

SWITCHES & CONTROLS

Rocker, Toggle, Pushbutton & Rotary



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

GLOBAL LOCATIONS:

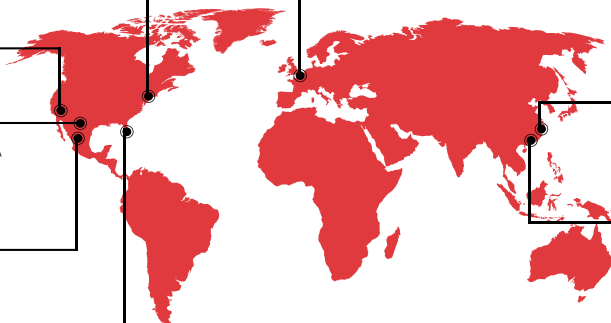
Carling Technologies
World Headquarters
Plainville, CT, USA
ISO9001:2008
ISO/TS16949:2009

Maretron
Phoenix, AZ, USA

Carling Technologies
Brownsville, TX, USA
ISO14001:2004
ISO9001:2008
ISO/TS16949:2009

Carling Technologies
Matehuala, Mexico
ISO14001:2004
ISO9001:2008
ISO/TS16949:2009

Carling Technologies
Jupiter, FL, USA



Carling Technologies
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Carling Technologies
Kowloon, Hong Kong
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Carling Technologies
Zhongshan, China
ISO14001:2004
ISO9001:2008
ISO/TS16949:2009

OTHER SERVED INDUSTRIES:



Medical



Industrial Control



Audio / Visual



Commercial Food



HVAC



Floor Care



Generators



Small Appliances



Security Systems



Test & Measurement

WORLDWIDE NUMBERS:

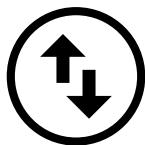


2200+
EMPLOYEES

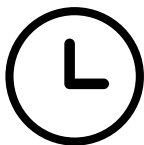


150+
ENGINEERS

COMPETITIVE ADVANTAGES⁺



Vertical
Integration



Reliable &
On-Time Delivery



Excellent
Customer Service






Innovative &
Eco-Friendly Products



70+
DISTRIBUTORS



50+
REP FIRMS

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Switches and Controls, Carling Technologies is the leading manufacturer of switches and controls serving OEMs worldwide. Carling Technologies broad product range offers a full line of rocker, toggle, pushbutton, rotary and mini switches for a wide variety of applications. Featuring cutting edge designs and advanced features, Carling products are well known for their performance and reliability.

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

Available Online are tools such as a 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 can be tailor-made for most any application using our extensive engineering resources.

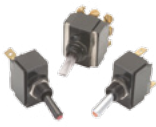





Other Products such as hydraulic-magnetic, thermal and ground fault circuit breakers are also available.

SEALED SWITCHES					
	 V-Rotary	 ST-Series	 V-Series	 W-Series	 L-Series
Poles	one, two	one, two	one, two	one, two	one, two
Ratings	dry circuit to 15A 24VDC 15A 150VAC 10A 250VAC	16A 12V 16A 18V 15A 24V 15A 125VAC 10A 250VAC	dry circuit to 15A 24VDC 15A 150VAC 10A 250VAC	dry circuit to 10A 24VDC	dry circuit to 15A 125VAC 10A 250VAC 20A 18VDC
Sealed Actuator	IP67, rotary knob	IP68, bat	IP66, rocker, paddle, locking rocker	IP68 including connector, 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	.500" dia [12.7mm] bushing 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	.250 tabs screw terms	.250 tabs solder lug wire leads	.110 tabs	.187 tab .250 tabs
Illumination	incandescent, LED, neon	n/a	incandescent, LED, neon	LED	incandescent, LED
Approvals	pending	UL, cUL pending	UL, CSA, VDE	n/a	n/a






	FULL-SIZED ROCKERS		MID-SIZED AND SMALL-SIZED ROCKERS			
	 S-Series	 TIL / LTIL TIG / LTIG / LS	 RR / LRR	 R / LRA / RSC RG / LRG	 620 / 621 / 622 632 / 651	 T / LTA / TG / LTG / TLG / TTG
Poles	one, two	one, two	one	one, two	one, two	one, two
Ratings	dry circuit to 10A 28VDC	dry circuit to 15A 125VAC 10A 250VAC	up to 12A 125VAC 10A 250VAC	up to 20A 125VAC 15A 250VAC	dry circuit to 12A 125VAC 10A 250VAC 8A 250VAC 1/2 HP 125- 250VAC	up to 20A 125VAC 10A 250VAC
Sealed Actuator	bezel-less rocker	rocker, paddle	rocker	rocker, paddle	rocker, paddle	rocker, lever, paddle, plunger, toggle (bat)
Mounting Hole Specifications	.787" x 1.575" snap-in, keyed	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount screw mount	.795" [20.2mm] round snap-in mount	.480" x 1.072" [12.19mm x 27.23mm] .866" x 1.182" [22mm x 30mm] snap-in mount	.508" x .756" [12.9mm x 19.2mm] snap-in mount	.550" x 1.125" [13.97mm x 28.57mm] 1.00" x 1.125" [25.4mm x 28.57mm] snap-in mount
Termination	.110 Tabs	.187 tab solder lug .250 tabs screw terms wire leads	.187 tab	solder lug .250 tabs wire leads PC terms	.187 tab solder lug wire leads PC terms	.187 tab solder lug .250 tabs wire leads
Illumination	LED	incandescent, neon	incandescent, neon	incandescent, neon	incandescent, LED, neon	incandescent, neon
Approvals	n/a	UL, CSA, VDE	UL, CUL	UL, CSA, VDE	UL, CSA, VDE	UL, CSA




*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.

CONTROLS					
	 <i>LD Dimmer</i>	 <i>LMR Mirror</i>	 <i>LW Wiper</i>	 <i>N-Series</i>	 <i>V-Charger</i>
Poles	multi-function	multi-function	multi-function	one	one
Ratings	up to 10A 12VDC 5A 24VDC	up to 1A 14VDC .5A 28VDC	up to 8A 14VDC 4A 28VDC	.4VA 28VDC	12V/24VDC
Actuator	rocker, paddle	joystick	rocker, paddle	rocker, paddle	sealed spring-loaded access doors
Mounting Hole Specifications	.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	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount
Termination	.250 tabs	wire leads with connector	.187 tabs	.187 tabs	.250 tabs
Illumination	LED	n/a	LED	LED	LED
Approvals	n/a	n/a	n/a	n/a	n/a

TOGGLE SWITCHES						
	 <i>LT-Series</i>	 <i>F / G / H / I</i>	 <i>C / D</i>	 <i>110-Series</i>	 <i>DK / EK</i>	 <i>MAAOA / 215</i>
Poles	one, two	one, two, three, four	one	one, two	one, two	one
Ratings	dry circuit to 15A 125VAC 10A 250VAC 15A 12-28VDC	dry circuit to 20A 125VAC 20A 277VAC	up to 20A 125VAC 10A 250VAC	up to 6A 125VAC/DC 3A 250VAC/DC	up to 20A 125VAC/DC 10A 250VAC/DC	up to 20A 125VAC 10A 250VAC 1/2HP 125- 250VAC
Actuator	paddle, toggle (bat)	paddle, toggle (bat)	paddle, toggle (bat)	toggle (bat), toggle (ball)	toggle (bat), toggle (ball)	toggle (bat)
Mounting Hole Specifications	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.656" x 1.218" [16.66mm x 30.54mm] snap-in mount
Termination	.187 tabs solder lug .250 tabs screw terms wire leads PC terms	.187 tabs solder lug .250 tabs screw terms wire leads PC terms	solder lug .250 tabs screw terms wire leads	solder lug .250 tabs screw terms wire leads	screw terms	.250 tabs screw terms wire leads
Illumination	incandescent, neon	n/a	n/a	n/a	n/a	n/a
Approvals	n/a	UL, CSA	UL, CSA	UL, CSA	UL, CSA	UL, CSA

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

PUSHBUTTON					
	 <i>16-3P</i>	 <i>170 / 172</i>	 <i>P26 / P27</i>	 <i>641 / 110</i>	 <i>P / PP</i>
Poles	one	one	one	one, two, three	one
Ratings	up to 3A 125VAC	up to 15A 125VAC 10A 250VAC	dry circuit to 6A 125VAC 3A 277VAC	up to 5A 125VAC 2A 250VAC	up to 20A 125VAC 10A 250VAC
Mounting Hole Specifications	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount	.500" dia [12.7mm] bushing mount
Termination	solder lug wire leads	solder lug screw terms wire leads	.250 tabs solder lug wire leads	solder lug wire leads PC terms	.250 tabs screw terms wire leads
Approvals	UL, CSA	UL, CSA	UL, CSA	UL, CSA	UL, CSA, TUV

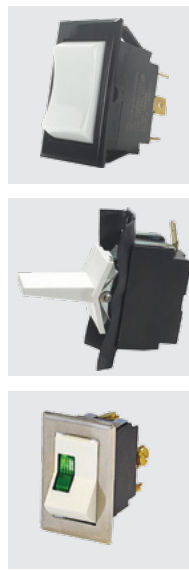
ROTARY			
	 <i>R135</i>	 <i>700 / 800</i>	 <i>V-Rotary</i>
Poles	one	one	one, two
Ratings	1.5A 250VAC 3A 125VAC 5A 12VDC	up to 3A 250VAC 6A 125VAC	dry circuit to 15A 24VDC 20A 12VDC
Actuator	round	asymmetrical	ergonomic
Mounting Hole Specifications	.375" dia [9.52mm] bushing mount .500" dia [12.7mm] snap-in mount	.500" dia [12.7mm] bushing mount	.830" x 1.450" [21.08mm x 36.83mm] snap-in mount
Termination	wire leads	.125 tabs solder lug .250 tabs	solder lug .250 tabs wire leads
Illumination	n/a	n/a	incandescent, LED
Approvals	UL, CSA	UL, CSA	pending

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

Tippette

FULL SIZED ROCKER SWITCHES

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



Electrical

Contact Rating 15 amps, 125 VAC
 10 amps, 250 VAC
 3/4 HP 125-250 VAC
 15 amps, 12-30 VDC

Life 25,000 cycles circuit dependent
 50,000 cycles circuit dependent
 consult factory for applicable circuits.

Contacts Fine silver, silver cad-oxide

Terminals Brass or copper/silver plate
 1/4" (6.3mm) Quick Connect terminations standard.
 Solder lug - Brass Tin Plated
 Wire Lead 16 gauge standard 105°C 600VAC
 Screw Terminals - Brass

Physical

Lighted Incandescent - rated 10,000 hours
 Neon - rated 25,000 hours

Seals Bracket - Actuator WBL/MBL
 optional external gasket panel seal

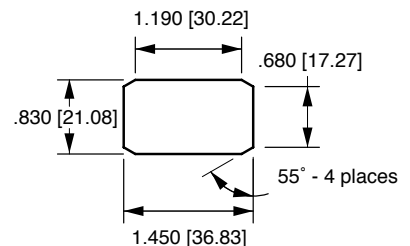
Base Phenolic (150°C)
Rocker/Bracket Nylon 66 (105°C)

Mechanical

Endurance 100,000 cycles minimum

Mounting

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



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

Agency Certifications



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

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

TIGA51 - 6M - BL - MBL

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

1 BASE PART NUMBER: SERIES/POLES / CIRCUITRY ^{8,11} / RATING ⁷ / TERMINATION ¹⁰

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

Single Pole in Double Pole base ²

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

Three Pole

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

VDE APPROVED

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

Single Pole in Double Pole base ²

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

Double Pole

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

Four Pole

solder	.250	screw	wire		
lug	tab	term.	leads		
TIHK50	TIHK51	TIHK54	TIHK55		
TIHK5A	TIHK5B	TIHK5E	TIHK5F		
TIHK5L	TIHK5M	TIHK5S	TIHK5T		
TIHL50	TIHL51	TIHL54	TIHL55		
TIHL5A	TIHL5B	TIHL5E	TIHL5F		
TIHM50	TIHM51	TIHM54	TIHM55		
TIHM5A	TIHM5B	TIHM5E	TIHM5F		
TIHM5L	TIHM5M	TIHM5S	TIHM5T		

Double Pole

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

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

2 ACTUATOR STYLE

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

3 ACTUATOR COLOR ⁹

BL Black WH White RD Red

4 BRACKET STYLE ⁹

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

Notes:

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

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

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

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

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

illuminated Single Pole in Double Pole base

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

illuminated Double Pole

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

Additional ratings up to 12A 250VAC, 17A 125 VAC, 3/4 HP 125 VAC, 1HP 250VAC are available. Consult factory for specifics. Three pole switch is also available: Substitute H for fourth digit of part number. ex. LTIIHK51

2 ACTUATOR STYLE ⁴

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

3 ACTUATOR COLOR ¹¹

BL Black WH White RD Red

4 LENS COLOR ¹³

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

5 BRACKET STYLE ¹¹

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

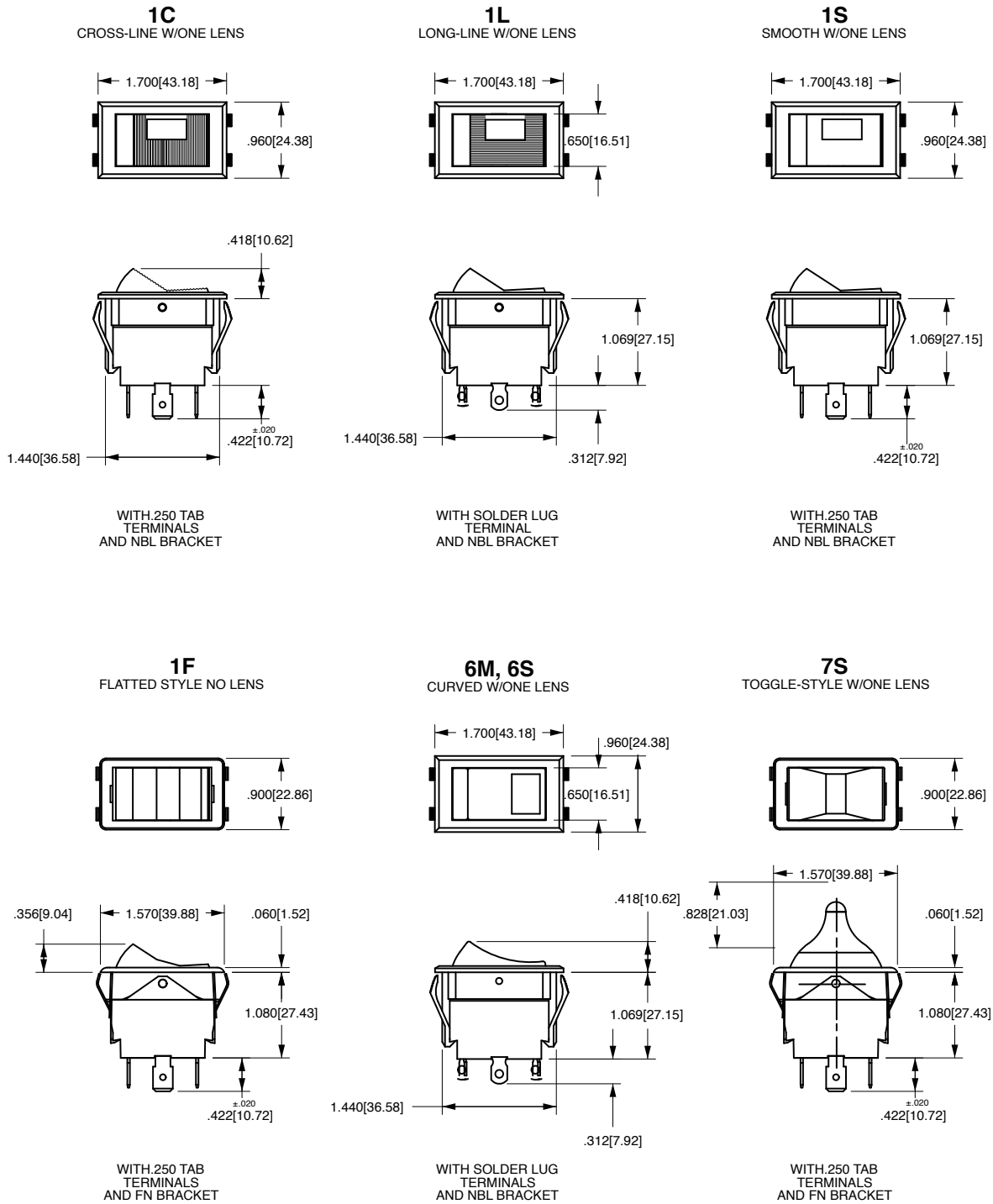
6 LAMP VOLTAGE

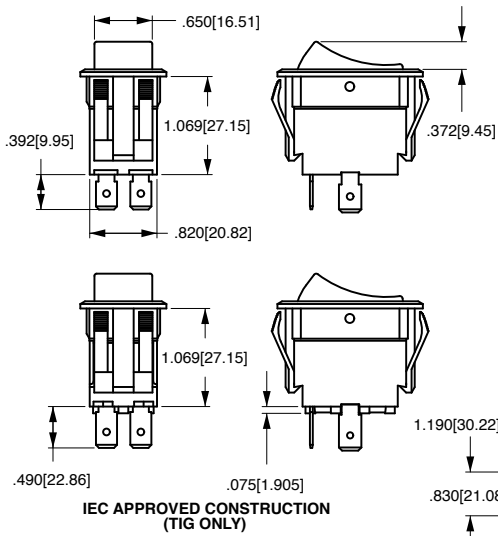
neon ⁹			
125N	125 volt	250N	250 volt
incandescent			
6V	6 volt	12V	12 volt
18V	18 volt	24V	24 volt
28V	28 volt		

Notes:

- NBL, FN, & FW brackets only. Double pole circuits provided with 3 pole base.
- LTIL-Series with NBL, FN, & FW brackets only.
- NBL, WBL, & MBL brackets only. With 6M actuator, bracket will also be matte finish.
- 1S, 1C, 1L, & 7S with NBL bracket only available with LTIL-Series.
- 6M, 6S actuators only.
- Not available with 6M and 6S actuators.
- Not recommended with neon lamps.
- Consists of WBL bracket, neoprene seal, dummy rivets at open holes. Consult factory for agency approval status.
- Not recommended with blue or green lenses.
- All ratings are appropriate for usage in low voltage applications.
- Custom colors and additional bracket styles are available, consult factory.
- () - momentary
- All double throw circuits supplied with two lenses. To specify two different lens colors, specify second color, after first color. (ex. LTIGM51-6S-BL-RC/GN-WBL-12V)
- .187 tab and PC terminations are also available. Consult factory for catalog number callout.

Dimensional Specifications: in. [mm]

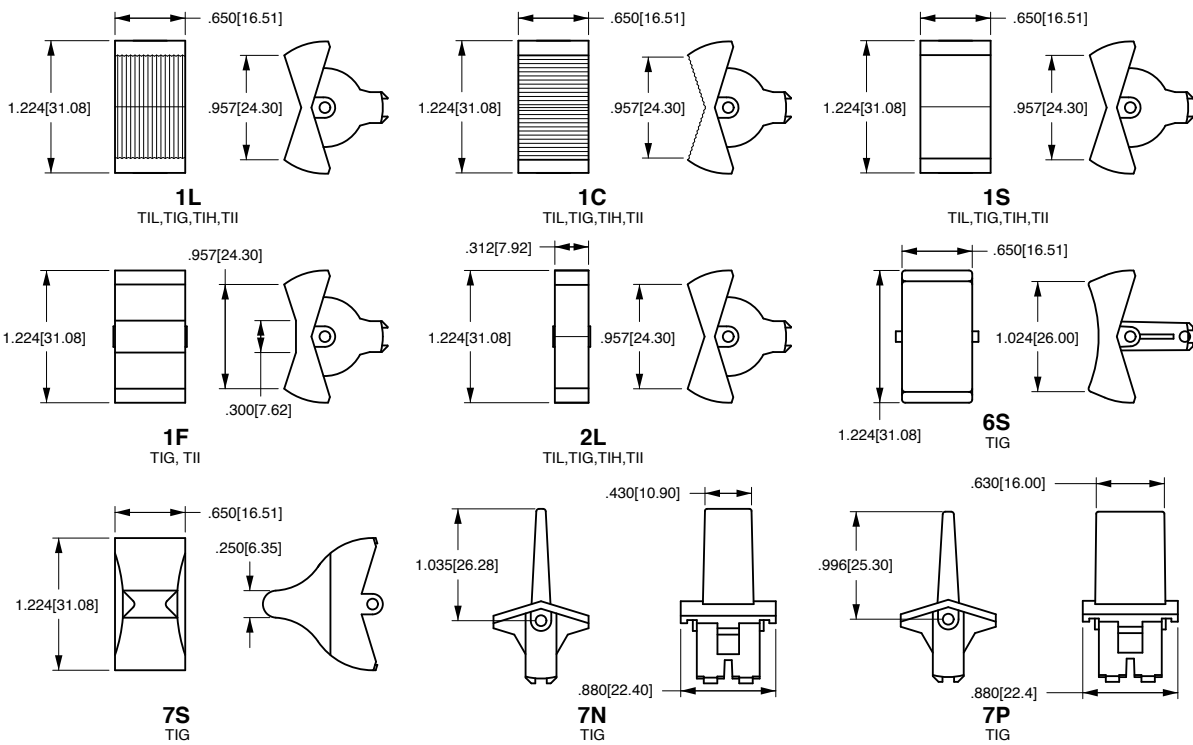




SOLDER LUG	.250 TAB (Q.C.)	.187 TAB (Q.C.)
TERMINAL TYPE		
SCREW (ASSEMBLED)	WIRE LEAD	PRINTED CIRCUIT

MOUNTING HOLE
 (Nylon Snap-in Brackets)
 Panel Thickness:
 .030 min. - .250 max.
 Switch should be mounted at 90°
 for maximum water shedding
 (45° to 90° acceptable)

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

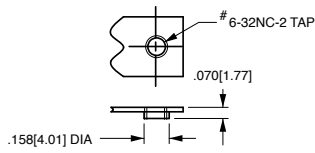


SPECIAL CIRCUITS FOR TIPPETTE ROCKER SWITCHES

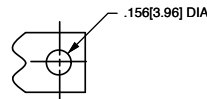
Circuit	Position 1	Position 2	Position 3
Progressive Two Circuit			
GG	BOTH CIRCUITS ON	ONE CIRCUIT ON	OFF
GG	BOTH CIRCUITS (ON)	ONE CIRCUIT ON	OFF
Single Pole Triple Throw			
GE	ON	ON	ON
Two Circuit			
GH	CIRCUIT 1 ON	BOTH CIRCUITS ON	CIRCUIT 2 ON
GP	CIRCUIT 2 ON	CIRCUIT 1 ON	OFF
Reversing Double Pole Double Throw			
GO	ON	OFF	ON
GX	ON	NONE	ON

() Indicates momentary function.

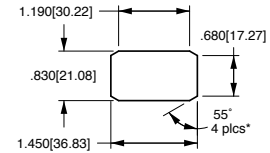
Dimensional Specifications: in. [mm]



TAPPED HOLE
Standard with
A & B Brackets



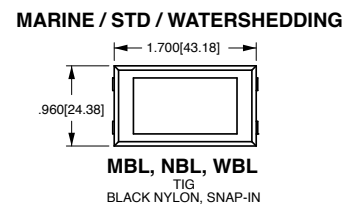
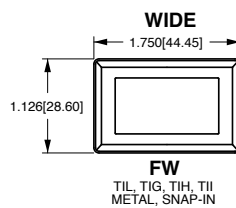
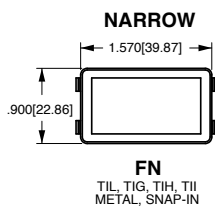
CLEARANCE HOLE
Standard with
C Bracket



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

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

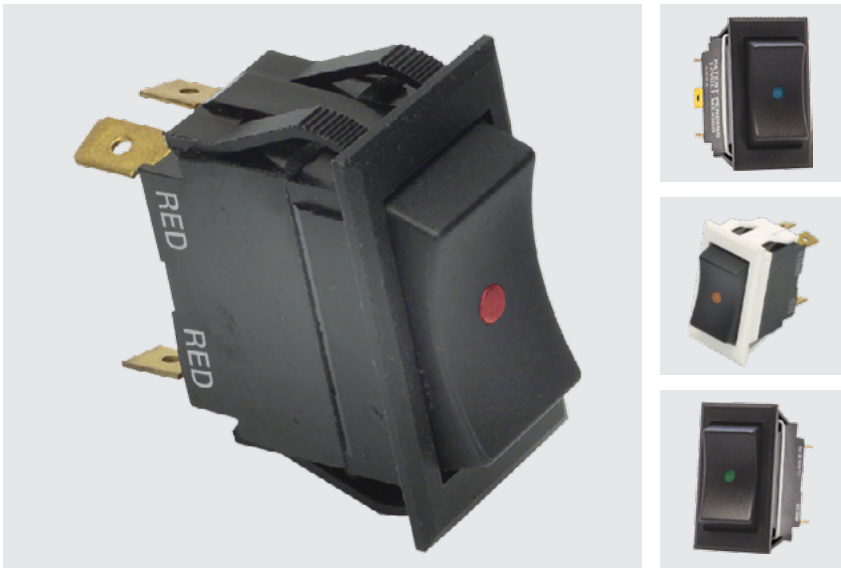
<p>TIL</p> <p>A TIL</p>	<p>TIG</p> <p>A TIG</p>	<p>TII</p> <p>A TII</p>	<p>TIH</p> <p>A TIH</p>
<p>B TIL</p>	<p>B TII, TIG</p>		
<p>CX TIL</p>	<p>C TIG</p>	<p>C TIH, TII</p>	
<p>H TIG</p>		<p>GCP / GMP GLOSS FINISH / MATTE FINISH HOLE PLUG FOR TIL, TIG, TIH & TII</p>	



LS-Series

ROCKER SWITCHES

The LS-Series Softspot illuminated rocker switches feature a three-color high brightness light sequence, from a single lamp. These switches are designed with a standard nylon snap-in bracket and “Drip-Dry” construction that protects the front panel from dust and moisture.



Product Highlights:

- ◆ Water Resistant Construction
- ◆ Independent or Dependent Illumination
- ◆ Up to 3 Different Colors Under a Single Lens
- ◆ Multiple Termination Options

Typical Applications:

- ◆ Marine
- ◆ Transportation



Dielectric Strength

1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

0°F to 150°F (-17.8°C to +65.6°C)

LS1511 - 13 - BL - BL - 012

1
Base Part Number

2
Lighting Sequence

3
Actuator Color

4
Base Color

5
Lamp Voltage

1 BASE PART NUMBER: SERIES / POLES / ILLUMINATION / CIRCUITRY / RATING / TERMINATION³
10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 15A 15-28VDC

Single Pole	Solder Lug	.250 Tab QC	Screw Terms	Wire Leads
On-None-Off	LS1510	LS1511	LS1514	LS1515
On-None-(Off)	LS1520	LS1521	LS1524	LS1525
(On)-None-Off	LS1530	LS1531	LS1534	LS1535
On-None-On	LS1540	LS1541	LS1544	LS1545
On-None-(On)	LS1550	LS1551	LS1554	LS1555
On-Off-On	LS1560	LS1561	LS1564	LS1565
On--Off-(On)	LS1570	LS1571	LS1574	LS1575
(On)-Off-(On)	LS1580	LS1581	LS1584	LS1585

2 LIGHTING SEQUENCE 1,2

	position 1	position 2	position 3
01	red	red	red
02	amber	amber	amber
03	green	green	green
10	red	---	none
11	red	clear	red
12	red	clear	amber
13	red	clear	green
14	red	clear	blue
15	red	clear	clear
20	amber	---	none
21	amber	clear	red
22	amber	clear	amber
23	amber	clear	green
24	amber	clear	blue
25	amber	clear	clear
30	green	---	none
31	green	clear	red
32	green	clear	amber
33	green	clear	green
34	green	clear	blue
35	green	clear	clear
40	blue	---	none
41	blue	clear	red
42	blue	clear	amber
43	blue	clear	green
44	blue	clear	blue
45	blue	clear	clear
50	clear	---	none
51	clear	clear	red
52	clear	clear	amber
53	clear	clear	green
54	clear	clear	blue
55	clear	clear	clear

3 ACTUATOR COLOR 4

BL	Black
WH	White

4 BASE COLOR 4

BL	Black
WH	White

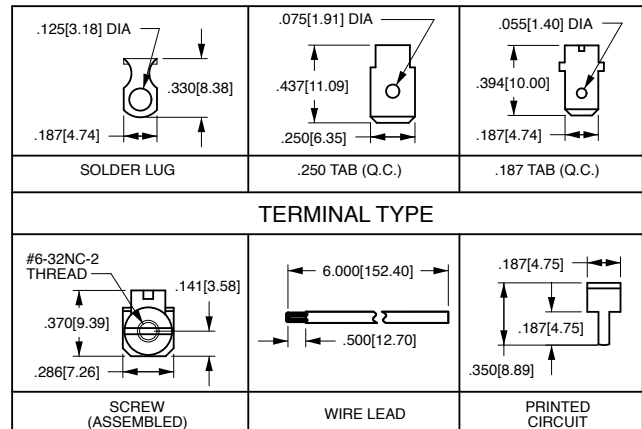
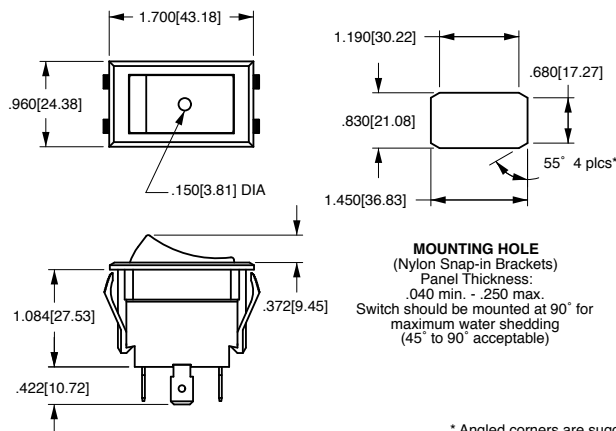
5 LAMP VOLTAGE 2

incandescent	
6V	6 volt
12V	12 volt
18V	18 volt
24V	24 volt
28V	28 volt

neon	
125N	125 volt neon
250N	250 volt neon

Notes:

- Independent lamp is standard. Dependent lamp with ON-OFF function (including momentary) is available with Lighting Sequences 10, 20, 30, 40 and 50. (No light in OFF position.)
- Green and blue not recommended with 125 volt or 250 volt neon lamps.
- Additional terminations available. Consult factory.
- Custom colors available. Consult factory.
- () Indicates momentary function.



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

S-Series

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

Typical Applications:

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



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
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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)

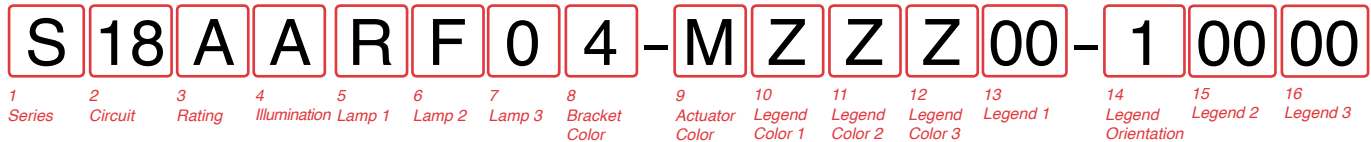
2 position (1/2 throw)	12°
3 position (full throw)	12° from center

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.)
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1 SERIES
S

2 CIRCUIT
Terminal Connections as viewed from bottom of switch:

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

Position:

SP	DP	1	2	3
16	26	5 & 7, 6 & 8	Connected Terminals	3 & 5, 4 & 6
18	28	ON	OFF	ON
		(ON)	OFF	(ON)

SPECIAL CIRCUITS

31	(6 & 8)	4, 5, 6, 7	OFF
41	51	ON	NONE ¹
42	52	(ON)	OFF
43	53	(ON)	3 & 5
44	54	ON	3 & 5
45	55	(ON)	OFF
46	56	NONE	5 & 7
47	57	NONE	5 & 7
	75	(5 & 7, 3 & 6)	(3 & 5, 4 & 6)
	98 ²	(5 & 7, 2 & 6)	(5 & 7, 4 & 6)

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

Standard Rocker, Laser Etched	Black M	Titan Gray N	Dark Carbon R
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10, 11, 12 LEGEND COLOR

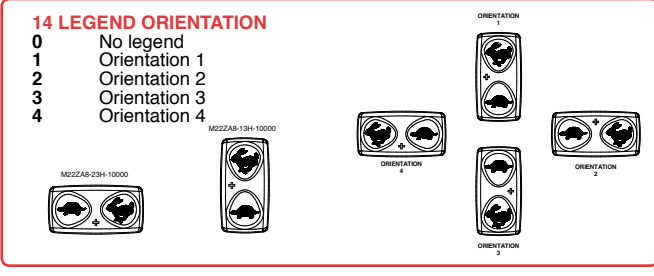
Z	No Legend
1	Clear

13 LEGEND 1⁵

00	No Legend
----	-----------

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

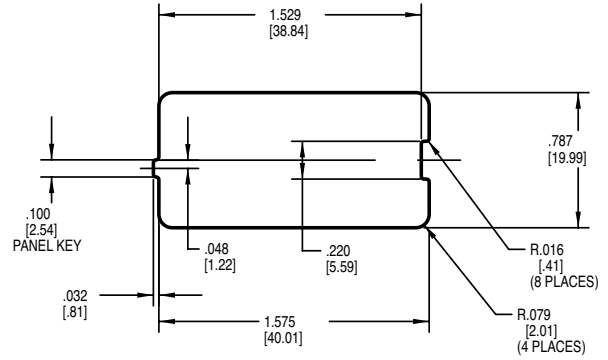
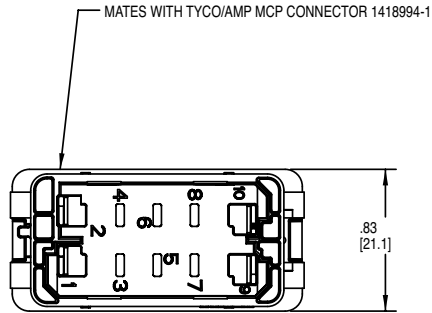
	Lamps	Illumination Type	Lamp wired to Terminals
S	NONE	INDEPENDENT	-
A	1	INDEPENDENT	1 (+) 2 (-)
C	1	INDEPENDENT	1 (+) 2 (-)
	2	INDEPENDENT	9 (+) 2 (-)
D	1	INDEPENDENT	1 (+) 2 (-)
	2	INDEPENDENT	9 (+) 10 (-)
E	1 & 3	INDEPENDENT	1 (+) 2 (-)
		PARALLEL	
F	1	INDEPENDENT	1 (+) 10 (-)
		SNAP	
G	1 & 2	INDEPENDENT	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	

15,16 LEGEND 2,3⁶

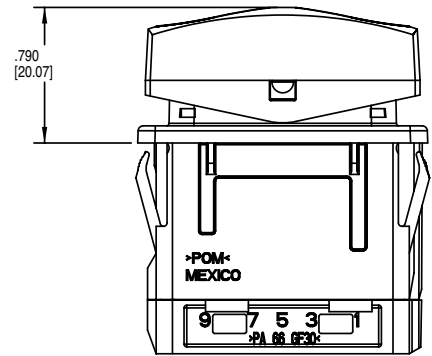
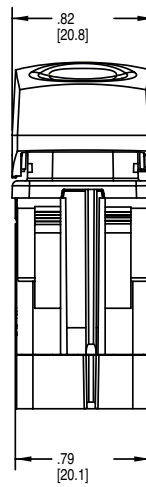
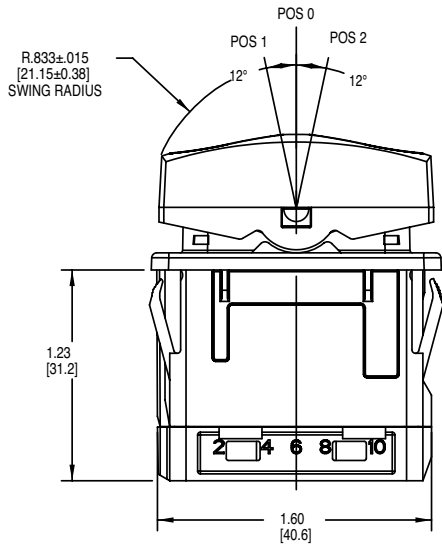
00	No legend
----	-----------

- 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

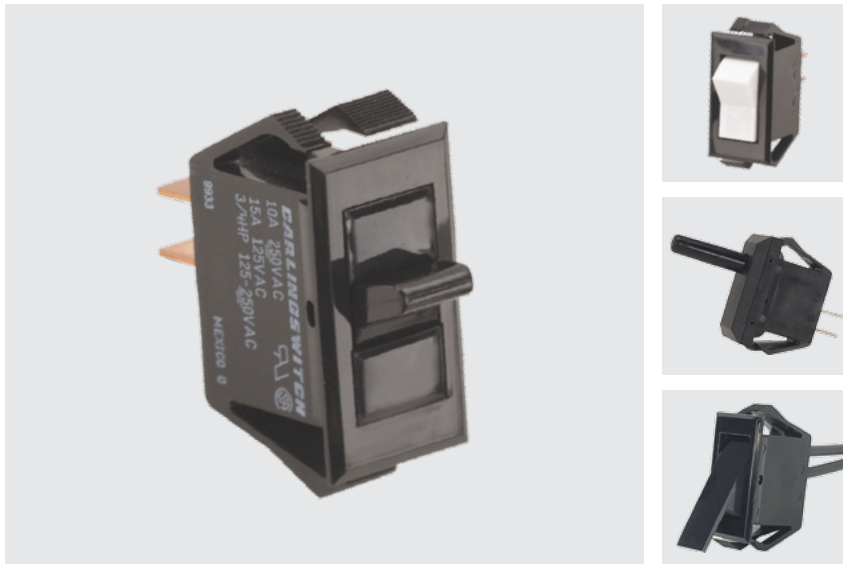


T-Series

T-Series

SINGLE POLE ROCKER & PADDLE SWITCHES

The predecessor to the Corvette series whose versatility has allowed it to stand the test of time. Traditional styling coupled with self cleaning contacts, integrated wire leads, a multitude of circuits, ratings, and actuator choices has made the TA/LTA-Series appeal to a wide range of markets.



