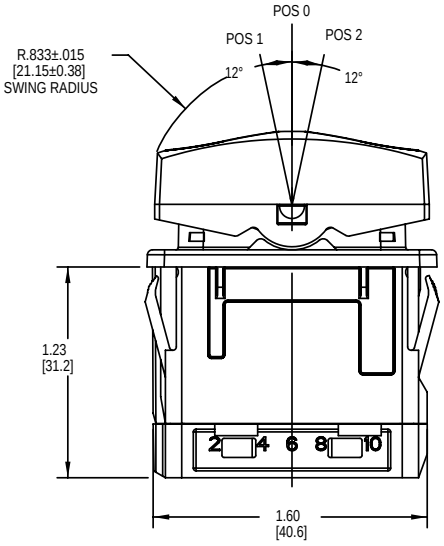
Notes:
1 Indicates 1/2 travel for actuator.
2 Snap-Action Contact Mechanism
3 Not available with circuit 98.
4 Available with circuit 98 only.
5 Located over T1-2.
6 Legend 2 located in center of rocker, Legend 3 located over T9-10. Legend 2 options are limited due to a very small marking area. Consult factory for specifics.

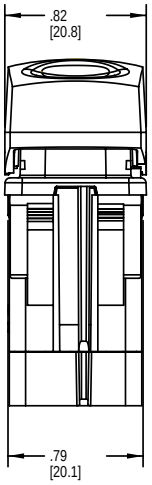
Dimensional Specifications: in. [mm]

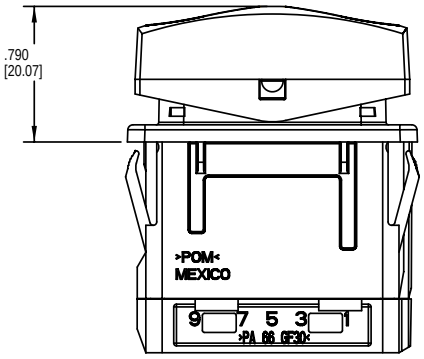




PANEL THICKNESS: 2.5±0.1mm
PANEL OPENING CLEARANCE: ±5°
SCALE 2.000







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

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

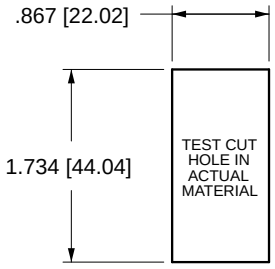
Actuator Travel (Angular Displacement)

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

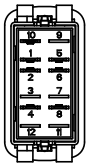
Panel Thickness Range
Acceptable Panel Thickness
.030 to .156 (.76mm to 3.96mm)
Recommended:
.030, .062, .093, .125 and .156

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

N	4	1	2	1	A	N	H	1	-	1	1	2	46	-	1	EK
1 Series	2 Actuator	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	5320
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	1	2	3	4
Rockerguard at Lamp 1	A	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.

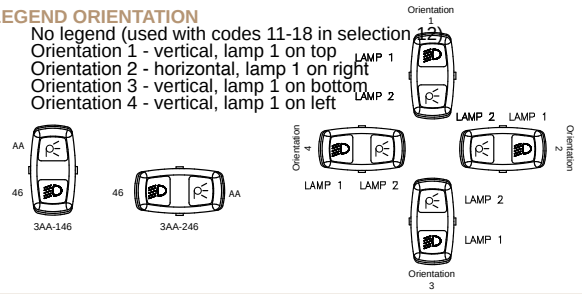
0 - No Actuator **Z** - No Lens

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



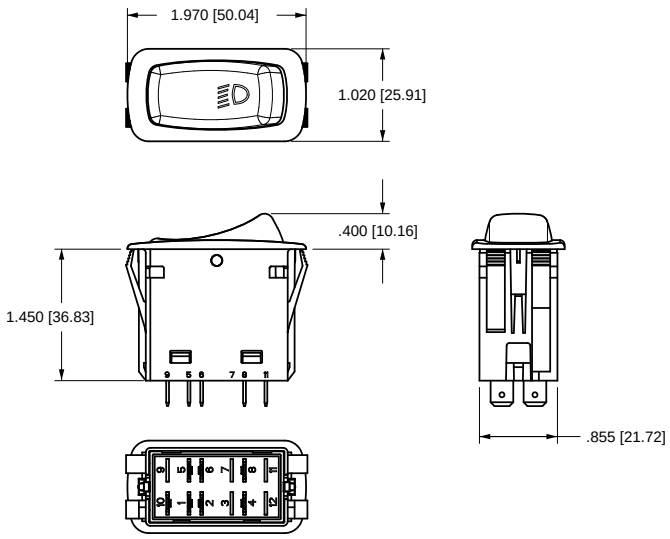
15 ACTUATOR LENS LEGEND
00 No legend this location / no actuator

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

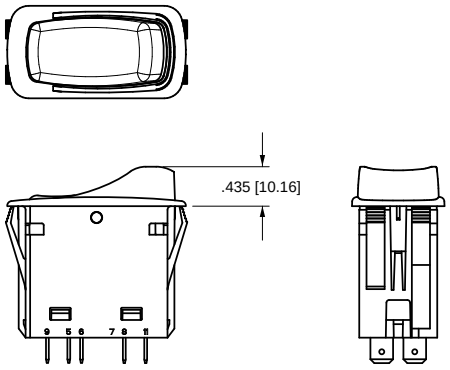
Notes:
1 Custom colors are available. Consult factory.
2 Switch supplied with .187 tab terminals.

Dimensional Specifications: in. [mm]

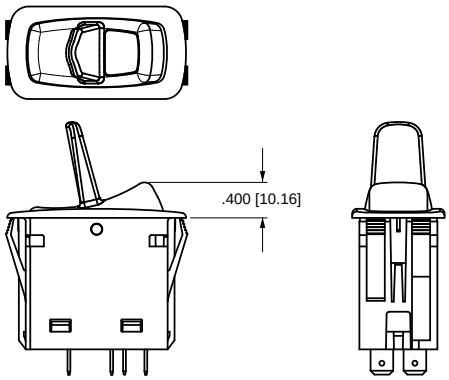
N-SERIES
SHOWN WITH LASER ETCHED ACTUATOR



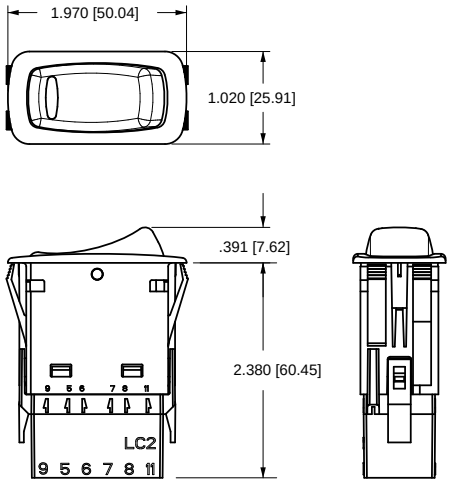
N-SERIES
SHOWN WITH ROCKER GUARD



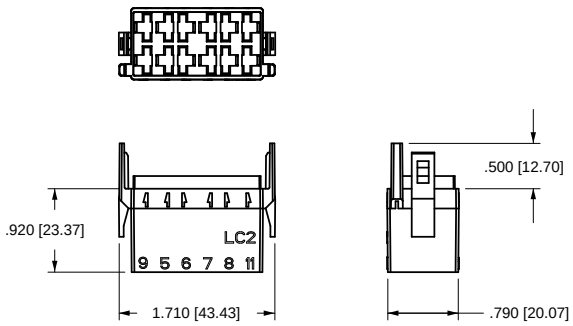
N-SERIES
SHOWN WITH LARGE LENS
AND PADDLE ACTUATOR



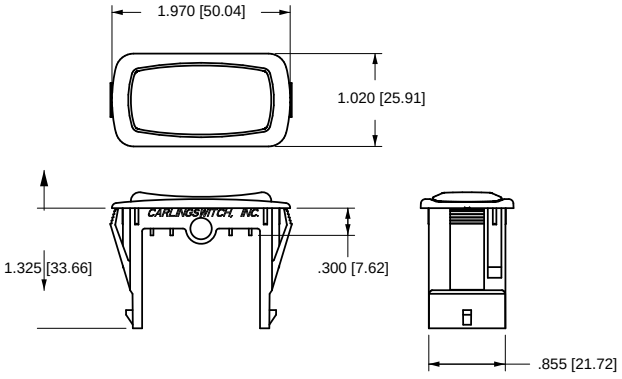
N-SERIES
SHOWN WITH BARS LENS
AND CONNECTOR