Product Highlights:

- Ratings Up To 20A
- Rocker, Paddle, Plunger or Door Interlock Actuators
- Integrated Wire Lead Construction
- Self-Cleaning Wiping Style Contacts

Typical Applications:

- Appliance
- HVAC
- Food Service
- Transportation



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts

Electrical Life

100,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

TA201 - T B - B

¹ Base Part Number

² Actuator Style

³ Actuator Color

⁴ Bezel Color/Style

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING ⁴ / TERMINATION

10A 250 VAC, 15A 125 VAC, 3/4 HP 125-250 VAC
Solder Lugs .250 Tabs Wire Leads

Standard Base

ON-NONE-OFF	TA200	TA201	TA205
ON-NONE-ON	TB200	TB201	TB205
ON-OFF-ON	TC200	TC201	TC205

5A 250 VAC, 10A 125 VAC, 1/2 HP 125-250 VAC

(ON)-NONE-OFF	TA10A	TA10B	TA10F
ON-NONE-(OFF)	TA10L	TA10M	TA10T
ON-NONE-(ON)	TB10A	TB10B	TB10F

T-SERIES WITH PLUNGER ACTUATOR^{1,2}

10A 250 VAC, 16A 125 VAC, 1/2 HP 125-250 VAC			
OFF-NONE-(ON)	-	TA25B-PLB-B	TA25F-PLB-B
ON-NONE-(OFF)	-	-	TA25T-PLB-B

T SERIES WITH MOMENTARY ROCKER ACTUATOR

10A 250 VAC, 15A 125 VAC, 20A 125-250 VAC "H", 3/4 HP 125-250 VAC			
(ON)-NONE-OFF	-	TA22B-TLB-B	-
ON-NONE-(OFF)	-	TA22M-TLB-B	-

2 ACTUATOR STYLE

T	Rocker	PS	Short Paddle
P	Paddle		

3 ACTUATOR COLOR ⁵

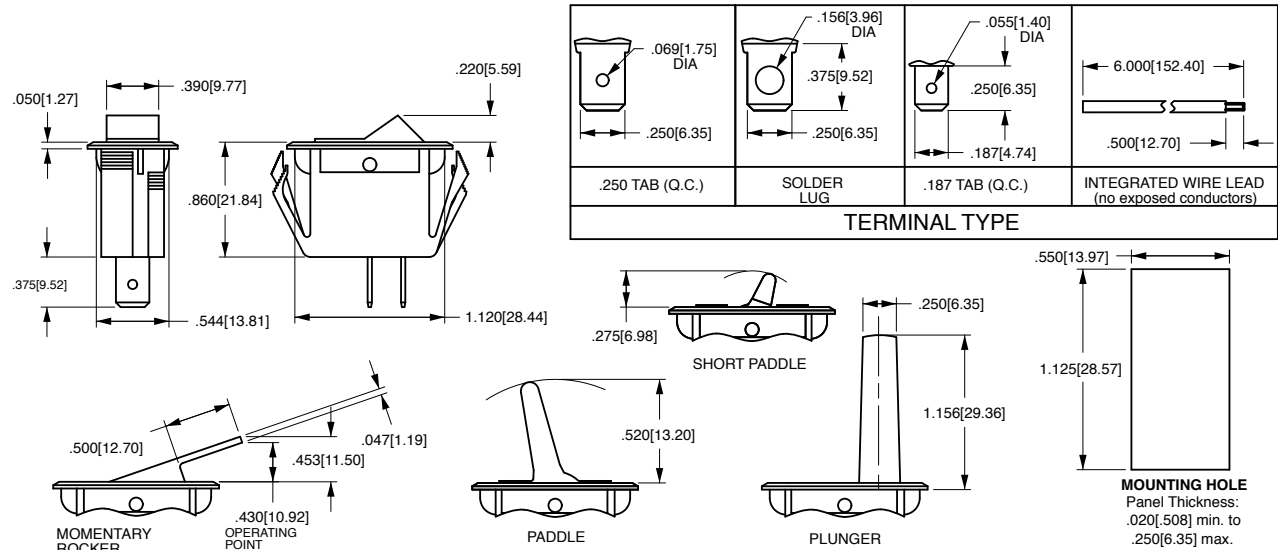
B	Black	W	White
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4 BEZEL COLOR ⁵

B	Black	W	White
---	-------	---	-------

Notes:

- Imprinting is available. Consult factory.
- ¹ Optional plunger support option is available for applications requiring extensive lateral travel, consult factory for details.
- ² Maintained circuit not available with TA22 and TA25 Series.
- ³ .187 tab terminals also available. Consult factory for catalog number callout.
- ⁴ Additional ratings are available. Consult factory.
- ⁵ Additional colors are available. Consult factory.
- () Indicates momentary function.



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

LTA-Series

SINGLE POLE LIGHTED ROCKER SWITCHES

The illuminated predecessor to the Corvette series whose versatility has allowed it to stand the test of time. Traditional styling coupled with self cleaning contacts, integrated wire leads, and various actuator choices has made the LTA-Series appeal to a wide range of markets.



Product Highlights:

- ◆ Neon or Incandescent Illumination
- ◆ Long Paddle, Short Paddle or Rocker Actuators
- ◆ Good for 125/250VAC or Low Voltage DC Applications
- ◆ Integrated Wire Lead Construction

Typical Applications:

- ◆ Appliance
- ◆ HVAC
- ◆ Food Service
- ◆ Transportation



Dielectric Strength

UL/CSA:
 1000V - live to dead metal parts
 750V - across open contacts

Electrical Life

100,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

LTA201 - P R - B -A 125N

1 Base Part Number 2 Actuator Style 3 Actuator Color 4 Bezel Color/Style 5 Lens Color 6 Lamp Voltage

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING 1 / TERMINATION
10A 250VAC; 15A 125VAC; 3/4 HP 125-250VAC
 OFF-NONE-ON Solder Lugs .250 Tabs .187 Tabs Wire Leads
LTA200 LTA201 LTA203 LTA205

2 ACTUATOR STYLE 3
T Rocker **PS** Short Paddle
P Paddle

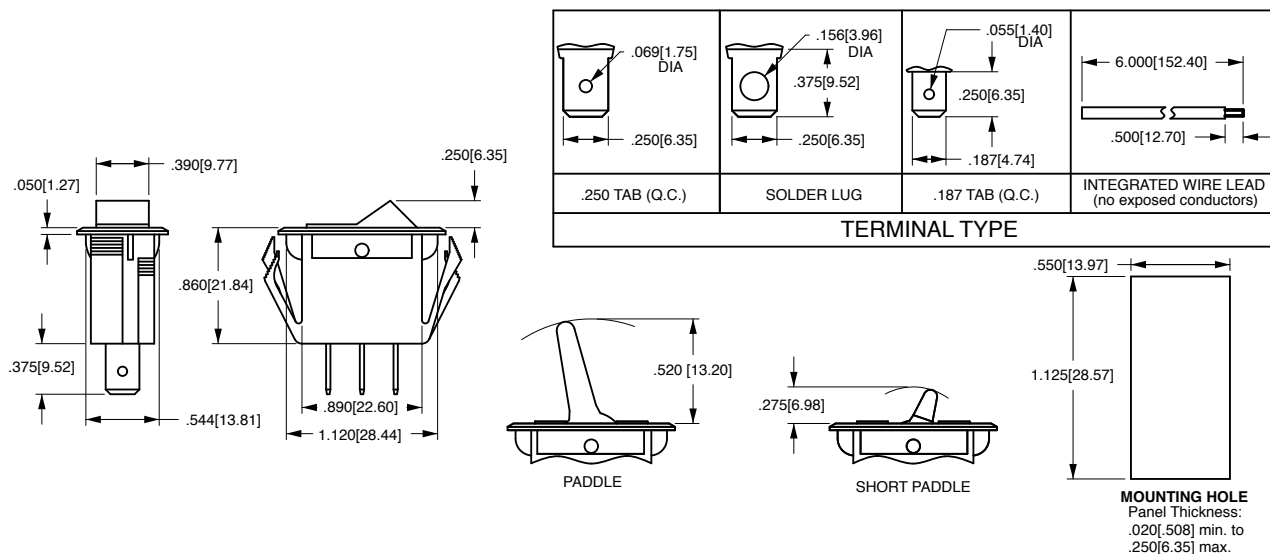
2 ACTUATOR STYLE 1
A Amber **R** Red
C Clear **G** Green 2

4 BEZEL COLOR 1
B Black **W** White

5 LENS COLOR 2,3
 / No Lens **-G** Green
-A Amber **-R** Red
-C Clear **-LU** Blue

6 LAMP VOLTAGE 2
006V 6V incandescent **024V** 24V incandescent
012V 12V incandescent **125N** 125V neon
018V 18V incandescent **250N** 250V neon

Notes:
 1 Additional ratings and colors are available. Consult factory for details.
 2 Neon lamps not recommended with green or blue rocker/lenses.
 3 Lens color is specified only if actuator style is P or PS. If style is T (rocker), then use / as the code in position 5.



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

TG/LTG

TG/LTG-Series

ROCKER SWITCHES

The TG-Series Mini Tippette rocker switches are single or double pole and feature an all nylon double-insulated construction. These switches are designed with snap-in mounting for fast, low cost assembly. The illuminated version (LTG) is available with either a paddle or rocker actuator. These AC rated switches are also suitable for low-voltage DC applications assuring compatibility for a wide range of markets.



Product Highlights:

- ◆ Single or Double Pole
- ◆ Gloss Finish Surfaces
- ◆ Illuminated or Non-Illuminated
- ◆ 20 Available Circuit Options

Typical Applications:

- ◆ Appliance
- ◆ HVAC
- ◆ Food Service
- ◆ Transportation



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts

Electrical Life

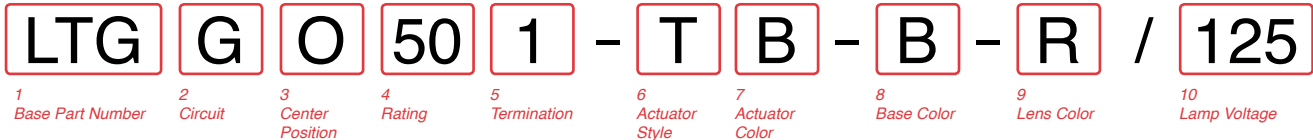
50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

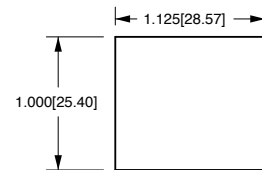
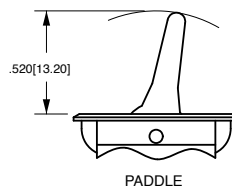
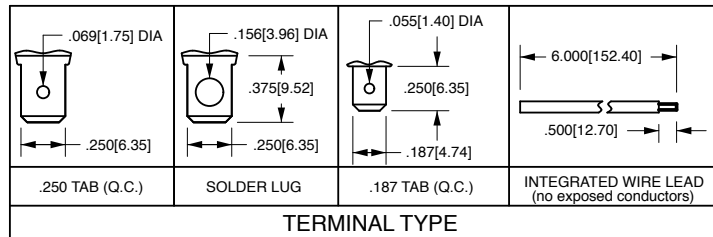
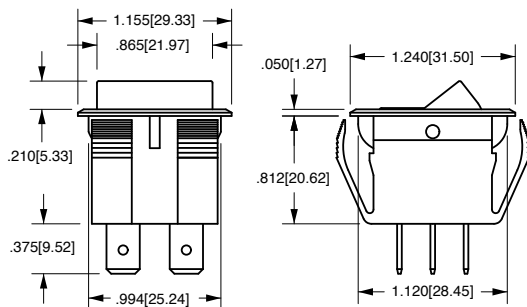
32°F to 185°F (0°C to 85°C)



1 BASE PART NUMBER: SERIES				
TG	Double Pole, Non-Lighted			
LTG	Double Pole with Indicator Lights			
2 CIRCUIT 1				
See Circuit Designation Chart				
3 CENTER POSITION				
C	Center OFF, Three position			
O	No Center OFF, Two position			
4 RATING				
40	5A 250VAC, 10A 125VAC, 1/2HP 125-250VAC			
41	5A 250VAC, 10A 125VAC			
50	10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC			
51	10A 250VAC, 15A 125VAC			
5 TERMINATION / FUNCTION				
	Solder Lug	.250 Tab QC	.187 Tab QC	Wire Leads
On-None-Off	0	1	3	5
(On)-None-Off	A	B	D	F
On-None-(Off)	L	M	R	T
On-None-On	0	1	3	5
On-None-(On)	A	B	D	F
On-Off-On	0	1	3	5

6 ACTUATOR STYLE			
P	Paddle	T	Rocker
7 ACTUATOR COLOR²			
B	Black	W	White
8 BASE COLOR²			
B	Black	W	White
9 LENS COLOR³			
A	Amber	C	Clear
		R	Red
10 LAMP VOLTAGE			
<i>incandescent</i>		<i>neon</i>	
6V	6 volt	125N	125 volt neon
12V	12 volt	250N	250 volt neon
18V	18 volt		
24V	24 volt		
28V	28 volt		

Notes:
Imprinting is available. Consult factory.
Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
1 TG available with circuits A, B, C, D, E, F; LTG available with circuits G, H, I, J, M, N, P, Q, R, T, U, V, Y, Z.
2 Custom colors are available. Consult factory.
3 Specify lens color for LTG-Series only.
() Indicates momentary function.



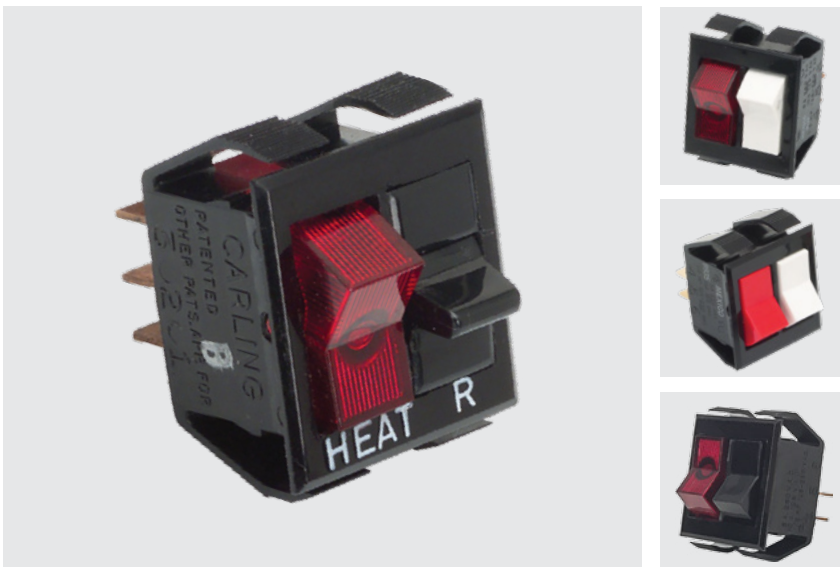
MOUNTING HOLE
Panel Thickness:
.030[.762] min. to
.250[6.35] max.

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

TTG-Series

ROCKER SWITCHES

The TTG-Series Mini Tippetto snap-in rocker switches consist of two single pole illuminated or non-illuminated switches in a common base. Each pole can have the same or different switch function. These switches are AC rated up to 20 amps and are also suitable for low-voltage DC applications, in a wide range of markets.



Product Highlights:

- ♦ Independent or Dependent Illumination
- ♦ Ratings up to 20 Amps
- ♦ Diamond or Long Line Lens Options
- ♦ Self-Cleaning Wiping Style Contacts

Typical Applications:

- ♦ Appliance
- ♦ HVAC
- ♦ Food Service
- ♦ Transportation



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts

Electrical Life

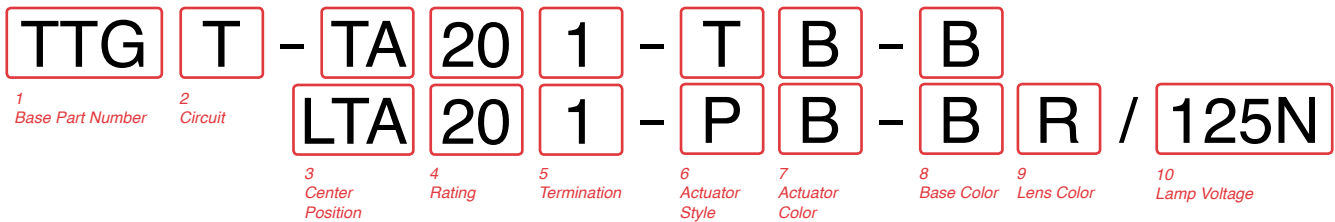
50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)



1 BASE PART NUMBER: SERIES
TTG Two Single Pole switches in one base

2 CIRCUIT 1
See Circuit Designation Chart

3 BASIC SWITCH NUMBER
TA On-None-Off TC On-Off-On, Lighted
TB On-None-On LTA On-None-Off, Lighted

4 RATING
10 5A 250VAC, 10A 125VAC, 1/2HP 125-250VAC
11 5A 250VAC, 10A 125VAC, 5A 125VAC L
20 10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC
21 10A 250VAC, 15A 125VAC
22 10A 250VAC, 15A 125VAC, 20A 125-250VAC H, 3/4HP 125-250VAC

5 TERMINATION / FUNCTION

	Solder Lug	.250 Tab QC	.187 Tab QC	Wire Leads
On-None-Off	0	1	3	5
(On)-None-Off	A	B	D	F
On-None-(Off)	L	M	R	T
On-None-On	0	1	3	5
On-None-(On)	A	B	D	F
On-Off-On	0	1	3	5

6 ACTUATOR STYLE
P Paddle PS Short Paddle
T Rocker

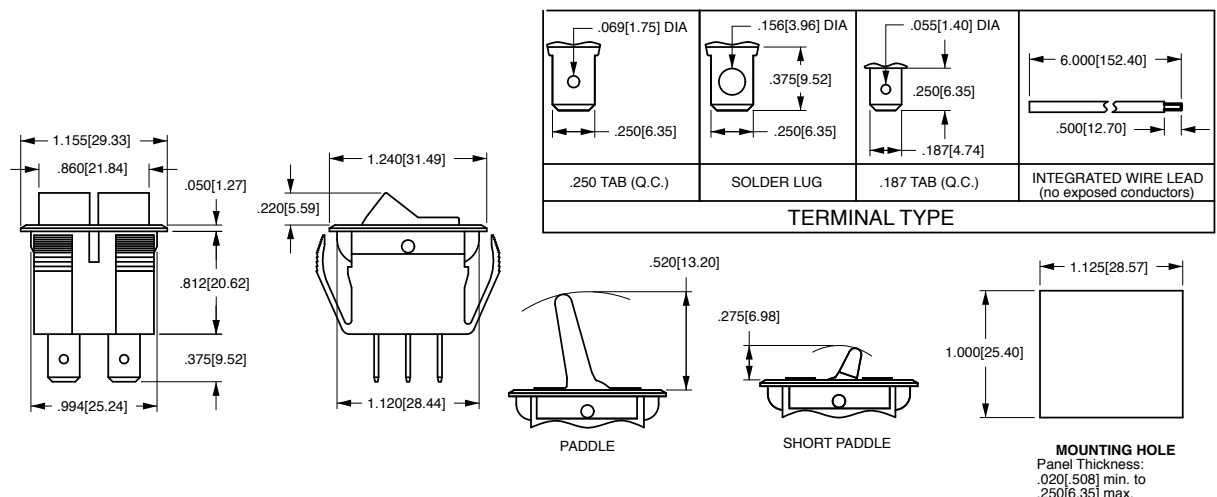
7 ACTUATOR COLOR
lighted³
A Amber
C Clear
G Green
LU Blue
R Red
unlighted²
B Black
W White

8 BASE COLOR 2
B Black W White

9 LENS COLOR 4
A Amber G Green R Red
C Clear LU Blue W White

10 LAMP VOLTAGE
incandescent
6V 6 volt
12V 12 volt
18V 18 volt
24V 24 volt
28V 28 volt
neon
125N 125 volt neon
250N 250 volt neon

Notes:
Imprinting is available. Consult factory.
Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
1 TG available with circuits A, B, C, D, E, F, L, T, U
G, H, I, J, M, N, P, Q, R, T, U, V, Y, Z.
2 Custom colors are available. Consult factory.
3 Specify lens color for LTA with rocker only.
4 Specify lens color for LTA with paddle actuators only.
(.) Indicates momentary function.



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

TLG-Series

ROCKER SWITCHES

The TLG-Series Mini Tippette snap-in rocker switches are single pole, rocker or paddle actuated with an adjacent indicator light. These single-actuator-switches are AC rated to 20 amps and are also suitable for low voltage DC applications.



Product Highlights:

- ◆ Maintained or Momentary Circuitry
- ◆ Rocker Paddle or mixed Rocker/Paddle actuators
- ◆ Illuminated or Non-Illuminated
- ◆ Integrated wire lead construction

Typical Applications:

- ◆ Appliance
- ◆ HVAC
- ◆ Food Service
- ◆ Transportation



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

TLG G - D R - TA 20 1 - T B - B / 125N

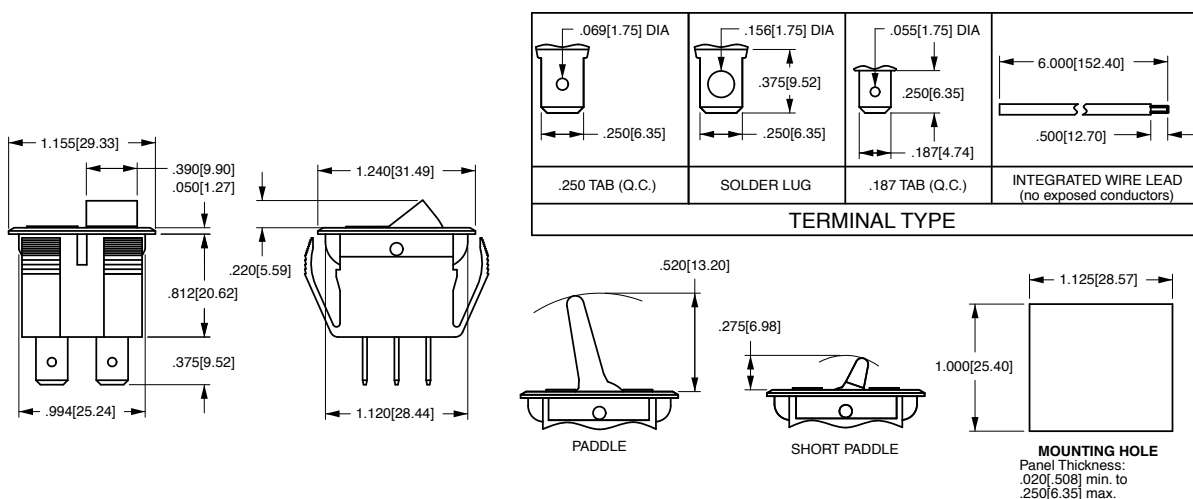
1 Base Part Number 2 Circuit 3 Lens Design 4 Lens Color 5 Center Position 6 Rating 7 Termination 8 Actuator Style 9 Actuator Color 10 Base Color 11 Lens Color 12 Lamp Voltage

1 BASE PART NUMBER: SERIES TLG Single Pole with adjacent Indicator Light
2 CIRCUIT 4 See Circuit Designation Chart.
3 LENS DESIGN D Diamond L Long Line
4 LENS COLOR A Amber C Clear G Green R Red W White
5 BASIC SWITCH NUMBER TA On-None-Off TC On-Off-On TB On-None-On LTA On-None-Off, Lighted
6 RATING 10 5A 250VAC, 10A 125VAC, 1/2HP 125-250VAC 11 5A 250VAC, 10A 125VAC, 5A 125VAC L 20 10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC 21 10A 250VAC, 15A 125VAC 22 10A 250VAC, 15A 125VAC, 20A 125-250VAC H, 3/4HP 125-250VAC
7 TERMINATION / FUNCTION On-None-Off Solder Lug .250 Tab QC .187 Tab QC Wire Leads (On)-None-Off A B D F On-None-(Off) L M R T On-None-On 0 1 3 5 On-None-(On) A B D F On-Off-On 0 1 3 5

8 ACTUATOR STYLE 2 P Paddle PS Short Paddle T Rocker
9 ACTUATOR COLOR <i>unlighted</i> ² A Amber B Black W White <i>lighted</i> A Amber C Clear G Green LU Blue R Red
10 BASE COLOR 2 B Black W White
9 LENS COLOR 1,3 A Amber C Clear G Green LU Blue R Red W White
10 LAMP VOLTAGE 1 <i>incandescent</i> 6V 6 volt 12V 12 volt 18V 18 volt 24V 24 volt 28V 28 volt <i>neon</i> 125N 125 volt neon 250N 250 volt neon

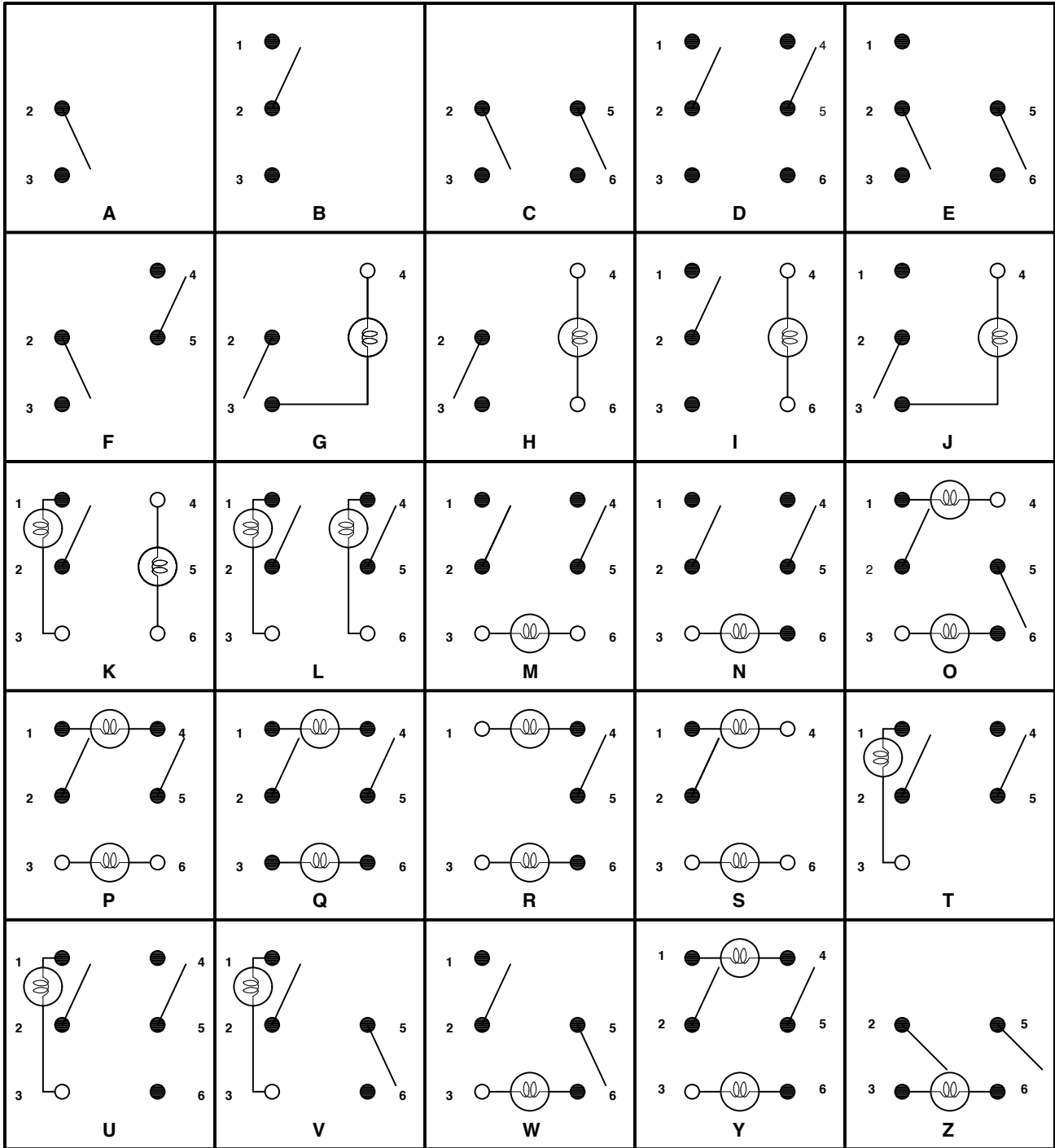
Notes:

- Imprinting is available. Consult factory.
Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
- Neon Lamps not recommended with green or blue actuators and lenses.
 - Custom colors are available. Consult factory.
 - Specify lens color only if actuator is lighted paddle.
 - Available with circuits G, H, I, J, K only.
- () Indicates momentary function.



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

Circuit Designation Chart:



● CONTACT TERMINAL
Will make contact with switching lever

○ ISOLATED TERMINAL
Does not make contact with switching lever

● CONTACT TERMINAL AND SWITCH LEVER

○ BULB

RR/LRR-Series

ROUNDED ROCKER SWITCHES

Carling Technologies' RR and LRR-Series round rocker switches feature a uniquely sculpted rocker design with electrical ratings of up to 12A 125VAC, 10A 250VAC and fit an industry standard cutout, making installation a snap. The lighted LRR-Series can be wired to accommodate dependent or independent, illumination, neon or incandescent lamps with red, green, amber or white translucent rockers. Standard or custom actuator legends are available.



Product Highlights:

- ♦ 125/250VAC or low voltage 12/24VDC
- ♦ Neon or Incandescent Illumination
- ♦ Industry Std. 20.2mm mounting hole
- ♦ Maintained or momentary circuitry

Typical Applications:

- ♦ Appliance
- ♦ Vacuum Cleaners
- ♦ Office Automation
- ♦ Food Service
- ♦ Audio Visual
- ♦ Test & Measurement



Dielectric Strength

UL/CUL:
1000V-live to dead metal parts
& opposite polarity

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)



1 SERIES²
RR Rocker
LRR Lighted Rocker

2 CIRCUIT
RR-Series (Non-Illuminated)
1 On-None-Off
2 (On)-None-Off
3 On-None-(Off)
4 On-None-On
5 On-None-(On)
6 On-Off-On
LRR-Series (Illuminated)
1 On-None-Off

3 RATING¹
1 10A, 125-250VAC; 12A 125 VAC
1/4 HP 125-250 VAC
3 6A, 28 VDC
4 12A, 12 VDC
5 12A, 6 VDC

4 TERMINATION
2 .187 Tab

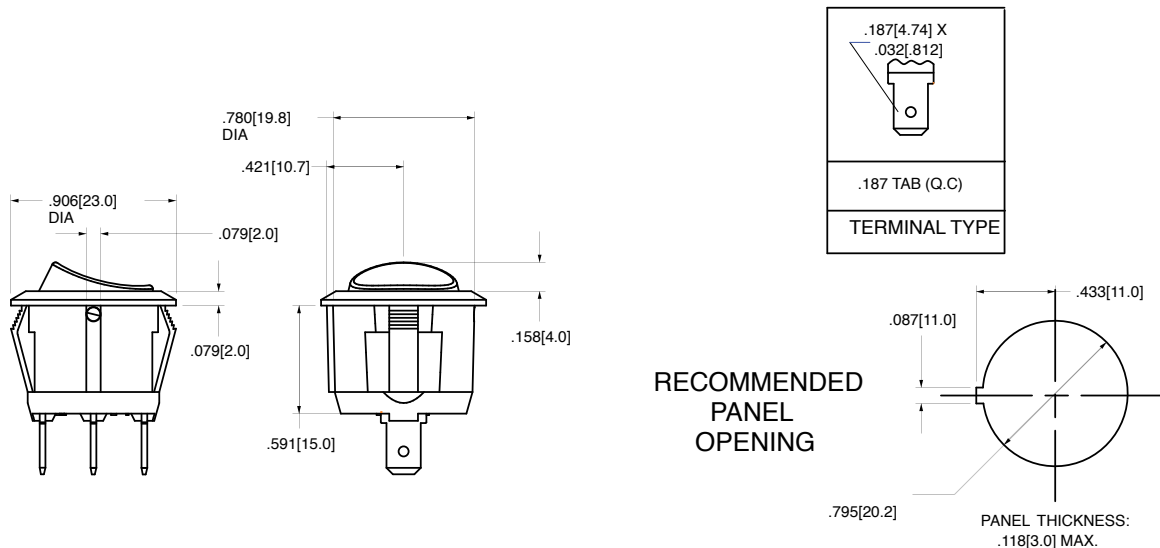
5 ACTUATOR COLOR²
RR-Series (Non-Illuminated) Solid Color
B Black
W White
R Red
LRR-Series (Illuminated) Transparent Color
1 Amber
2 Red
3 Blue³
4 Green³
5 Clear

6 BASE COLOR²
B Black
W White

7 LAMP VOLTAGE
N None
A 6V Incandescent
B 12V Incandescent
C 28V Incandescent
J 125V Neon
K 250V Neon

8 ROCKER FACE LEGEND
N No imprinting
A On-Off (vertical)
B On-Off (horizontal)
D I-O (horizontal)
E I-O (vertical)
F O (on rocker end)
G II-O-I (vertical)
H II-O-I (horizontal)
J Off-On (vertical)
K Off-On (horizontal)

Notes:
1 For additional rating requirements, consult factory.
2 Custom colors are available, consult factory.
3 Not recommended with Neon Lamps



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

CURVETTE

R/RSC-Series

SINGLE POLE ROCKER & PADDLE SWITCHES

Since its introduction, the Curvette switch has become the barometer for versatility and performance in the miniature switch market. Self cleaning contacts, International approvals, along with a wide variety of circuits, ratings, and actuator options make the Curvette the switch of choice for many markets.



Product Highlights:

- ◆ Two color visi rocker to indicate “on” function
- ◆ Ratings to 20A
- ◆ Oval or rectangular bezels
- ◆ Patented mounting wings accommodate a wide range of panel openings

Typical Applications:

- ◆ Appliance
- ◆ HVAC
- ◆ Food Service
- ◆ Transportation



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts
VDE:
4000V - live to dead metal parts;
750V - across open contacts

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

Electrical Life

100,000 cycles

RA901 - V B - B - 9 - V

¹ Base Part Number

² Actuator Style

³ Actuator Color

⁴ Bezel Color/Style

⁵ Rocker Legend

⁶ Visi-Rocker End/Legend Color

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING 1 / TERMINATION

10A 250 VAC; 16A 125 VAC; 3/4 HP 125-250 VAC; 10(4) A 250 VACu T85

	Solder Lugs	.250 Tabs	Wire Leads
OFF-NONE-ON	RA900	RA901	RA905
ON-NONE-ON	RB900	RB901	RB905
ON-OFF-ON ³	RC910	RC911	RC915
OFF-NONE-ON ²	RD220	RD221	RD225

15A 250 VAC; 20A 125 VAC; 3/4 HP 125-250 VAC

	Solder Lugs	.250 Tabs
OFF-NONE-ON	RSCA200	RSCA201
ON-NONE-ON	RSCB200	RSCB201

4 BEZEL COLOR / STYLE

STANDARD

B Black (matte)

W White (matte)



OVAL

1 Black (gloss)

2 White (gloss)



5 ROCKER LEGEND

	molded in	hot stamp
NO LEGEND	0	0
Off-On vertical	1	A
Off-On horizontal	2	B
I-O horizontal	8	D
I-O vertical	9	E
dual OFF-ON/I-O	n/a	H

2 ACTUATOR STYLE

M Momentary Rocker	R Rocker
P Paddle	V Visi-rocker (2 color)

3 ACTUATOR COLOR

1 Black (gloss)	B Black (matte)
2 White (gloss)	W White (matte)

6 VISI-ROCKER END / LEGEND COLOR

N N/A
B Black
V Visi-red
W White

Notes:

PC Terminals also available, consult factory for details.

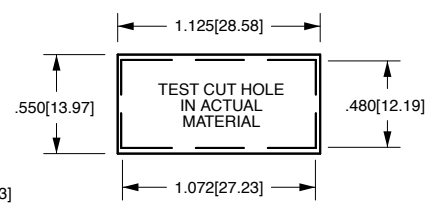
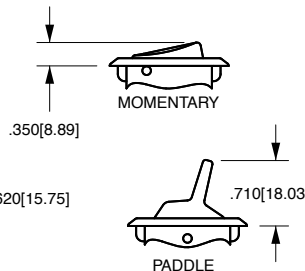
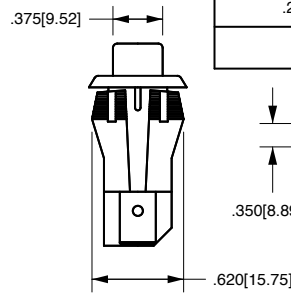
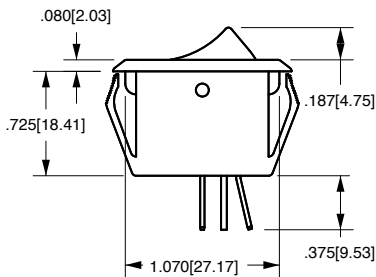
1 For additional ratings, consult factory.

2 Rating is 8A 250 VAC, 12A 125 VAC, 1/2 HP 125-250 VAC, and must specify M actuator style.

3 Not rated at 3/4 HP 125-250 VAC

() indicates momentary function.

.250 TAB (Q.C.)	SOLDER LUG	WIRE LEAD
TERMINAL TYPE		



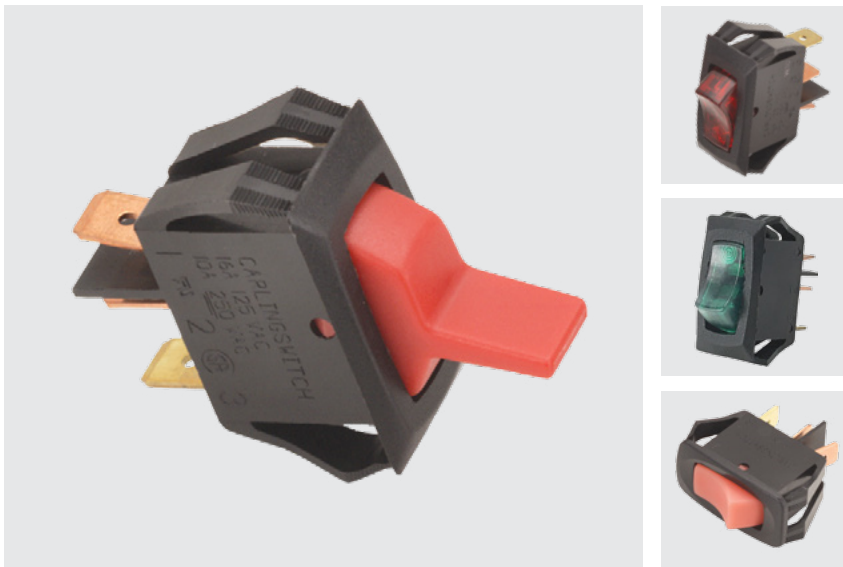
MOUNTING HOLE
Panel Thickness: .025 min - .187 max.
Specific cutout dimension range dependent on panel thickness and material.
Consult factory.

CURVETTE

LRA-Series

SINGLE POLE LIGHTED ROCKER & PADDLE SWITCHES

Since its introduction, the Curvette switch has become the barometer for versatility and performance in the miniature switch market. This lighted version features the very same self cleaning contacts, International approvals, along with a wide variety of circuits, ratings, and actuator options that make the Curvette the switch of choice for various applications.



Product Highlights:

- ◆ Clear or translucent style rockers
- ◆ Neon or Incandescent illumination
- ◆ Self-cleaning wiping style contacts
- ◆ UL, CSA and VDE approved

Typical Applications:

- ◆ HVAC
- ◆ Office Lighting
- ◆ Transportation
- ◆ Commercial Food
- ◆ Lawn & Garden
- ◆ Power Strip



Dielectric Strength

UL/CSA:
1000V-live to dead metal parts
VDE:
4000V - live to dead metal parts;
750V - across open contacts

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

Electrical Life

100,000 cycles

LRA911 - R S - B / 250N

1 Base Part Number 2 Actuator Style 3 Actuator Color 4 Bezel Color/Style 5 Lamp Voltage

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING 2 / TERMINATION

125 neon lamp (use 125N in Selection 5 Lamp Voltage)
10A 250VAC; 16A 125VAC; 10(4)A 125VACu
 Solder Lugs .250 Tabs Wire Leads
 OFF-NONE-ON **LRA210** **LRA211** **LRA215**

250 neon lamp (select 250N in selection 5 Lamp Voltage)
15A 250 VAC; 10A 250VAC; 16A 125VAC; 10(4)A 250 T85
 Solder Lugs .250 Tabs
 OFF-NONE-ON **LRA910** **LRA911** **LRA915**

Incandescent lamp (select 006V-024V in selection 5 Lamp Voltage)
10A 30V
 Solder Lugs .250 Tabs Wire Leads
 OFF-NONE-ON **LRA510** **LRA511** **LRA515**

3 ACTUATOR COLOR

translucent
A Amber
C White
P Yellow
S Red
W Pale Red

clear
A Amber
C Clear
G¹ Green
B¹ Blue
R Red

4 BEZEL COLOR/STYLE

STANDARD
B Black (matte) 
W White (matte)

OVAL
1 Black (gloss) 
2 White (gloss)

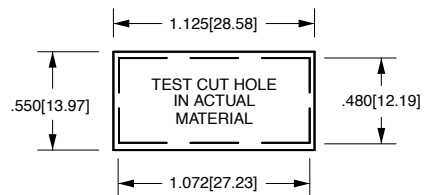
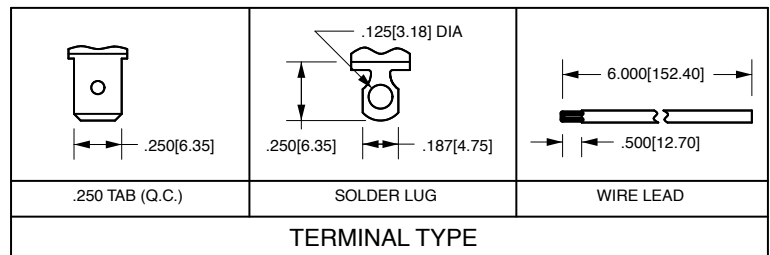
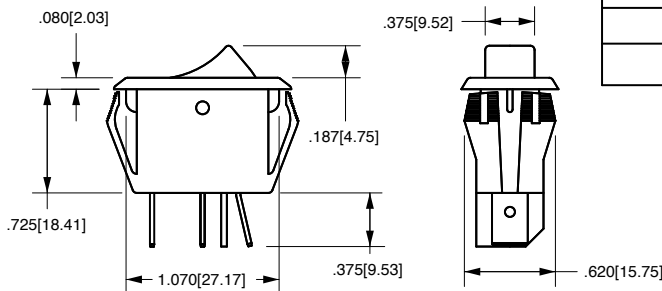
5 LAMP VOLTAGE

006V 6 volts incandescent
012V 12 volts incandescent
018V 18 volts incandescent
024V 24 volts incandescent
125N¹ 125 volts neon
250N¹ 250 volts neon

2 ACTUATOR STYLE

P Paddle
R Rocker translucent
C Rocker Clear

Notes:
 LED illumination, PC terminals, independent lamps, and additional color options are available. Consult factory.
 1 Neon lamps not available with blue or green actuators.
 2 Consult factory for additional ratings.



MOUNTING HOLE
 Panel Thickness: .025 min. - .187 max.
 Specific cutout dimension range dependent on panel thickness and material.
 Consult factory.

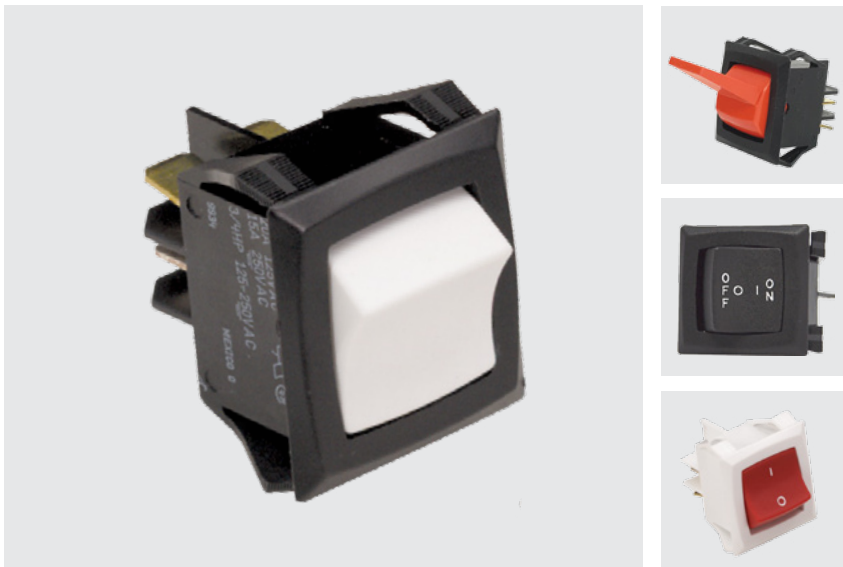
*Manufacturer reserves the right to change product specification without prior notice.

RG-Series

RG-Series

SINGLE/DOUBLE POLE ROCKER & PADDLE SWITCHES

The double pole version of the R-Series incorporates the same sleek lines as the original Corvette, in a double pole envelope. Features include silver-plated butt-action contacts which afford ratings to 20A/125, 15A 250VAC and withstand peak inrush currents up to 100 amps. Paddle or rocker actuators and a choice of solder lug, .250 Tab and wire lead terminations enable this switch to adapt to high current applications.



Product Highlights:

- ◆ Ratings to 20A
- ◆ UL, CSA and VDE approved
- ◆ Rocker or Paddle actuators
- ◆ Fits Euro or American standard mounting holes

Typical Applications:

- ◆ Power Supply
- ◆ Appliance
- ◆ Exercise Equipment
- ◆ Music Equipment



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts & opposite polarity
VDE:
4000V - live to dead metal parts;
1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

-40°F to 185°F (-40°C to 85°C)

RGSCA901 - R - B - B - A

1 Base Part Number

2 Actuator Style

3 Actuator Color

4 Bezel Color

5 Rocker Legend

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING ¹ / TERMINATION
15A 250 VAC, 20A 125 VAC, 3/4 HP 125-250 VAC, 14(6)A 250 VAC

	Solder Lugs	.250 Tabs	Wire Leads
Standard Base			
OFF-NONE-ON (Single Pole)	RGSCA900	RGSCA901	RGSCA905
ON-NONE-ON (Single Pole)	RGSCB900	RGSCB901	RGSCB905
OFF-NONE-ON (Double Pole)	RGSCC900	RGSCC901	RGSCC905
ON-NONE-ON (Double Pole)	RGSCD900	RGSCD901	RGSCD905
European Base (22 x 30 mm cutout)			
OFF-NONE-ON (Single Pole)	RGSEA900	RGSEA901	RGSEA905
ON-NONE-ON (Single Pole)	RGSEB900	RGSEB901	RGSEB905
OFF-NONE-ON (Double Pole)	RGSEC900	RGSEC901	RGSEC905
ON-NONE-ON (Double Pole)	RGSED900	RGSED901	RGSED905

3 ACTUATOR COLOR ¹

B Black	W White
----------------	----------------

4 BEZEL COLOR ¹

B Black	W White
----------------	----------------

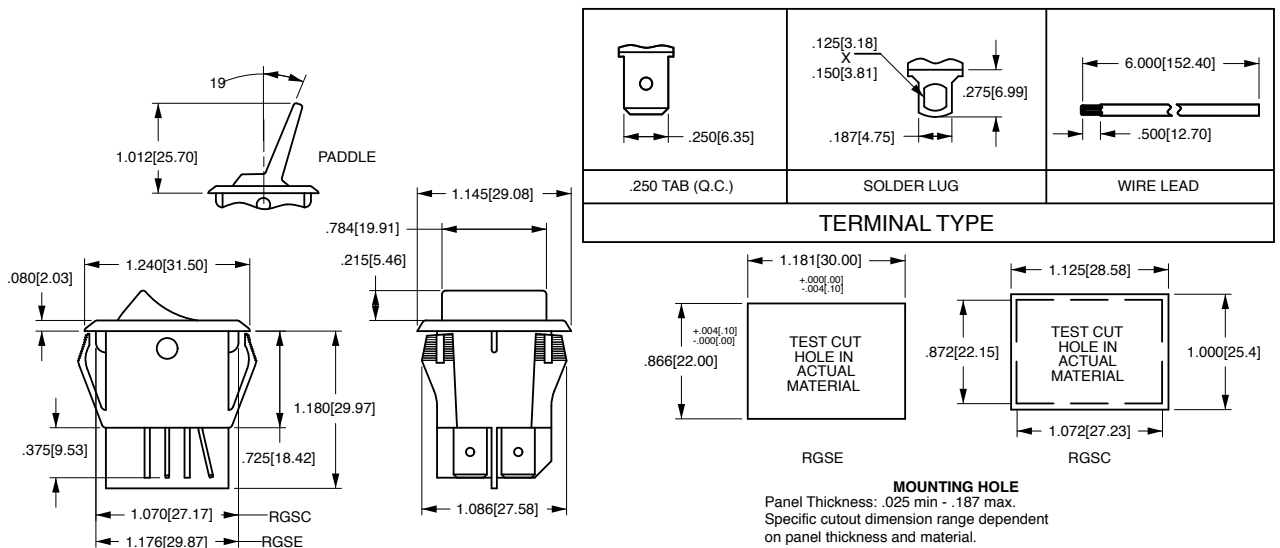
5 ROCKER LEGEND

	hot stamp
NO LEGEND	0
OFF-ON vertical	A
OFF-ON horizontal	B
I-O horizontal	D
I-O vertical	E
Dual OFF-ON, I-O vertical	H
Dual OFF-ON, I-O horizontal	J

2 ACTUATOR STYLE

P Paddle	R Rocker
-----------------	-----------------

Notes:
1 Additional ratings, colors and clear style actuators are available. Consult factory.



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

LRG-Series

ILLUMINATED DOUBLE POLE ROCKER & PADDLE SWITCHES

The double pole lighted version of the R-Series incorporates the same sleek lines as the original Curvette, in a double pole envelope. This illuminated version features silver-plated butt-action contacts with ratings to 20A/125, 15A 250VAC and withstand peak inrush currents up to 100 amps. Clear or translucent style rocker actuators and a choice of solder lug, .250 Tab and wire lead terminations enable this switch to adapt to high current applications.



Product Highlights:

- ◆ Ratings to 20A
- ◆ Neon or Incandescent Illumination
- ◆ Silver Plated Butt-contact mechanism
- ◆ Clear or translucent style rockers

Typical Applications:

- ◆ Power Supply
- ◆ Appliance
- ◆ Exercise Equipment
- ◆ Music Equipment



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts & opposite polarity

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

-40°F to 185°F (-40°C to 85°C)

LRGSCK611 - **R** **S** - **B** - **B** / **250N**

¹
Base Part Number

²
Actuator Style

³
Actuator Color

⁴
Bezel Color

⁵
Rocker Legend

⁶
Lamp Voltage

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING ¹ / TERMINATION
15A 250 VAC, 20A 125 VAC, 3/4 HP 125-250 VAC

	Solder Lugs	.250 Tabs	Wire Leads
Standard Base			
OFF-NONE-ON	LRGSCK610	LRGSCK611	LRGSCK615
European Base (22 x 30 mm cutout)			
OFF-NONE-ON (Single Pole)	LRGSEK610	LRGSEK611	LRGSEK615
15A 6-24 V ³			
Standard Base			
OFF-NONE-ON	LRGSCK510	LRGSCK511	LRGSCK515
European Base (22 x 30 mm cutout)			
OFF-NONE-ON (Single Pole)	LRGSEK510	LRGSEK511	LRGSEK515

4 BEZEL COLOR ¹

B Black	W White
----------------	----------------

5 ROCKER LEGEND

	hot stamp
NO LEGEND	O
OFF-ON vertical	A
OFF-ON horizontal	B
I-O horizontal	D
I-O vertical	E
Dual OFF-ON, I-O vertical	H
Dual OFF-ON, I-O horizontal	J

2 ACTUATOR STYLE

R Rocker (translucent)	C Rocker (clear)
-------------------------------	-------------------------

3 ACTUATOR COLOR

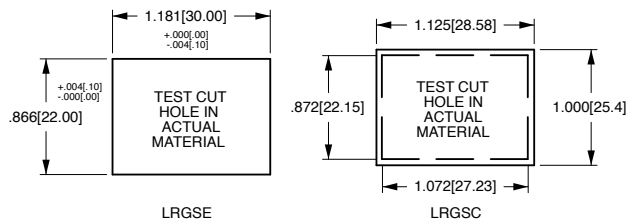
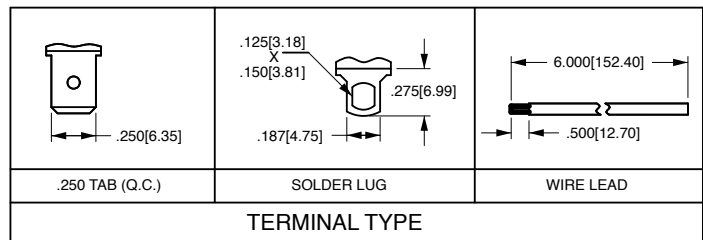
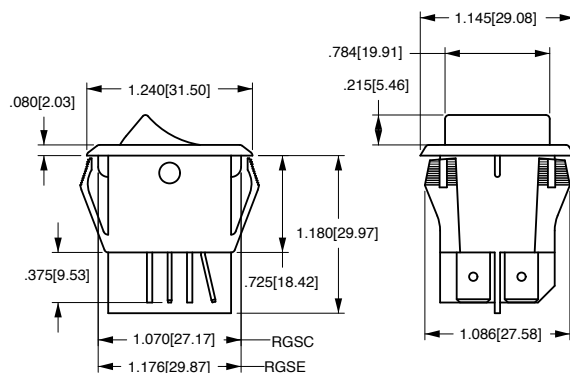
A Amber	L ³ Lime Green
B ^{3,5} Blue	P Yellow
C ⁴ White/Clear	R Red (clear)
G ⁵ Green	S Red
	W Pale Red

6 LAMP VOLTAGE ²

006V 6V incandescent	024V 24V incandescent
012V 12V incandescent	125N 125V neon
018V 18V incandescent	250N 250V neon

Notes:

- Additional ratings, colors and clear style actuators are available. Consult factory.
- Incandescent lamps must specify 15A 24V rating only.
- Available with incandescent lamps only.
- Clear color provided where specified with clear style rocker.
- Available with clear style rocker only.



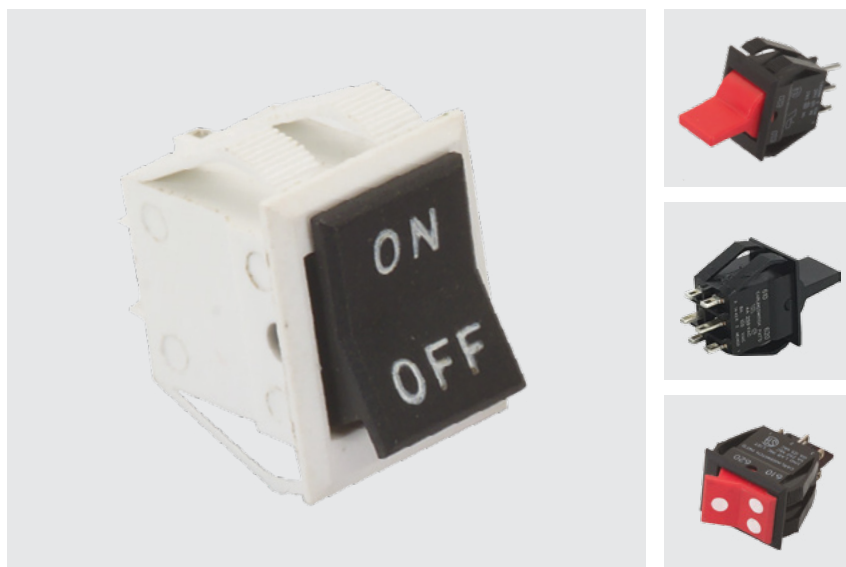
MOUNTING HOLE
Panel Thickness: .025 min - .187 max.
Specific cutout dimension range dependent on panel thickness and material.

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

610/620-Series

SUB-MINIATURE ROCKER SWITCHES

The miniature 610/620-Series switches are double insulated and available in single or double pole configurations. These snap-in mounted switches are offered with either a paddle or rocker actuator and with ratings up to 8 amps.



Product Highlights:

- ◆ Single or double pole
- ◆ Paddle rocker actuator options
- ◆ Snap-In mounting method

Typical Applications:

- ◆ Handheld Appliance
- ◆ Audio-Visual
- ◆ Power Supplies
- ◆ Computers



Dielectric Strength

UL/CSA:
1000V - live to dead metal parts & opposite polarity

Mechanical Life

100,000 cycles

Electrical Life

50,000 cycles- single pole
50,000 cycles- double pole

Operating Temperature

32°F to 185°F (0°C to 85°C)

62012421 - **0** - **0**

¹
Base Part Number

²
Terminal Sealing

³
Legend

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING ¹ / TERMINATION ¹
4A 250VAC; 8A 125VAC
Single Pole

	Solder Lugs	PC Term
On-none-On	62011421	62011422
On-none-(On)	62011431	62011432
On-off-On	62011461	62011462
On-off-(On)	62011471	62011472
(On)-off-(On)	62011481	62011482
Double Pole		
On-none-On	62012421	62012422
On-none-(On)	62012431	62012432
On-off-On	62012461	62012462
On-off-(On)	62012471	62012472
(On)-off-(On)	62012481	62012482

2 TERMINAL SEALING

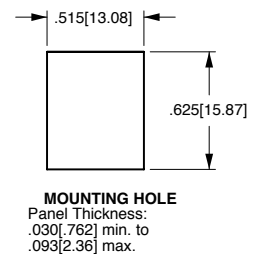
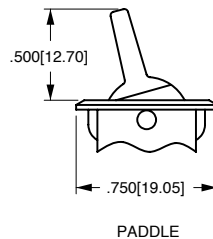
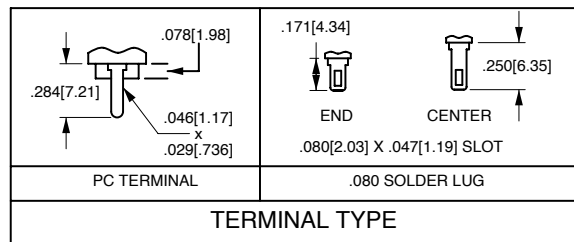
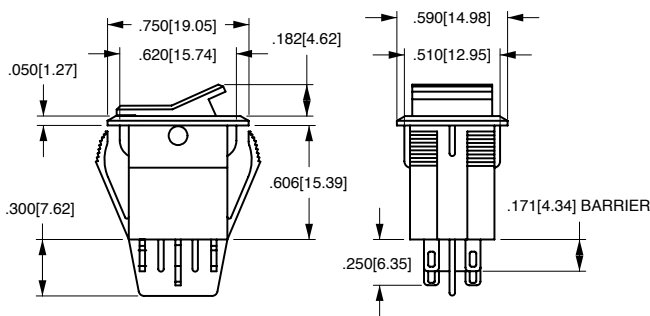
0 None
E Epoxy sealed terminals

3 LEGEND

NO LEGEND hot stamp
On-OFF vertical **0**
On-OFF horizontal **A**
I-O horizontal **B**
I-O vertical **D**
G

Notes:

- ¹ Base part number specifies black rocker and bezel. To specify paddle actuator, change 2nd digit of part number from 2 to 1 (ex. 61012421) For additional ratings and colors, consult factory.
- () indicates momentary function.



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

611/621-Series

SINGLE/DOUBLE POLE ROCKER & PADDLE SWITCHES

The patriarch of the Carling line of sub-miniature switches has its roots deep in the many markets. The 611/621-Series compact size, sleek styling, actuator and termination choices make this switch a cost effective solution to most any switching need. International approvals, single or double pole circuitry, and ratings to 11A 125VAC further the broad appeal of this product family.



Product Highlights:

- ◆ Single or double pole
- ◆ Paddle and single color or dual color visi-rocker options
- ◆ UL, CSA and VDE approvals for select circuits
- ◆ Choice of 7 termination options

Typical Applications:

- ◆ Appliance
- ◆ Audio-Visual
- ◆ Power Supplies



Dielectric Strength

UL/CSA:
 1000V - live to dead metal parts & opposite polarity
 VDE: 4000V - live to dead metal parts;
 1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles- single pole
 50,000 cycles- double pole

Operating Temperature

32°F to 185°F (0°C to 85°C)

Mechanical Life

100,000 cycles

62116919 - 0 - 9 - V

1
Base Part Number

2
Epoxy Sealing

3
Rocker Legend

4
Visi-Rocker End Color

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING 2 / TERMINATION

	187 Tabs ⁴	.080 Solder Lugs	PC Terms	Wire Leads	PC Front Mount	PC Back Mount	.187 Solder Lugs
Single Pole; 4A 250VAC; 8A 125VAC; 6(4) A 250V⁴							
ON-NONE-OFF	62116919	-	-	62111914	62111918 ⁶	62111917 ⁶	62111916
ON-NONE-ON	62116929	62116421	62111422	62111924	62111828 ⁶	62111927 ⁶	62111926
ON-OFF-ON ³	-	62111461	62111462	62111263 ⁷	-	-	-
ON-NONE-(ON) ³	-	62111431	62111432	62111233 ⁷	-	-	-
ON-OFF-(ON) ³	-	62111471	62111472	62111273 ⁷	-	-	-
(ON)-OFF-(ON) ³	-	62111481	62111482	62111283 ⁷	-	-	-
Double Pole; 4A 250VAC; 8A 125VAC; 6(4) A 250V⁴							
ON-NONE-OFF	62115919	-	-	62112914	62112918 ⁶	62112917 ⁶	62112916
ON-NONE-ON	62115929	62115420	62112422	62112924	62112928 ⁶	62112927 ⁶	62112926
ON-OFF-ON ³	-	62112461	62112462	62112263 ⁷	-	-	-
ON-NONE-(ON) ³	-	62112431	62112432	62112233 ⁷	-	-	-
ON-OFF-(ON) ³	-	62112471	62112472	62112273 ⁷	-	-	-
(ON)-OFF-(ON) ³	-	62112481	62112482	62112283 ⁷	-	-	-

2 TERMINAL SEALING

0 None E Epoxy sealed terminals

Notes:

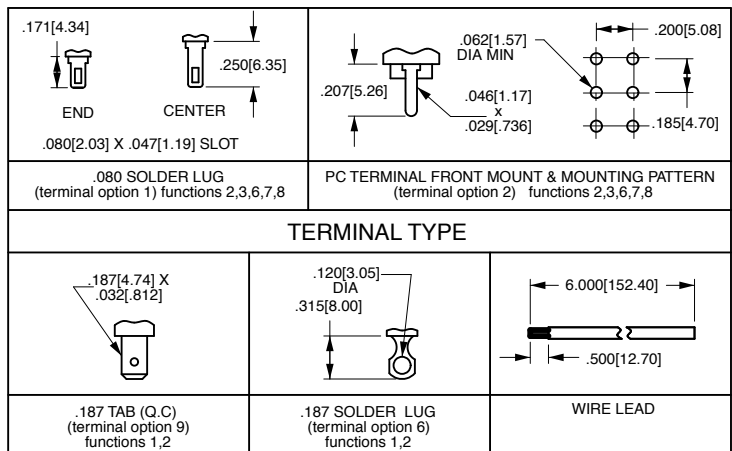
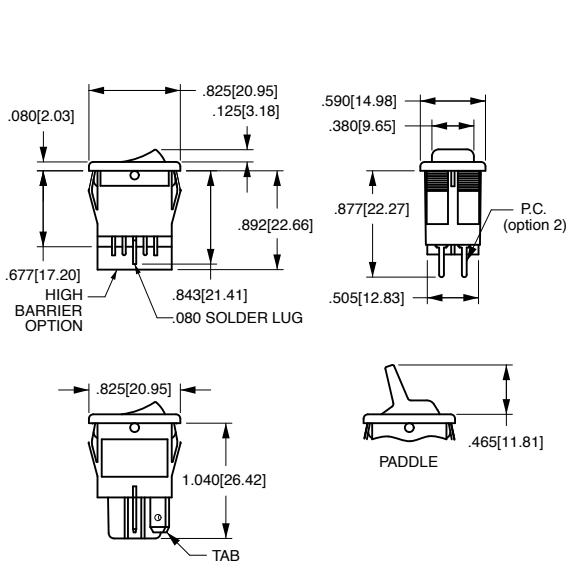
- Base part number specifies black rocker with black bezel. To specify paddle actuator change 2nd digit from 2 to 1. ex: 61115919 = black paddle with black bezel. For additional ratings & colors, consult factory.
- Dry circuit rating is available, consult factory.
- Not available with 6(4) A 250 V rating or VDE approval.
- 6(4)A 250V VDE approved rating available with On-none-Off and On-none-On circuits only.
- Available with visi-rocker option only.
- Consult factory for PC footprint.
- Rated 2A 250VAC, 5A 125 VAC resistive.
- () Indicates momentary function.

3 ROCKER LEGEND

	molded in ⁵	hot stamp
NO LEGEND	0	A
Off-On vertical	n/a	B
Off-On horizontal	n/a	D
I-O horizontal	8	E
I-O vertical	9	F (Indicates ON)
O on rocker radius	n/a	

4 VISI-ROCKER END COLOR

N n/a
 V visi-red
 W visi-white



PANEL THICKNESS	X	Y
.030[.762]-.060[1.52]	.508[12.90]	.756[19.20]
.060[1.52]-.093[2.36]	.508[12.90]	.764[19.40]
.093[2.36]-.156[3.96]	.508[12.90]	.780[19.81]

TEST CUT HOLE IN ACTUAL MATERIAL

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

622/632

622/623-Series

MINIATURE ROCKER SWITCHES

A high powered offering packed into a compact sized envelope, the 622/632-Series is a staple of numerous markets. With its silver-alloy butt contacts, the 622/632 will handle inrush spikes up to 125 amps and steady state current to 12A 125VAC. The lighted 632-Series features a multitude of illumination circuit options available with LED, incandescent and neon style lamps.

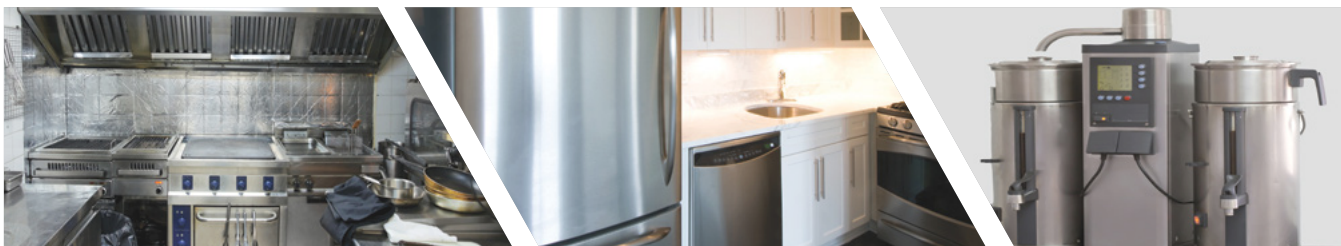


Product Highlights:

- ◆ Illuminated or Non-Illuminated
- ◆ Silver Plated Butt contacts that handle high Inrush spikes
- ◆ Independent or Dependent lamp circuitry
- ◆ Industry standard size mounting hole

Typical Applications:

- ◆ Appliance
- ◆ Food Service
- ◆ Transportation
- ◆ General Purpose



Dielectric Strength

UL/CSA:
1000V-live to dead metal parts
& opposite polarity

Electrical Life

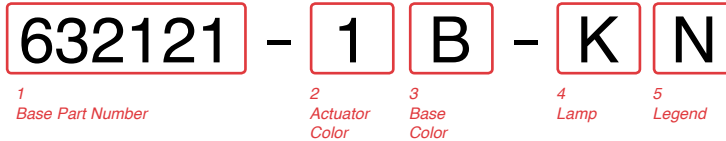
50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)



BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION
8A 250VAC; 12A 125VAC; 1/2 HP 125-250VAC
622-SERIES NON-ILLUMINATED ROCKER

- ON-none-OFF (Single Pole)
- ON-none-OFF (Double Pole)
- 632-SERIES ILLUMINATED ROCKER**
- ON-none-OFF (Single Pole, dependent lamp) schematic 1
- ON-none-OFF (Single Pole, independent lamp) schematic 3
- ON-none-OFF (Single Pole, independent lamp unballasted) schematic 5
- ON-none-OFF (Double Pole, dependent lamp with 5 terms.) schematic 2
- ON-none-OFF (Double Pole, dependent lamp with 4 terms.) schematic 4

	Solder Lugs	.187 Tabs
622121	622122	622122
622221	622222	622222
632121	632122	632122
632321	632322	632322
632521	632522	632522
632221	632222	632222
632421	632422	632422

3 ACTUATOR COLOR³

622 (non illuminated)	632 (illuminated)
B Black	1 Clear Amber
W White	2 Clear Red
	3 Clear Blue ²
	4 Clear Green
	5 Clear

4 LAMP VOLTAGE / STYLE¹

N	622 (non illuminated)	A	6V incandescent
1	unballasted LED	C	12V incandescent
2	6V LED	E	18V incandescent
3	12V LED	H	24V incandescent
4	24V LED	J	125V neon
		K	250V neon

3 BASE COLOR³

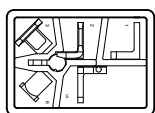
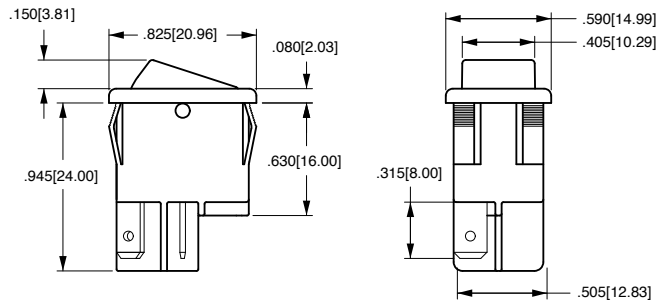
B Black	W White
---------	---------

5 ROCKER LEGEND

- N NO Legend
- A OFF-ON vertical
- B OFF-ON horizontal
- D I-O horizontal
- E I-O vertical
- F O on rocker radius

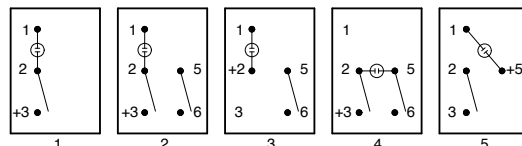
Notes:

- 1 For all incandescent or LED lamps specify 5 in 5th digit of part number. Example 632151-1B-CN
- 2 Available with incandescent lamps only.
- 3 Additional colors available. Consult factory for details.

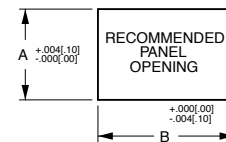
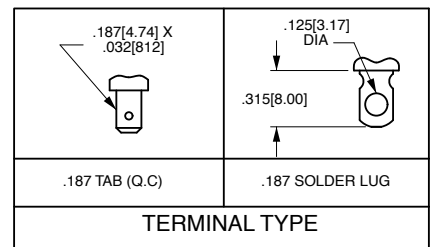


BOTTOM VIEW OF TERMINAL ARRANGEMENT

632 SCHEMATIC



UNBALLASTED



PANEL THICKNESS	A	B
.030[.76]-.050[1.27]	.508[12.90]	.756[19.20]
.050[1.27]-.078[1.98]	.508[12.90]	.764[19.40]
.078[1.98]-.125[3.17]	.508[12.90]	.780[19.81]

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

651/652-Series

SUB-MINIATURE ROCKER SWITCHES

This sub-miniature switch is ideal for applications with back panel size constraints. It fits in a standard rectangular cutout and is designed to provide ease of insertion along with superior panel retention qualities. A high profile rocker and butt-action contacts provide the user with a crisp positive-type feel and electrical ratings to 12A 125VAC 10A 250VAC. A variety of ratings, circuitry and termination choices will appeal to many market segments.



Product Highlights:

- ♦ Ratings to 12A 125VAC, 6A 250VAC
- ♦ Suitable for low voltage 12/24V DC
- ♦ Solid or 2 color visi-rocker options
- ♦ 5 choices of termination

Typical Applications:

- ♦ Handheld Appliance
- ♦ Audio-Visual
- ♦ Power Supplies



Dielectric Strength

UL/CSA:
1000V-live to dead metal parts

Electrical Life

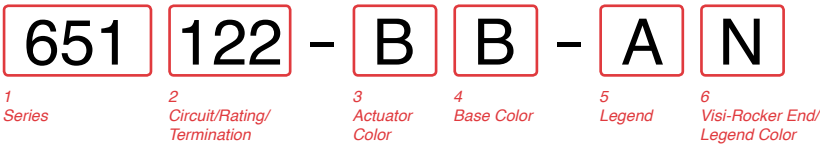
100,000 cycles- maintained
50,000 cycles- momentary
50,000 cycles- T-rating

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)



1 SERIES	
651 Matte Finish	652 Gloss Finish

4 BASE COLOR	
B Black	W White

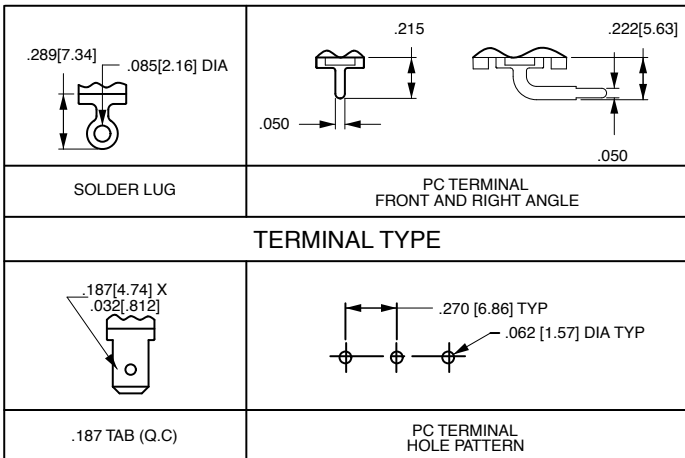
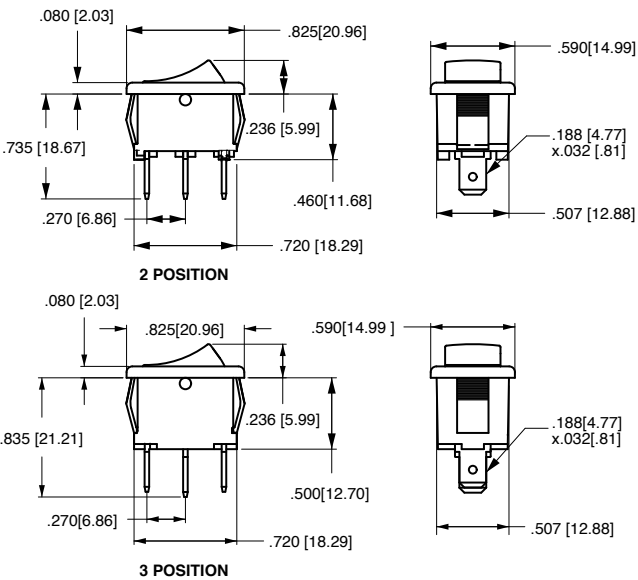
2 CIRCUITRY / RATING / TERMINATION					
10A 250VAC, 10A 125VAC, 1/4 HP, 125-250 VAC					
	.187	.187	PC	PC	Wire
	Solder Lugs	Tabs	Terms	Rt. Angle	Leads
ON-NONE-OFF	121	122	123	124	125
(ON)-NONE-OFF	261 ¹	262	263	264	265
ON-NONE-(OFF)	361 ¹	362	363	364	365
ON-NONE-ON	421	422	423	424	425
ON-NONE-(ON)	561 ¹	562	563	564	565
ON-OFF-ON	681 ²	682	683	684	686
ON-OFF-(ON)	781 ²	782	783	784	785
(ON)-OFF-(ON)	881 ²	882	883	884	885

5 ROCKER LEGEND		
	molded in ⁴	hot stamp
NO LEGEND	0	0
Off-On vertical	1	A
Off-On horizontal	-	B
I-O horizontal	8	D
I-O vertical	9	E
O on rocker end	-	F
II-O-I vertical	-	G
II-O-I horizontal	-	H

3 ACTUATOR COLOR	
B Black	W White

6 VISI-ROCKER END / LEGEND COLOR	
N	N/A
B	Black
V	Visi-red
W	White

Notes:
Additional ratings (including 14V T) & color options are available; Consult factory.
1 Rated 12A 125VAC, 6A 250 VAC, 1/4HP 125-250VAC.
2 Rated 8A 125-250VAC, 1/4HP 125-250VAC.
3 Additional colors available. Consult factory for details.
4 Available with Visi-Rocker option only.
() Indicates momentary function.



RECOMMENDED PANEL OPENING	PANEL THICKNESS	A	B	
	.030[.76]-.050[1.27]	.508[12.90]	.756[19.20]	
	.050[1.27]-.078[1.98]	.508[12.90]	.764[19.40]	
	.078[1.98]-.125[3.17]	.508[12.90]	.780[19.81]	TEST CUT HOLE IN ACTUAL MATERIAL

V-Series

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.

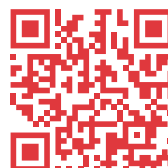


Resources:

[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.

Typical Applications:

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



V-Series Switch

DESIGN FEATURES

INTERCHANGEABLE ACTUATORS

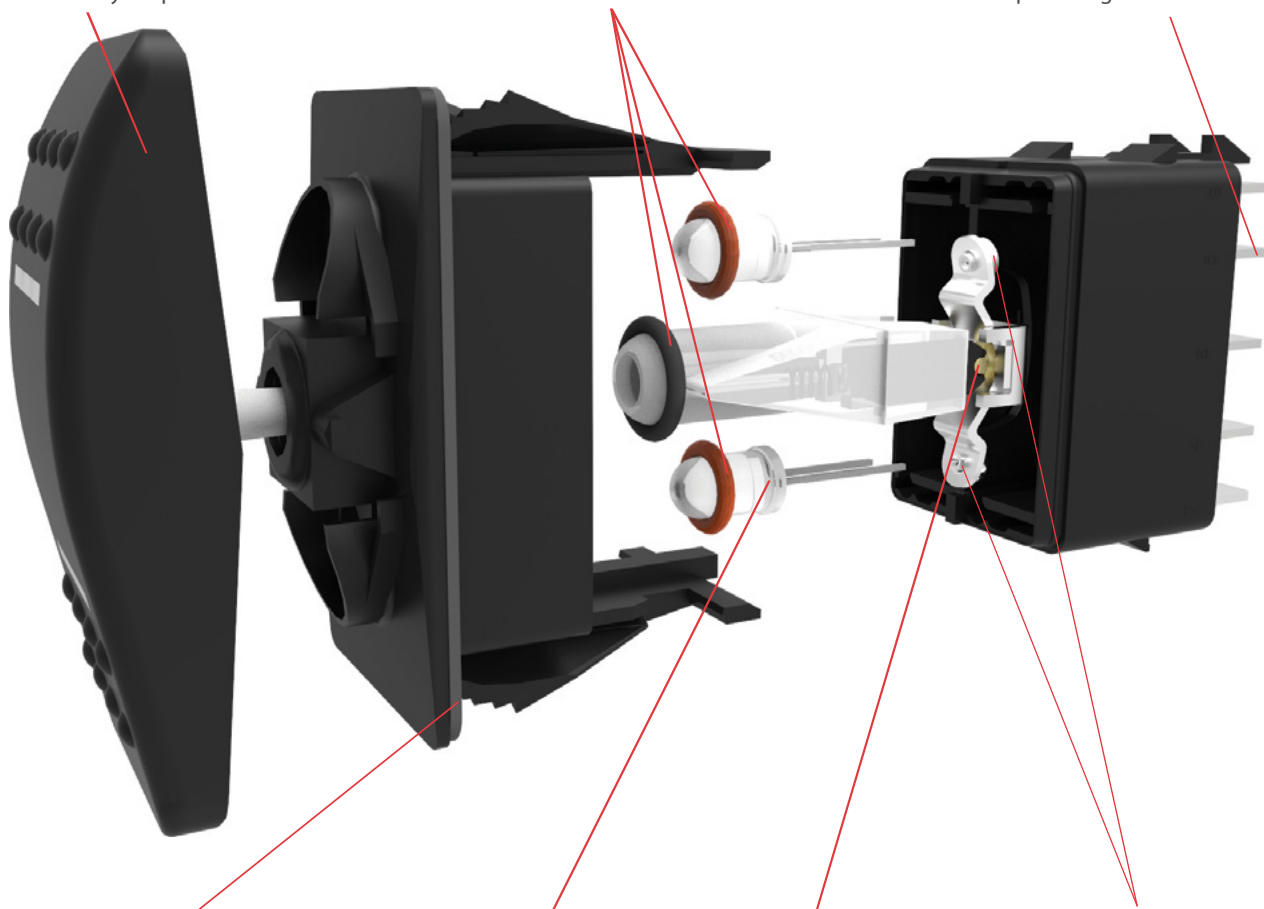
Panel redesign is a snap with our wide range of rocker styles. Achieve maximum design variety with minimum inventory. Simply swap rockers to create an entirely new look for your panel.