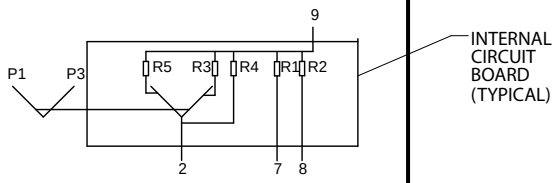
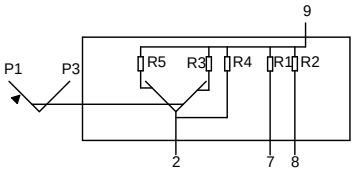
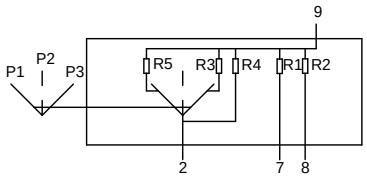
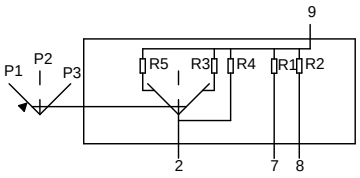
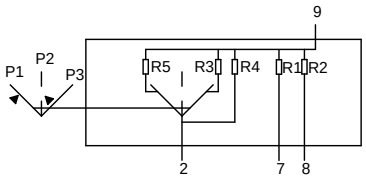
N-SERIES
LC2-01 BLACK .187 TAB CONNECTOR (PACKARD 480-SERIES)



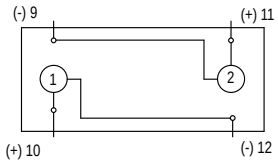
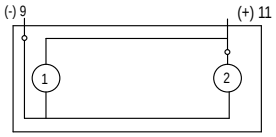
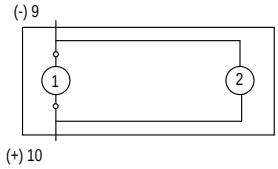
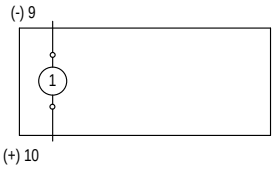
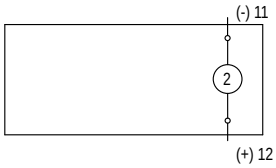
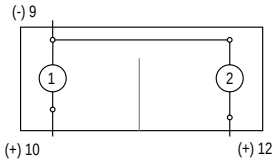
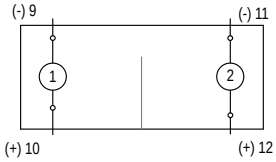
N-SERIES
LH1 REMOVABLE HOLE PLUG WITH NON-SERRATED WINGS
LH2 HOLE PLUG WITH SERRATED WINGS



Circuit Diagrams:

CIRCUIT CODE	SCHEMATIC
4	
5	
6	
7	
8	

Lamp Circuit Diagrams:

ILLUM. CODE	SCHEMATIC
A	
B	
C	
1	
2	
3	
4	

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, providing cost-savings as well; 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.

Product Highlights:

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

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. @ 4VDC
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 .230 (5.84 mm) 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
Rocker	Nylon 66 Reinforced, rated to 105°C (modular lens). Locking rocker, standard rocker & paddle. Laser etching with a polycarbonate actuator
Lock	Acetal
Lens	Polycarbonate rated at 100°C
Bracket	Nylon Zytel
Connector	Nylon 66 rated at 85°C. Polarized

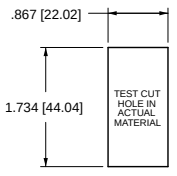
Actuator Travel (Angular Displacement)

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	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.

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**	

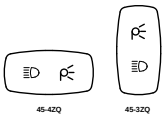
7 BRACKET COLOR [1]
1	Black	**2**	White	**3**	Gray

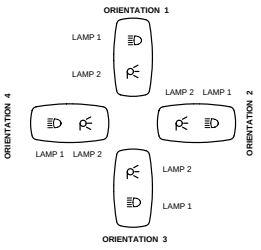
8 ACTUATOR STYLE / COLOR [1]
	Laser Etched	Black	White	Gray	Red
Rocker	**3**	**A**	**B**	**C**	**D**
Paddle	**4**	**J**	**K**	**M**	**N**

9 & 10 LENS COLOR
Clear	White	Amber	Green	Red	Blue	Lens Style
Z	No Lens					
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

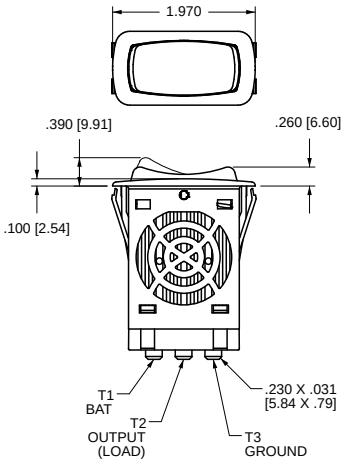
12 LEGEND ORIENTATION
0 No legend
1 vertical (lamp 1 on top)
2 horizontal (lamp 1 on right)
3 vertical (lamp 1 on bottom)

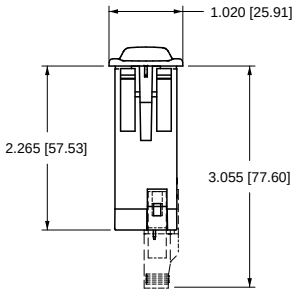


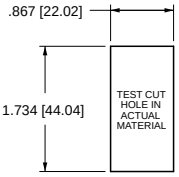


13 LEGEND #2
00 No legend **FC** Dim **FE** Bright
For legend options, visit us at carlingtech.com

Notes:
1 Custom colors are available. Consult factory.

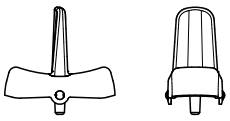




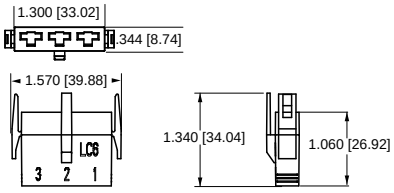


MOUNTING HOLE

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



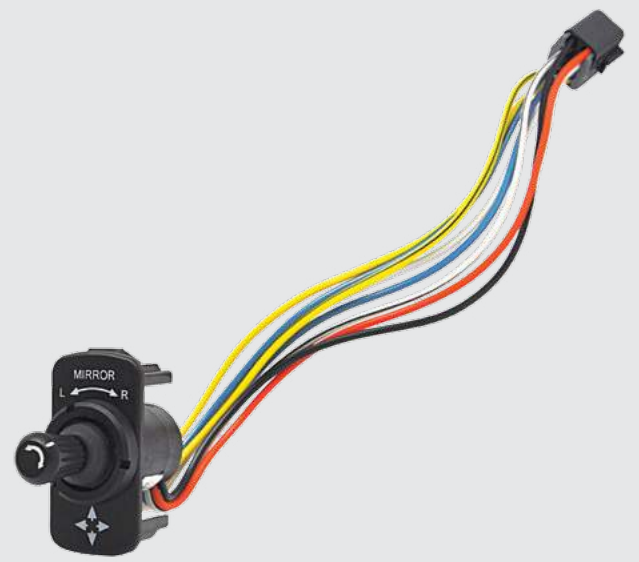
PADDLE STYLE ACTUATOR



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

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.



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

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

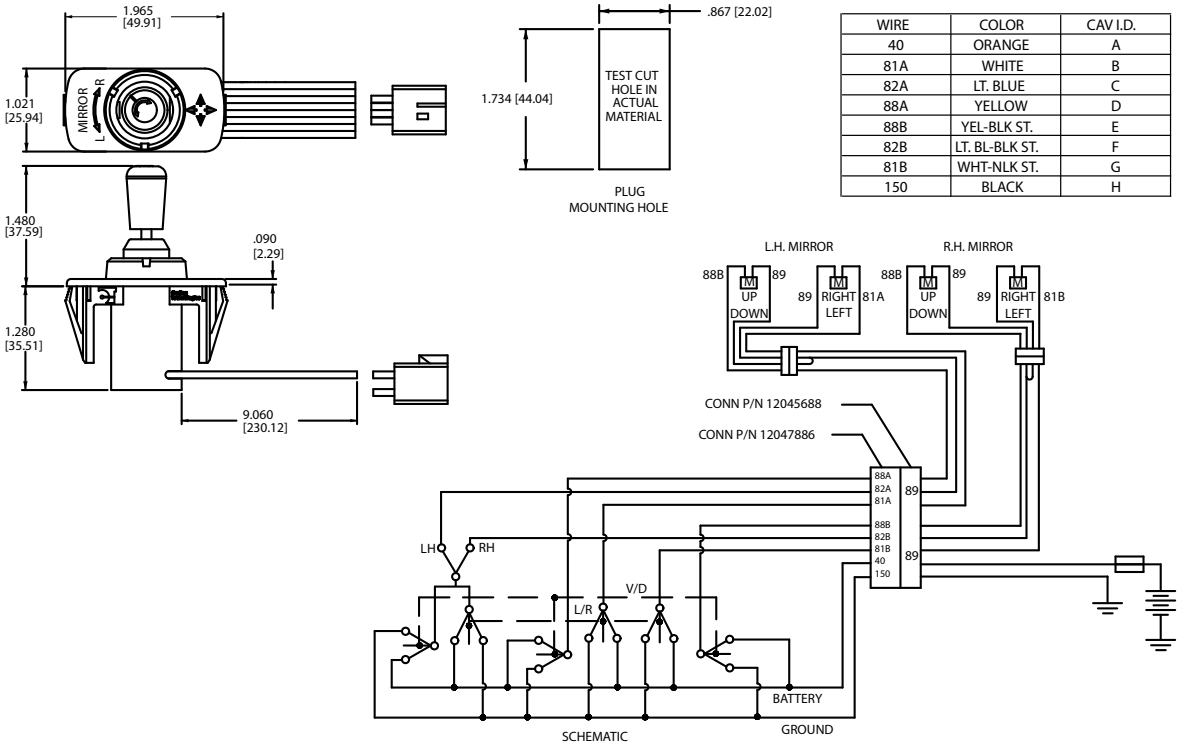
1 Base Part Number | 2 Color | 3 Legend

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.