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 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 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 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 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 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 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 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.



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.



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
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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
Base	Optional external gasket panel seal Polyester blend rated to 125°C with a UL flammability rating of 94V0.
Contura II,III,IV,V, VI, VII Actuator	Hard Surface: Basic actuator structure molded of thermoplastic polycarbonate with a hard Nylon 66 thermoplastic surface overlay. Soft Surface: Basic actuator structure molded of thermoplastic polycarbonate with an elastomer overlay.
Contura X,XI,XII Actuator,VP	Nylon 66 Reinforced rated to 105°C
Lens	Polycarbonate rated at 100°C
Contura XIV	Polycarbonate lens/sub-rocker with ABS shell

Actuator Travel (Angular Displacement)

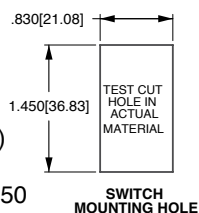
2 position	18°
3 positions	9° from center

Mounting Specifications

Panel Thickness Range

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

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



Agency Certifications



Environmental

Sealing	Sealed version: IP66, 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 O 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 () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. 8 - -7 8 - -7 Terminals 7, 8, 9 & 10 for lamp circuit only. 1 - -4 1 - -4 2 - -5 2 - -5 3 - -6 3 - -6 10 - -9

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

	2 & 3	2 & 3, 5 & 4	5 & 4
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)

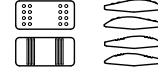
Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6
 No lamp 0
 Neon 1 125VAC 2 250VAC
 Incandescent 4 3V 5 6V
 LED* 6 12V superbright 7 18V superbright 8 24V superbright
 2VDC A Red L Amber F Green R Red
 6VDC B M N H S T
 12VDC C P J V
 24VDC D
 * Consult factory for "daylight bright" 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	Blue
Clear White Amber Green Red	G M T	
1 6 8	H N U	
2 7 C	J P V	
3 8 D	K R W	
4 9 E	L S Y	
5 A 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 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	12 OFF	13 I	14 O
OFF	ON	O	I
15 O O	16 O O	17 O I	18 I O
F N	N F		
F	F		

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.
- Custom colors are available. Consult factory.
- 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.
- Additional ratings available. See V-Series Switch Accessories page.
- Contura II available with two square lenses. Consult factory for details.

V 1 D A S W O B - A Z E 00 - 0

1 Series 2 Circuit 3 Rating 4 Termination Illumination 5 Lock 6 Lamp 7 Bracket 8 Actuator 9 Lens 10 Function 11 Legend 12 Legend 13 Legend Orientation

1 SERIES
V

2 CIRCUIT
Terminal Connections as viewed () - momentary from bottom of switch: 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.

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

Position:

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

	2 & 3	2 & 3, 5 & 4	5 & 4
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	Lamps	Illumination Type	Lamp wired to Terminals
		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	
LED*		Red		Amber	6 12V superbright Green
		A		L	7 18V superbright Red
2VDC		B		M	R
6VDC		C		N	S
12VDC		D		O	T
24VDC				P	V

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

8 FLUSH BRACKET COLOR 1, PANEL SEAL

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

9 HARD SURFACE ACTUATOR 1

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

Actuator orientation above terminals:
3,6 1,4

10 LENS
Z - No Lens
Clear White Amber Green Red Blue

3	8	D	J	P	V
---	---	---	---	---	---

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

11 ACTUATOR LOCK FUNCTION AND COLOR 1

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

12 ACTUATOR LENS OR BODY LEGEND 2

00 - No Legend
21 OFF 22 ON 23 O 24 I

25 O 26 O 27 O 28 I

F N

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.

- Custom colors are available. Consult factory.
- White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
- Only available with 3 position circuits. Center OFF and special circuits only available with center position lock function.
- Additional ratings available. See V-Series Switch Accessories page.

V 1 D A B T O B - E P C 00 - 0 00

1 Series 2 Circuit 3 Rating 4 Termination Illumination Lamp 5 Lamp 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 () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. 8 - -7 8 - -7 Terminals 7, 8, 9 & 10 for lamp circuit only. 1 - -4 1 - -4 2 - -5 2 - -5 3 - -6 3 - -6 10 - -9

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*			superbright	superbright	
	Red	Amber	Green	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

No Seal	Black	White	Gray
One Seal	B	W	G
	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
1	6	8	G	M
2	7	C	H	N
3	8	D	J	P
4	9	E	K	R
5	A	F	L	S
				Y

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

11 ACTUATOR COLOR 1,5,6

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

12 ACTUATOR LENS OR BODY LEGENDS 2

11	ON	12	OFF	13	I	14	O
	OFF		ON		O		I
15	O O	16	O O	17	O I	18	I O
	F N		N F				
	F		F				

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.
- Custom colors are available. Consult factory.
- White imprinting is standard on black actuators; Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
- Gloss brow is on left side of E actuator and right side of F actuator.
- Additional ratings available. See V-Series Switch Accessories page.
- Laser etched rocker only available with lens code Z & actuator colors black, nickel or pewter.
- Pewter and nickel colors only available with laser etched actuator.

V 1 D A B T O B - G P C 00 - 0 00

1 Series 2 Circuit 3 Rating 4 Termination Illumination 5 Lamp 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 () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. 8 - -7 8 - -7 Terminals 7, 8, 9 & 10 for lamp circuit only. 1 - -4 1 - -4 2 - -5 2 - -5 3 - -6 3 - -6 10 - -9

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

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

B	.4VA @ 28VDC Resistive
C	15A 24V
D	20A 18V
E	20A 12V
F	20A 14V, 10A 14VT (circuit 1, 4, A & D only)
M	10A 14V, 6A 14VT (circuit G only)
N	.4VA/20A 12V
	.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*					superbright superbright
		Red		Amber	Green
2VDC	A		L		F
6VDC	B		M		G
12VDC	C		N		H
24VDC	D		P		J

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

8 FLUSH BRACKET COLOR 1, PANEL SEAL

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

9 ACTUATOR

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

10 Lens

0	No Actuator	Z	No Lens	style & location: #1 / #2	
Clear	White	Amber	Green	Red	Blue
1	6	8	G	M	T
2	7	C	H	N	U
3	8	D	J	P	V
4	9	E	K	R	W
5	A	F	L	S	Y

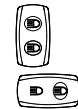
Lens color for LEDs must be clear, white, or match color of LED. Green or blue lenses are not recommended with Neon lamps.

11 ACTUATOR COLOR 1,3,5

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

12 ACTUATOR LENS OR BODY LEGENDS 2,6

11 ON	12 OFF	13 I	14 O
OFF	ON	O	I
15 O O	16 O O	17 O I	18 I O
F N	N F		
F	F		

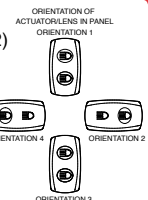
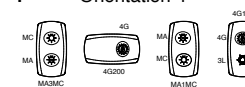


For additional legend options & codes, visit us at www.carlingtech.com.

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

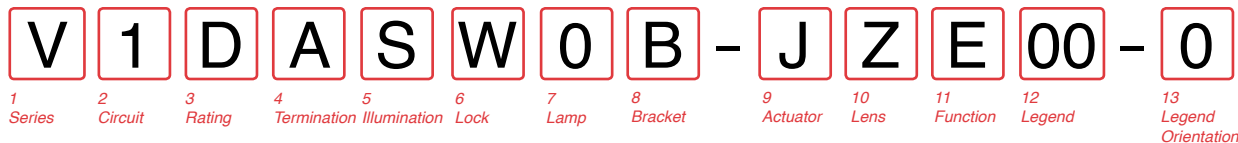


14 ACTUATOR LENS LEGEND

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.



1 SERIES
V

2 CIRCUIT 3
Terminal Connections as viewed () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. Terminals 7, 8, 9 & 10 for lamp circuit only.

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

Position:

SP DP	1	2	3
	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

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

7 LAMP
Lamp above terminals 3 & 6 end of switch

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

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

8 FLUSH BRACKET COLOR 1, PANEL SEAL

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

9 HARD SURFACE ACTUATOR
CONTURA IV:
Orientation Black Gray Red White
Left J K L M
Right N P R S

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	26	27	28	
O	O	O	I	
F	N			

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

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

1 SERIES
V

2 CIRCUIT

Terminal Connections as viewed () - momentary from bottom of switch: 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.

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

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 (-)
E	5	2	DOWN	1 (+) 7 (-)
F	6	1	UP	3 (+) 7 (-)
G	7	1	INDEPENDENT	8 (+) 7 (-)
H	Z	2	UP	3 (+) 7 (-)
U	Y	1	INDEPENDENT	8 (+) 7 (-)
		2	INDEPENDENT	10 (+) 9 (-)
SINGLE POLE SWITCHES ONLY				
J	8	1	DOWN	3 (+) 8 (-)
K	W	1	INDEPENDENT	6 (+) 7 (-)
		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 LED*	4 3V	5 6V	6 12V superbright	7 18V superbright	8 24V
	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

No Seal	B Black	W White	G Gray
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
-	7	C	H
3	-	D	J
4	-	E	K
-	A	F	L
			N
			U
			V
			W
			Y

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	N Bright Nickel Plated
C Bright Chrome Plated	S Satin Chrome Plated
D Satin Chrome Painted	T Satin Nickel Plated
	W White

14 ACTUATOR LENS OR BODY LEGENDS 2

00 - No Legend this location/No actuator	
11 ON	12 OFF
13 I	14 O
OFF	ON
15 O O	16 O O
F N	N F
F	F

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:

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

V 1 D A B T O B - Z R C 00 - 0 00

1 Series 2 Circuit 3 Rating 4 Termination Illumination 5 Lamp 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 () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal 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

	2 & 3	2 & 3, 5 & 4	5 & 4
H*	2 & 3	2 & 3	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 LED*	4	3V	5	6V	
		Red		Amber	6
					12V superbright
					Green
					7
					18V superbright
					Red
2VDC	A		L	F	
6VDC	B		M	G	
12VDC	C		N	H	
24VDC	D		P	J	

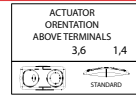
* Consult factory for "daylight bright" LED options. Typical current draw for LED is 20ma.

8 FLUSH BRACKET COLOR 1, PANEL SEAL

No Seal	Black	White	Gray
One Seal	B	W	G
	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.

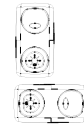
White	Amber	Green	Red	Blue	U	Y	White/Black	Black/Black	Red/Black
6	B	G	M	T					
7	C	H	N	U					
8	D	J	P	V					
9	E	K	R	W					
A	F	L	S	Y					
1	2	3	4	5					

11 ACTUATOR COLOR/THUMB PRINT COLOR 1

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

14 ACTUATOR LENS OR BODY LEGENDS 2

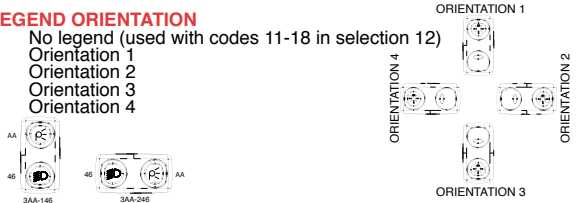
11 ON	12 OFF	13 I	14 O
OFF	ON	O	I
15 O O	16 O O	17 O I	18 I O
F N	N F		
F	F		



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.
- Custom colors are available. Consult factory.
- White imprinting is standard on black actuators. Black imprinting is standard on white, red and gray actuators. Custom colors are available, consult factory.
- Additional ratings available. See V-Series Switch Accessories page.
- 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 Illumination 5 Lamp 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 () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. Terminals 7, 8, 9 & 10 for lamp circuit only.

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

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

	2 & 3	2 & 3, 5 & 4	5 & 4
H*	2 & 3	2 & 3, 5 & 4	5 & 4
G*	2 & 3	2 & 3, 5 & 4	OFF
M*	2 & 3, 5 & 6	2 & 3, 5 & 4	1 & 2
S*	2 & 3, 5 & 6	2 & 3, 5 & 4	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	F	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	1	INDEPENDENT	8 (+) 7 (-)
B	2	1	1	DOWN	3 (+) 7 (-)
C	3	2	1	UP	3 (+) 7 (-)
D	4	1	1	DOWN	3 (+) 7 (-)
E	5	1	2	DOWN	1 (+) 7 (-)
F	6	1	2	UP	3 (+) 7 (-)
G	7	1	1	INDEPENDENT	8 (+) 7 (-)
H	Z	2	2	UP	3 (+) 7 (-)
U	Y	1	1	INDEPENDENT	8 (+) 7 (-)
		2	2	INDEPENDENT	10 (+) 9 (-)
SINGLE POLE SWITCHES ONLY					
J	8	1	1	DOWN	3 (+) 8 (-)
K	W	1	1	INDEPENDENT	6 (+) 7 (-)
		2	1	INDEPENDENT	8 (+) 7 (-)
		2	1	INDEPENDENT	6 (+) 7 (-)
DOUBLE POLE SWITCHES ONLY					
L	9	1	1	DOWN	3 (+) 6 (-)
M	R	1	1	UP	3 (+) 6 (-)
N	T	1	1	DOWN	3 (+) 6 (-)
P	V	1	2	DOWN	1 (+) 4 (-)
		1	1	UP	1 (+) 4 (-)
		2	1	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	1 125VAC	2 250VAC	6 12V	7 18V	8 24V
Neon	4 3V	5 6V	6 12V	7 18V	8 24V	
Incandescent	4 3V	5 6V	6 12V	7 18V	8 24V	
LED*	Red	Amber	Green	superbright	superbright	
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	12 OFF	13 I	14 O
	OFF	ON	O	I
15 O O	16 O O	17 O I	18 I O	
F N	N F			
F F				
21 OFF	22 ON	23 O	24 I	
25 O	26 O	27 O	28 I	
F	N			

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

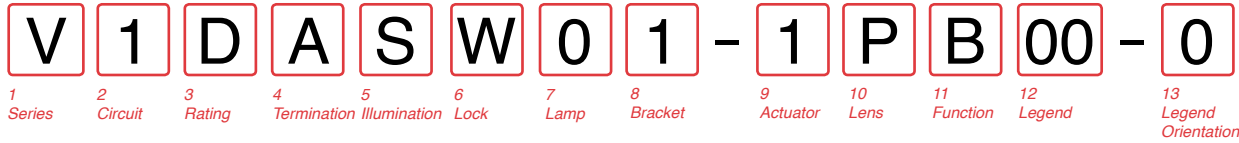


14 ACTUATOR LENS LEGEND

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.
- Custom colors are available. Consult factory.
- White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators. Custom colors are available, consult factory.
- With 2 square lenses, use selection 12 for lens above lamp 1, & selection 14 for lens above lamp 2.
- Additional ratings available. See V-Series Switch Accessories page.
- Not available with Contura XI rockers.



1 SERIES
V

2 CIRCUIT

Terminal Connections as viewed () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. 8 - -7 8 - -7 Terminals 7, 8, 9 & 10 for lamp circuit only. 1 - -4 1 - -4 2 - -5 2 - -5 3 - -6 3 - -6 10 - -9

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

	2 & 3	2 & 3, 5 & 4	5 & 4
H*	2 & 3	2 & 3	OFF
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

Notes:

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

6,7 LAMP (same coding for both selections)

Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6
No lamp 0
Neon 1 125VAC 2 250VAC
Incandescent 4 3V 5 6V
LED* 6 12V superbright Green 7 18V superbright Red
2VDC A Red L Amber F Green R Red
6VDC B C M N G H S T
12VDC N P H J V
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	Up	Down	Up & Down
Match Actuator	A	H	R
Black	B	J	S
White	C	K	T
Red	D	L	V
Gray	E	M	W
Safety Orange	F	N	Y

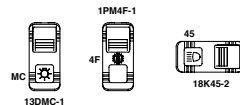
12 ACTUATOR LENS OR BODY LEGEND 2

00 - No Legend	21	22	23	24
	OFF	ON	O	I
	25 O	26 O	27 O	28 I
	F	N		

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

13 LEGEND ORIENTATION 3

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



V 1 D B B C 0 B - F A P C A B - 1 00

1 Series 2 Circuit 3 Rating 4 Termination Illumination 5 Lamp 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 () - momentary from bottom of switch: SP - single pole - uses terminals 1, 2 & 3. 8 terminal 10 terminal DP - double pole uses terminals 1, 2, 3, 4, 5 & 6. Terminals 7, 8, 9 & 10 for lamp circuit only.

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

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

S	Lamps	Illumination Type	Lamp wired to Terminals
	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 LED*	4 3V	5 6V	6 12V superbright Green	7 18V superbright Red	8 24V 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 BRACKET COLOR & PANEL SEAL

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

9 ACTUATOR STYLE

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

10 LENS COLOR / STYLE

0	No Actuator	Z	No Lens		
Clear	White	Amber	Green	Red	Blue
1	6	B	G	M	T
2	7	C	H	N	U
3	8	D	J	P	V
4	9	E	K	R	W
5	A	F	L	S	Y
5	A	N/A	N/A	N/A	N/A

Legend symbols: I (Illumination), T (Terminal), U (Up), V (Down), W (Wire Leads), Y (Yellow), Z (Zinc Plated)


Legend symbols: PAD Printed, 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

0	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	13 I O
	OFF ON	14 O I
15	O O	17 O I
	F N	18 I O
	F N	F F

13 LEGEND ORIENTATION

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

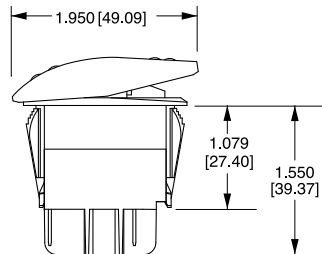
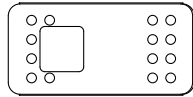
14 ACTUATOR / LENS LEGEND
00 No legend this location / no actuator (used with codes 11-18 in selection 12) Selection 14 required when switch requires two legends. If the two legends consist of one lens and one body legend, lens legend must be specified in selection 12; body legend specified in selection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

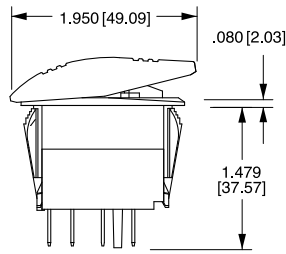
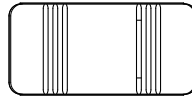
CONTURA II

SHOWN WITH SQUARE LENS



8 TERMINAL BASE W/BARRIERS

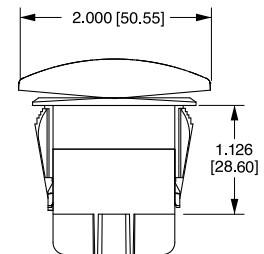
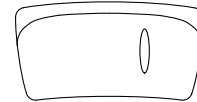
CONTURA III



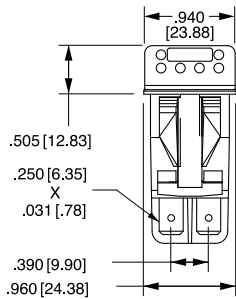
8 TERMINAL BASE W/O BARRIERS

CONTURA IV

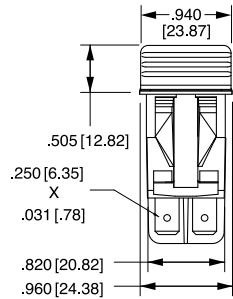
SHOWN WITH BAR LENS



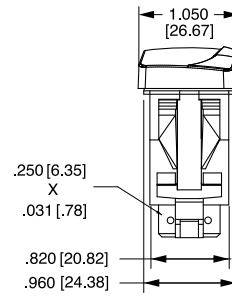
10 TERMINAL BASE W/BARRIERS



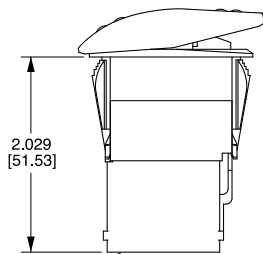
8 TERMINAL BASE W/BARRIERS



10 TERMINAL BASE W/BARRIERS

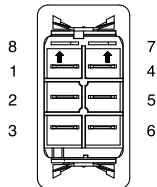


10 TERMINAL BASE W/O BARRIERS

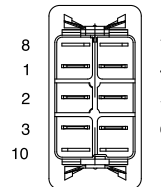


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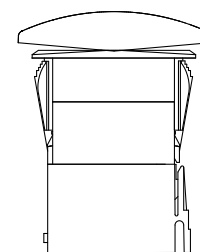
SWITCH SHOWN WITH VCH CONNECTOR 8 TERMINAL



BOTTOM VIEW TERMINAL ARRANGEMENT 8 TERMINAL BASE



BOTTOM VIEW TERMINAL ARRANGEMENT 10 TERMINAL BASE

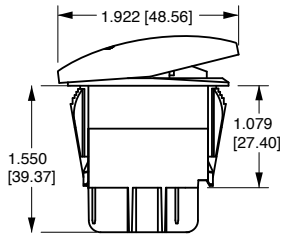
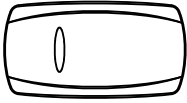


SWITCH SHOWN WITH VC1 CONNECTOR 10 TERMINAL

Dimensional Specifications: in. [mm]

CONTURA V

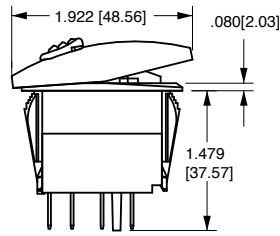
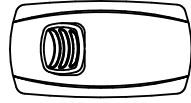
SHOWN WITH
BAR LENS



**8 TERMINAL BASE
W/BARRIERS**

CONTURA V

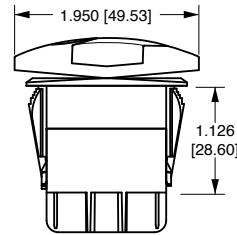
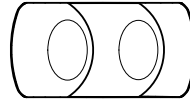
SHOWN WITH
LOW PROFILE LOCK



**8 TERMINAL BASE
W/O BARRIERS**

CONTURA VI

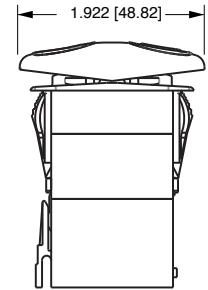
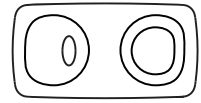
SHOWN WITH OVAL
LENS



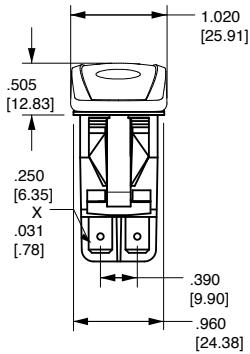
**10 TERMINAL BASE
W/BARRIER AND
LAMP TERMINAL**

CONTURA VII

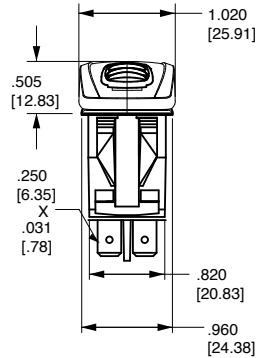
SHOWN WITH LARGE LENS
AND BAR LENS



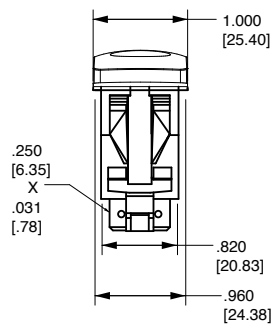
**10 TERMINAL BASE
W/O BARRIERS**



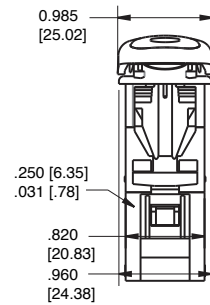
**8 TERMINAL BASE
W/BARRIERS**



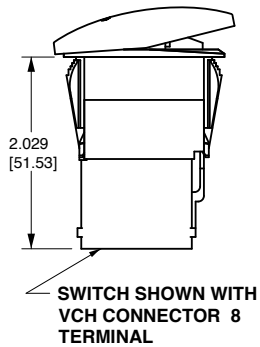
**8 TERMINAL BASE
W/O BARRIERS**



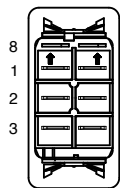
**10 TERMINAL BASE
W/O BARRIERS**



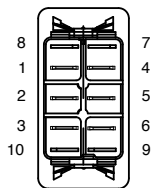
**10 TERMINAL BASE
W/O BARRIERS**



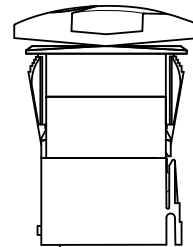
**SWITCH SHOWN WITH
VCH CONNECTOR 8
TERMINAL**



**BOTTOM VIEW
TERMINAL
ARRANGEMENT
8 TERMINAL BASE**



**BOTTOM VIEW
TERMINAL
ARRANGEMENT
10 TERMINAL BASE**



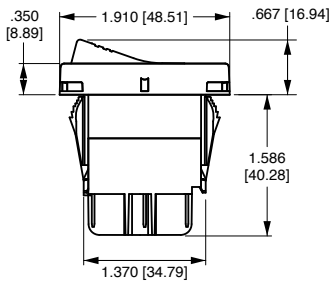
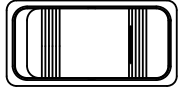
**SWITCH SHOWN WITH
VC1 CONNECTOR 10
TERMINAL**



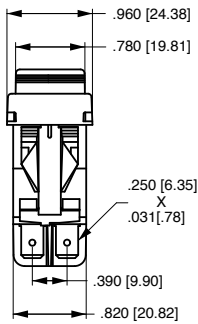
**SWITCH SHOWN
WITH VC1
CONNECTOR 10
TERMINAL**

Dimensional Specifications: in. [mm]

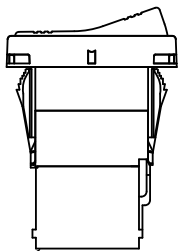
CONTURA X
SHOWN WITH RAISED BRACKET



8 TERMINAL BASE
W/BARRIERS

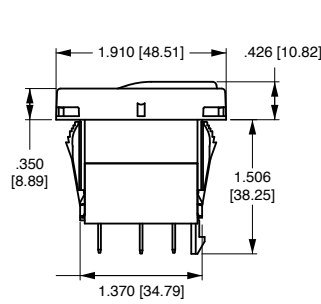
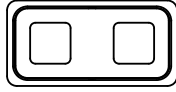


8 TERMINAL BASE
W/BARRIERS

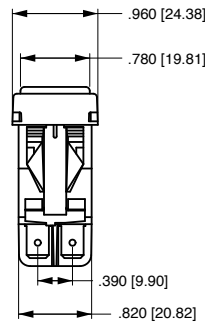


SWITCH SHOWN WITH
VCH CONNECTOR
8 TERMINAL

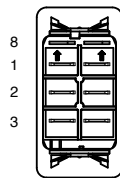
CONTURA XI
SHOWN WITH RAISED
BRACKET AND TWO SQUARE
LENSES



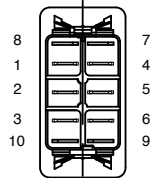
10 TERMINAL BASE
W/O BARRIERS



10 TERMINAL BASE
W/BARRIERS

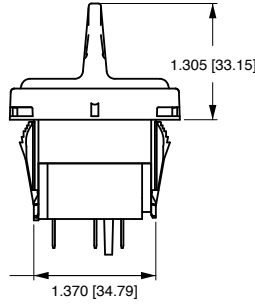
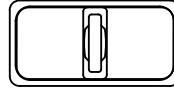


BOTTOM VIEW
TERMINAL
ARRANGEMENT
8 TERMINAL BASE

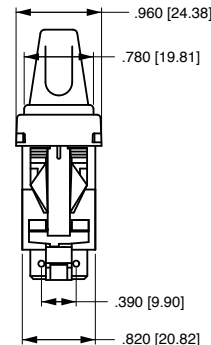


BOTTOM VIEW
TERMINAL
ARRANGEMENT
10 TERMINAL BASE

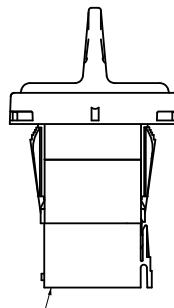
CONTURA XII
SHOWN WITH PADDLE
ACTUATOR



8 TERMINAL BASE
W/O BARRIERS

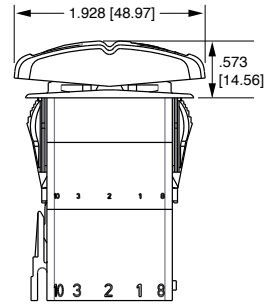
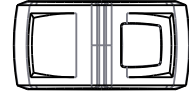


10 TERMINAL
BASE
W/O BARRIERS

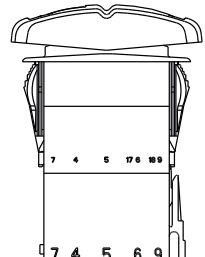
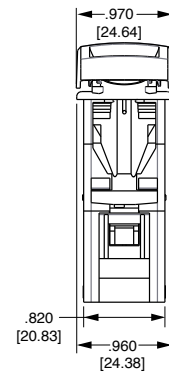


SWITCHES SHOWN WITH
VC1 CONNECTOR
10 TERMINAL

CONTURA XIV
SHOWN WITH LARGE LENS



10 TERMINAL BASE
W/O BARRIERS



SWITCHES SHOWN WITH
VC1 CONNECTOR
10 TERMINAL

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	LAMP CIRCUIT	CIRCUIT DIAGRAM	LAMP CIRCUIT	CIRCUIT DIAGRAM	LAMP CIRCUIT	CIRCUIT DIAGRAM
A/1		F/6		L/9		SPECIAL #1	
B/2		G/7		M/R		SPECIAL #3	
C/3		H/Z		N/T		SPECIAL #4	
D/4		J/8		P/V			
E/5		K/W		U/Y			

Hazard Warning Circuit Diagrams:

CIRCUIT	CIRCUIT DIAGRAM	CIRCUIT	CIRCUIT DIAGRAM	CIRCUIT	CIRCUIT DIAGRAM
J1		J5		JA	
J2				JJ	
J3				JK	
J4					

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

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

Rotary

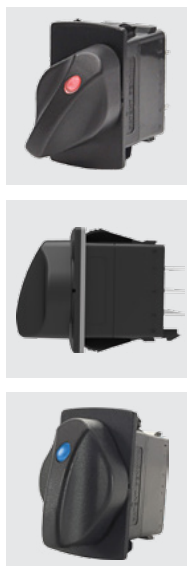
V-Series

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](#)



[Watch Product Video](#)



Product Highlights:

- ◆ Accommodates up to three separate LEDs
- ◆ Patented mechanism translates rotary into linear motion
- ◆ Secondary CAM for definitive detent positions
- ◆ PC Board supports LED and surface mount resistors
- ◆ IP67 sealing protection above panel
- ◆ Common terminal & circuit functionality with V-Series Rocker switches, with no harness change required

Typical Applications:

- ◆ On/Off Highway Equipment
- ◆ Marine
- ◆ Test & Measurement
- ◆ Instrumentation
- ◆ Speed Control

V-Series Rotary Switch

DESIGN FEATURES

OPTIONAL PANEL SEAL

Prevents water/dust ingress behind panel

SEALS

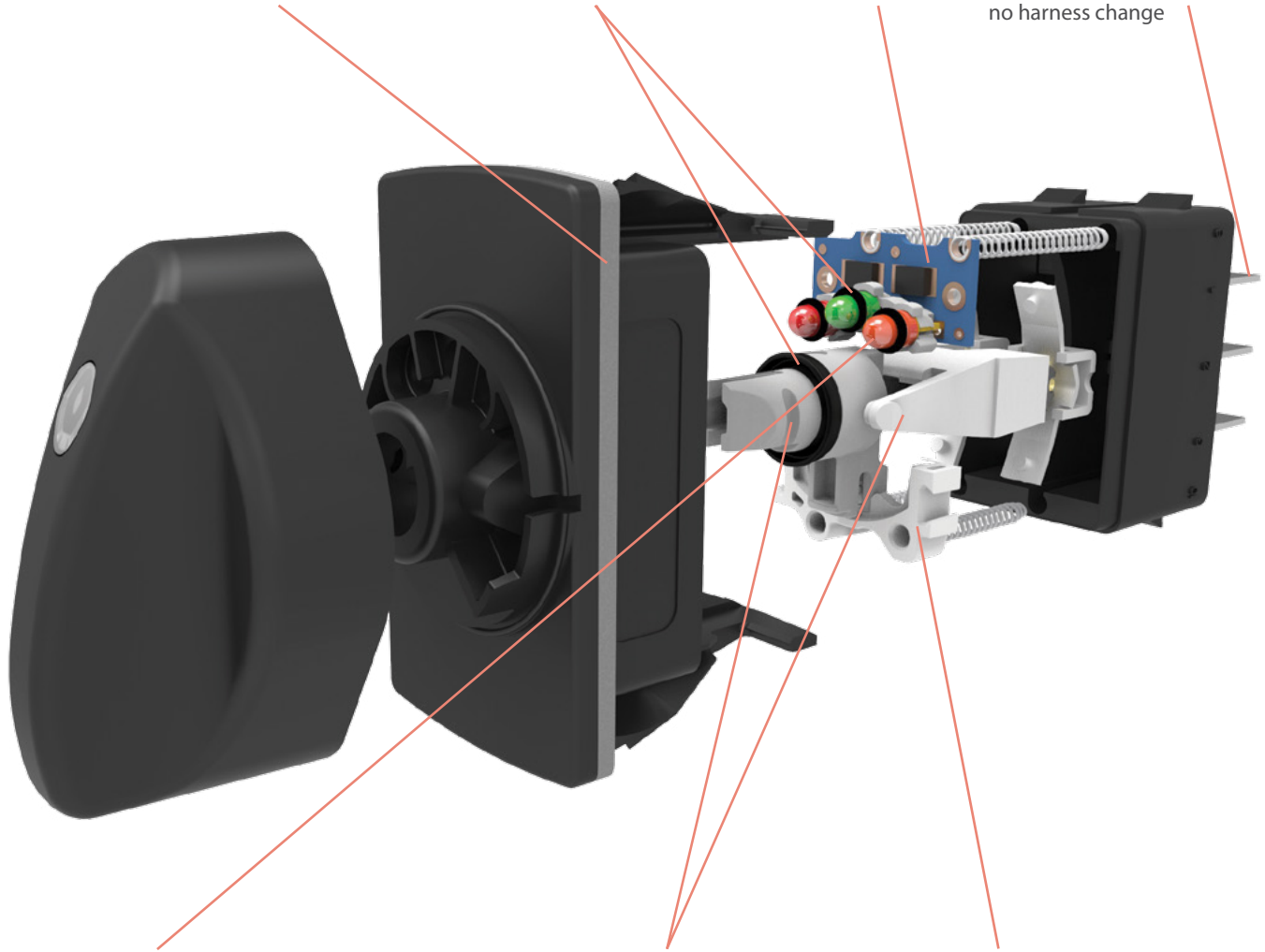
LED and stem seals provide IP67 protection above panel

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	Single and Double Pole Single Throw, SPST, DPST Single and Double Pole Double Throw, SPDT, 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)

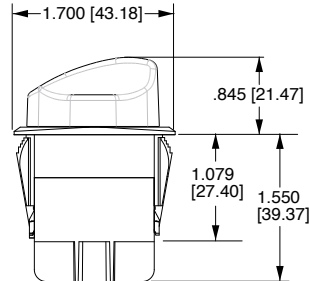
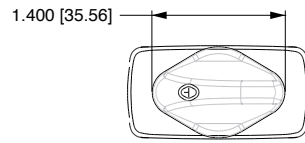
Mechanical

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

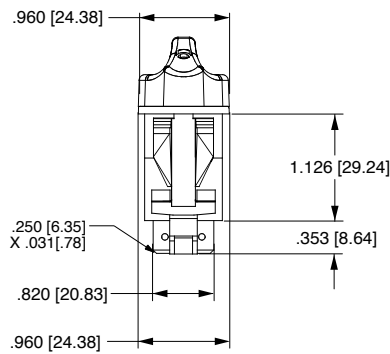
Environmental

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

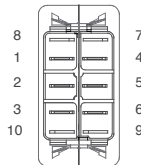
Dimensional Specifications: in. [mm]



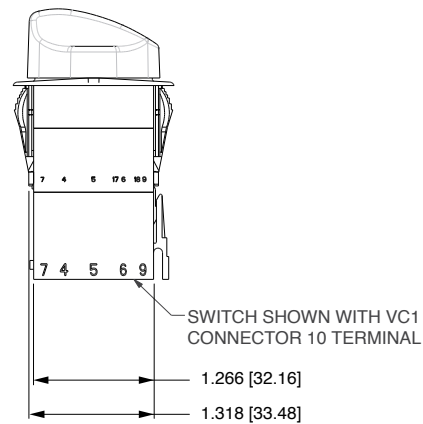
**10 TERMINAL BASE
W/ BARRIERS**



**10 TERMINAL BASE
W/O BARRIERS**

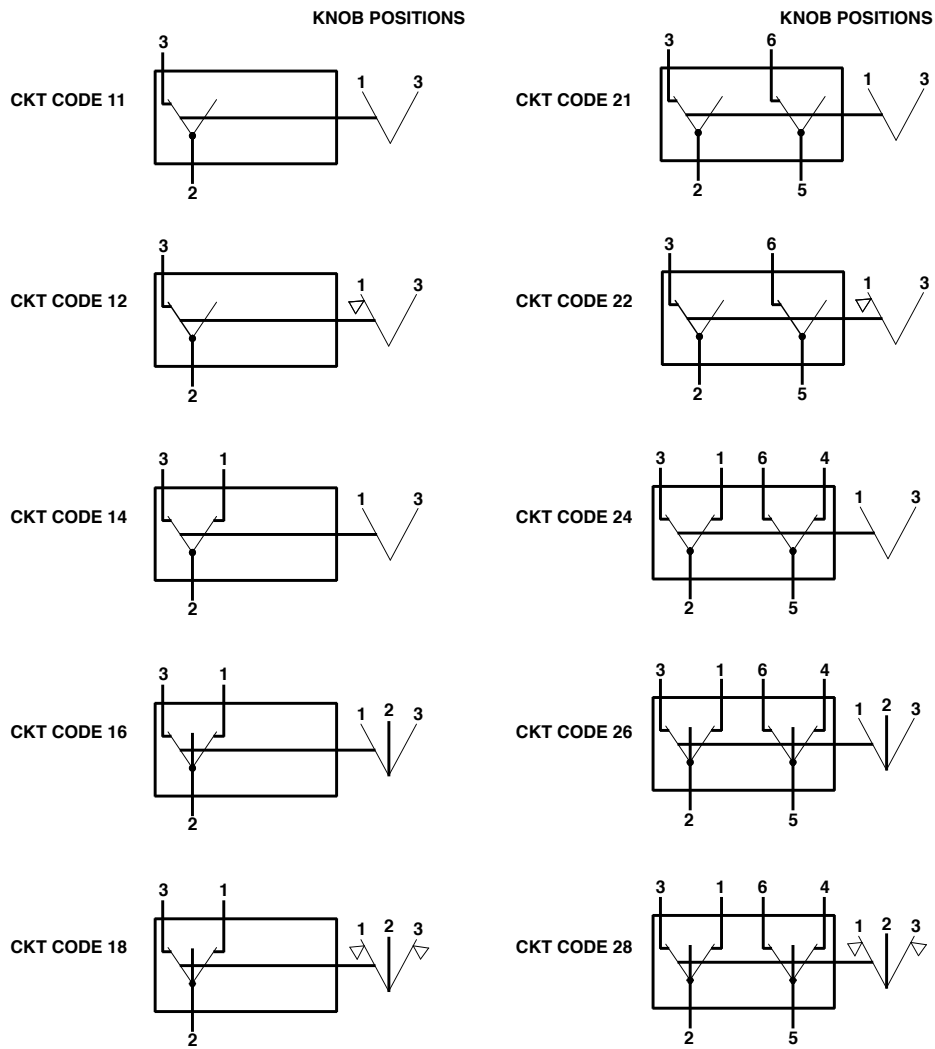


**BOTTOM VIEW
TERMINAL ARRANGEMENT
10 TERMINAL BASE**



SWITCH SHOWN WITH VC1
CONNECTOR 10 TERMINAL

Circuits Diagrams:



LEGEND

SYMBOL	DEFINITION
	TERMINAL LOCATION
	MAINTAINED CIRCUIT
	MOMENTARY CIRCUIT
	INTERNAL CONNECTION (JUMPER TERMINAL)
	2 POSITION CONNECTION
	2 POSITION CONNECTION
	2 POSITION
	3 POSITION

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	
U	
V	

RV 11 D 2 B C 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: () - momentary

8 - - 7	SP - single pole uses 1, 2 & 3.
1 - - 4	DP - double pole uses 1, 2, 3 and 4, 5, 6.
2 - - 5	
3 - - 6	
10 - - 9	

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
14 24	ON	NONE	ON
16 26	ON	OFF	ON
18 28	(ON)	OFF	(ON)

3 RATING

1	External
B	.4VA 28VDC Resistive
D	15A 24V
	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
3	4	Solder Lug - no barriers	No
C	D	Solder Lug	No
5	6	Wire Leads - no barriers	No
E	F	Wire Leads	No

5 ILLUMINATION 2

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	Independent	1+ 7-
U	# 1	Dependent	3+ 6-
V	# 1	Dependent	3+ 6-
	# 3	Dependent	1+ 4-

Single Pole Switches Only

6, 7, 8 LAMP #1, 2 AND OR LAMP #3 4
 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 3

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 4

No Actuation	0				
No Lens	Z				
Clear	White	Amber	Green	Red	Blue
4	9	E	K	R	W

12 KNOB COLOR

Black	Gray	Red
C	H	S

Notes:
 1 SP-single pole uses terminals 1,2 & 3. DP-double pole uses terminals 1,2,3,4,5 & 6. Terminals 7,8,9 & 10 are for lamp circuit only.
 2 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 1. Positive (+) and negative (-) symbols apply to LED lamps only.
 3 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.
 4 Lens color for LEDs must be clear, white, or match color of LED.

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



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

Typical Applications:

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

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

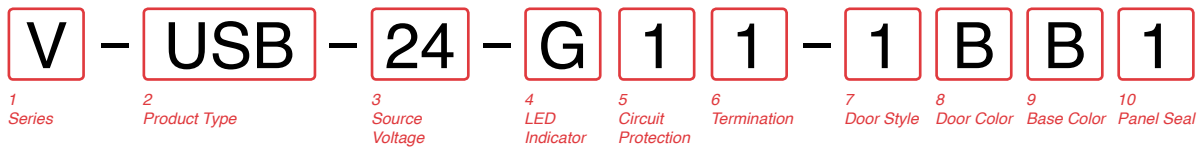
Environmental

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

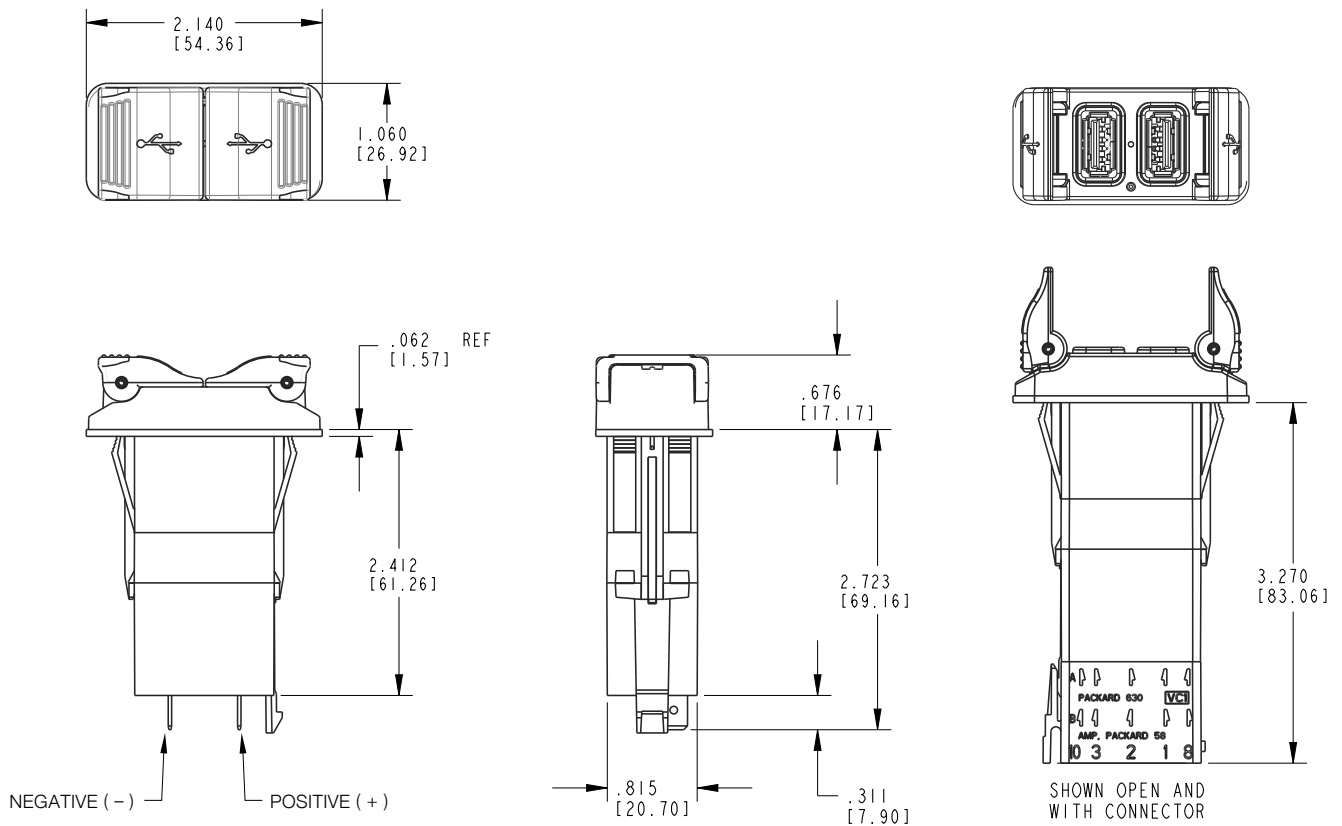
Endurance	10,000 door cycles minimum
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Ordering Scheme



1 SERIES V	6 TERMINATION 1 .250 Tab
2 PRODUCT TYPE USB Charger	7 DOOR STYLE 1 Curved
3 SOURCE VOLTAGE 24 24 / 12 Volts DC	8 DOOR COLOR B Black
4 LED INDICATOR (VOLTAGE MATCHES SOURCE) G Green	9 FRAME COLOR B Black
5 CIRCUIT PROTECTION 1 Reverse Polarity, Thermal Overload & Overcurrent	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	5	square lens on top/ bar lens on bottom (Contura X only)
2	One bar lenses		
3	One square lens		
4	two square lens		

4 ACTUATOR LENS OR BODY LEGEND

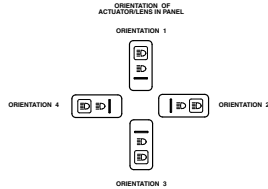
00 - No Legend this location

11	ON	12	OFF	13	O	14	O
	OFF		ON		I		I
15	O	16	O	17	O	18	I
	F		N		F		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:

- If actuator lens opening for 2 bar or 2 square lenses, legend orientation 0,1, or 2 must be chosen.
- Center of actuator marking not available for Contura XII.
- Legend is not available for bar style lens.
- Not recommended with neon lamps.
- 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 Orientation

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

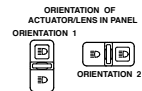
5, 7 LENS OR BODY LEGEND 2

00	No Legend	21	OFF	22	ON	23	O	24	I
		25	O	26	O	27	O	28	I
			F		N				

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

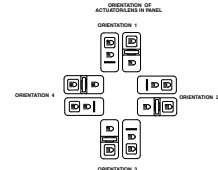
4 LENS OR BODY LEGEND 2

00	No Legend	21	OFF	22	ON	23	O	24	I
		25	O	26	O	27	O	28	I
			F		N				

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

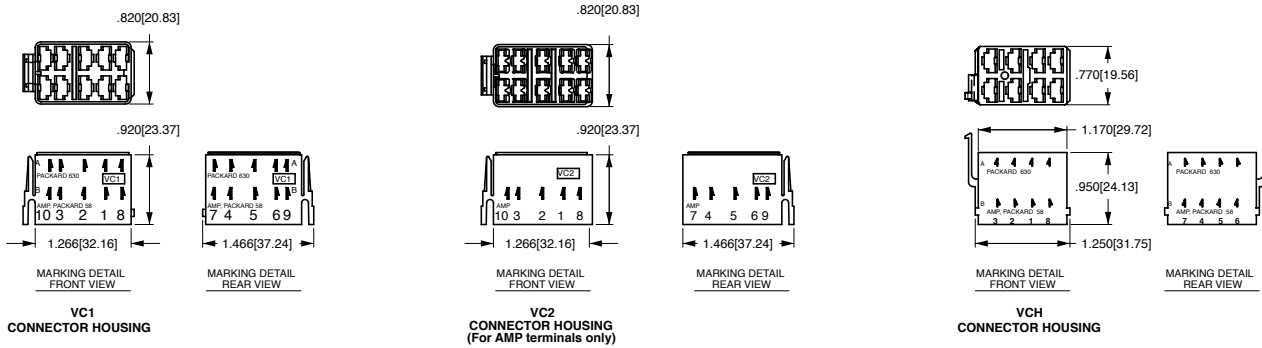
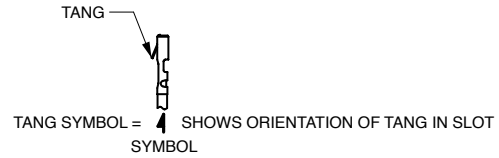


Easily integrate Contura products into your system, with Contura Accessories

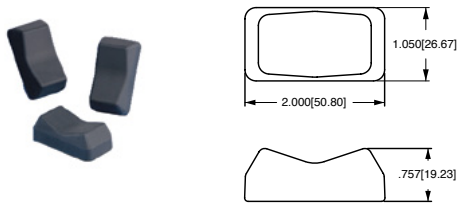
Contura Connectors

Q.C. SELECTION GUIDE					
COMPANY SERIES	PART NO		WIRE RANGE		ORIENTATION
	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	20-18	.5-.8	
		12052222	20-22	.35-.5	
AMP 250 SERIES FASTIN-FASTON	60253-1	60253-2	16-12	1.3-3	B
	42100-1	42100-2	(2) 16	(2) 1.3	
	60295-1	60295-2	18-14	.8-2	
			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



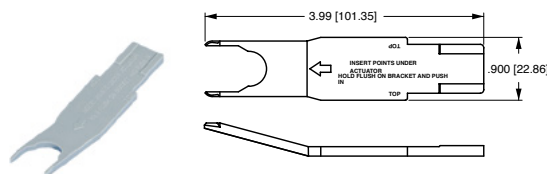
Contura X Boot (P/N VB1-01)



Additional V-Series Ratings

- 1 .4VA @ 28VDC Resistive
- 4 10A 250VAC 1/2 HP, 15A 125 VAC 1/2 HP, No Agency Listings
- 5¹ 10A 250VAC 1/2 HP, 15A 125 VAC 1/2 HP, UL Recognized, CSA Certified
- 6² 15A 125VAC 1/2 HP, 12(2)A 125 VAC μ T85
- 7² 15A 125VAC 1/2 HP, 12(6)A 125 VAC T85
- 8² 10A 250VAC, 15A 125VAC, 1/2 HP 125-250VAC, 12(2)A 250 VAC μ T85
- 9² 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)

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



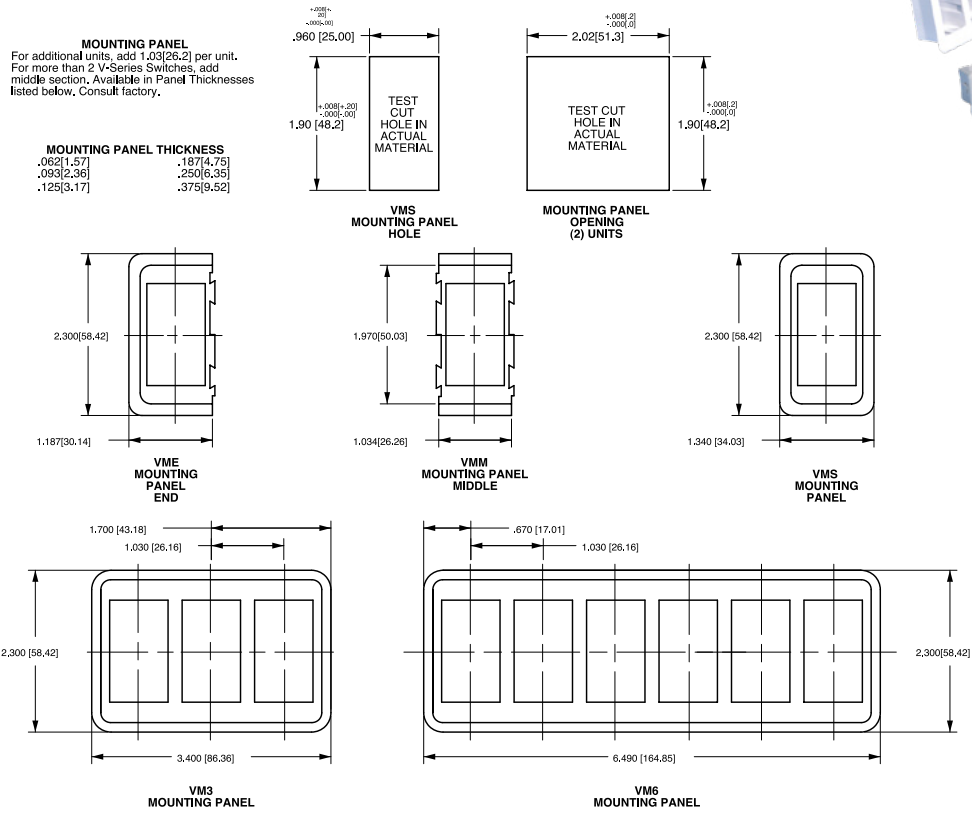
NOTES

Consult factory to determine availability for individual circuits and their HP rating.

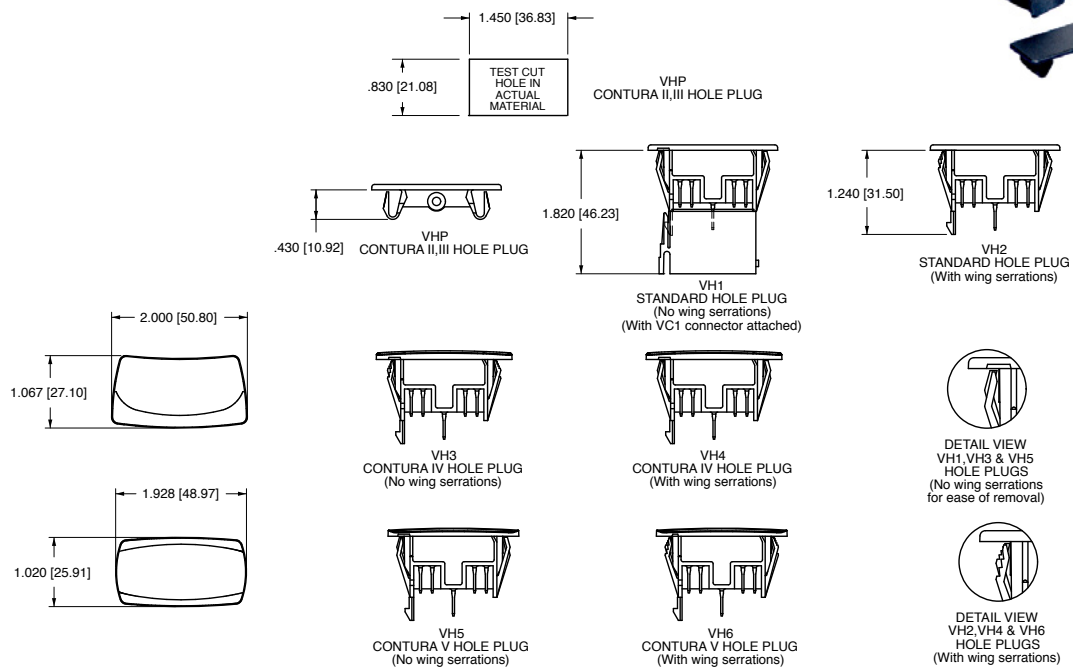
- Not available with Contura 7 or 14 rocker styles.
- Ratings 6 - 9 are UL, CSA & VDE certified, require terminations A or B for double pole circuits, & are not available with illumination circuits 4, 8, D, J, N, & T or with wire lead or solder lug terminations.

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]



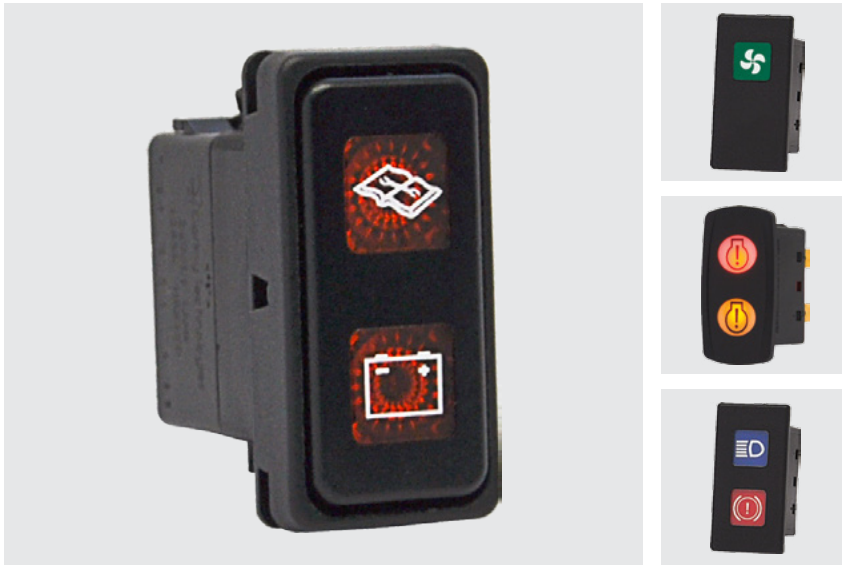
Contura Hole Plug Dimensional Specifications: in. [mm]



VP-Series

CONTURA ILLUMINATED INDICATORS

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



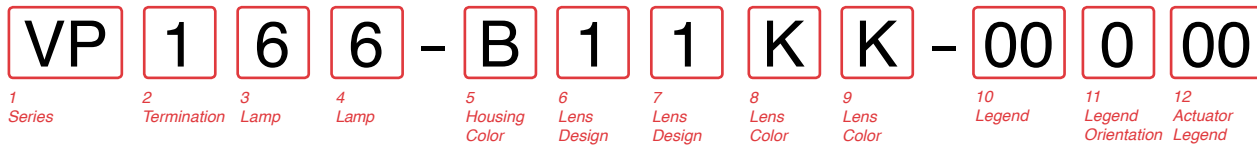
Product Highlights:

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

Typical Applications:

- ◆ Transportation





1 SERIES

VP Illuminated plug
 H2¹ Housing only
 H3² 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 3 24V 4 6V 5 12V 6 18V
 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 square¹⁰
 2 translucent square⁷
 3 laser etched¹⁰
 4 transparent oval
 5 translucent oval

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

Z	Clear	White	Amber	Green	Red	Blue	Legend
4	9	E	K	R	W	Y	One piece Square/Oval ¹¹
5	A	F	L	S	U	T	Two piece Square* (with clear top protective lens)
2	7	C	H	N	U	T	Two piece Square* (with smoke top protective lens)
1	6	B	G	M	T	T	Two piece Square* (with white top protective lens)

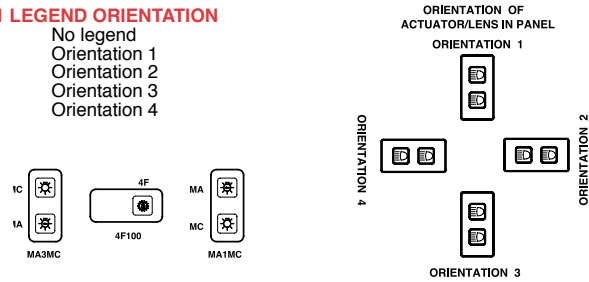
*All bottom lenses are molded of opaque material. Consult factory for other lens colors.

10 LAMP #1 LENS OR BODY LEGEND⁵

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 LEGEND⁵

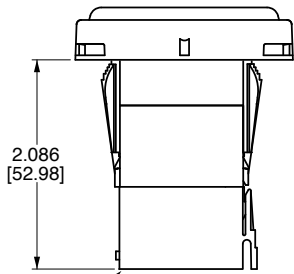
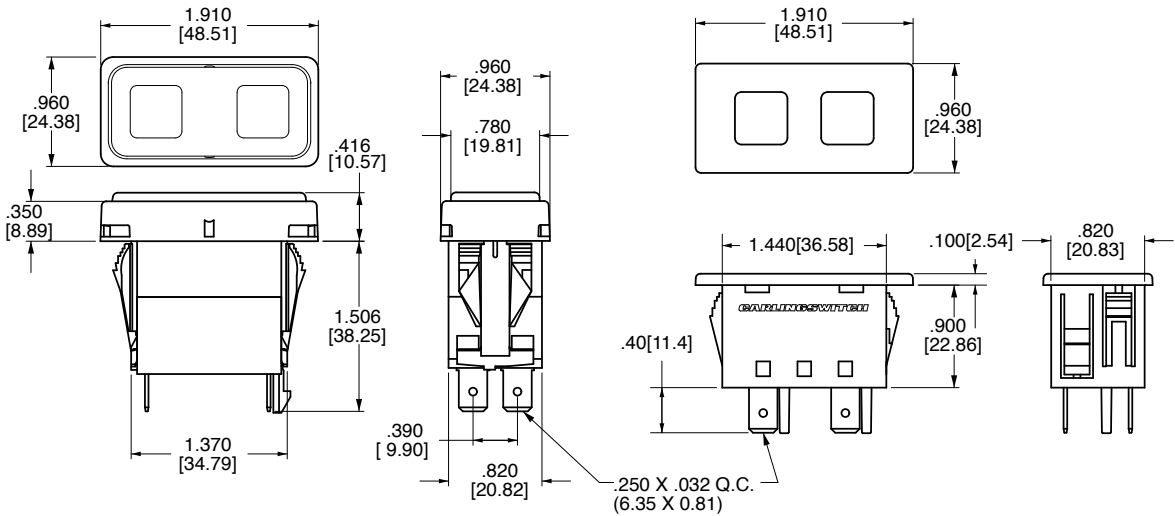
00 No legend
 For legend options, visit us at carlingtech.com

Notes:

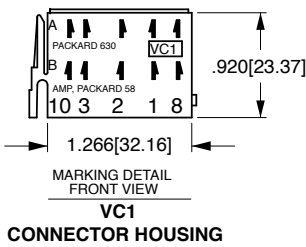
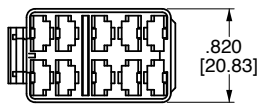
- To order housing with lenses only, specify H2 followed by fields 5-12. (flush bezel only)
- To order lamp module only, specify H3 followed by fields 2-3. (flush bezel only)
- Two piece lens not available with oval bezel.
- If only 1 lamp, specify 0 in selection 4 and Z in selections 7 & 9.
- Lamp and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

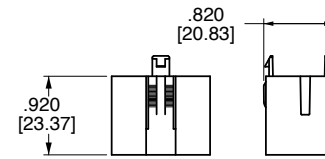
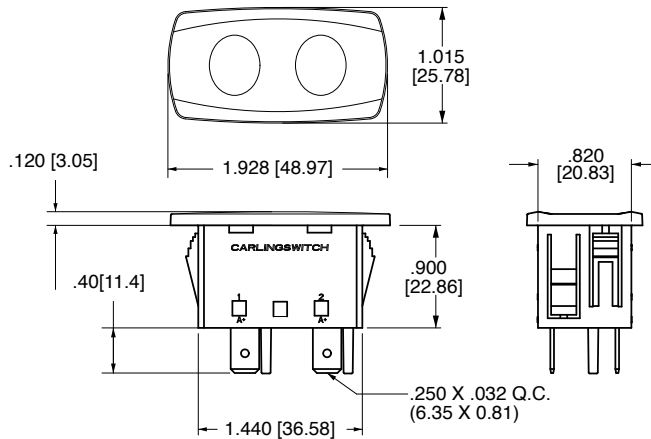
Dimensional Specifications: in. [mm]



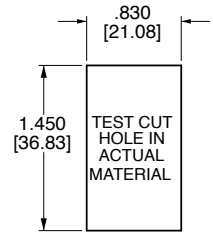
PLUG SHOWN WITH VC1 CONNECTOR



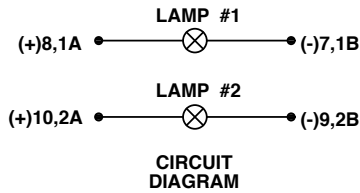
VC1 CONNECTOR HOUSING



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

Typical Applications:

- ◆ Marine equipment
- ◆ ON/OFF Highway equipment



W-Series Switch

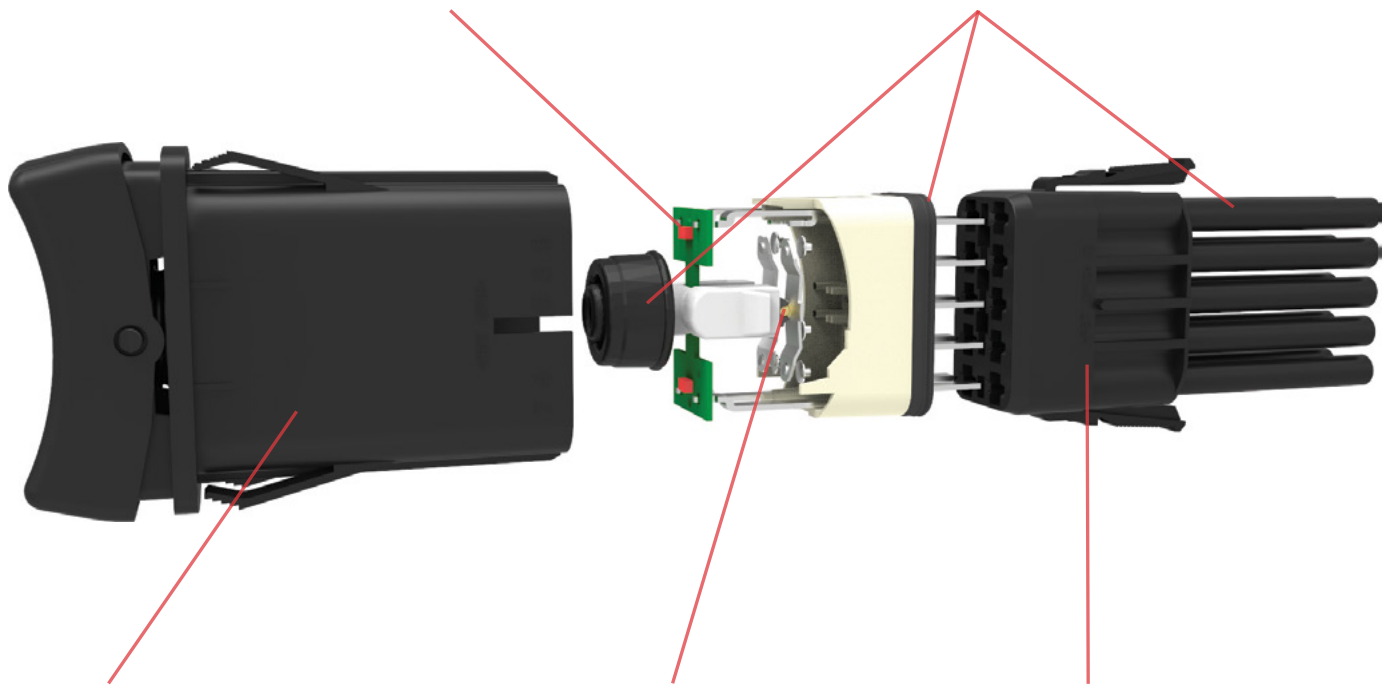
DESIGN FEATURES

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	Connect terminations.
Voltage	3-24 VDC
Overcurrent	15A for 50 cycles

Mechanical

Endurance	250,000 cycles minimum
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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

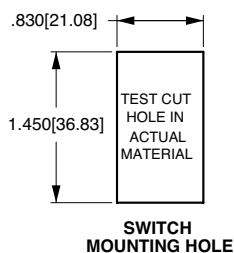
Environmental

Environmental	IP68, Fully sealed
Corrosion/ Chemical Splash	Flowing Mixed Gas (FMG) Class III 3 year accelerated exposure per ASTM B-827, B-845 -40°C to +85°C, 22 cycles, 300 hours
Operating Temperature	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz.
Vibration 1	Resonance search 24-50 Hz 0.40 DA 50-2000 ±10 G's peak Results Horizontal Axis 3-5 G's max.
Vibration 2	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



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

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

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

6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)

Selection 6: above terminals 1 & 4; Selection 7: above terminals 3 & 6

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

* 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	Clear	White	Amber	Green	Red	Blue	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-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

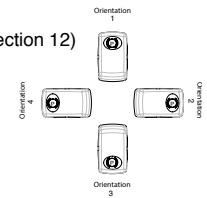
11 ON	12 OFF	13 I	14 O
OFF	ON	O	I
15 O O	16 O O	17 O I	18 I O
F N	N F	F	F
21 OFF	22 ON	23 O	24 I
25 O	26 O	27 O	28 I
F	N		



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

13 LEGEND ORIENTATION

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



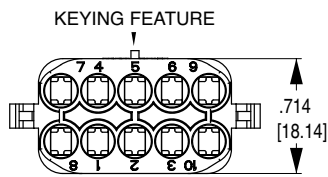
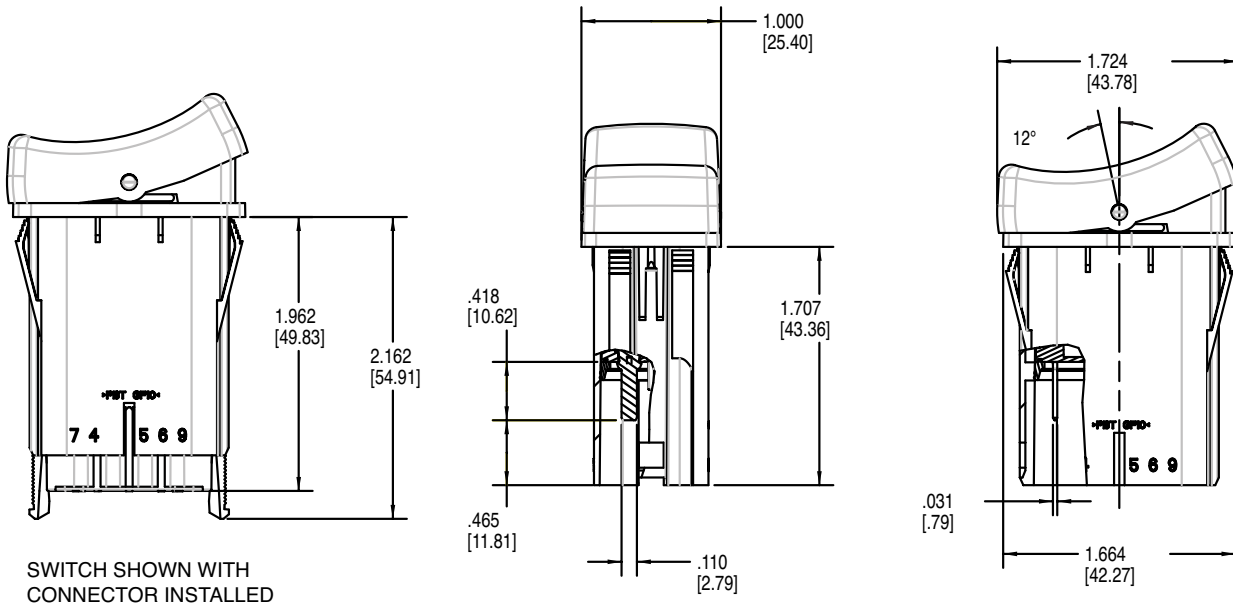
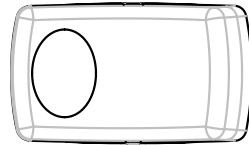
14 ACTUATOR LENS LEGEND 2

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

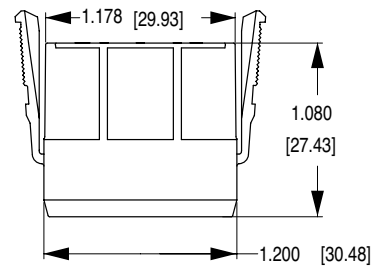
Notes:

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

Dimensional Specifications: in. [mm]



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



Watch Product Video



Product Highlights:

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

Typical Applications:

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



L-Series Switch

DESIGN FEATURES

LED LIGHTING

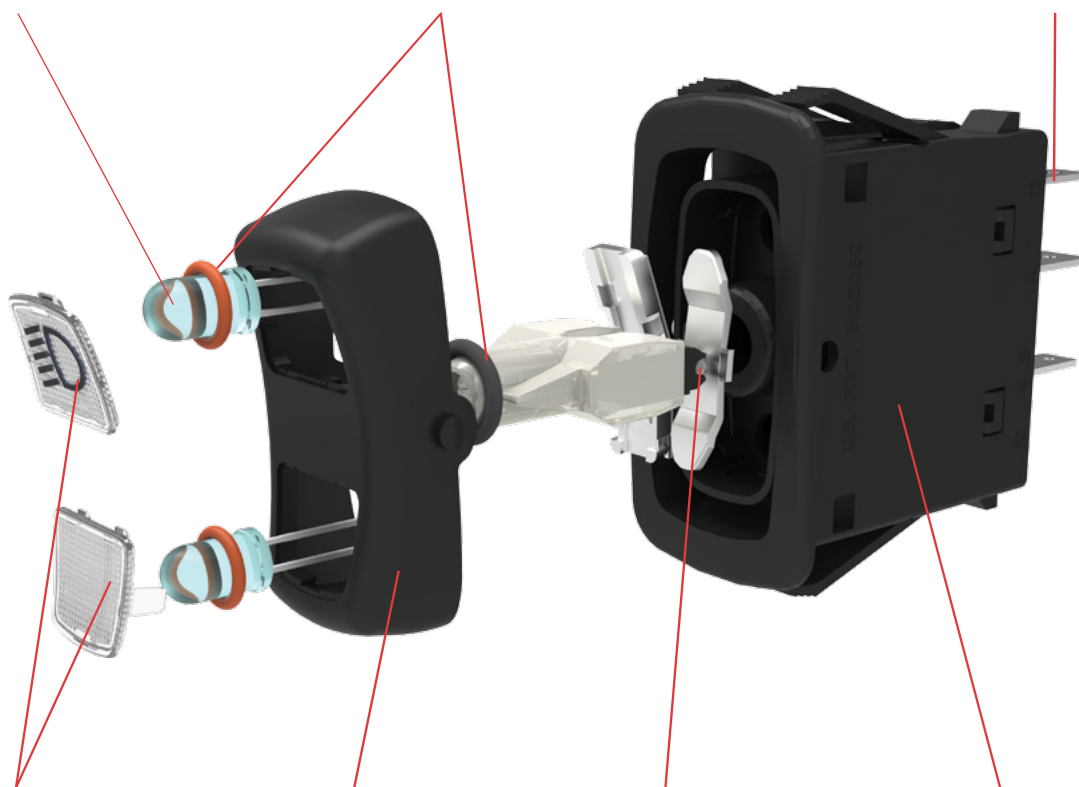
Utilize less current and are not affected by vibration, providing long lasting illumination. Available in 3 standard colors.

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].

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 oxide,	90/10 silver-nickel, silver tin-gold
Terminals	Brass or copper/silver plate 3/16" (4.76mm) & 1/4" (6.3mm) Quick Connect terminations standard.

Mechanical

Endurance	250,000 cycles minimum
-----------	------------------------

Physical

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

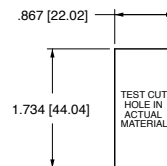
Actuator Travel (Angular Displacement)

2 position	26°
3 positions	13° from center

Environmental

Environmental	IP67 for above panel components of the actual switch, representing an index of protection as applied to electrical equipment in accordance with IEC 529, BS 5490, DIN 400 50 & NFC 20 010.
Corrosion	Mixed Flowing Gas MFG Class III per ASTM B-827 & B-845, Method H, with 3 years exposure.
Operating Temperature	-40°C to + 85°C
Vibration 1	Per Mil-Std 202F, Method 204D Test Condition A 0.06 DA or 10G's 10-500 Hz. Tested with connector. Test criteria - No loss of circuit during test and pre and post test contact resistance. 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
VCH	No loss of circuit during test; <10µ chatter. 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.
Vibration 2	Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs. Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C. Test criteria - pre and post test contact resistance.
Shock	Per Mil-Std 202F, Method 106F, Test Criteria - 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



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.