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

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.

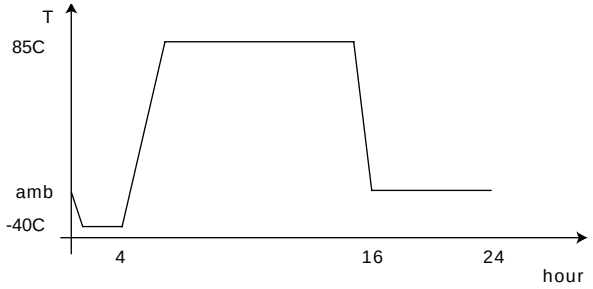
Endurance	According to SAE J2349, March 97 for windshield washer switch for Trucks, Buses and Multipurpose Vehicles (20,000 cycle minimum).

Physical Characteristics

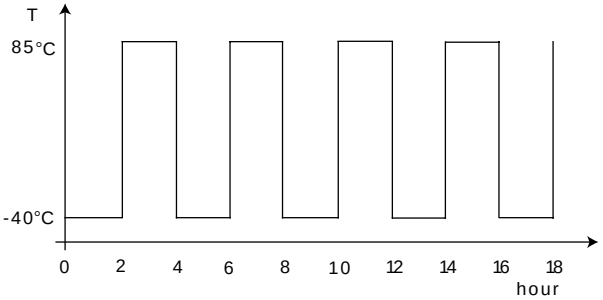
Illumination	LED, rated 100,000 hours 1/2 life
Cover	Acetate
Washer Actuator	Silicone
Toggle Actuator	Nylon 6/6 glass filled
Bracket	Nylon 6/6
Connector	Nylon 6/6 rated 85°C polarized
Washer Function	Momentary
Toggle Function	Maintained Intermittent
Operation	Momentary
Weight	44 grams

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.

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)

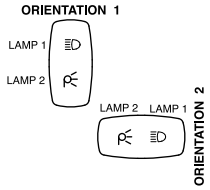
Z	No Lamp	**2**	Red LED
1	Green LED	**3**	Amber LED

7 BRACKET COLOR
1 Black

8 ROCKER / PADDLE COLOR
1 Black

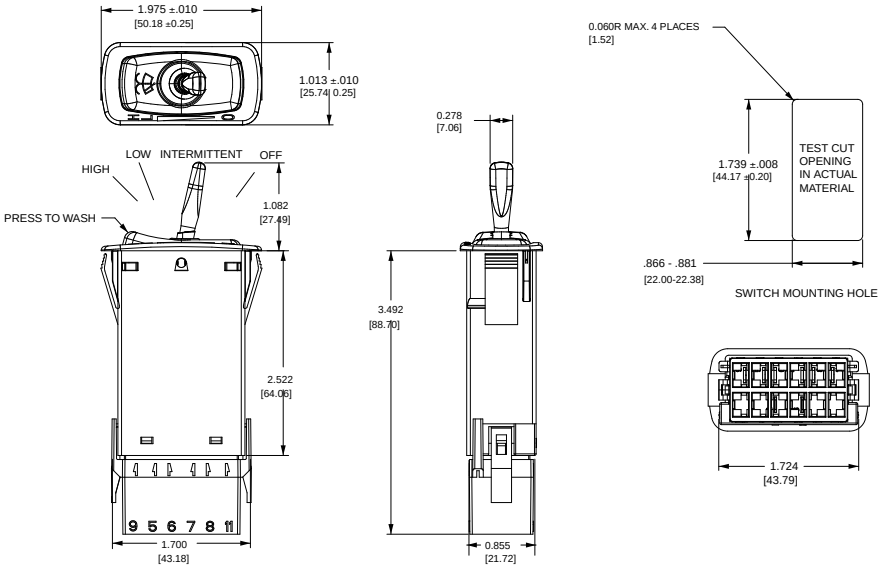
9 LEGEND #1
00 No legend
For legend options, visit us at carlingtech.com

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)

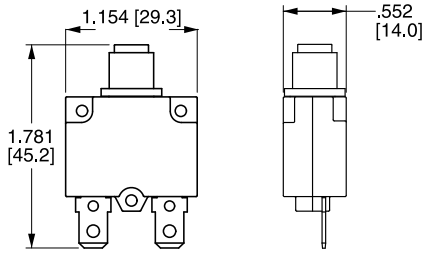
CMB-Series
THERMAL CIRCUIT PROTECTORS

The CMB-Series is a compact, single pole, push-to-reset family of thermal circuit breakers designed to protect equipment. Utilizing simple, precision design with few moving parts, these breakers offer cost effective, extremely reliable circuit protection with high resistance against shock and vibration.

Product Highlights:

- Ratings from 3-20A, 125, 250VAC, 32VDC
- 2500 VAC/1 minute
- 60°C Max Operating Temperature
- 2500A @ 32VDC Interrupting Capacity
- 100M ohms Insulation Resistance
- Voltage drop <0.25 V
- UL, CUL, CSA, TUV, CE
- UL1500/ISO8846 for ignition protection/marine

Dimensional Specifications: in. [mm]



CMB – 10 3 – 11 C 3 N – B – A /10

1 Series	2 Rating	3 Voltage	4 Mounting Hole	5 Bushing Type	6 Mounting Nut	7 Indicator Plate	8 Button	9 Terminal	10 Button Marking
CMB	10	3	11	C	3	N	B	A	/10

1 SERIES
CMB

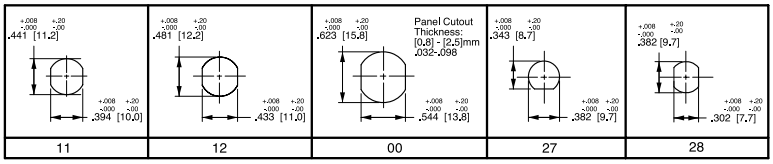
3 VOLTAGE
3 125-250VAC/ 32 VDC

2 RATING

03	3 amps	**10**	10 amps
04	4 amps	**12**	12 amps
05	5 amps	**13**	13 amps
06	6 amps	**14**	14 amps
07	7 amps	**15**	15 amps
08	8 amps	**16**	16 amps
		20	20 amps

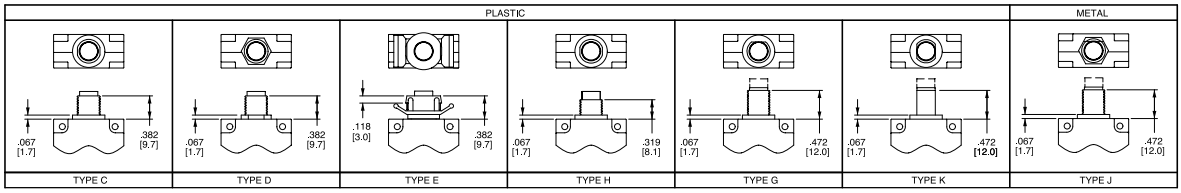
4 MOUNTING HOLE

11 [1] M11
12 [2] M12
00 [3] Snap In Style
27 [9] 3/8" 27 UNS
28 [12] 3/8" 27 UNS (double flatted)



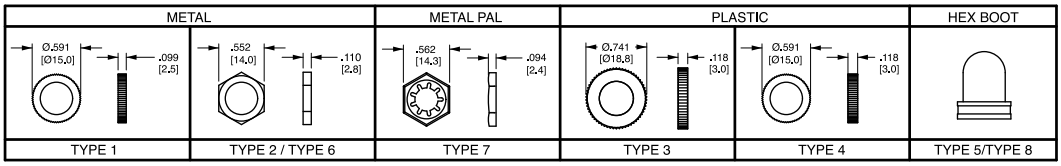
5 BUSHING

PLASTIC
C [4] Type C
D [4] Type D
E [5] Type E
G [8] Type G
H [6] Type H
K [13] Type K
METAL
J [8] Type J



6 MOUNTING NUT [7]

N None
1 Type 1
2 Type 2
3 [11] Type 3
4 Type 4
5 Type 5
6 [14] Type 6
7 [9] Type 7
8 [9] Type 8

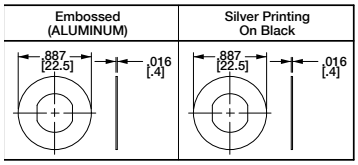


NOTE: Type 5 is clear hex boot. Type 8 is black hex boot (available for bushings G, J & K only); Type 3 nut includes molded in "PRESS TO RESET" marking.