S	Lamps	Illumination Type	Lamp Wired to Terminals
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
-	7	C	H	N	U
3	-	D	J	P	V
-	9	E	K	R	W
5	A	-	-	-	-

Large Transparent, Large Translucent, Bar Transparent, Bar Translucent, Laser Etched background color

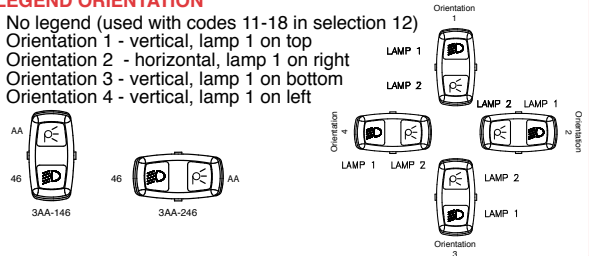
12 LASER ETCHED, LENS OR BODY LEGEND

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

13 LEGEND ORIENTATION

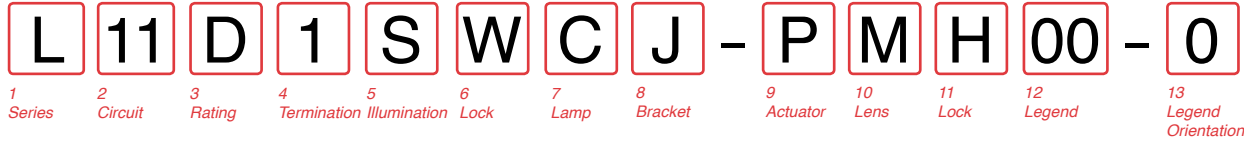
0 No legend (used with codes 11-18 in selection 12)

- 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



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	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

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

Locking Rocker	Black	Red
	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
-	7	C	H	N	U
3	-	D	J	P	V
-	9	E	K	R	W

Large Transparent
Large Translucent
Bar Transparent
Bar Translucent

11 LOCK FUNCTION AND COLOR

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

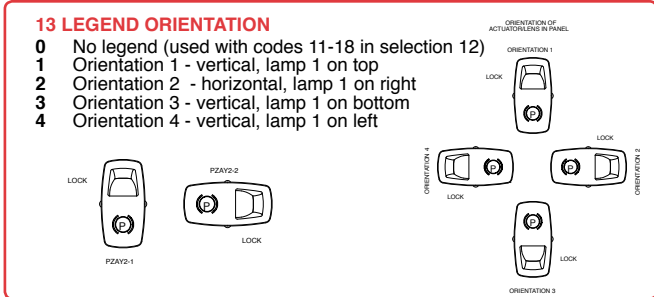
3 RATING 2

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

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

4 TERMINATION 4

1	.250 (6.4mm) TAB (QC)
3	.187 (4.7mm) TAB (QC)



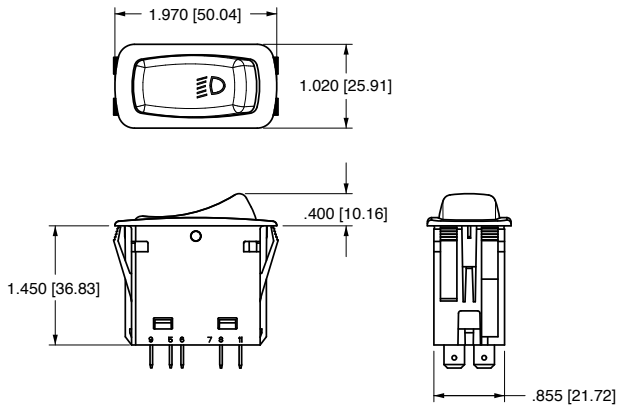
5 ILLUMINATION
Lamp #1: above terminals 9 & 10 end of switch.; Lamp #2 above terminals 11 & 12 end of switch. Positive (+) and negative (-) symbols apply to LED lamps only.

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

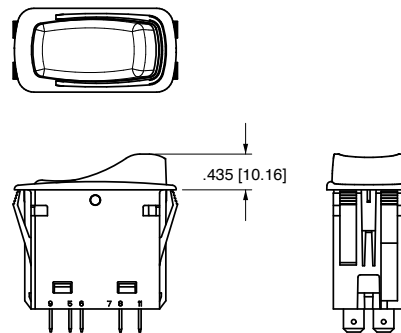
- Notes:
Consult factory to verify horsepower rating for your particular circuit choice.
1 Custom colors are available. Consult factory.
2 Additional lamp circuits available. Consult factory.
3 Available only with 3 position circuits.
4 Termination 3 only available with ratings 1, B and E.
5 Circuits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

Dimensional Specifications: in. [mm]

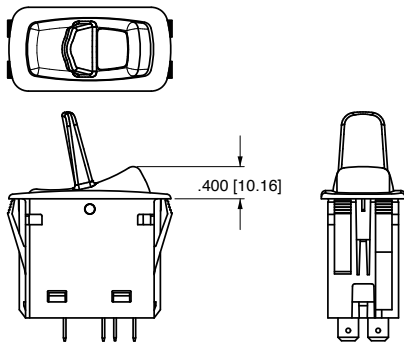
L-SERIES
SHOWN WITH LASER ETCHED
ACTUATOR



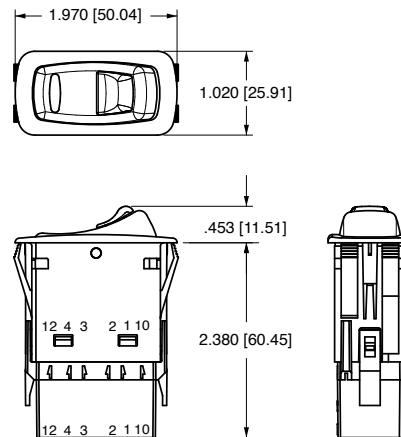
L-SERIES
SHOWN WITH ROCKER GUARD



L-SERIES
SHOWN WITH LARGE LENS
AND PADDLE ACTUATOR



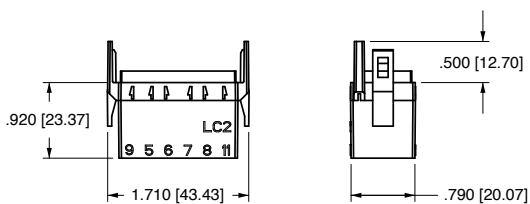
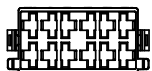
L-SERIES
SHOWN WITH BAR LENS, LOCK
AND CONNECTOR



Connector

L-SERIES
CONNECTOR

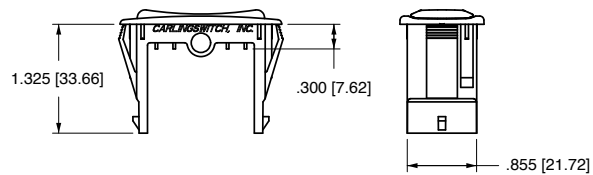
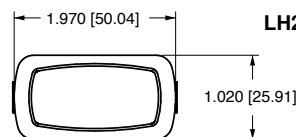
- LC1-01** BLACK .250 TAB CONNECTOR (PACKARD 630 SERIES)
- LC2-01** BLACK .187 TAB CONNECTOR (PACKARD 480 SERIES)
- LC3-01** BLACK .250 TAB CONNECTOR (AMP ONLY)



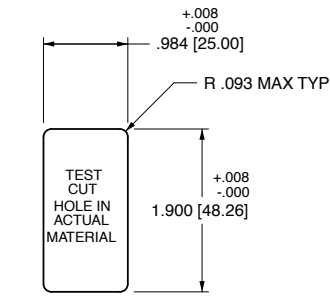
Hole Plug

L-SERIES
HOLE PLUG

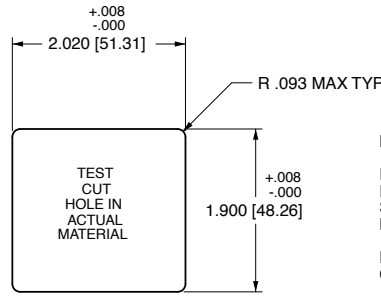
- LH1** REMOVABLE HOLE PLUG WITH NON-SERRATED WINGS
- LH2** HOLE PLUG WITH SERRATED WINGS



Dimensional Specifications: in. [mm]



LMS MOUNTING PANEL HOLE



MOUNTING PANEL OPENING (2) UNITS

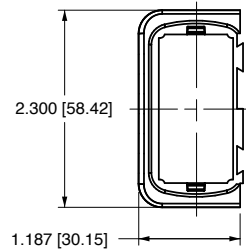
MOUNTING PANEL

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

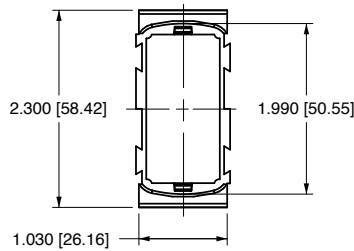
DIMENSIONS: LME 2.02 [51.3mm] PLUS NUMBER OF CENTER BEZELS (LMM) X 1.034 [26.26mm]

MOUNTING PANEL THICKNESS

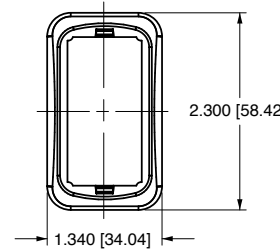
- .062 [1.57]
- .093 [2.36]
- .125 [3.17]
- .156 [3.96]



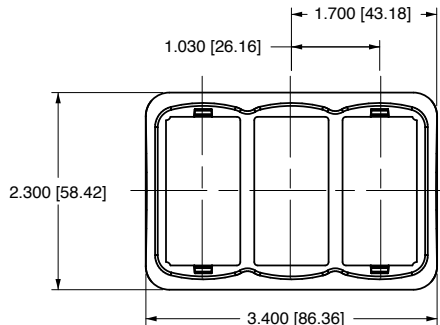
LME MOUNTING PANEL END



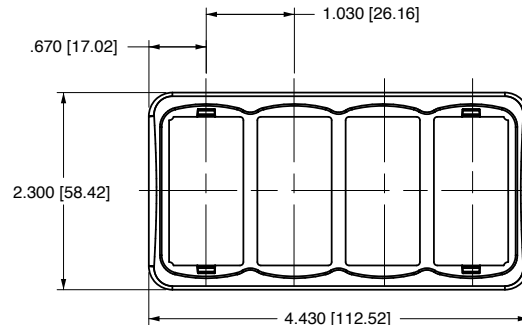
LMM MOUNTING PANEL MIDDLE



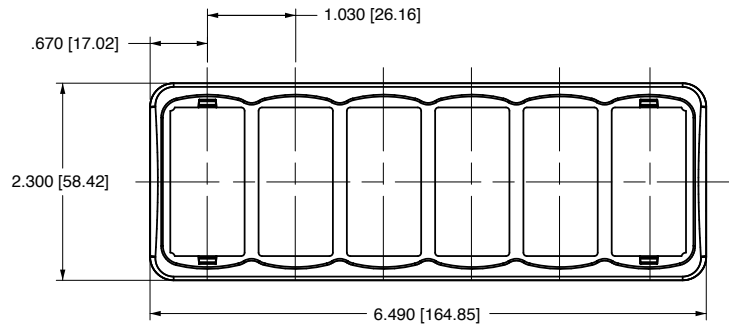
LMS MOUNTING PANEL



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	

LEGEND	
SYMBOL	DEFINITION
	TERMINAL LOCATION
	LAMP LOCATION
	MAINTAINED CIRCUIT
	MOMENTARY CIRCUIT
	INTERNAL CONNECTION (JUMPER TERMINAL)
	2 POSITION CONNECTION
	2 POSITION
	3 POSITION

LP-Series

ILLUMINATED INDICATORS

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



Product Highlights:

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

Typical Applications:

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



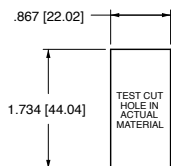
Electrical

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

Physical

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

Mounting Specifications



MOUNTING HOLE

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

Environmental

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

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



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 (-).

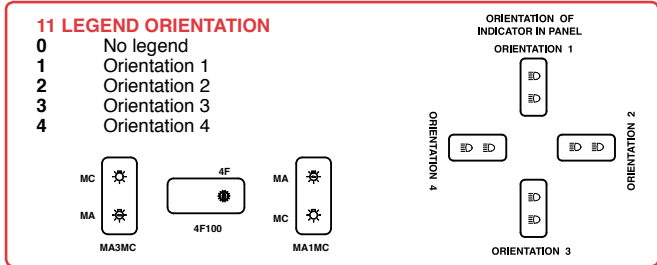
No lamp	0 (position 5 only)	4 3V	5 6V	6 12V	7 18V	8 24V
Incandescent						
LED	Amber	Green	Red			
2VDC	L	F	R			
6VDC	M	G	S			
12VDC	N	H	T			
24VDC	P	J	V			

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)

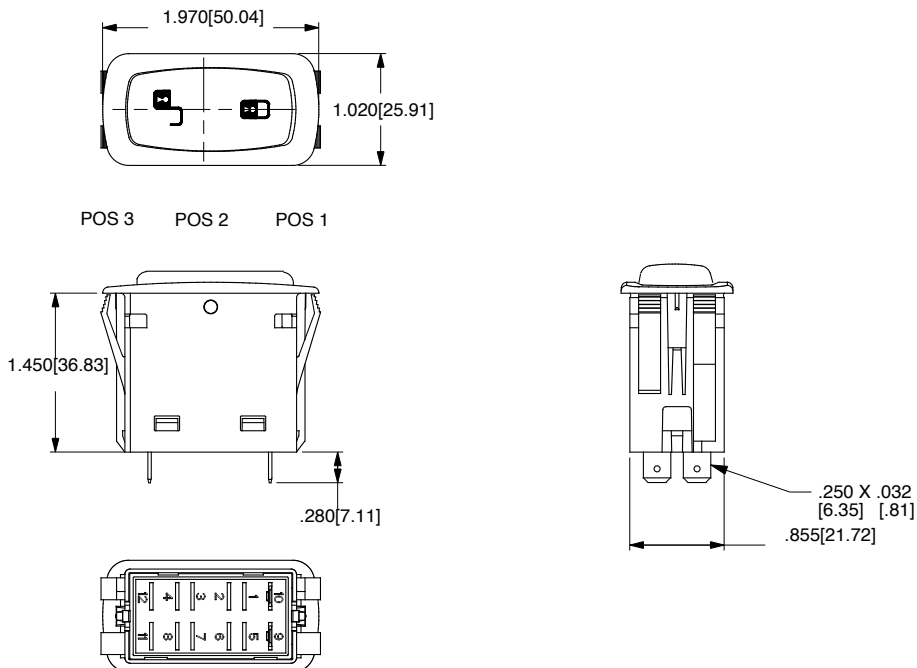
8, 9 STYLE (same coding for both selections)
Z Not Painted (used with Insert Colors A-F)
5 Clear Laser Etch Background Color (used with Insert Color 9)
A White Laser Etch Background Color (used with Insert Color 9)

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



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).



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

Typical Applications:

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



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 3/16" (4.76mm) & 1/4" (6.3mm) Quick Connect terminations standard.

Mechanical

Endurance	.250,000 cycles minimum
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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

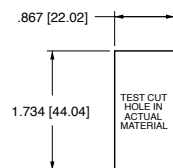
Actuator Travel (Angular Displacement)

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
Shock	No loss of circuit during test; <10µ chatter. 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

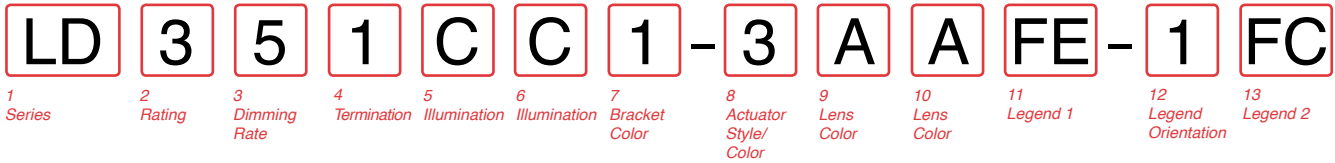
Mounting Specifications



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.



1 SERIES
LD Electronic Dimmer Control

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

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

4 TERMINATION
1 .250 TABS (6.4 mm)

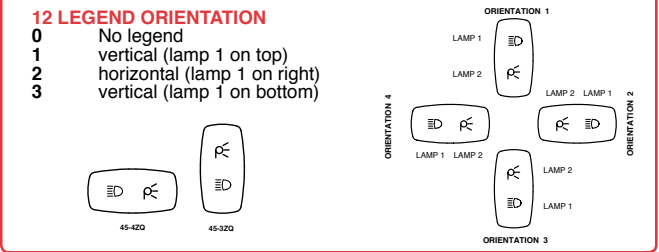
5 & 6 ILLUMINATION
No lamp S
12V LED C N H
24V LED D P J
Red Amber Green

7 BRACKET COLOR 1
1 Black 2 White 3 Gray

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

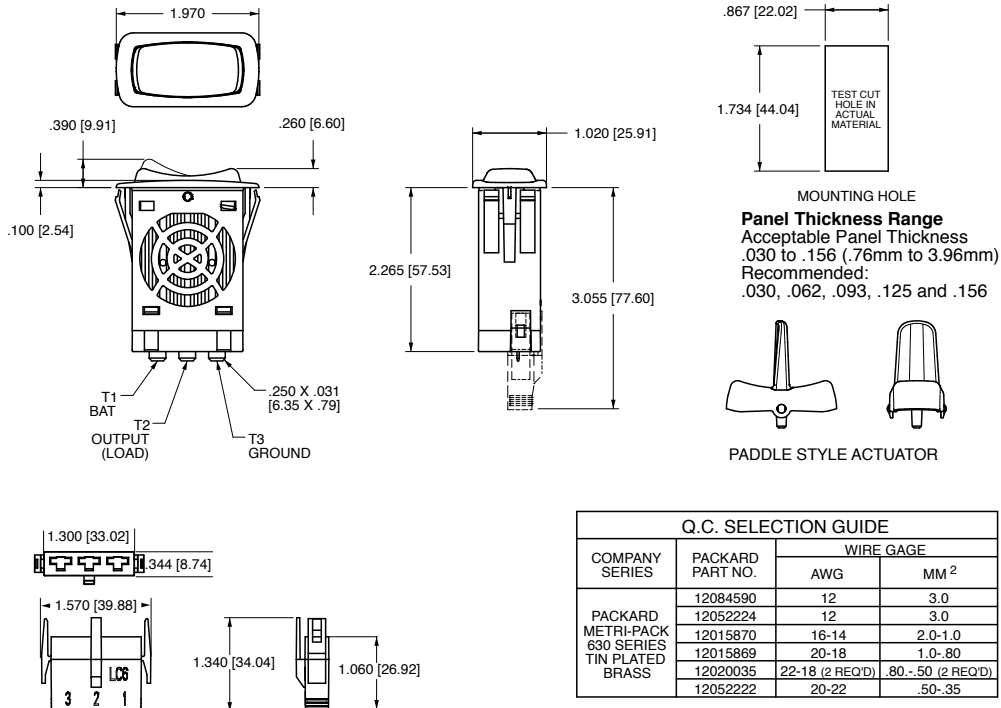
9 & 10 LENS COLOR
Z No Lens
1 Clear 2 White 3 Amber 4 Green 5 Red 6 Blue
7 B C D E
8 G H J K
9 M N P R
10 T U V W
Lens Style
Large Transparent
Large Translucent
Bar Transparent
Bar Translucent
Laser Etch

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



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

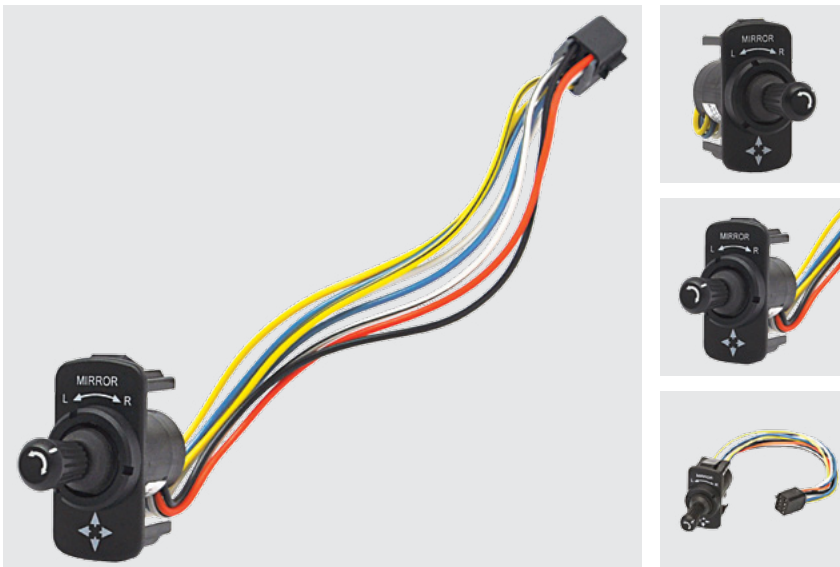
Notes:
1 Custom colors are available. Consult factory.



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

Typical Applications:

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



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

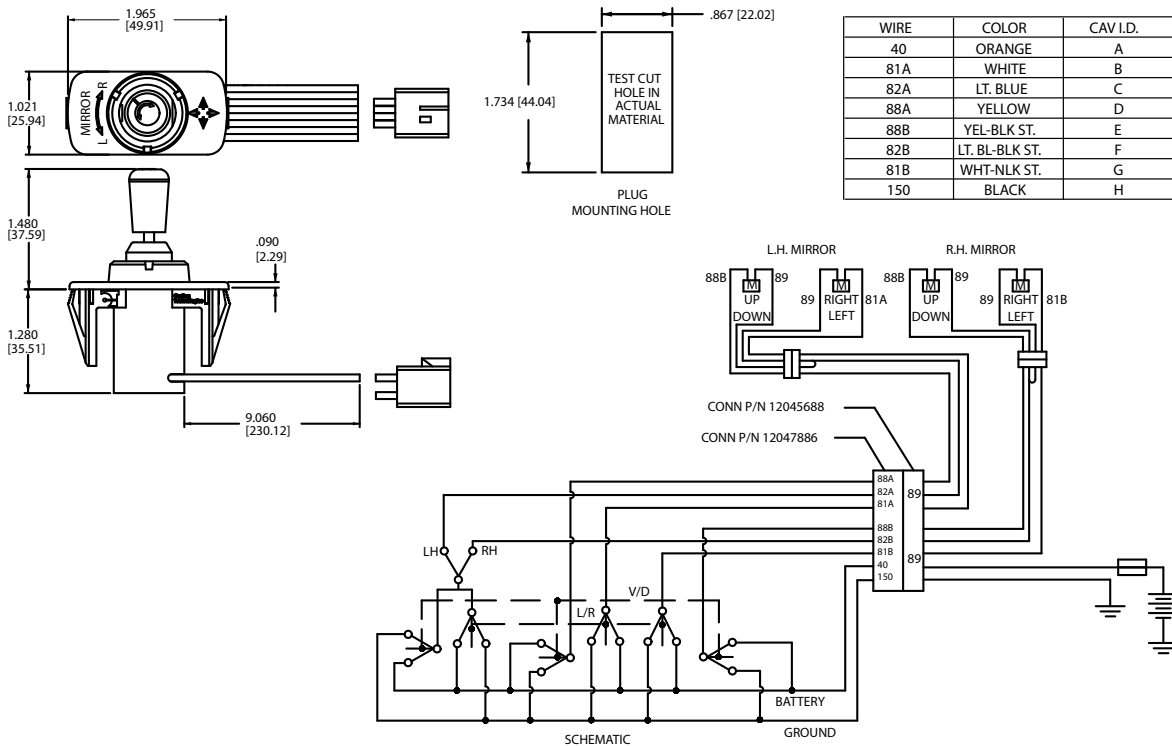
1 BASE PART NUMBER: SERIES / RATING / FUNCTION / TERMINATION
LMR 2 position (left, right), 4 axis (N,S,E,W) with wire leads

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.



*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

Typical Applications:

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



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

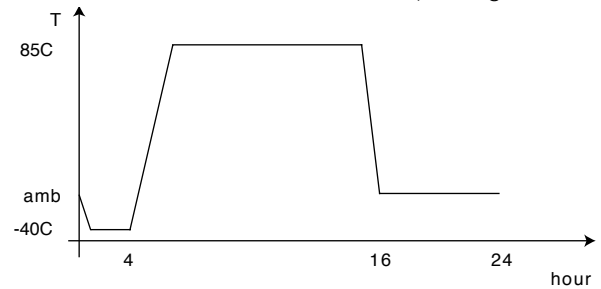
Mechanical Vibration	Sinusoidal Vibration: 10-55-10 Hz, 0.06" DA, one minute-cycle, three hours/axis Random Vibration: Three hours/axis, three mutually perpendicular axes with a test level 4G's. Frequency Amplitude 5Hz 0.16 G2/Hz 100Hz 0.16 G2/Hz 500Hz -3dB/octave roll-off Tests were conducted according 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

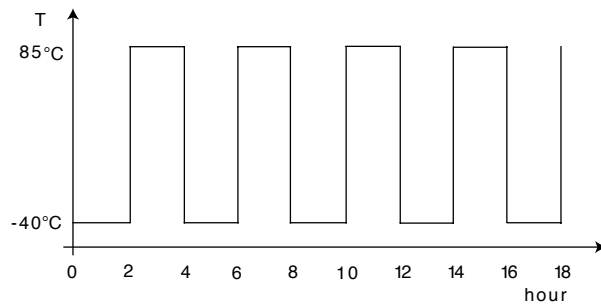
Illumination	LED, rated 100,000 hours 1/2 life
Cover	Acetate
Washer Actuator	Silicone
Toggle Actuator	Nylon 6/6 glass filled
Bracket	Nylon 6/6
Connector	Nylon 6/6 rated 85°C polarized
Washer Function	Momentary
Toggle Function	Maintained Intermittent
Operation	Momentary
Weight	44 grams

Environmental

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

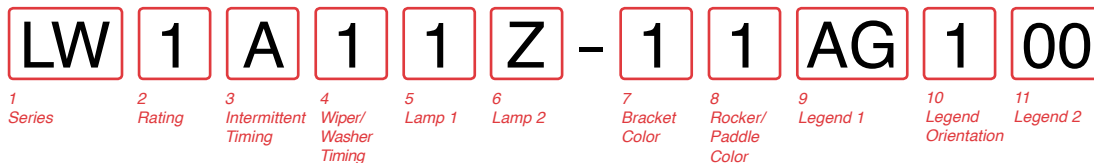


Thermal Shock	According to SAE J1455, Sec. 4.1.3.2 (See Figure below)
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Humidity	According to SAE J1455, Sec. 4.2.3 (30 cycles for 8 hrs. with maximum temperature of 85°C and 95% relative humidity.
Dust Bombardment	According to SAE J1455, Sec. 4.7.3 (with dust concentration of 0.88gm/m ³ for 24 hours.)
Salt Spray	MIL-STD-202G, Method 101D for 96 hours.

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



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

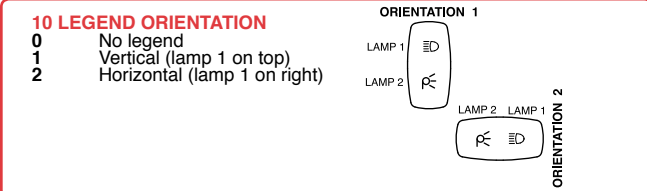
5 LAMP #1 (ABOVE WASH)
Z No Lamp **2** Red LED
1 Green LED **3** Amber LED

6 LAMP #2 (ABOVE WIPE)
Z No Lamp **2** Red LED
1 Green LED **3** Amber LED

7 BRACKET COLOR
1 Black

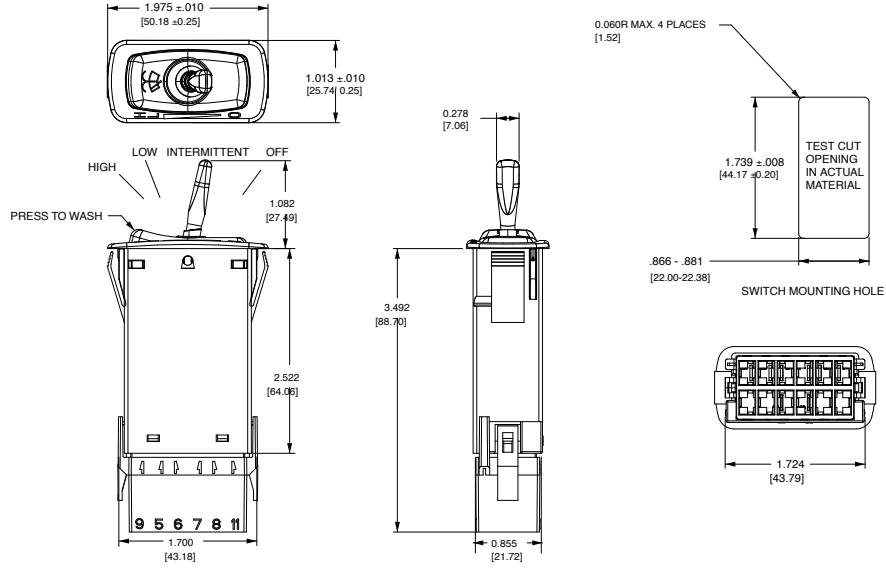
8 ROCKER / PADDLE COLOR
1 Black

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



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

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



Principles of operation:

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

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

N-Series

ADDRESSABLE ROCKER SWITCHES

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



Resources:

[Download 3D CAD Files](#)

[IGS >](#) [STP >](#)

Product Highlights:

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

Typical Applications:

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



Electrical

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

Mechanical

Endurance	250,000 cycles minimum
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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

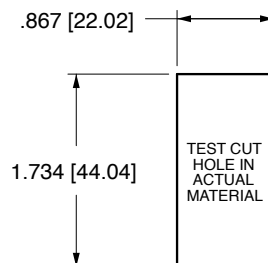
Actuator Travel (Angular Displacement)

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% NCl 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.

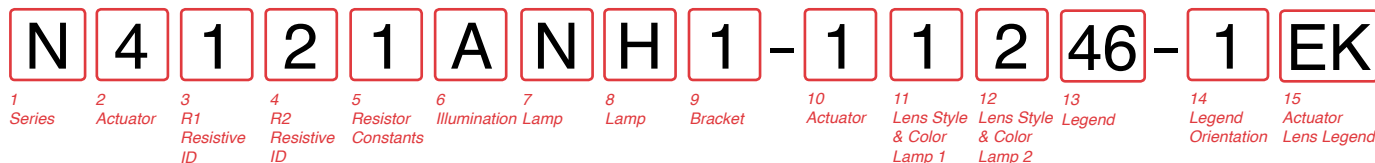
Mounting Specifications



MOUNTING HOLE

Panel Thickness Range

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



1 SERIES
N

2 CIRCUIT²
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.

S	Lamps	Illumination Type	Lamp wired to Terminals
A	# 1	Standard	10+ 12-
A	# 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-
3	# 2	Independent	12+ 9-
4	# 1	Independent	10+ 9-
4	# 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* 12VDC	Red C	Amber N	Green H
* Consult factory for "daylight bright", blue/green and white LED options. Typical current draw for LED is 20ma.			

9 BRACKET COLOR¹

	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 COLOR¹

	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

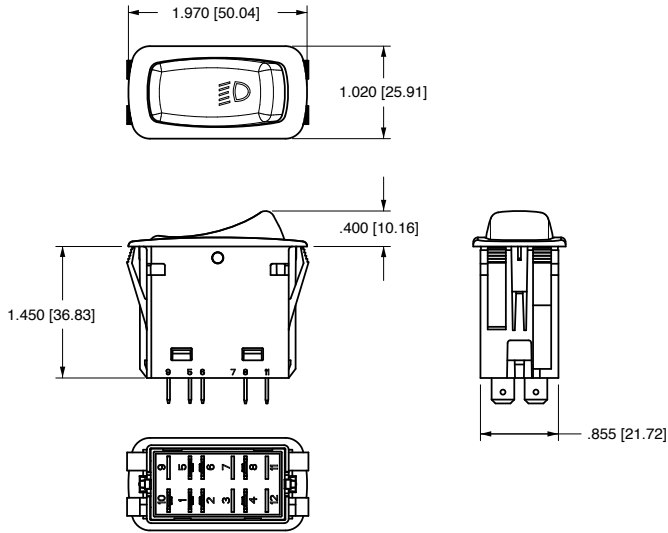
15 ACTUATOR LENS LEGEND
00 No legend this location / no actuator
For legend options & codes, see pages 54-65 of this catalog.

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

Dimensional Specifications: in. [mm]

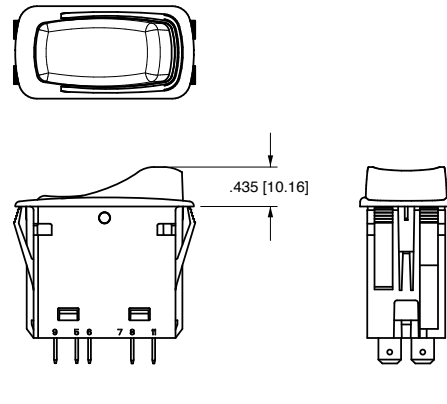
N-SERIES

SHOWN WITH LASER ETCHED ACTUATOR



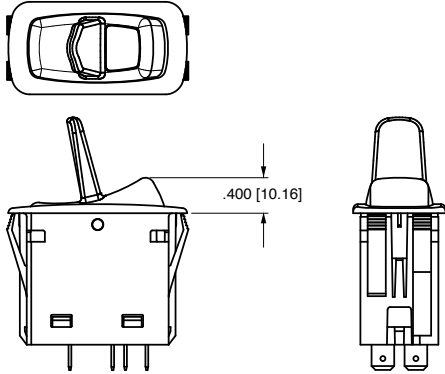
N-SERIES

SHOWN WITH ROCKER GUARD



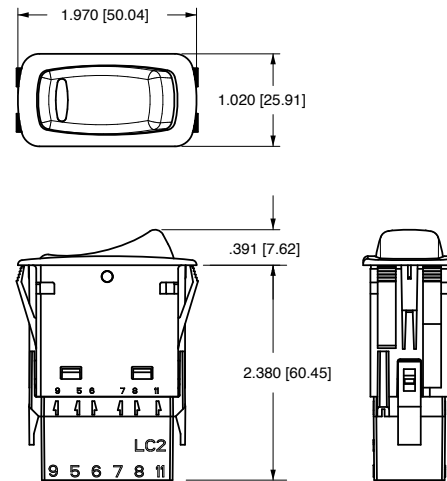
N-SERIES

SHOWN WITH LARGE LENS AND PADDLE ACTUATOR



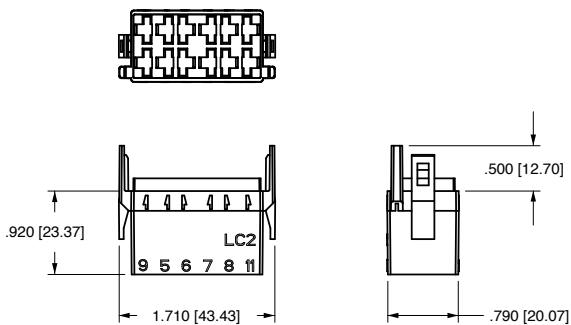
N-SERIES

SHOWN WITH BARS LENS AND CONNECTOR



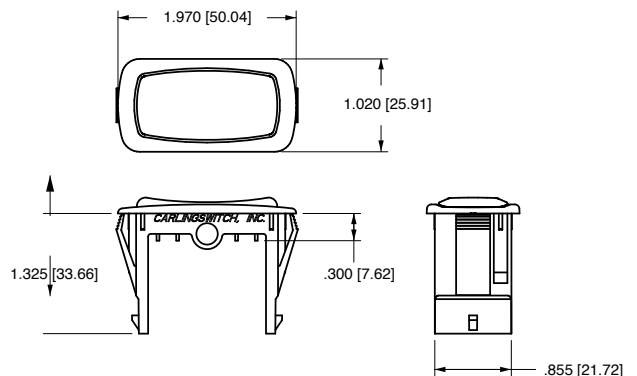
N-SERIES

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	<p>INTERNAL CIRCUIT BOARD (TYPICAL)</p>
5	
6	
7	
8	

Lamp Circuit Diagrams:

ILLUM. CODE	SCHEMATIC
A	
B	
C	
1	
2	
3	
4	

LEGEND		LEGEND CODE		
SYMBOL	NAME <small>(SYMBOL MEANING)</small>	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 <small>(SYMBOL MEANING)</small>	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

Notes:

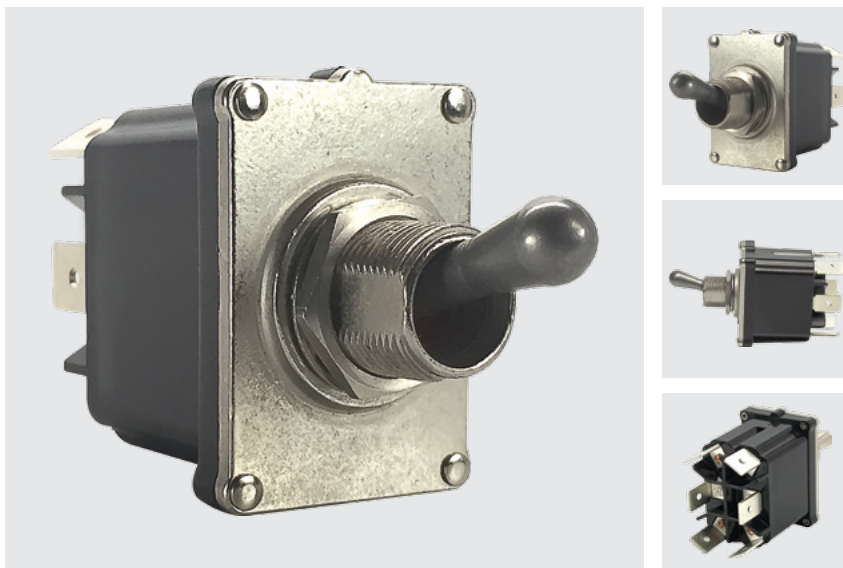
- Negative legends not available on L, LD, LW, and N-Series.
- Many symbols are SAE (J1362), ANSI and ISO approved symbols. Consult factory for custom symbols/icons.
- Use "body" legend codes for laser etched image identification.

ST-Series

SEALED TOGGLE SWITCHES

Designed to comply with MIL-DTL-3950G requirements for environmentally sealed toggle switches, Carling Technologies ST-Series Sealed Toggle Switch features innovative design and performance principles that are sure to withstand the most demanding applications.

The ST-Series features an innovative toggle seal composed of dynamic silicone material that bonds to the metal toggle, pin and bushing, providing ideal sealing and protection against the environment, vibration and shock, while withstanding extreme temperature variations. It also utilizes up to three terminal seals per pole and an optional o-ring assures additional under panel sealing protection. All silicone seals on the ST-Series comply with A-A-59588 for silicone rubber performance specifications and, together, these features meet the international IEC 60529 standard for sealing performance to an IP68 level.