7 INDICATOR PLATE [7]

N None
A Embossed Legend
B Silver Printing on Black

All indicator plates are marked "Suppl. Prot. press to reset".



8 BUTTON

B Black **R** Red **W** White

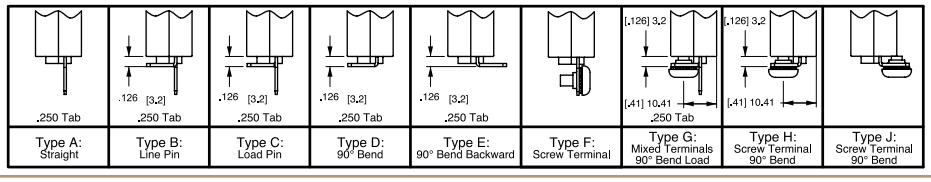
Notes: All dimensions are in.[mm]. Tolerance ±.005 [.127] unless otherwise specified.

1 Used with bushing C or D only.
2 Used with H bushing only.
3 Used with bushing E only.
4 Used with M11 mounting hole only.
5 Used with mounting hole 00 only.
6 Used with M12 mounting hole only.
7 All hardware available separately. Consult factory.
8 Available with mounting hole 27 only.
9 Available with G, J or K bushing only.
10 Amp rating must match button marking (ex: 20 will be marked on the button of CMB-203-27G3N-W-A/20)
11 Includes molded in "PRESS TO RESET" marking.
12 Available with K bushing only.
13 Available with mounting hole 28 only.
14 Thickness is 3.0 mm, .118 in.

9 TERMINAL

A Type A
B Type B
C Type C
D Type D
E Type E
F Type F
G Type G
H Type H
J Type J

F,G,H,J TERMINALS ARE 8-32 UNC

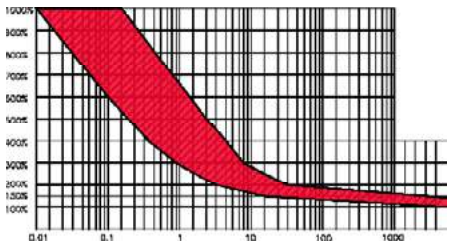


10 BUTTON MARKING (IF BLANK, NO MARKING.)[10]

Button Marking Orientation: line (20) load

03	3 amp	**05**	5 amp	**07**	7 amp	**10**	10 amp	**13**	13 amp	**15**	15 amp	**20**	20 amp
04	4 amp	**06**	6 amp	**08**	8 amp	**12**	12 amp	**14**	14 amp	**16**	16 amp		

Time Delay



Derating Factor	
-10 °C	x 1.70
-5 °C	x 1.60
0 °C	x 1.50
5 °C	x 1.40
10 °C	x 1.30
15 °C	x 1.20
20 °C	x 1.10
25 °C	x 1.00

Derating Factor	
30 °C	x 0.90
35 °C	x 0.85
40 °C	x 0.80
45 °C	x 0.75
50 °C	x 0.70
55 °C	x 0.65
60 °C	x 0.60

Overload	Trip Time
100%	No Trip
150%	Trip in 1 hr
200%	4.0 ~ 40 sec.
300%	0.9 ~ 8.0 sec.
400%	.42 ~ 5.0 sec.
500%	.25 ~ 3.0 sec.
600%	.01 ~ 1.8 sec.

Notes:
Breaker must hold 100% of rated current and must trip at 150% and above, within the time limits shown in curve. Trip times specified at 25° ambient with no preloading.
1 To adjust the breaker rating for ambient temperature multiply the breaker rating by the factor. (ex: 5 amp rating at 0°C: 5 x .67 = 3.3 amp. Select 3 amp rating.)

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

CLB-Series
THERMAL CIRCUIT PROTECTORS

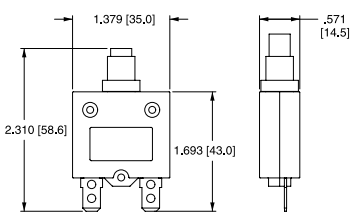
The CLB-Series is a compact, single pole, push-to-reset family of thermal circuit breakers designed to protect equipment. Utilizing simple, precision design with few moving parts, these breakers offer cost effective, extremely reliable circuit protection with high resistance against shock and vibration.

Product Highlights:

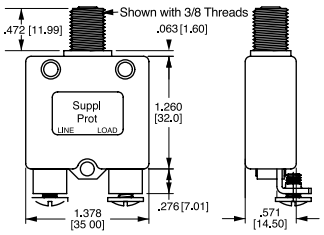
- Ratings from 3-60A, 125, 250VAC, 32VDC
- 2500 VAC/1 minute
- 60°C Max Operating Temperature
- 2500A @ 32VDC Interrupting Capacity
- 100M ohms Insulation Resistance
- Voltage drop <0.25 V
- UL, CUL, CSA, TUV, CE
- UL1500/ISO8846 for ignition protection/marine

Dimensional Specifications: in. [mm]

3-40A Construction



50 & 60A Construction



CLB - 10 3 - 12 C 3 N - B - A / 10

1 Series	2 Rating	3 Voltage	4 Mounting Hole	5 Bushing Type	6 Mounting Nut	7 Indicator Plate	8 Button	9 Terminal	10 Button Marking

1 SERIES
CLB

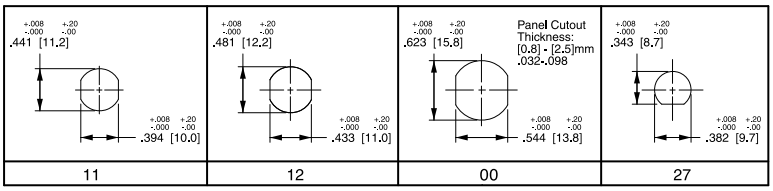
3 VOLTAGE
3 125-250VAC/ 32 VDC

2 RATING

03	3 amps	**15**	15 amps
04	4 amps	**18**	18 amps
05	5 amps	**20**	20 amps
06	6 amps	**25**	25 amps
07	7 amps	**30**	30 amps
08	8 amps	**35**	35 amps
10	10 amps	**40**	40 amps
12	12 amps	**50** [12]	50 amps
13	13 amps	**60** [12]	60 amps

4 MOUNTING HOLE

11 [1]	M11
12 [2]	M12
00 [3]	Snap In Style
27 [4]	3/8" 27 UNS



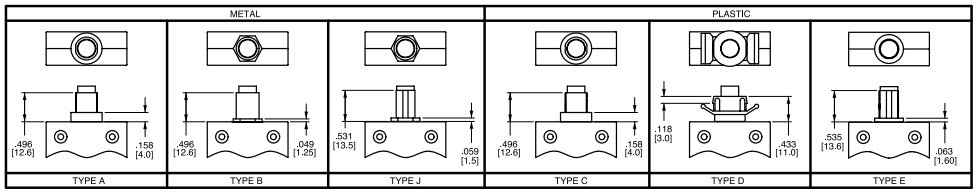
5 BUSHING

METAL

A [6]	Type A
B [6]	Type B
J [8]	Type J

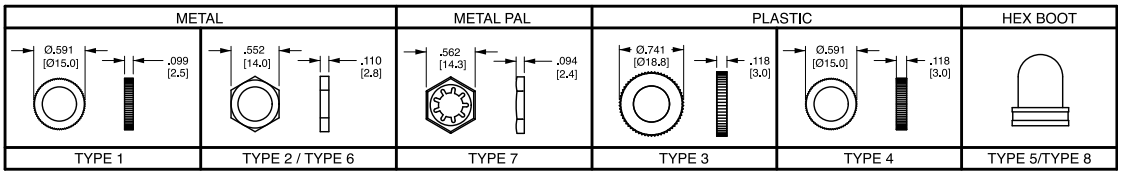
PLASTIC

C [5]	Type C
D [7]	Type D
E [8]	Type E



6 MOUNTING NUT [9]

N	None
1	Type 1
2	Type 2
3	Type 3
4	Type 4
5	Type 5
6 [4, 14]	Type 6
7 [4]	Type 7
8 [4]	Type 8

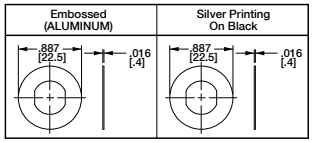


NOTE: Type 5 is clear hex boot. Type 8 is black hex boot (available for bushings E & J only); Type 3 nut includes molded in "PRESS TO RESET" marking.

7 INDICATOR PLATE [9]

N	None
A	Embossed
B	Silver Printing on Black

All indicator plates are marked "Suppl. Prot. press to reset".



8 BUTTON

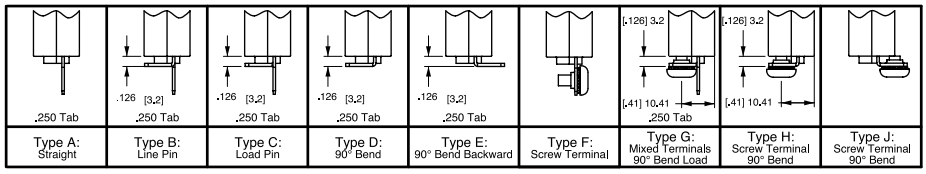
B	Black	**R**	Red	**W**	White

Notes: All dimensions are in.[mm]. Tolerance ±.005 [.127] unless otherwise specified.

1 Used with bushing A or B only.
2 Used with bushing C only.
3 Used with bushing D only.
4 Used with bushing E & J only.
5 Used with M12 mounting hole only.
6 Used with M11 mounting hole only.
7 Used with mounting hole 00 only.
8 Used with 27 mounting hole only.
9 All hardware available separately. Consult factory.
10 > 35 amp ratings must use solder joint to connect wire to non-screw type terminals.
11 Terminals are .040 [1.0] thickness for rating> 35, & .315 [.8] thickness is for ratings < 35 amps.
12 Available only with 10-24 unc. screw terms. (select type F, G, H, J only.) UL, CUL only.
13 Amp rating must match button marking (ex: "20" will be marked on the button of the breaker)
14 Thickness is 3.0 mm, .118 in.
15 Screw terminals are 8-32 UNC

9 TERMINAL [10,11,15]

A	Type A	**F**	Type F
B	Type B	**G**	Type G
C	Type C	**H**	Type H
D	Type D	**J**	Type J
E	Type E		

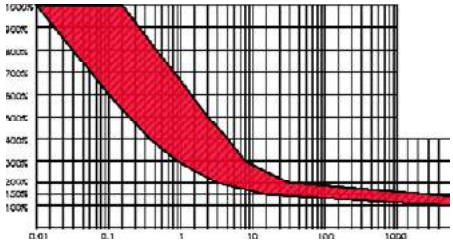


10 BUTTON MARKING (IF BLANK, NO MARKING.)[13]

Button Marking Orientation: line (20) load

03	3 amp	**06**	6 amp	**10**	10 amp	**15**	15 amp	**25**	25 amp	**40**	40 amp
04	4 amp	**07**	7 amp	**12**	12 amp	**18**	18 amp	**30**	30 amp	**50**	50 amp
05	5 amp	**08**	8 amp	**13**	13 amp	**20**	20 amp	**35**	35 amp	**60**	60 amp

Time Delay



Derating Factor	
-10 °C	x 1.70
-5 °C	x 1.60
0 °C	x 1.50
5 °C	x 1.40
10 °C	x 1.30
15 °C	x 1.20
20 °C	x 1.10
25 °C	x 1.00

Derating Factor	
30 °C	x 0.90
35 °C	x 0.85
40 °C	x 0.80
45 °C	x 0.75
50 °C	x 0.70
55 °C	x 0.65
60 °C	x 0.60

Overload	Trip Time
100%	No Trip
150%	Trip in 1 hr
200%	4.0 ~ 40 sec.
300%	0.9 ~ 8.0 sec.
400%	.42 ~ 5.0 sec.
500%	.25 ~ 3.0 sec.
600%	.01 ~ 1.8 sec.

Notes:
Breaker must hold 100% of rated current and must trip at 150% and above, within the time limits shown in curve.
Trip times specified at 25° ambient with no preloading.
1 To adjust the breaker rating for ambient temperature multiply the breaker rating by the factor. (ex: 5 amp rating at 0°C: 5 x .67 = 3.3 amp. Select 3 amp rating.)

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

CMBA/CLBA-Series
THERMAL CIRCUIT PROTECTORS

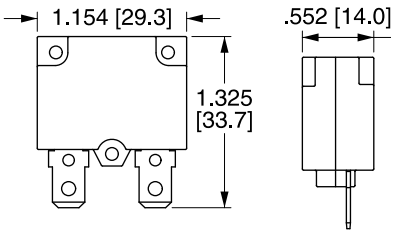
The CMBA/CLBA-Series features automatic cycling and resetting thermal protection capabilities with the same performance as its traditional push-to-reset counterparts.

Product Highlights:

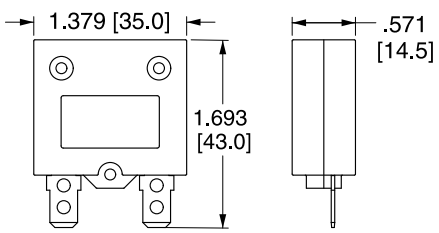
- CMBA: 3-20A, 125, 250VAC, 32VDC
- CLBA: 3-40A, 125, 250VAC, 32VDC
- 2500 VAC/1 minute
- 60°C Max Operating Temperature
- 2500A @ 32VDC Interrupting Capacity
- 100M ohms Insulation Resistance
- Voltage drop <0.25 V
- UL, cUL, TUV

Dimensional Specifications: in. [mm]

CMBA Construction



CLBA Construction



CMBA

CMBA	–	10	3	–	NN	F	N	N	–	B	–	A	
1 Series		2 Rating	3 Voltage		4 Mounting	5 Bushing	6 Mounting Nut	7 Indicator Plate		8 Button Color		9 Terminal	10 Plug Marking

1 SERIES
CMBA

2 RATING [2]

03	3 amps	**10**	10 amps
04	4 amps	**12**	12 amps
05	5 amps	**13**	13 amps
06	6 amps	**15**	15 amps
07	7 amps	**18**	18 amps
08	8 amps	**20**	20 amps

3 VOLTAGE
3 125-250VAC/ 32 VDC

4 MOUNTING
NN Plug In

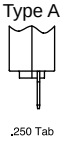
5 BUSHING
F None

6 MOUNTING NUT
N N/A

7 INDICATOR PLATE
N N/A

8 BUTTON COLOR
B Flush Black

9 TERMINAL
A Type A



.250 Tab

10 BUTTON MARKING [1] (IF BLANK, NO MARKING)

Plug Marking Orientation: line (20) load

03	3 amp	**07**	7 amp	**13**	13 amp
04	4 amp	**08**	8 amp	**15**	15 amp
05	5 amp	**10**	10 amp	**18**	18 amp
06	6 amp	**12**	12 amp	**20**	20 amp

CLBA

CLBA	–	10	3	–	NN	F	N	N	–	B	–	A	
1 Series		2 Rating	3 Voltage		4 Mounting	5 Bushing	6 Mounting Nut	7 Indicator Plate		8 Button Color		9 Terminal	10 Plug Marking

1 SERIES
CLBA

2 RATING [2]

03	3 amps	**13**	13 amps
04	4 amps	**15**	15 amps
05	5 amps	**18**	18 amps
06	6 amps	**20**	20 amps
07	7 amps	**25**	25 amps
08	8 amps	**30**	30 amps
10	10 amps	**35**	35 amps
12	12 amps	**40**	40 amps

3 VOLTAGE
3 125-250VAC/ 32 VDC

4 MOUNTING
NN Plug In

5 BUSHING
F None

6 MOUNTING NUT
N N/A

7 INDICATOR PLATE
N N/A

8 BUTTON COLOR
B Flush Black

9 TERMINAL
A Type A

.250 Tab

10 BUTTON MARKING [1] (IF BLANK, NO MARKING)

Plug Marking Orientation: line (20) load

03	3 amp	**07**	7 amp	**13**	13 amp	**25**	25 amp
04	4 amp	**08**	8 amp	**15**	15 amp	**30**	30 amp
05	5 amp	**10**	10 amp	**18**	18 amp	**35**	35 amp
06	6 amp	**12**	12 amp	**20**	20 amp	**40**	40 amp

Notes:
1 Amp rating must match plug marking. (ex: "20" will be marked on the plug of the breaker) No marking is standard.
2 See CMB/CLB graph for time delay information.

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

Cruise Control

The cruise control assembly digitally communicates with the VECU to provide the proper signal when the operator presses a button on one of the controls. The left control includes acceleration and deceleration, while the right control panel includes the OFF/ON and Resume buttons.

This product withstands temperatures from -40°C to +85°C, relative humidity up to 95%, condensation, direct sunlight and mechanical vibrations. The two controls are housed in an integrated assembly to minimize wiring. The expert design integrates seamlessly with the vehicle steering and wheel styling and is designed to meet customer-specific requirements for safety and ease of accurate assembly. Carling engineers will work with you and your vehicle design team to develop a customized cruise control solution for your specific needs.

Horn Control

The horn control is housed in an integrated assembly to minimize wiring and provides a flexible, yet durable actuator cover to endure exponential presses. It withstands temperatures from -40°C to +85°C, relative humidity up to 95%, condensation, direct sunlight and mechanical vibrations and was designed as a cost-effective alternative to traditional horn controls.

This rugged control has an operating voltage of 12 to 24VDC. Carling engineers will work with you and your vehicle design team to develop a customized cruise control solution for your specific needs.

Light Control Module

The light control module is a multifunctional package that encompasses four critical controls within one easy-to-install, space saving unit. Controls include a high-current rotary switch, which controls parking lights and headlights; a push-pull feature on the switch to operate fog lights; an adjacent high-current thumb wheel dimmer switch to select the desired brightness for dash lighting; and an additional miniature rocker switch for auxiliary high-current lighting functions.