Product Highlights:

- ◆ Designed to comply with MIL-DTL-3950G requirements
- ◆ IEC 60529 IP68 sealing performance
- ◆ Toggle seal bonds to toggle, pin and bushing
- ◆ Complies with UL 61058-1 requirements for spacing between poles

Typical Applications:

- ◆ Military Equipment
- ◆ Armored Vehicles
- ◆ Law Enforcement Vehicles
- ◆ Off-Highway Vehicles
- ◆ Applications that requires stringent sealing and performance capabilities



ST-Series Switch

DESIGN FEATURES

PIN TOGGLE/BUSHING

Keeps metal toggle firmly in place and prevents rotation

BRASS ROLLER PIN

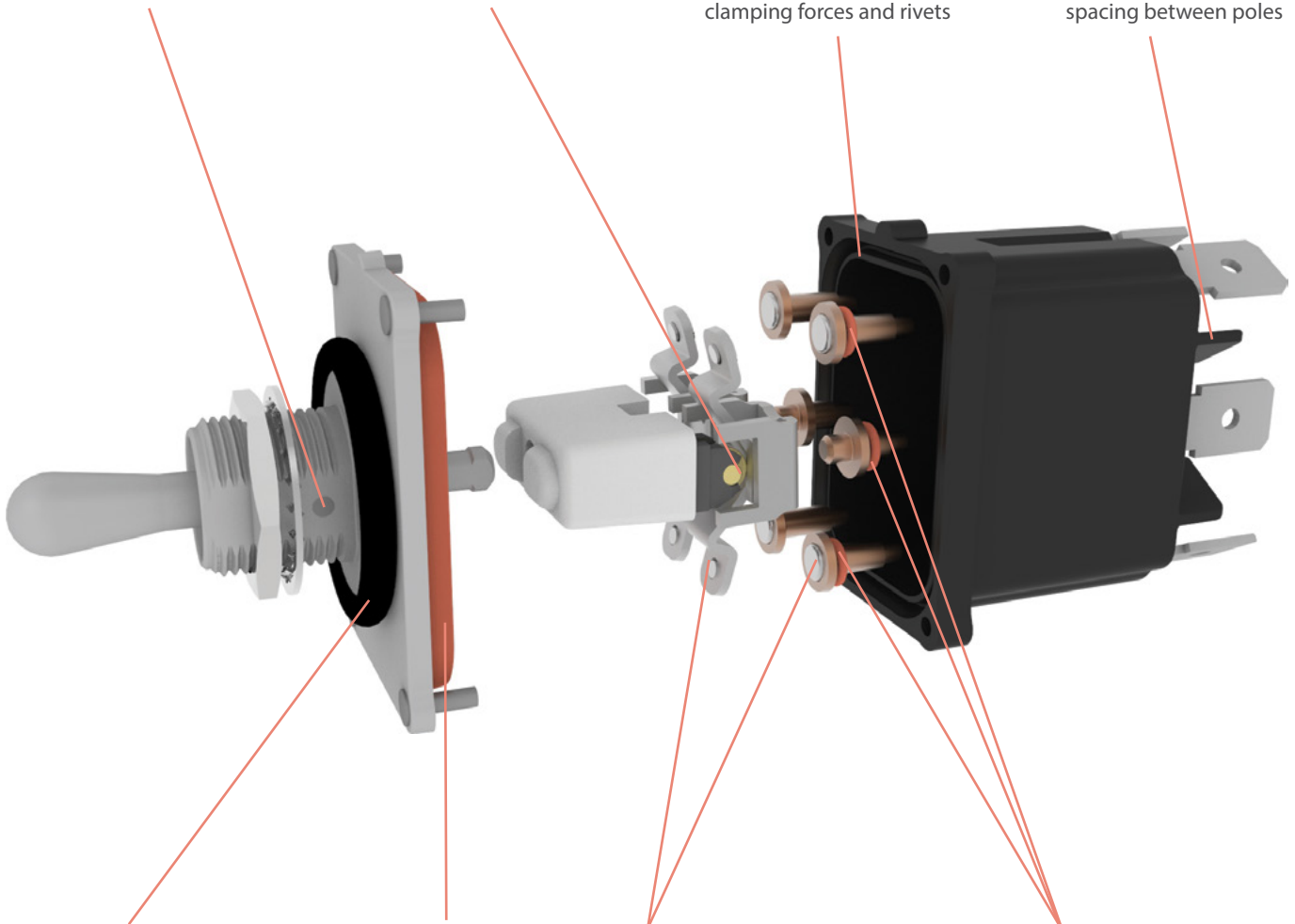
Provides rolling metal on metal actuation for maximum durability

BASE SEAL CHANNEL

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

TERMINAL BARRIERS

Comply with UL-61058-1 electrical requirements for spacing between poles



OPTIONAL O-RING

Assures additional under panel sealing protection

BUSHING/TOGGLE SEAL

Composed of dynamic silicone material that bonds to the metal toggle, pin and bushing

RIVETS

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

TERMINAL SEALS

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

Electrical

Contact Rating	16 amps, 12V
Dielectric Strength	MIL-STD-202G, Method 301 (1500 Volts RMS)
Insulation Resistance	MIL-STD-202G, Method 302 (50 MegOhms, 500 VDC)
Initial Contact Resistance	MIL-STD-202G, Method 307 (10 milliOhms max. @4VDC, 1 A)
Life	MIL-DTL-3950G, Section 4.8.11 (10-18 cpm, 3-5 in/sec velocity.) Overload: 50 cycles at 150% rated resistive load, .5 sec. min. closed time at room ambient. Resistive Load 3: 20,000 cycles at +71C; 50,000 cycles at +23C ambient, 20,000 cycles at -40C Temperature Rise: performed per UL 61058 30C rise after 6K cycles, 55C at end.
Contacts	Silver Alloy
Terminals	Copper Alloy / silver plated. Tab Terminal: Riveted, vertical ¼" quick-connect; MIL-STD-202G, Method 211 Test Condition A, and B: 25 lb. pull test, two terminal bends.

Physical

Function	Single Pole and Double Pole with Single Throw and Double Throw
Operation	Two and three position circuits
Toggle	Nickel plated brass.
Actuator, Internal	Polyester PBT, UL94-V0 and fungus resistant per ASTM G- 21
Seals	All seals are silicone per A-A-59588-1A.
Mounting	15/32"-32 UNS-2A threaded bushing with a keyway. A single nut and lock washer are supplied unassembled.
Bushing/Top Plate	Zinc/aluminum die cast, with nickel plating.
Base	Polyester PBT, UL94-V0 and fungus resistant per ASTM G-21
Actuation Force	Circuit D, 540G, 1.2Lb Circuit J, from Center 815G, 1.8Lb, from ON 500G, 1.1Lb
Angular Movement	15.5 degrees, each side of center

Mechanical

Life	150,000 cycles total (at ambient temperature). MIL-DTL-3950G, Section 4.8.10 (Continuity after -55C open for 2 hrs; 40,000 cycles at 10-18 cpm. Samples at -55C and samples at +71C.)
------	---

Environmental

Environmental	Operating: -40C to +85C. Storage: -65C to +85C.
Vibration	MIL-STD-202G: Method 204D, Test Condition A (10 G peak, Harmonic, 10Hz to 500Hz sweeps, 9 hours total).
Shock	MIL-STD-202G: Method 213B, Test Condition K (30 G, half sine)
Handling Drop	SAE J1455, Section 4.11.3.1, 1 meter drop in each of three planes
Sealing	MIL-STD-202G, Method 110 (sand and dust) IEC 60529, IP68 (dust-tight and continuous immersion in water)
Salt Atmosphere	MIL-STD-202G, Method 101, Test Condition A (96 hrs)
Thermal Shock	MIL-STD-202G, Method 107, Test Condition A (five cycles in air: -55C, +25C, +125C, +25C)
Moisture Resistance, Humidity	MIL-STD-202G, Method 106 (ten 24-hour stepped cycles)
Chemical Resistance	No permanent loss of function, obvious loss of sealing, distortion, softening, embrittlement, discoloration or corrosion after being brushed for 10 minutes, wetting all exposed surfaces. Relevant chemical compatibility documentation may be used in place of testing.

Chemical	Concentration
Diesel Fuel	100%
Gasoline	100%
Ethylene Glycol	50% in water
Ethanol/Methanol	10% in water

ST **A** **2** **D** **1** - **58**

1 Series 2 Circuit 3 Poles 4 Rating 5 Termination 6 Toggle Style

1 SERIES
ST Sealed Toggle

4 RATING ²
D 16A, 12V

2 CIRCUIT
 Connected Terminals

Position:	1	2	3
A	ON	NONE	OFF
B	(ON)	NONE	OFF
C	ON	NONE	(OFF)
D	ON	NONE	ON
F	ON	NONE	(ON)
J	ON	OFF	ON
K	ON	OFF	(ON)
L	(ON)	OFF	(ON)

5 TERMINATION
1 .250 (6.4mm) TAB (QC)
4 Screw with Cage Clamps

6 TOGGLE STYLE

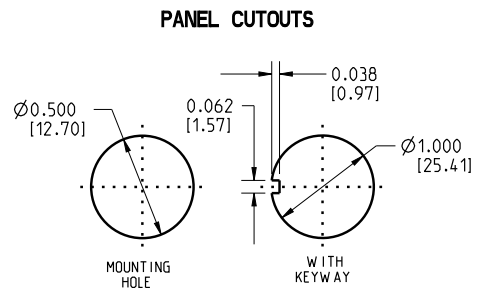
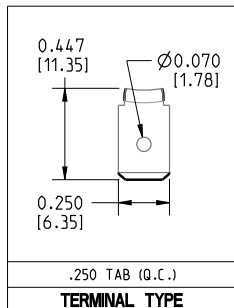
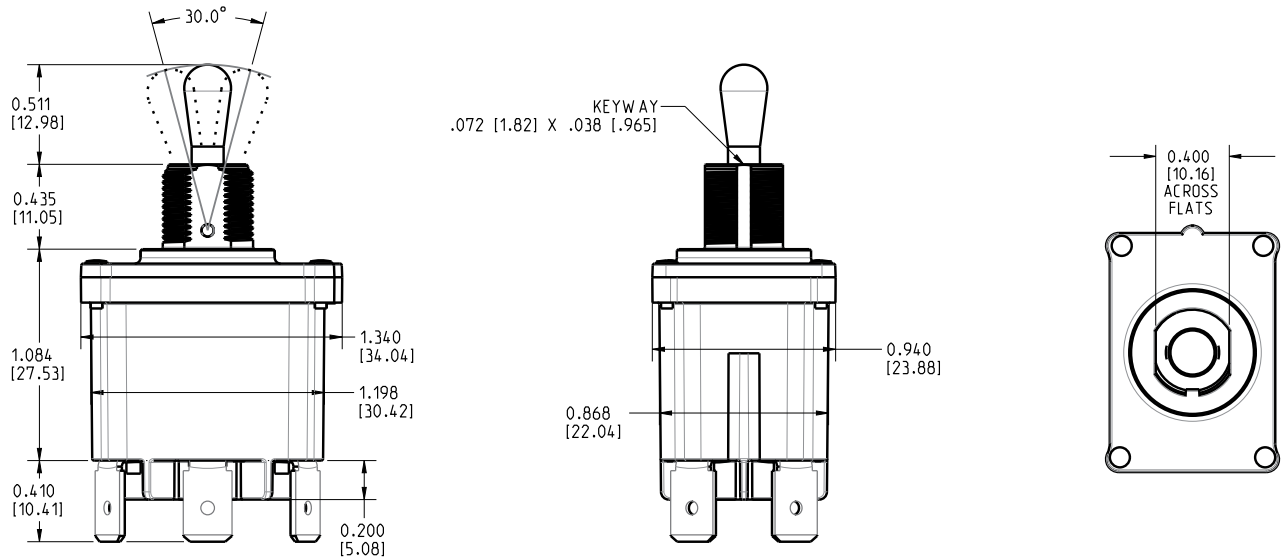
	Toggle Length	Bushing Length
53 Without Panel Seal	.511	.435
58 With Panel Seal (Bulk)	.511	.435

3 POLES

Position:	1	2	3
1	2 to 3	NONE	1 to 2
2	2 to 3, 5 to 6	NONE	1 to 2, 4 to 5

Notes:
 1 Standard hardware is (1) inner tooth lock washer and (1) hex nut bulk.
 2 UL and CUL approved AC Ratings available Q3 2014

Dimensional Specifications: in. [mm]



LT-Series

TOGGLE SWITCHES

The LT-Series illuminated toggle switches feature up to a three-color lighting sequence from a single lamp. These lighted toggles contain neoprene bushing seals for dust and moisture protection. A variety of circuits and terminations are available.



Product Highlights:

- ◆ 1 or 2 Pole
- ◆ Independent or Dependent Illumination
- ◆ Choice of 5 Actuator Styles
- ◆ Up to 3 different colors under a single lens

Typical Applications:

- ◆ Marine
- ◆ Transportation



Dielectric Strength

1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

LT-1561 - 1 30 - 012

¹
Base Part Number

²
Actuator
Style

³
Lighting
Sequence

⁴
Lamp Voltage

1 BASE PART NUMBER: SERIES / POLES / ILLUMINATION / CIRCUITRY / RATING / TERMINATION ⁵

10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 15A 12-28VDC

Single Pole	Solder Lug	.250 Tab QC	Screw Terms	Wire Leads
On-None-Off	LT-1510	LT-1511	LT-1514	LT-1515
On-None-(Off)	LT-1520	LT-1521	LT-1524	LT-1525
(On)-None-Off	LT-1530	LT-1531	LT-1534	LT-1535
On-None-On	LT-1540	LT-1541	LT-1544	LT-1545
On-None-(On)	LT-1550	LT-1551	LT-1554	LT-1555
On-Off-On	LT-1560	LT-1561	LT-1564	LT-1565
On-Off-(On)	LT-1570	LT-1571	LT-1574	LT-1575
(On)-Off-(On)	LT-1580	LT-1581	LT-1584	LT-1585
Double Pole	Solder Lug	.250 Tab QC	Screw Terms	Wire Leads
On-None-Off	LT-2510	LT-2511	LT-2514	LT-2515
On-None-(Off)	LT-2520	LT-2521	LT-2524	LT-2525
(On)-None-Off	LT-2530	LT-2531	LT-2534	LT-2535
On-None-On	LT-2540	LT-2541	LT-2544	LT-2545
On-None-(On)	LT-2550	LT-2551	LT-2554	LT-2555
On-Off-On	LT-2560	LT-2561	LT-2564	LT-2565
On-Off-(On)	LT-2570	LT-2571	LT-2574	LT-2575
(On)-Off-(On)	LT-2580	LT-2581	LT-2584	LT-2585

2 ACTUATOR STYLE

Paddle ¹

1	Clear Paddle
4	Solid Color Paddle

Snapkap Style ²

5	Bright Chrome
6	Satin Chrome
7	Black Molded

Notes:

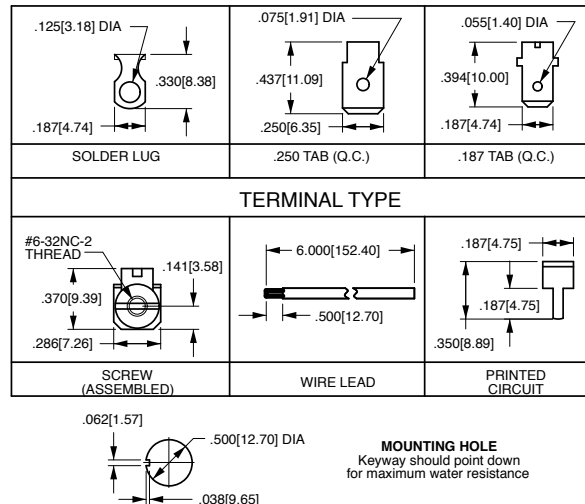
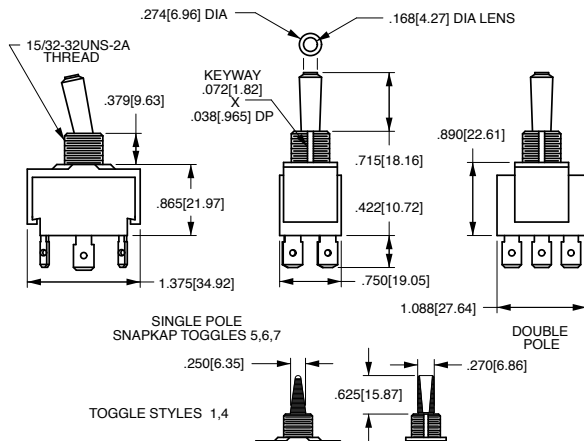
- Solid color paddle available with lighting sequence 01, 02, 10 or 20.
- SnapKap Toggle Lenses are available separately. Consult factory.
- Independent lamp is standard. Dependent lamp with ON-OFF function (including momentary) is available with Lighting Sequences 10, 20, 30, 40 and 50. (No light in OFF position.)
- Green and blue not recommended with 125 volt or 250 volt neon lamps.
- Additional terminations available. Consult factory for details.
- () Indicates momentary function.

3 LIGHTING SEQUENCE ^{3,4}

	position 1	position 2	position 3
01	red	red	red
02	amber	amber	amber
03	green	green	green
10	red	---	none
11	red	clear	red
12	red	clear	red amber
13	red	clear	green
14	red	clear	blue
15	red	clear	clear
20	amber	---	none
21	amber	clear	red
22	amber	clear	amber
23	amber	clear	green
24	amber	clear	blue
25	amber	clear	clear
30	green	---	none
31	green	clear	red
32	green	clear	red amber
33	green	clear	green
34	green	clear	blue
35	green	clear	clear
40	blue	---	none
41	blue	clear	red
42	blue	clear	red amber
43	blue	clear	green
44	blue	clear	blue
45	blue	clear	clear
50	clear	---	none
51	clear	clear	red
52	clear	clear	amber
53	clear	clear	green
54	clear	clear	blue
55	clear	clear	clear

4 LAMP VOLTAGE ⁴

incandescent		neon	
006	6 volt	125N	125 volt neon
012	12 volt	250N	250 volt neon
018	18 volt		
024	24 volt		



F-Series

SINGLE POLE TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 20A 277VAC, various actuator, bushing, termination, and circuit choices allow this versatile switch to easily integrate into a variety of different applications. The F-Series is appropriate for usage in low voltage DC applications.



Resources:

Download 3D CAD Files

[IGS >](#)

[STP >](#)

Product Highlights:

- ♦ Ratings to 20A
- ♦ Suitable for low voltage 12/24V DC
- ♦ Variety of termination options
- ♦ Consult factory for large choice of bushing/toggle length combinations

Typical Applications:

- ♦ Marine
- ♦ Food Service
- ♦ Generator
- ♦ Industrial Control
- ♦ Office Automation



Dielectric Strength

1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

0°F to 150°F (-17.8°C to +65.6°C)

2FA54 - 73 / TABS

¹
Base Part Number

²
Actuator
Style

³
Tab Terminals

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION¹

	Solder Lug	.250 Tab QC	Screw Terminals
On-None-Off	2FA53	2FA53-.../TABS	2FA54
(On)-None-Off	6FA53	6FA53-.../TABS	6FA54
On-None-(Off)	6FA57	6FA57-.../TABS	6FA58
On-None-On	2FB53	2FB53-.../TABS	2FB54
On-None-(On)	6FB53	6FB53-.../TABS	6FB54
On-Off-On	2FC53	2FC53-.../TABS	2FC54
On-Off-(On)	6FC57	6FC57-.../TABS	6FC58
(On-Off-(On))	6FC53	6FC53-.../TABS	6FC54

Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

**2 ACTUATOR STYLE
BAT STYLE TOGGLE²**

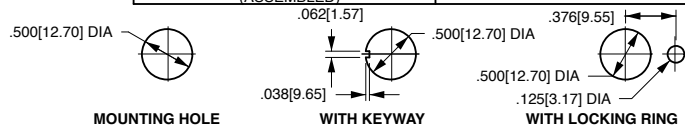
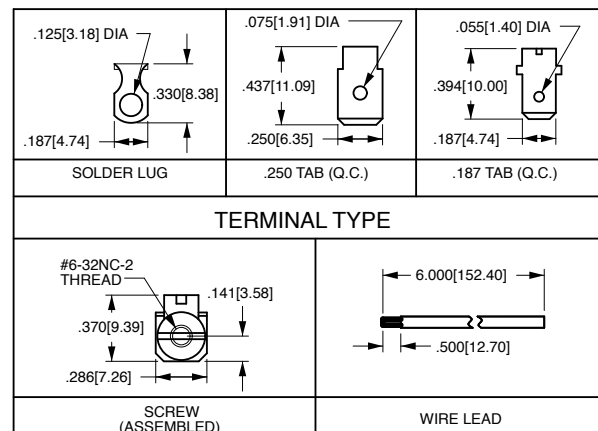
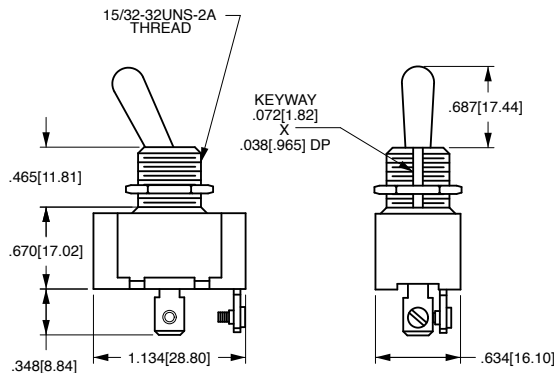
	unsealed	sealed	toggle length	bushing length
73		78	0.687	0.465
E3		E8	2.000	0.465

3 TAB TERMINALS

/TABS Tab Terminals
(blank) Leave blank if tab terminals not required.

Notes:

- 1 Consult factory for .187 tab, wire lead and combination screw/tab/solder lug termination callouts.
- 2 Additional toggle options are available. Consult factory.
- () indicates momentary function.



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

G-Series

TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 20A 277VAC, international approvals, various actuator, bushing, termination, and circuit choices allow this toggle switch to easily integrate into a variety of different applications. The G-Series is appropriate for usage in low voltage DC applications.



Resources:

Download 3D CAD Files

[IGS >](#)

[STP >](#)

Product Highlights:

- ♦ Ratings to 20A 277VAC available
- ♦ Metal bat or nylon bat/paddle actuator styles
- ♦ UL, CSA and VDE approvals for select circuits
- ♦ Suitable for low voltage 12/24V DC

Typical Applications:

- ♦ Marine
- ♦ Food Service
- ♦ Generator
- ♦ Industrial Control
- ♦ Office Automation



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

VDE: 4000V - live to dead metal parts; 1250V - opposite polarity & across open contacts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0° to 85°C)

2GM51 - 73

¹
Base Part Number

²
Actuator Style

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION ³

Single Pole in Double Pole base

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

Single Pole			Double Pole		
termination	tab	screw term.	termination	tab	screw term.
solder lug	.250 tab	screw term.	solder lug	.250 tab	screw term.
2GA50	2GA51	2GA54	2GK50	2GK51	2GK54
6GA5A	6GA5B	6GA5E	(On)-None-Off	6GK5A	6GK5B
6GA5L	6GA5M	6GA5S	(On)-None-(Off)	6GK5L	6GK5M
2GB50	2GB51	2GB54	On-None-On	2GL50	2GL51
6GB5A	6GB5B	6GB5E	On-None-(On)	6GL5A	6GL5B
2GC50	2GC51	2GC54	On-Off-On	2GM50	2GM51
6GC5A	6GC5B	6GC5E	On-Off-(On)	6GM5A	6GM5B
6GC5L	6GC5M	6GC5S	(On-Off-(On))	6GM5L	6GM5M
10A 250VAC, 15A 125VAC, 12 (6)A 250VAC T85/55 ENEC/VDE Approved ¹					
2GA90	2GA91	-	On-None-Off	2GK90	2GK91
2GB90	2GB91	-	On-None-On	2GL90	2GL91
2GC90	2GC91	-	On-Off-On	2GM90	2GM91

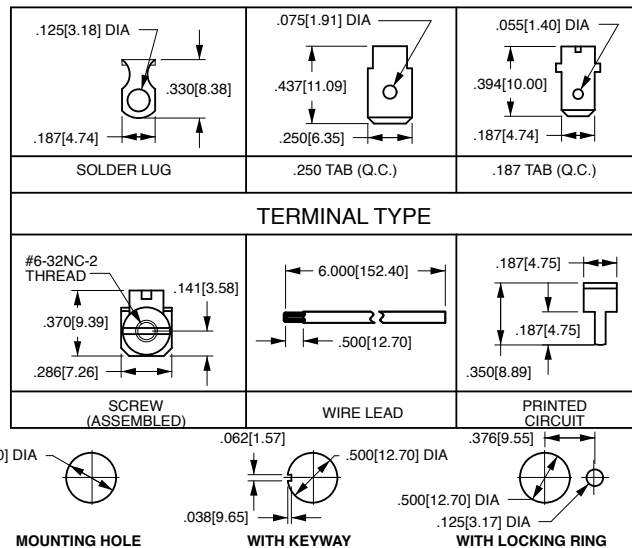
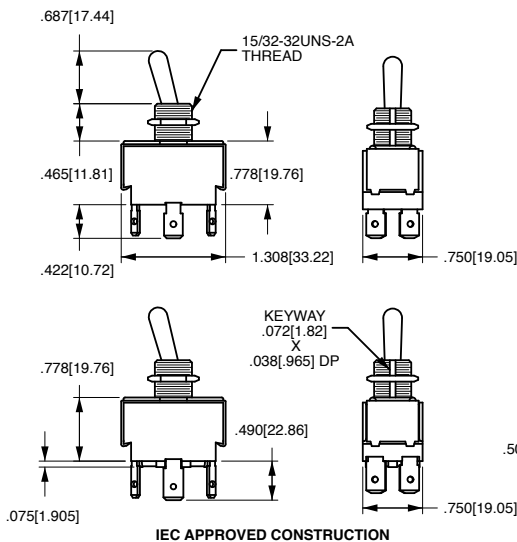
Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

2 ACTUATOR STYLE ⁴

Actuator Style	unsealed	sealed	toggle length	bushing length
BAT	73	78	0.687	0.465
PADDLE ⁵	NBL3	NBL8	0.687	0.465
BAT ²	D-3B-B	-	0.687	0.379
PADDLE ²	-	D-4B-B	0.687	0.379

Notes:

- Not available with 73 or NBL3 style toggles, T55 with 78 and NBL8 style toggles.
- All nylon bushing and toggle.
- Consult factory for .187 tab, wire lead and combination screw/tab/solder lug termination callouts.
- Additional actuator options available. Consult factory.
- Nylon toggle with black ebanol plated bushing.
- () Indicates momentary function.



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

H/I-Series

TOGGLE SWITCHES

General purpose workhorses with options tailored to meet most any need. Ratings to 17A 125VAC, various actuator, bushing, termination, and circuit choices allow this toggle to easily integrate into a variety of different applications. The H/I-Series is appropriate for usage in low voltage DC applications.



Product Highlights:

- ◆ Ratings up to 600VAC
- ◆ Available reversing and progressive switch circuits
- ◆ Variety of termination options
- ◆ Consult factory for large choice of bushing/toggle length combinations

Typical Applications:

- ◆ Food Service
- ◆ Generator
- ◆ Industrial Control
- ◆ Office Automation



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Electrical Life

50,000 cycles - maintained
25,000 cycles - momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0° to 85°C)

HK251 - 73

1 Base Part Number 2 Actuator Style

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION 2
10A 250VAC, 15A 125VAC, 3/4 HP 125-250VAC, 1, 2 or 3 phase

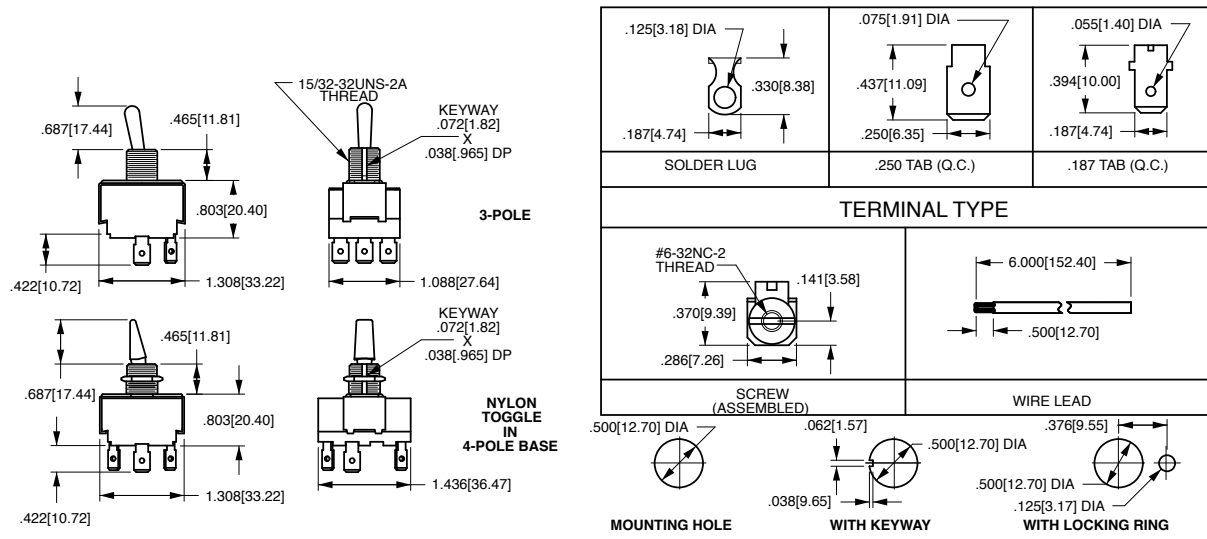
Three Pole				Four Pole			
solder lug	.250 tab	screw term.	wire leads	solder lug	.250 tab	screw term.	wire leads
HK250	HK251	HK254	HK255	IK250	IK251	IK254	IK255
HK25A	HK25B	HK25E	HK25F	IK25A	IK25B	IK25E	IK25F
HK25L	HK25M	HK25S	HK25S	IK25L	IK25M	IK25S	IK25T
HL250	HL251	HL254	HL25E	IL250	IL251	IL254	IL255
HL25A	HL25B	HL25E	HL25F	IL25A	IL25B	IL25E	IL25F
HM250	HM251	HM254	HM25E	IM250	IM251	IM254	IM255
HM25A	HM25B	HM25E	HM25F	IM25A	IM25B	IM25E	IM25F
HM25L	HM25M	HM25S	HM25T	IM25L	IM25M	IM25S	IM25T

Additional ratings up to 20A 125VAC, 12A 250VAC, 1HP 120-240 VAC available. Consult factory for specifics.

2 ACTUATOR STYLE 1

	unsealed	sealed	toggle length	bushing length
BAT	73	78	0.687	0.465
	E3	E8	2.000	0.465
PADDLE ³	NBL3	NBL8	0.687	0.465

- Notes:
 1 Additional actuator options available. Consult factory for details.
 2 Consult factory for .187 tab and combination screw/tab/solder lug termination callouts.
 3 Nylon toggle with black ebanol plated bushing.
 () Indicates momentary function.



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

C-Series

SINGLE POLE TOGGLE SWITCHES

The C-Series single pole compact high current toggle switches are ideal for applications with back panel size constraints. These switches feature self-cleaning contacts and ratings up to 20A 125VAC, 10A 250VAC, 1 1/2 HP 125-250VAC. With a rugged metal construction, these switches figure prominently in markets with stringent current carrying requirements.



Product Highlights:

- ◆ Ratings to 20A 125VAC and 1.5HP 125-250VAC
- ◆ Compact size
- ◆ Self-cleaning wiping style contacts
- ◆ 4 termination choices

Typical Applications:

- ◆ Environmental Controls
- ◆ Marine
- ◆ Food Service
- ◆ Vacuum Cleaners



Dielectric Strength

1000V - live to dead metal parts and opposite polarity.

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

CA201 - 73

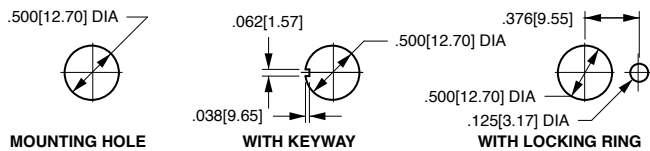
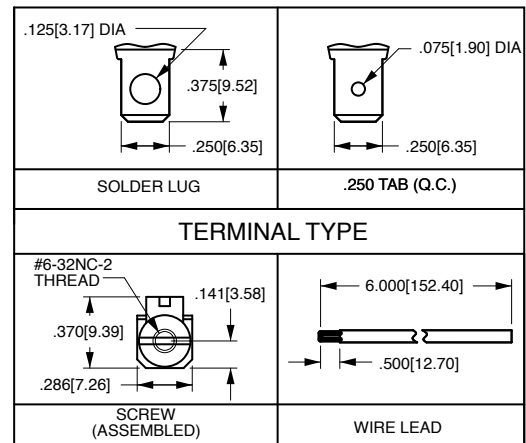
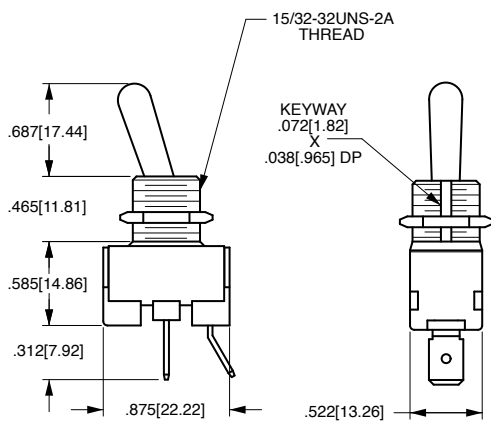
¹
Base Part Number

²
Actuator Style

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION				
10A 250VAC, 20A 125VAC, 1 1/2 HP 125-250VAC				
Single Pole	Solder Lug	.250 Tab	Screw Term.	Wire Leads
On-None-Off	CA200	CA201	CA204	CA205
On-None-On	CB200	CB201	CB204	CB205

2 ACTUATOR STYLE 1				
BAT	unsealed	sealed	toggle length	bushing length
	73	78	0.687	0.465

Notes:
1 Additional toggle styles available. Consult factory.



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

D-Series

SINGLE POLE TOGGLE SWITCHES

The D-Series single pole compact high current toggle switches are ideal for applications with back panel size constraints. These switches feature self-cleaning contacts and ratings up to 20A 125VAC, 10A 250VAC, 1 1/2 HP 125-250VAC. With an economical double insulated all nylon construction, these switches figure prominently in markets with stringent current carrying requirements.



Product Highlights:

- ◆ Compact all nylon double insulated construction
- ◆ Ratings to 20A 125VAC, 1.5 HP 125-250VAC
- ◆ Integrated wire lead construction
- ◆ Paddle or Bat style actuators

Typical Applications:

- ◆ Environmental Controls
- ◆ Marine
- ◆ Food Service
- ◆ Vacuum Cleaners



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity
 TUV: 4000V - live to dead metal parts; 750V - across open contacts

Electrical Life

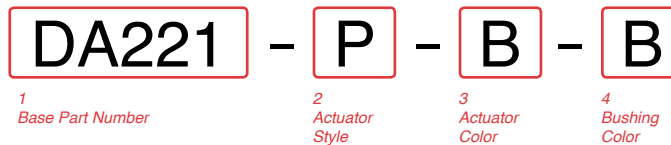
50,000 cycles

Mechanical Life

100,000 cycles

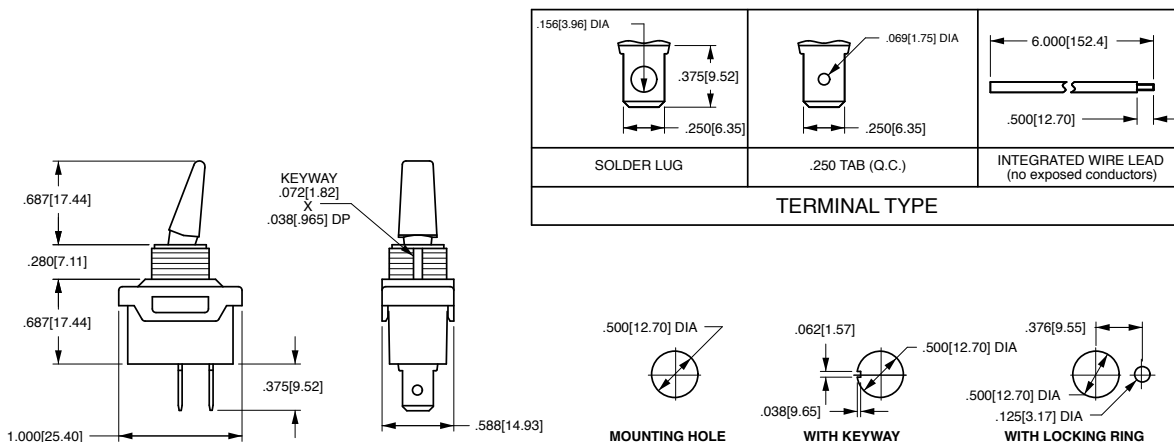
Operating Temperature

32°F to 185°F (0° to 85°C)



1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING ¹ / TERMINATION			
10A 250VAC, 20A 125VAC, 1 1/2 HP 125-250VAC			
On-None-Off	Solder Lug DA220	.250 Tab DA221	Wire Leads DA225
On-None-On	DB220	DB221	DB225
On-Off-On	DC220	DC221	DC225
5A 250VAC, 10A 125VAC, 1/2 HP 125-250VAC, 4(4) 250VACμ TUV approved			
On-None-Off	Wire Leads DA945	Solder Lugs DA940	.250 Tabs DA941
2 ACTUATOR STYLE			
B Bat		P Paddle	
3 ACTUATOR COLOR ²			
B Black		W White	
4 BUSHING COLOR ²			
B Black		W White	

Notes:
 1 DA945 available with wire leads and ON-OFF circuit only.
 2 Additional colors available. Please consult factory.



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

110-Series

HEAVY ACTION TOGGLE SWITCHES

The 110-Series is a compactly designed, versatile metal construction toggle switch which is appropriate for a variety of uses. Features include single or double pole options, maintained or momentary construction with termination choices including solder lug end or bottom, wire leads and .250 tab terminals. The quick make/quick break contact mechanism makes the switch suitable for high voltage (125-250 volt) applications.



Product Highlights:

- ♦ 125/250V AC or DC rated
- ♦ Compact space saving envelope
- ♦ Single or double pole
- ♦ 2 position Maintained or Momentary circuits

Typical Applications:

- ♦ Small Appliance
- ♦ Floor Maintenance
- ♦ Lighting



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

0°F to 150°F (-17.8°C to +65.6°C)

110-S - 73

¹
Base Part Number

²
Actuator Style

1 BASE PART NUMBER: SERIES / CIRCUITRY ¹ / RATING / TERMINATION ²

3A 250V, 6A 125V, AC/DC

	Solder Lug (end)	Solder Lug (bottom)	Screw Terminals	Wire Leads
Single Pole				
On-None-Off	110	110-B	110-S	111-16
Off-None-(On)	110-M-NO	110-BM-NO	110-SM-NO	111-16M-NO
On-None-(Off)	110-M-NC	110-BM-NC	110-SM-NC	111-16M-NC
Double Pole				
On-None-Off	2BK62	-	-	2BK65
On-None-On	2BL62	-	-	2BL65

1A 250V, 3A 125V, AC/DC

Single Pole				
On-None-On	112	-	-	112-A
On-None-(On)	112-M	-	-	112-M-A
Double Pole				
On-None-Off	216	-	-	216A
Off-None-(On)	216-M-NO	-	-	216A-M-ANO
On-None-(Off)	216-M-NC	-	-	216A-M-ANC
On-None-On	316	316-B	-	-
On-None-(On)	316-M	316-BM	-	-
2 circuit				
1 On - 1 Off	516	516-B	-	516-A
1 (On) - 1 (Off)	516-M	516-BM	-	516-AM

6A 120VAC

Single Pole			
On-None-On	2BB62	-	2BB65

5A 250V, 10A 125V, 1/4HP, 125V

Single Pole			
On-None-Off	160H	160H-B	160H-S
			160H-A

2 ACTUATOR STYLE

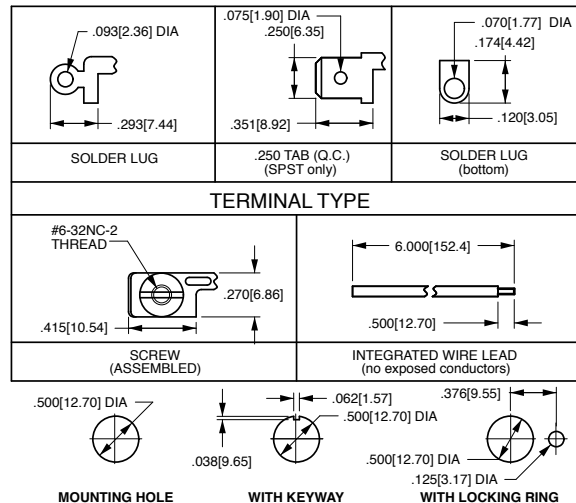
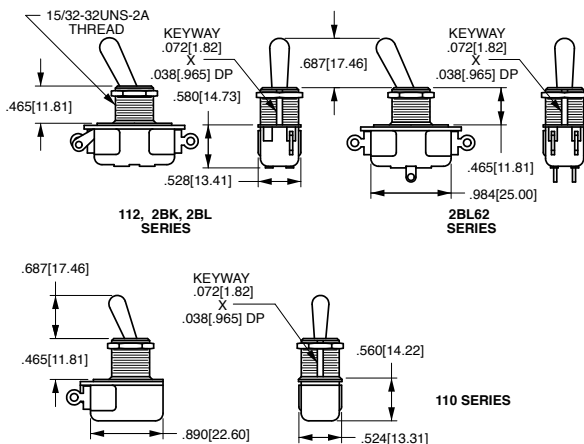
BAT STYLE TOGGLE			
unsealed	sealed	toggle length	bushing length
52	57	0.375	0.343
63	68	0.500	0.465
73	78	0.687	0.46555

BALL STYLE TOGGLE			
unsealed	sealed	toggle length	bushing length
21	-	0.375	0.250
22	-	0.375	0.343
25	-	0.375	0.875

Notes:

- Momentary function only available with 73 toggles.
- 160H and 110-Series are available with .250 tab terminals. Add suffix /TABS to end of part number. ex. 110-73/TABS

() Indicates momentary function.