The light control module is a compact, sleek, operator friendly, cost effective module. The rugged high-current switch design allows high-current loads to be handled without the need to include costly relays in the switch circuit. The snap-in design and integrated keyed connector make installation easy, and the compact design uses little valuable dashboard space.

HVAC Motor Controller

The HVAC motor controller efficiently controls heating and ventilation and interfaces with the vehicle's VECU to adjust the speed of the HVAC blower motor. There are two connections in the controller, one to the load through the harness and another to the VECU. The signal from the VECU controls the motor speed and creates a soft start that will suppress any inrush during the motor's start up.

The HVAC motor controller operates at 12 or 24VDC and drives DC motors up to 30A. It provides overvoltage protection, up to 100V for two minutes, meeting automotive requirements for EMC, vibration and shock. These features help extend the life of the HVAC unit and prevent the nuisance blowing of fuses or circuit breakers. The HVAC controller is sealed to IP68, providing protection from the extreme environmental conditions experienced by the blower housing. The HVAC Motor Controller is compact and uses fewer components and connections than traditional motor control devices.

Keypads

Operator control modules utilize industry standard SAE J1939 CAN and NMEA communication protocols. By incorporating a single connector to the CAN bus via a communications cable, wire harnesses are greatly simplified, saving space, weight and cost. Through the use of embedded software, these modules are configurable to your specific load requirements and diagnostic needs.

The compact keypad, available in standard or custom silicone designs, is the perfect interface for the many HMI functions that it controls. These sleek control pads provide a distinctive tactile feel for the operator, while incorporating wear-resistant lasered graphics for long life. Operator Control Modules are available with many features including multiple function lighting, CAN data-controlled variable dimming, and backlighting

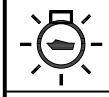
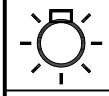
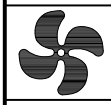
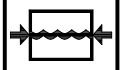
Solid State Power Control

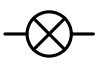
Module Features:

- 12 Channel/24 VDC electronic circuit breakers
- J1939 Communication
- Software Selectable Trip Characteristics
- Dimming and Soft Start PWM
- Reverse Polarity Protection
- Up to 15 Amps per channel
- Rated for 80 Amps Continuous Operation
- Load Shedding Capability

VOCM

Multiplexed V-Series rocker modules use industry standard SAE J1939, LIN, and NMEA communications protocols. The rocker module provides the look and feel of a traditional electromechanical switch with the connection benefits of a multiplexed module. Using one cut-out for six switch functions, the multiplexed V-Series rocker modules save assembly time, and greatly simplify wiring and harness requirements, providing a high-tech yet cost-effective solution.

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
	RUNNING LIGHTS (UNDER POWER)	AA	NA	MA
	LIGHT	AB	NB	MB
	MASTER LIGHT SWITCH	AC	NC	MC
	HORN	AD	ND	MD
	PROPULSION SYSTEM TRIM TRIMMING OPERATION	AE	NE	ME
	VENTILATION FAN OR BLOWER	AF	NF	MF
	WINDSHIELD WASHER	AG	NG	MG
	WINDSHIELD WIPER	AH	NH	MH
	BILGE PUMP	AJ	NJ	MJ
	BILGE BLOWER	AK	NK	MK
	POTABLE WATER PRESSURE	AL	NL	ML
	ENGINE START	AM	ED	MM
	ENGINE STOP	AN	EE	MN
	DRIVE TILT TILT OPERATION	30		31
	EMERGENCY START	32		33
	UP/DOWN LIFT	34		
	TRIM TAB TRIMMING OPERATION	35		36

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
	ANCHOR LIGHT	37		38
	ANCHOR	39		40
	WATER FLUSHING TAP FOR OUTBOARDS	41		42
	HIGH BEAM	43	44	45
	LOW / DIPPED BEAM	46	47	48
	SIDE MARKER LIGHT	DG	49	DF
	INTERIOR LIGHT	50	51	52
	WORK LIGHT	53	54	55
	WORK LAMP	56	57	58
	LOADING FLOOR LAMP	CW	59	CY
ON -WIPER- INT DELAY		60		
	ROTARY BEACON	61	62	63
	LAMP TEST	DK	64	DL
	WINDSHIELD WIPER/WASHER	65	66	67
	HAZARD WARNING	68	69	70
	WARM AIR BLOWER	71	72	73
	HORN REAR	AX	74	Y4

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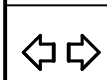
LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
	REAR FOG LAMP	75	76	77
	DIFFERENTIAL LOCK	78	79	80
	ALL WHEEL DRIVE	81	82	83
	DIRECTION INDICATOR	84	85	86
ENG HATCH		87		88
HORN		89		90
BLOWER		91		92
DEPTH		93		94
BILGE PUMP		95		96
NAV LTS		97		98
COURT LTS		99		1A
PANEL LTS		1B		1C
ANCH LTS		1D		1E
TRIM TAB		1F		1G
WATER PUMP		1H		1J
WIPER		1K		1L
BILGE		1M		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
ENG COMP		1N		1P
ACC		1R	1S	1T
NAV ANC		1U		1V
WNDLS UP/DN		1W		1Y
NAV ANCH LTS		1Z		2A
WNDLS ON/OFF		2B		2C
DOCKING LTS		2D		2E
	MUSIC	2F		2G
	BATTERY	2H	FM	2J
	LEVER UP/DOWN	2K		
	ENG PREHEAT	2M	EA	2N
UP		2P		2R
ANTENNA		2S		
DOWN		2T		
PRESS		2U		
AUX START		2V		2W
	GAS	2Y	EB	2Z

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	RIDE CONTROL	3A	EN	3B
	KICK OUT	3C		3D
	BEACON	3E	EP	3F
	SLOW	3G		3H
	CHECK	3J	DJ	3K
	A/C	3L		3M
	REAR DEFOGGER	3N	3P	3R
	FORK LIFT	3S	ER	3T
	ENG PREHEAT	3U		3V
	REAR WINDOW WIPER	AY	3Y	Y5
REAR				EC
	EXCAVATOR BACKHOE BOOM SHIFT	4B		4C
	UNLOCK	4D		4E
	TRANSMISSON LOCK	4F		4G
	FORK LIFT DOWN / UP	4H		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	DRIVER SEAT LIGHTING	4J		4K
	SIDE MARKER LAMPS	4L	4M	4N
	FOG LAMP	4P	4R	4S
	TRUNK LIGHT	4T		4U
RED		4V		4W
AMBER		4Y		
	LINE INDICATOR	5B		5C
	HANDICAP	5D	BX	5E
	STOP REQUEST	5F		5G
	WINDSCREEN HEATING & VENTILATION	5H	FP	5J
	EXTERIOR MIRROR DEFROSTER	5K		5L
	MOMENTARY LEVER	5M		5N
	SLOW	5P		5R
HIGH		5T	Y6	5U
LOW		5V	Y7	5W
PARK		5Y		5Z

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
WASHER		6C		
	SUPPLEMENTAL STEERING	6D		6E
BATT PARL		6F		6G
	DEPTH SOUNDER	6H		6J
	MUTE	6K		6L
TIMER		6M		
MAN		6N		
LIVEWELL		6R		
	WATER TANK		6S	
	REAR WASHER/WIPER	6T	BY	6U
	FRONT DIFFERENTIAL LOCK	6V		6W
	LEVER UP/DOWN	6Y		
	BILGE PUMP#1	6Z		7A
	BILGE PUMP#2	7B		7C
	BILGE PUMP#3	7D		7E
	RIGHT STABILIZER	7F		7G
	LEFT STABILIZER	7H		7J

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
HEAD LIGHTS		7K		EJ
CL / ID LIGHTS		7L		
CRUISE CONTROL		7M		
SET/DECEL RES/ACCEL		7N		
ENGINE BRAKE		7P		
HIGH MED LOW		7R		
POWER WINDOW		7S		
ENGINE FAN		7T		
DRIVING LIGHTS		7U		
FOG LIGHTS		7V		
TRAILER CL / ID LIGHTS		7W		
ENGINE DIAGN		7Y		
LH/RH TANK		7Z		
MIRROR DEFOG		8A		
BACKUP LIGHTS		8B		
DASH LIGHTS		8C		
CAB SLEEPER		8D		

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
SLEEPER START		8E		
HIGH LOW		8F		
	CRUISE CONTROL	8G	8H	8J
	CRUISE CONTROL ADJUST	8K	8L	8M
	ENGINE BRAKE	8N	8P	8R
	HIGH/MED/LOW	8S	8T	8U
	POWER WINDOW	8V	8W	8Y
	ENGINE FAN	8Z	9A	9B
	DIAGNOSTICS	9C	9D	9E
	LH/RH TANK	9F	9G	9H
	LENS BLACKOUT		9J	
	VARIABLE	9L	9M	9N
	MIRROR ADJUST	9P	9R	9S
	SPEAKER	9T		9U
	SLEEPER START	9V	9W	9Y
	HIGH / LOW	9Z	A1	A2
BEACON		A3		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
MIRROR		A4		
	MASTER SWITCH	A5		A6
	RABBIT (FAST)	A7		A8
	RETARDER	A9		B1
	EXHAUST BRAKE	B2	BZ	B3
	TANDEM AXLE	B4		B5
	AIR TANK	B6		B7
DRAIN		B8		
	AUTOMATIC TRANSMISSION	B9	EX	C1
	LOADER BUCKET DOWN	C2		C3
	LOADER BUCKET	C4		C5
AUTO		C6		
	NEUTRAL LOCK	C7	EF	C8
	TRANSMISSION NEUTRALIZER	C9		D1
	RUNNING / ANCHOR LIGHTS	D2		
	TRIM TAB TRIMMING OPERATION	D3		D5
	TRACTOR FORWARD	D6		D7

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE [1]	POSITIVE
	STEERING	D8	FN	D9
BATTERY PARALLEL		E1		
	MIRROR DEFROST	DD	E2	DE
	SLEEPER LIGHTS		E3	
	IDLE SPEED	FB	E4	FAFN
SLEEPER LIGHTS		E5		
IDLE SPEED		E6		
	MOWER DECK UP/DN	E7		E8
	4 / 2 WD LOCK	E9		F1
	STEERING CONTROL	F2		F3
	DRIVE TILT UP	F4		F5
	MILL MAIN	F6		F7
	MILL REVERSAL	F8		F9
	HEAD LIGHTS	G1		G2
	WORK LIGHT	G3		G4
RAISE		G5	EY	G6
LOWER		G7	Ez	G8

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE [1]	POSITIVE
FWD		G9		H1
REV		H2		H3
	BROOM	H4		H5
	SANDER	H6		H7
KNEEL		H8		
	CHIME MUTE	DY	H9	DZ
R. DOOR		J1		J2
F. DOOR		J3		J4
AUX BATT		J5		J6
	SWING MAIN	J7		J8
	ACTIVE SWING	J9		K1
	CENTERING	K2		K3
	REAR OPERATION AUTO-LIFT RELEASE	K4		K5
		K6		K7
	ARROW		K8	
	FRONT WINDOW DEFROST	K9		L1
	REAR WINDOW DEFROST	L2		L3

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	SIDE WINDOW DEFROST	L4		L5
		L6		L7
	CRAWLER STRETCHING	L8		L9
	CRAWLER LOOSENING	M1		M2
	SEARCH LIGHT	M3		M4
	SIDE MIRROR DEFROST	M5		M6
		M7	CA	M8
	UNLOADER AUGER	M9		N1
	REVERSING	N2		N3
	DRIVING LIGHT	N4		N5
HAZARD	HAZARD	N6		N7
	EXTRA PLUG	N8		N9
	GRAIN TANK LIGHT	P1		P2
	ROTOR LIGHT	P3		P4
	CHAFF SPREADER	P5		P6
	HANDLE	P7	EM	P8
	LEFT / RIGHT TABLE	P9		R1

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	LEFT SIDE KNIFE	R2		R3
	ALL MECHANISMS	R4		R5
AUTO	MONITOR MENU	R6		R7
	VERTICAL BAR	S1		S2
	THRESHING SYSTEM	S3		S4
	TABLE MOVEMENT	S5		S6
	CYLINDER SPEED	S7		S8
	COVER PLATE	S9		T1
	ENGINE STARTING AID	T2		T3
TCS	TRACTION CONTROL SYSTEM	T4		T5
	HYDRAULIC DIVERTER VALVE	T6		T7
TEST	LAMP TEST	T8	T9	U1
	DOCKING LIGHT	U2		U3
	ROCKSHAFT	U4		U5
AUX		U6	EG	U7
DOCK LIGHTS		U8		
CTSY LIGHTS		U9		

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
TRIM		V1		
AIR TEMP SEA		V2		
ENGINE LIGHTS		V3		
TRANS LIGHTS		V4		
DEFOG		V5		
SEAT		V6		
UP TRAILER		V7		EH
DEPTH FINDER		V8		
EXHAUST		V9		
SINK PUMP		W1		W2
STORAGE LIGHTS		W3		
UP HATCH DOWN		W4		
	TRAILER 3rd AXLE LIFT	W5	W6	W7
TRAILER 3rd AXLE LIFT		W8		
	HANDLE BAR HEATER	W9		Y1
P	PARKING BRAKE	Y2	DH	Y3
	ARROW (UP)	Y8	ES	Y9

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
	ARROW (DOWN)	Z1		Z2
	RIGHT SIDE KNIFE	Z3		Z4
	HYDRAULIC HAMMER	Z5		Z6
	HYDRA-CLAMP	Z7		Z8
	SHOVEL FLOAT	Z9		AP
	SHOVEL HORIZONTALLY	AR		AS
	HYDRAULIC HITCH	AT		AU
	LOCK	AV	BW	AW
LIGHT		AZ		BA
	BLOWER FAST	BB		BC
	ARROW (LEFT)	BD	EU	BE
	ARROW (RIGHT)	BF	EV	BG
	HYDRAULIC FLUID	BH		BJ
	WORK LIGHTS	BK		BL
	TRACTOR WITH REAR PTO	BM		BN
	READING LIGHTS	BP		BR
5	5TH GEAR LOCKOUT	BS		BT

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	FAILURE/ MALFUNCTION	BU		BV
COCKPIT LTS	COCKPIT LIGHTS	CB		CC
STOR LTS	STORAGE LIGHTS	CD		CE
SEAT		CF		CG
LIGHT		CH		CK
ANCHOR		CJ		CL
	POWER TAKE OFF	CR	EW	CS
STBD		CM		CN
FUEL		CP		CT
PORT		CU		CV
	SEAT BELT	CZ		DA
	ENGINE DIAGNOSTIC	DB		DC
	TRANS. OIL TEMP	DM	FG	DN
	TRANS. OIL PRESSURE	DP	FH	DR
	AIR FILTER	DS	FJ	DT
	WATER TEMP.	DU	FK	DV
	ENG.. OIL PRESSURE	DW	FL	DX
	✳ BAR LENS LASER ETCHED	EK		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	✳✳ BAR LENS LASER ETCHED	EL		
DIM		FC		FD
BRIGHT		FE		FF
	REAR INTERAXLE WHEEL DIFF LOCK	FS		
	FRONT WHEEL DIFF LOCK	FT		
	CRAWLING	FU		
	HI/LO GEAR XFER BOX	FV		
	REAR INTERAXLE DIFF LOCK	FW		
	XFER BOX NEUTRAL	FX		
	SUNROOF CLOSE	FY		
	SUNROOF OPEN	FZ		
	BOGGIE LIFT SELECT0R/UP	GA		
	BOGGIE LIFT SELECTOR/DN	GB		
	REAR BUZZER INHIBIT	GC		
	EXTRA HIGH BEAM LAMP	GD		
	MIRROR HEAT	GE		
	ASR OFF ROAD	GF		
	REAR WHEEL DIFF LOCK	GG		

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
	ADR SWITCH	GH		
	EQUIP LIGHT	GJ		
	PANIC ALARM	GK		
	BEACON WARNING LIGHT	GL		
	MAIN DOOR UNLOCK	GM		
	BOGGIE RATIO CTRL	GN		
	WATER IN FUEL	GP		
OFF	REDUCED SET BURGLAR ALARM	GR		
2	PTO ADD GEAR BOX	GS		
	EBS TRAILER BRAKE	GT		
RPM	MUDDY SITE	GU		
1	PTO GEAR BOX	GV		
	MAIN DOOR LOCK	GW		
	HAZARD WARNING	GX		
	HILL START AID	GY		
	DRIVING LEVEL CTRL	GZ		
2	DRIVING LEVEL CTRL/2	HA		
	REAR WORK PROJ LAMP	HB		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
OFF	OFF ENG CTRL RATING/PTO	HC		
	ON/OFF PARKING HEATER	HD		
	RED INTERIOR LIGHTING	HE		
	BYPASS/PARKING HEATER	HG		
	AIR SUSPENSION DN	HJ		
	AIR SUSPENSION UP	HK		
—	ENGINE RATING CTRL-	HL		
AUTO	AUTO/MANUAL	HM		
MEM	MEM/RECALL	HN		
AUTO	DRIVING LEVEL CTRL/AUTO	HP		
	PERM XFER BOX DIFF LOCK	HR		
	FUNCTION LAMP	HT		
3	ENGINE/XFER BOX PTO	HU		
	WINDOW LIFT	HV		
ABS OFF	ABS INHIBIT	HW		

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LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	CONTURA IV &V BAR LENS LASER ETCHED	HX		
	CONTURA IV &V BAR LENS LASER ETCHED	HY		
	ENGINE RATING CTRL	HZ		
ON	ON ENG CTRL RATING/PTO	JA		
	ENGINE RATING CTRL+	JB		
	HAZARD WARNING LAMP	JC		
	ADR SWITCH	JD		
	DRIVING LEVEL CONTROL	JE		
	DRIVING LEVEL CONTROL	JF		
	FUNCTION INDICATOR	JG		
	AUTO/MANUAL	JH		
	MIRROR HEAT LEFT DRIVING	JJ		
1	PTO GEAR BOX	JK		
TCS	ASR OFF ROAD/ TRACTION CTRL	JL		
	REAR WHEEL DIFF LOCK	JM		
	HSA/BSRA SWITCH	JN		
	EQUIPMENT LIGHTING	JP		
ON	MACHINE ON	JR		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS NEGATIVE[1]	LENS POSITIVE
	PANIC ALARM	JS		
	BEACON WARNING LIGHT	JT		
	MV SUNROOF HATCH	JU		
	BOGGIE LIFT SELECTOR	JV		
	BOGGIE LIFT SELECTOR	JW		
R	ACOUSTIC REVERSE LIGHT	JX		
	REAR WORK PROJECTOR LAMP	JY		
	PTO ON REAR ENGINE NMV	JZ		
	REAR INTER AXLE/ WHEEL DIFF LOCK	KA		
	WINDOW LIFT	KB		
	AIR SUSPENSION DOWN	KC		
	AIR SUSPENSION UP	KD		
	MAIN DOOR UNLOCK	KE		
	MAIN DOOR LOCK	KF		
MEM	MEMORIZE/ RECALL SWITCH	KG		
2s recall 5s store	MEMORIZE/ RECALL SWITCH	KH		
ON	ON/OFF ENGINE RATING CTRL	KJ		
	REDUCED SET BURGLAR ALARM	KK		

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SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
	PARKING HEATER	KL		
2	PTO ADD GEAR BOX	KM		
rpm	MUDDY SITE SWITCH	KN		
	EBS TRAILER BRAKE	KP		
	+/- POUR PMT	KR		
	+/- POUR PMT	KS		
	ADR SWITCH	KT		
	ADR SWITCH	KV		
	WINCH UP	KW		
	WINCH DOWN	KX		
	CRUISE SPEED	KY		
R+	CRUISE RESUME	KZ		
S−	CRUISE SET	LA		
	MAIN SWITCH CONTROL	LB		
	ADDITIONAL WARNING	LC		
	REAR SEARCH SPOTLIGHT	LD		
	FRONT SEARCH SPOTLIGHT	LE		
	2 TONES SIREN	LF		

LEGEND		LEGEND CODE		
SYMBOL	NAME (SYMBOL MEANING)	BODY	LENS	
			NEGATIVE[1]	POSITIVE
NUIT	DAY/NIGHT MODE	LG		
OFF ROAD	OFF ROAD MODE	LH		
ROAD	ROAD MODE	LJ		
	WINDOW LIFT	LK		
N AUTO	AUTO NEUTRAL MV/DV	LL		
	SUNROOF CONTROL	LM		
	BEACONS WARNING LIGHTS	LN		
	REDUCE SET ALARM	LP		
	NIGHT HEATER	LR		
	WHITE DISC	LS		
N AUTO	AUTO NEUTRAL RENAULT	LT		
OFF ROAD	OFF ROAD	LU		
	FUNCTION LIGHT	LV		
ON OFF		11		
OFF ON		12		
I O		13		
O I		14		
OFF ON		15		

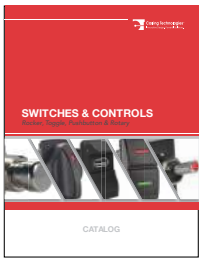
Notes:
1 Negative legends not available on L, LD, LW, and N-Series.
2 Many symbols are SAE (J1362), ANSI and ISO approved symbols. Consult factory for custom symbols/icons.
3 Use “body” legend codes for laser etched image identification.

There are several catalogs available featuring complete details on all Carling Technologies products. Below is a list of useful information such as catalogs, brochures and videos. Please visit our website at **carlingtech.com** or scan the QR codes below for complete details.

www.carlingtech.com

Watch Company Profile Video

Switches & Controls



catalog

Complete line and ordering details for Switches & Control products including Rocker, Toggle, Pushbutton, and Rotary style switches.

Hydraulic-Magnetic

catalog

Complete line and ordering details for all hydraulic-magnetic circuit breakers.

Thermal

catalog

Complete line and ordering details for all thermal circuit breakers.

GFCI / ELCI

catalog

Complete line and ordering details for all GFCIs/ELCIs.

Marine

catalog *brochure*

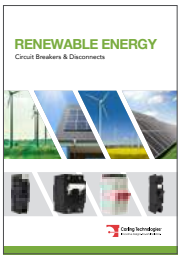
Complete line of ELCIs, thermal and hydraulic-magnetic circuit breakers specific for marine applications.

On-Off Highway

catalog *brochure*

Complete line of switches, controls and custom solutions specific for on-off highway applications.

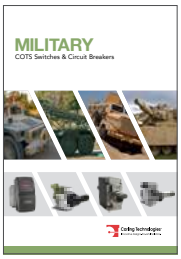
Renewable Energy



catalog *brochure*

Complete line of circuit breakers and disconnect products specific for renewable energy applications.

Military



catalog *brochure*

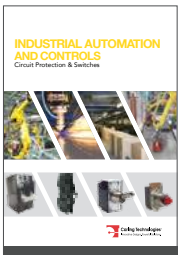
Complete line of COTS *(Commercial-Off-The-Shelf)* switches and circuit breakers specific for military applications.

Telecom/Datacom

catalog *brochure*

Complete line of hydraulic-magnetic circuit breakers specific for telecom/datacom applications.

Industrial Automation

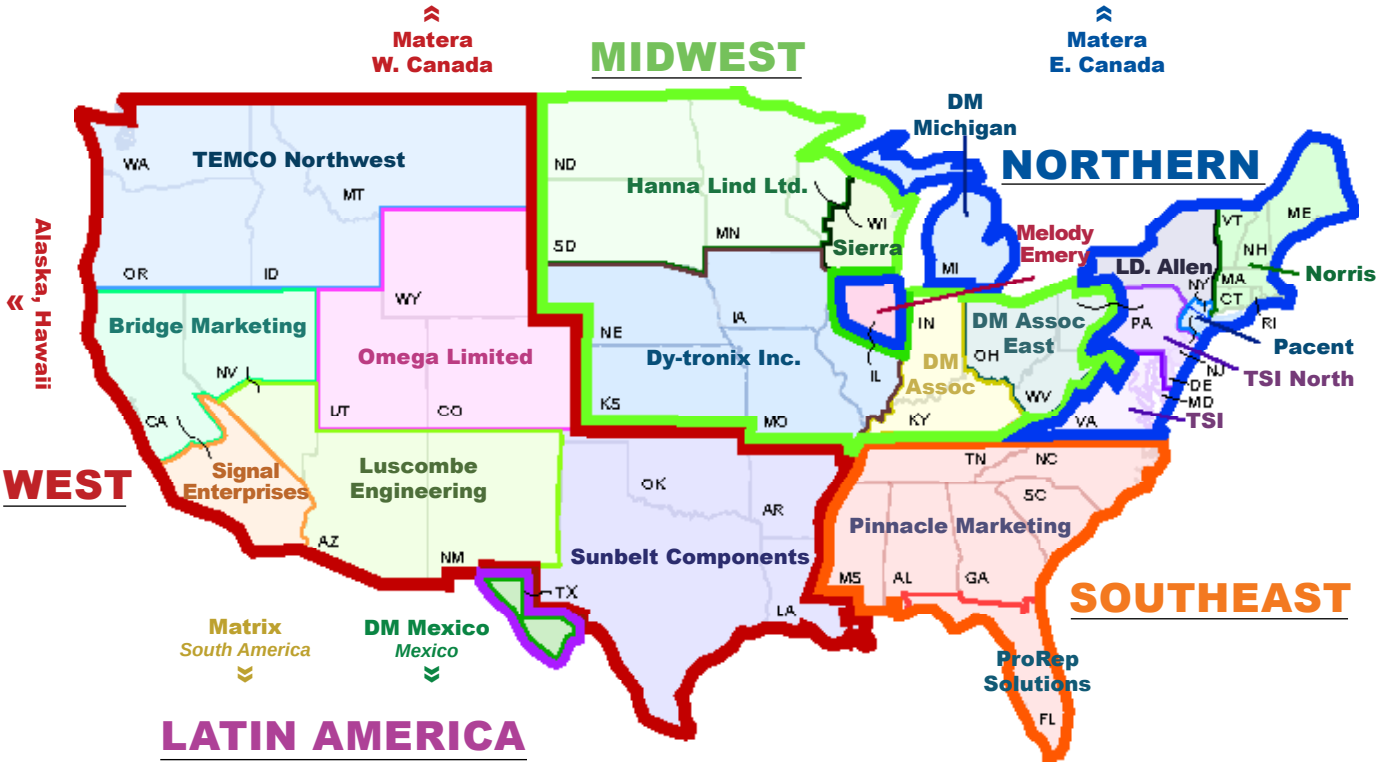


brochure

Complete line of switches and circuit breakers specific for industrial automation & controls applications.

Authorized Sales Representatives

Click on the group name on the map below to find your local representative or visit *www.carlingtech.com/findarep*.



Americas

Europe
Middle East
Africa

Asia-Pacific
Oceania

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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