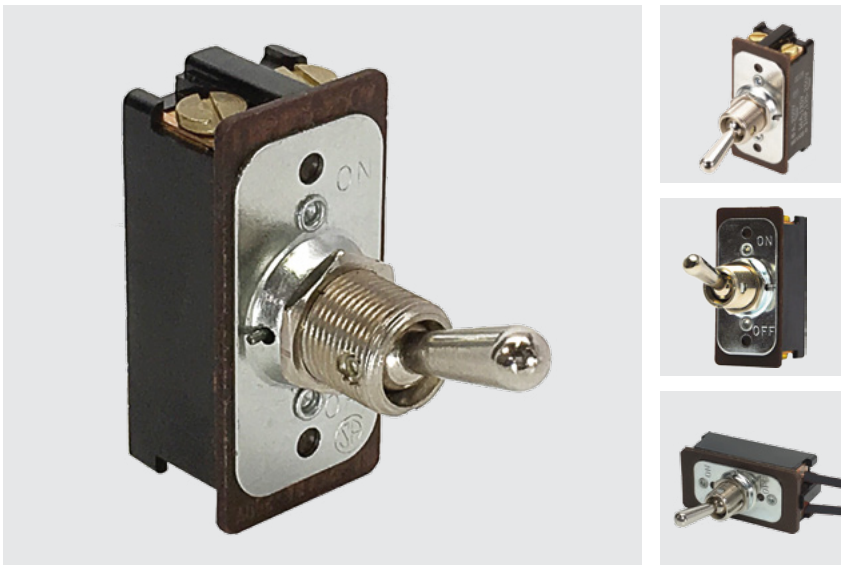


*Manufacturer reserves the right to change product specification without prior notice.

DK/EK-Series

HEAVY DUTY TOGGLE SWITCHES

The switch that can handle your heavy duty requirements. Single or double pole with wire lead or screw terminations, and ratings to 20A 125V 10A 250V, the ac/dc DK/EK-Series is the most heavy duty toggle switch in the Carling line. Its sturdy metal construction and stiff actuation force will withstand the abuses of virtually any stringent application. The quick make/quick break contact mechanism is ideal for high voltage DC applications.

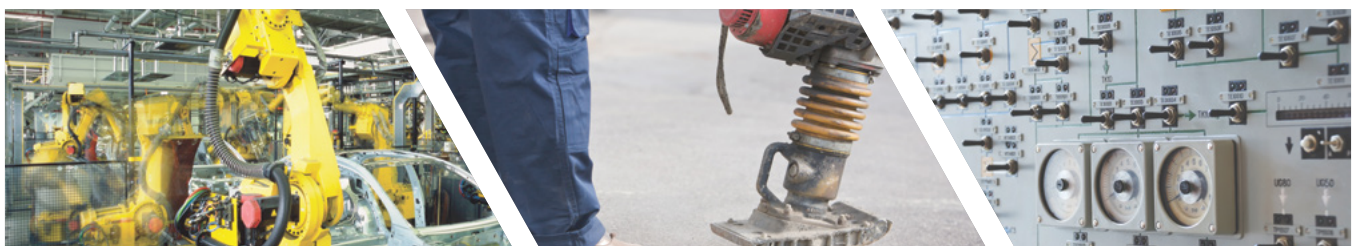


Product Highlights:

- ◆ Ratings up to 20A 125V AC or DC
- ◆ Screw Term or Wire Lead terminations
- ◆ Quick Make / Quick Break contact mechanism
- ◆ Bat or Ball style toggle options

Typical Applications:

- ◆ Industrial Motor Control
- ◆ General Purpose



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

0°F to 150°F (-17.8°C to +65.6°C)

DK284 - 73

¹
Base Part Number

²
Actuator Style

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

8A 250V, 16A 125V, 1 HP 125-250V
Screw Terminals Wire Leads

Single Pole
On-None-Off **DA284** **DA285**

Double Pole
On-None-Off **DK284** **DK285**

10A 250V, 20A 125V, 1 1/2 HP 125-250V
Screw Terminals Wire Leads

Single Pole
On-None-Off **EA204** **EA205**

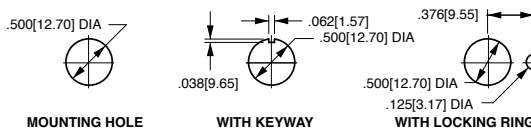
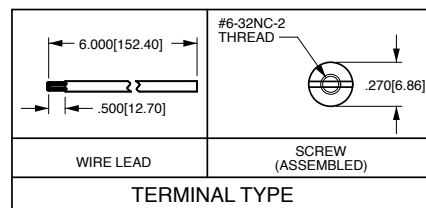
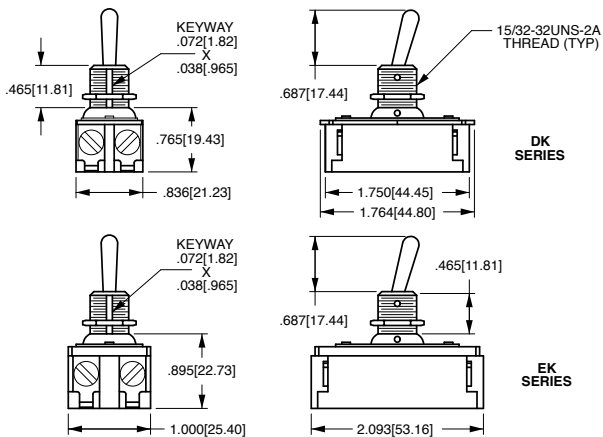
Double Pole
On-None-Off **EK204** **EK205**

2 ACTUATOR STYLE ¹

BAT STYLE TOGGLE
unsealed toggle length bushing length
73 0.687 0.465

BALL STYLE TOGGLE
unsealed toggle length bushing length
32 0.500 0.343

Notes:
1 Additional toggle lengths available. Consult factory for details.



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

MAAOA/215-Series TOGGLE SWITCHES

The MAAOA/215-Series toggle switches are single pole, AC rated at 20 amps and 125 VAC. These switches are snap-in mounted, with a phenolic toggle and base, and are suitable for high ambient temperature applications.



Product Highlights:

- ♦ High temperature Phenolic base and toggle
- ♦ Ratings to 125VAC
- ♦ Optional embossed On-Off legend
- ♦ Choice of screw, .250 Tab or integrated wire lead connections

Typical Applications:

- ♦ Coffee Makers
- ♦ Food Warmers



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

MAAOA - **BL** / **ON-OFF**

¹
Base Part Number

²
Color

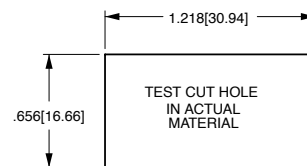
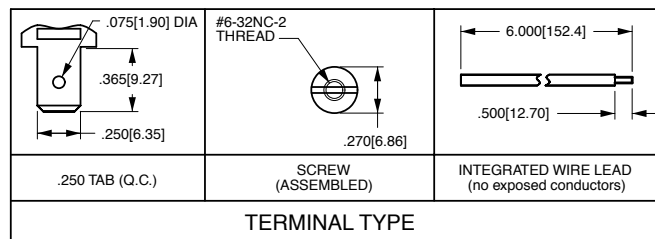
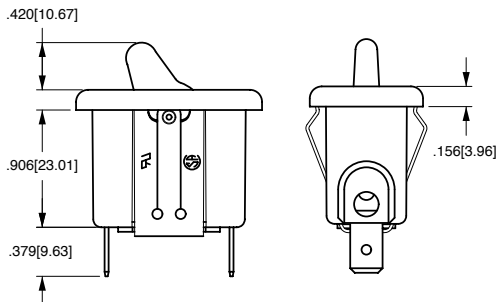
³
Legend

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION			
	10A 250 VAC, 20A 125 VAC, 1/2 HP 125-250 VAC		
	.250 Tabs	Screw Terms.	Wire Leads
Single Pole	MAAOA	215	215A
On-Off	MM-021	-	-
(On)-Off			

2 BASE & ACTUATOR COLOR			
BL	Black	BN	Brown

3 LEGEND¹	
On-Off	

Notes:
 Panel Cut-Out recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. (Burr on bottom.) Test cut hole in actual material.
 1 Imprinting is available. ON-OFF legend is not standard and must be specified after color. If not specified, switch will be manufactured with no legend.
 () Indicates momentary function.



MOUNTING HOLE
 Panel Thickness: .030[.762] min - .090 [2.28] max.
 Specific cutout dimension range dependent on panel thickness and material.

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

Carling Technologies full or half hexboot is the perfect complement to Carling's line of toggle switches. The boot is compatible with 15/32" threaded bushings and will provide extra protection against the elements in harsh environments.

Product Highlights:

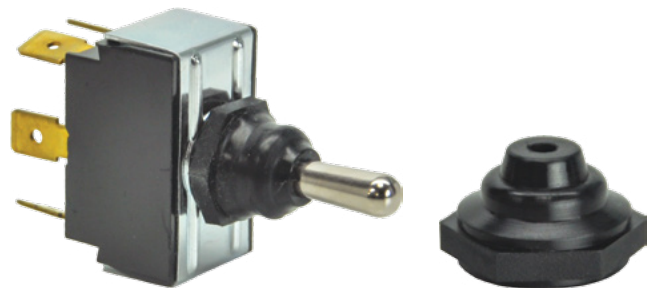
- Flexible tear-resistant silicone rubber overmolded onto a 15/32" brass hexnut
- Full hexboot completely covers toggle actuator and bushing
- Meets ROHS 2011/65/EU directive
- Inhibits the rotation of switches subjected to low frequency vibration
- Complementary, cost effective addition to Carling's toggle switches
- Suitable for toggle models: F-Series, G-Series, 110-Series, C-Series, D-Series, DK/EK-Series, H/I-Series, LT-Series

Full Hexboot



Part #: 999-37246-001

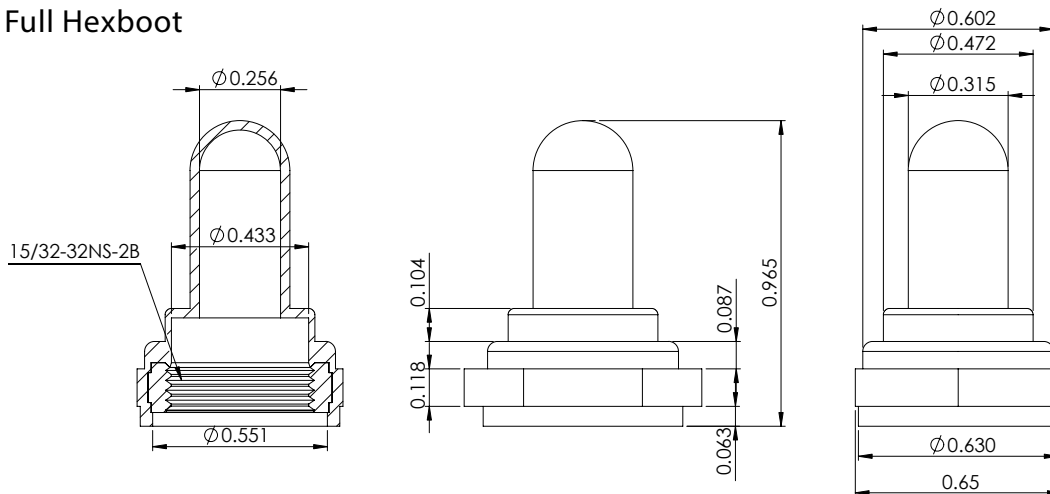
Half Hexboot



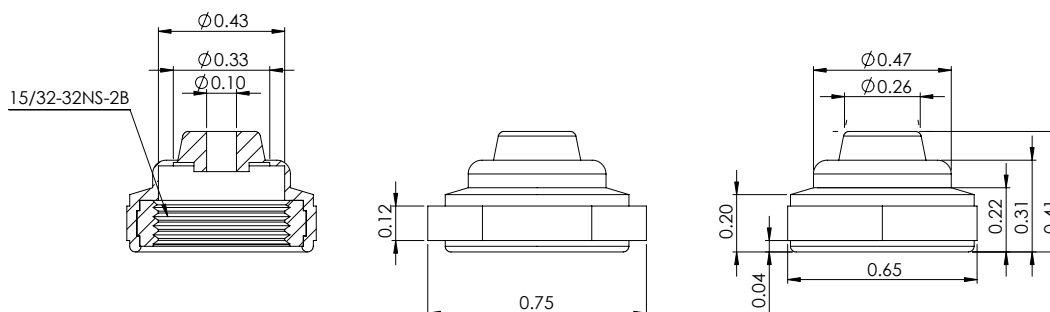
Part #: 999-37245-001

Dimensional Specifications: in. [mm]

Full Hexboot

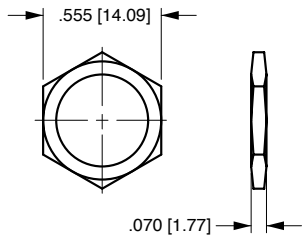


Half Hexboot

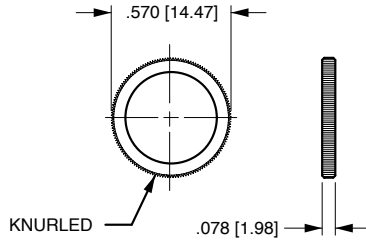


Bushing Accessories

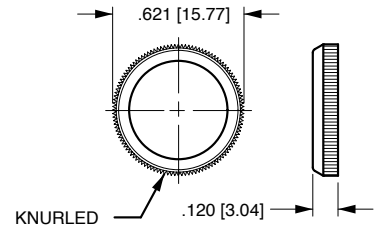
The hardware options and accessories listed below were specifically designed to be used with toggle and pushbutton switches. The drawings are representative of the actual products. When other hardware options are required, please consult factory.



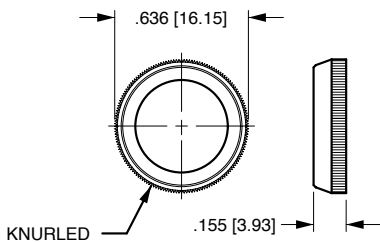
STANDARD HEXNUT
 .562 in. [14.27 mm] X .076 in. [1.93 mm]
 NICKEL: 380-08602
 BLACK: 380-08606



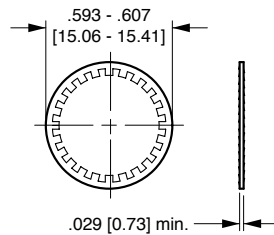
STANDARD FACENUT
 .570 in. [14.47 mm] X .078 in. [1.98 mm]
 NICKEL: 380-08693
 BLACK: 380-08694



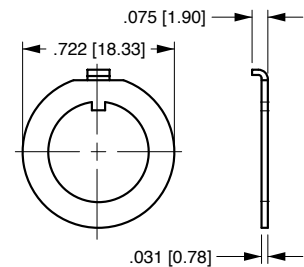
PLASTIC FACENUT
 (Wrench Supplied N/C)
 .625 in. [15.87 mm] X .120 in. [3.04 mm]
 BLACK: 384-17126-001
 RED: 384-17126-002
 WHITE: 384-17126-003



DRESS FACENUT
 .636 in. [16.15 mm] X .155 in. [3.93 mm]
 NICKEL: 380-08810
 BLACK: 380-08811

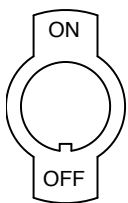


LOCKWASHER
 NICKEL-PLATED: 728-15907

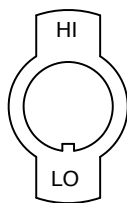


LOCKING RING
 ZINC: 728-15946
 BLACK: 728-15947

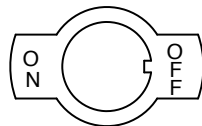
All indicator plates are nickel-plated steel. Odd keyway locations, alternate imprints and plating available on special order. Contact factory for minimum quantities and specifications.



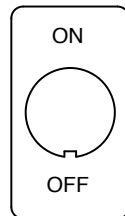
Y01
 272-06747



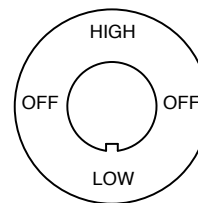
Y02
 272-06764



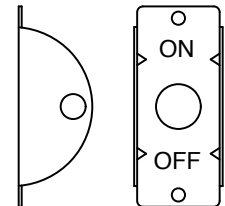
Y51
 272-06842



Y101
 272-06935



Y311
 272-07258



Y500
 272-07293

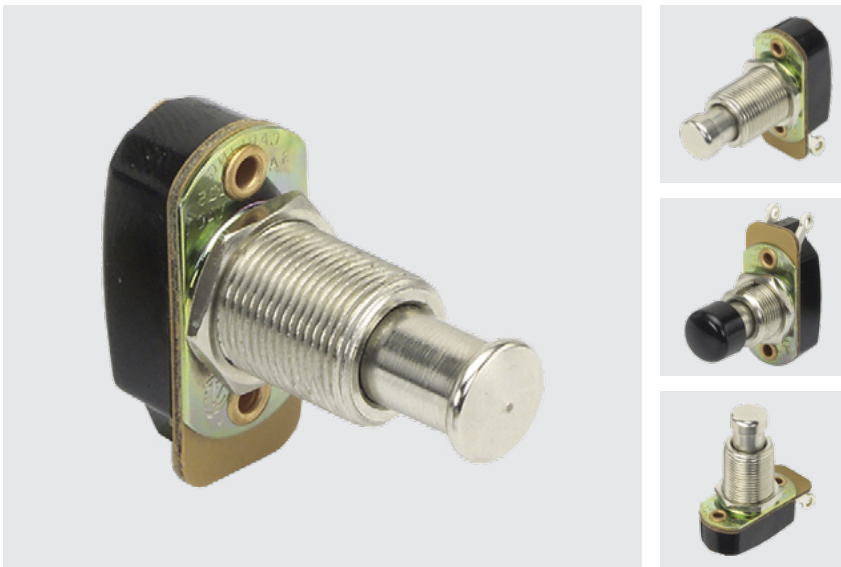
ALL PLATES SHOWN FIT 15/32" (.465 [11.81]) BUSHINGS

16-3P

16-3P-Series

PUSHBUTTON SWITCHES

The 16-3P-Series pushbutton switches are single pole and AC rated up to 3 amps. These momentary action switches have a slow-make, slow-break contact mechanism and require only light actuation force (4 oz. - 1 lb.). These switches are typically used in general purpose applications requiring finger actuation.



Product Highlights:

- ◆ Maintained, Momentary and 2 circuit function choices
- ◆ Available with optional overtravel plunger action
- ◆ Light 4 oz – 1 lb actuation force
- ◆ Metal plunger available with optional colored plastic cap

Typical Applications:

- ◆ Test & Measurement
- ◆ Audio Visual



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

16-3POFF - **4** - **CBL**

¹
Base Part Number

²
Bushing

³
Actuator Style

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

Single Pole	Solder Lug	Wire Leads
3A 125VAC		
Off-(On)	16-3P Off	16-3AP Off
Off-(On) with overtravel ¹	16-3P Off-Ov	16-3AP Off-Ov
On-(Off)	16-3P On	16-3AP On
1A 125VAC		
On-On	116-P	116-AP
On-On with overtravel ¹	116-P-OV	116-AP-OV
1 On-1 Off (2 circuit)	516-P	516-AP
1 On-1 Off with overtravel ¹ (2 circuit)	516-P-OV	516-AP-OV

2 BUSHING STYLE

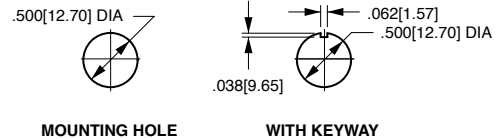
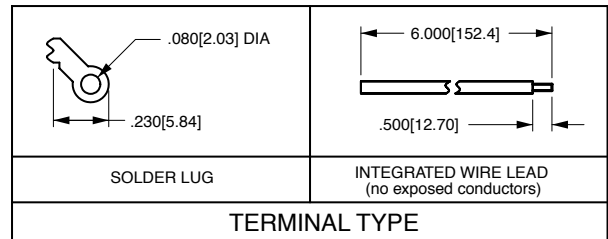
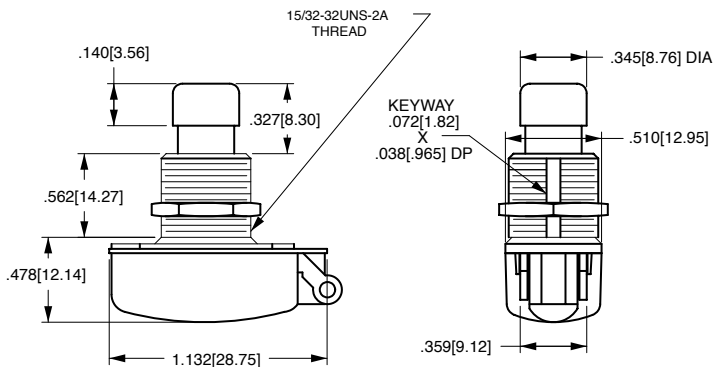
2	.312 length
4	.562 length

3 ACTUATOR STYLE ²

CBL	black plastic color cap
CRD	red plastic color cap

Notes:

- ¹ Overtravel only available with #4 bushing.
- ² When selection 3 is left blank, a standard nickel plated plunger is supplied.
- () Indicates momentary function.

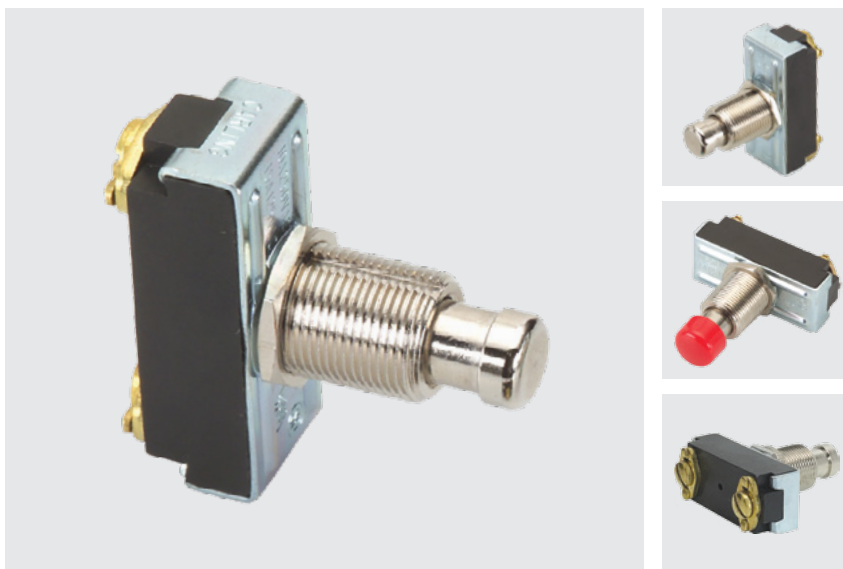


*Manufacturer reserves the right to change product specification without prior notice.

170/172-Series

PUSHBUTTON SWITCHES

The 170/172-Series pushbutton switches are single pole, high amperage switches suitable for shallow back panel applications. These switches are momentary action and require an actuation force of 2.5 lbs. The 170/172-Series switches are equipped with a slow-make, slow-break contact mechanism and are rated at 15 amps at 125VAC.



Product Highlights:

- ◆ Rated to 15A 125VAC
- ◆ Sturdy metal clad construction
- ◆ Metal plunger available with optional colored plastic cap
- ◆ Momentary On or Momentary Off circuitry

Typical Applications:

- ◆ Test & Measurement
- ◆ Meters
- ◆ Horns



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Electrical Life

25,000 cycles - Momentary

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

172 - CBL

¹
Base Part Number

²
Cap Style/Color

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION
10A 250VAC; 15A 125VAC

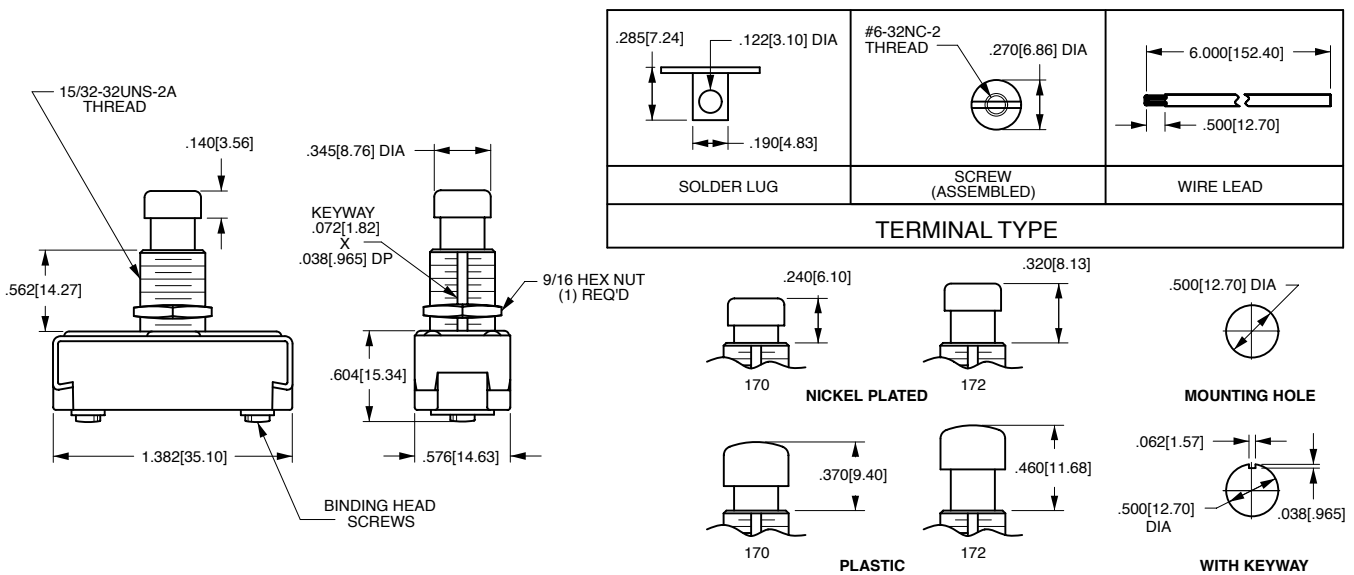
Single Pole	Solder Lug	Wire Leads	Screw Terms.
On-(Off)	170-B	170-A	170
Off-(On)	172-B	172-A	172

2 CAP STYLE / COLOR ¹

CBL	Black Plastic
CGN	Green Plastic
CRD	Red Plastic
CWH	White Plastic

Notes:

- 1 When selection 2 is left blank, a standard nickel plated plunger is supplied.
- () Indicates momentary function.



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

P26-Series

P26-Series

PUSHBUTTON SWITCHES

The P26-Series pushbutton switches are single pole, AC rated for 8 amps at 125 VAC and suitable for shallow back panel applications. These switches are momentary action with a medium actuation force (13 oz. typical). The P26-Series switch is equipped with a slow-make, slow-break contact mechanism.



Product Highlights:

- ◆ 6A 125VAC, 3A 277VAC rated
- ◆ Momentary On or Momentary Off circuitry
- ◆ 4 bushing size combinations
- ◆ Round Metal, Concave Metal and Nylon Style Actuators

Typical Applications:

- ◆ Intercoms
- ◆ Security System
- ◆ Electronic Signs
- ◆ Marine



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

P26L - **1D** - **BL**

¹
Base Part Number

²
Bushing Style

³
Button Style/Color

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

	Solder Lug	.250 Tab	Wire Leads
Single Pole			
3A 250VAC, 6A 125 VAC, 3/4A 125V			
Off - (On)	P26A	P26B	P26F
On - (Off)	P26L	-	P26T
3A 277VAC, 6A 125 VAC ¹			
Off - (On)	P267A	P267B	P267F
On - (Off)	P267L	-	P267T

2 BUSHING STYLE

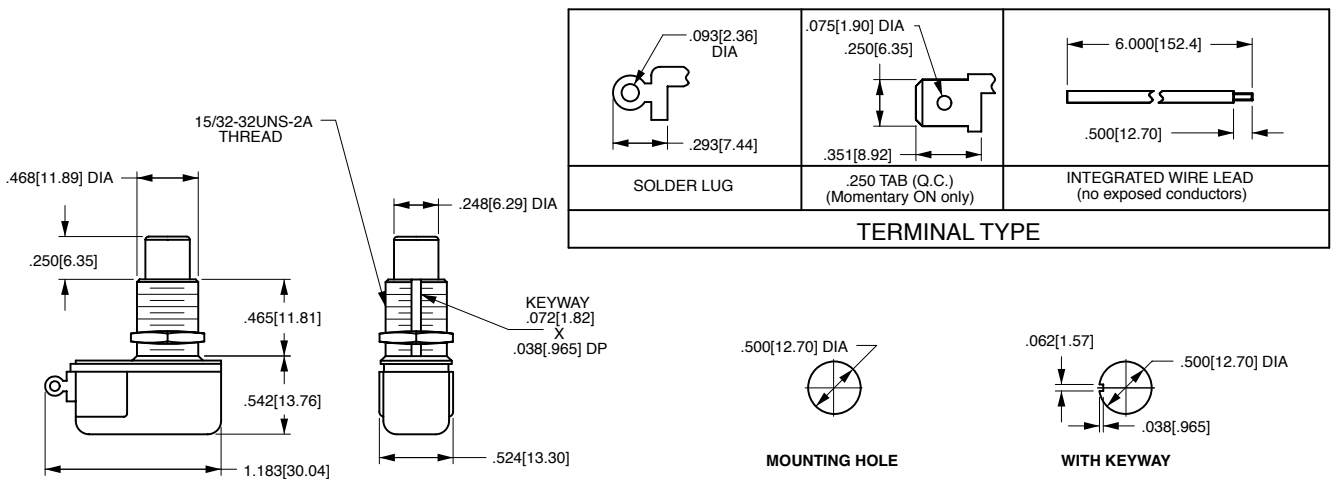
	length	diameter
1A	.406	.375
1B	.406	.468
1C	.465	.375
1D ³	.465	.468

3 BUTTON STYLE / COLOR

BL	Black Nylon
RD	Red Nylon
RND MTL ²	Round Metal
CON MTL ²	Concave Metal

Notes:

- 1 Additional ratings available. Consult factory for details
- 2 Only available with 1D bushing in .562 length
- 3 Length is .562 for RND MTL and CON MTL bottoms
- () Indicates momentary function.



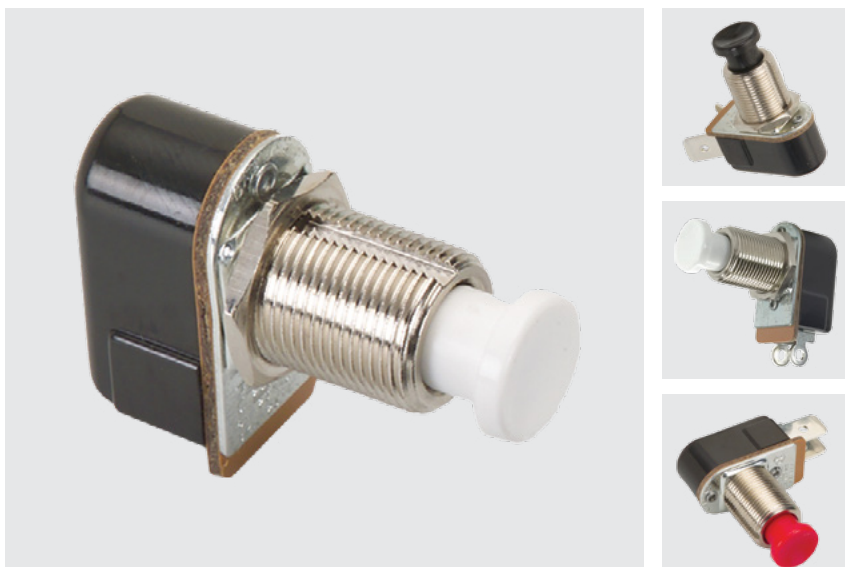
*Manufacturer reserves the right to change product specification without prior notice.

P27-Series

P27-Series

PUSHBUTTON SWITCHES

The P27-Series pushbutton switches are single pole, AC rated switches suitable for general purpose applications with a shallow back panel. These switches are momentary action with a medium actuation force (26 oz. typical). The P27-Series switch is equipped with a slow-make, slow-break contact mechanism, rated at 6 amps with a nylon concave pushbutton.



Product Highlights:

- ◆ Ratings to 6A 125VAC 3A 277VAC
- ◆ Momentary On or Momentary Off circuitry
- ◆ .250 Tab, Solder Lug or Wire Lead terminations
- ◆ Shallow space saving envelope

Typical Applications:

- ◆ Intercoms
- ◆ Security System
- ◆ Electronic Signs
- ◆ Marine



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

P27A - **BL**

1
Base Part Number

2
Button Color

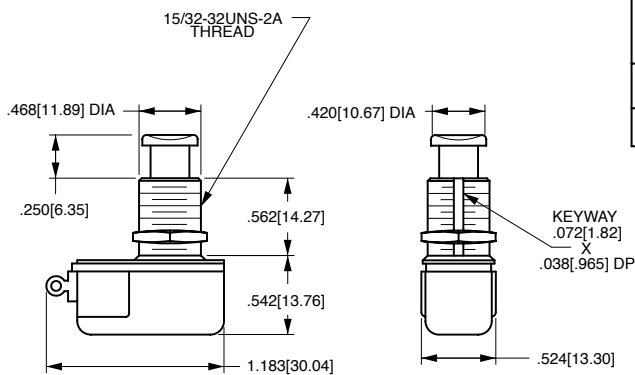
1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION

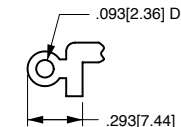
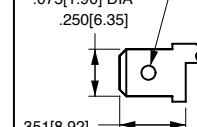
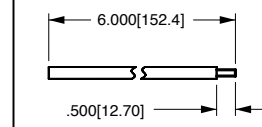
Single Pole	Solder Lug	.250 Tab	Wire Leads
3A 250VAC, 6A 125 VAC, 3/4A 125V			
Off - (On)	P27A	P27B	P27F
On - (Off)	P27L	-	P27T

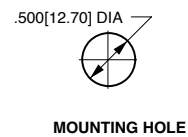
3 BUTTON STYLE / COLOR

BL	Black
RD	Red
WH	White

Notes:
() Indicates momentary function.



 .093[2.36] DIA .293[7.44]	 .075[1.90] DIA .250[6.35] .351[8.92]	 6.000[152.4] .500[12.70]
SOLDER LUG	.250 TAB (Q.C.) (Momentary ON only)	INTEGRATED WIRE LEAD (no exposed conductors)
TERMINAL TYPE		



641-Series

PUSHBUTTON SWITCHES

The single, double and triple pole 641-Series represents the most compact offerings of the Carling's pushbutton switch line. These switches are UL approved and meet ENEC spacing requirements. Additionally, the new 3-pole switch affords the versatility to control an extra function or indicator light. Rugged metal construction, self-cleaning contacts and stiff actuation force (3-3 1/2 lbs. typical) have made these switches ideal for most "foot pedal" type applications. These alternate action switches fit a standard .500" mounting hole with options of solder lug, wire lead and PC terminals.



Resources:

Download 3D CAD Files

[IGS >](#) [STP >](#)

Product Highlights:

- Available in 1-3 poles
- 3+ lbs. actuation force ideal for Foot pedal applications
- Solder Lug, Wire Lead or PC Terminal options
- Self-cleaning wiping style contacts

Typical Applications:

- Music Equipment
- Test & Measurement Devices
- Audio-Visual Equipment
- Appliances



Electrical

Rating	5A 125VAC, 2A 250VAC
Dielectric Strength	1500V RMS
Insulation Resistance	50 Megohms
Initial Contact Resistance	10 Milli Ohm max @ 4Vdc
Electrical Life	50,000 Cycles
Terminals	Solder Lug, Wire Leads and PC

Mechanical

Mechanical Life	100,000 Cycles
-----------------	----------------

Environmental

Vibration Sinusoidal	Mil STD 202G, Method 204D, Test Condition A 0.06DA or 10G's 10-500Hz
Shock	MIL-STD 2020G, Method 213B Test Condition K, 30G's
Handling Shock	1 Meter Drop onto Hard Surface, all surfaces and planes
Thermal Shock	MIL-STD 2020G, Method 107G Test Condition A -55 C to 85 C
Moisture Resistance	MIL-STD 2020G, Method 106F 10 25 C to 65 C Cycles 95% RH
Thermal Cycling	25 Cycles -40 C to 85 C
Operating Temperature	32°F to 185°F (0°C to +85°C)

Physical

Function Circuits	Three Pole Single Throw, TPST Three Pole Double Throw, TPDT
Operation	Alternate Action, Push ON, Push OFF
Button Travel	0.19 (4.83mm)
Actuation Force	3 to 5 LB, 1360 to 2268 g
Base	Polyester, PBT Glass Filled
Button	Brass, Nickel Plated
Bushing	Brass, Nickel Plated
Plunger	Brass, Nickel Plated
Top Plate	Stainless Steel
Actuator (Internal)	Nylon 6/6
Pin (Internal) ¹	Nylon 6/6
Driver	Cold Rolled Steel
Springs	Music Wire
Movable Contact	Copper
Terminals	Brass (tin plated)
Mounting	½" Dia. Hole, with and without keyway, or with locking ring

Safety & Regulation

Agency	UL 61058, EN 61058 (3 Pole Version) UL 1054 (1 & 2 Pole Version)
Materials	RoHS, REACH

¹Manufacturer reserves the right to change product specification without prior notice.

64111210

¹
Part Number

1 PART NUMBER: SERIES / POLES / CIRCUITRY / RATING / TERMINATION ¹

**One Pole
2A 250VAC, 5A 125VAC**

solder lug	PC term.	wire leads.	
64111210	64111212	64111215	ON-OFF
64111220	64111222	64111225	ON-ON

Two Pole

solder lug	PC term.	wire leads
64112210	64112212	64112215
64112220	64112222	64112225

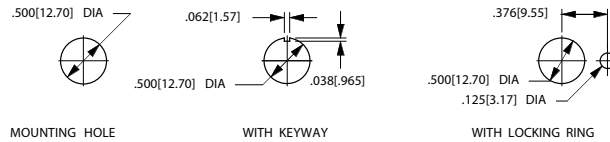
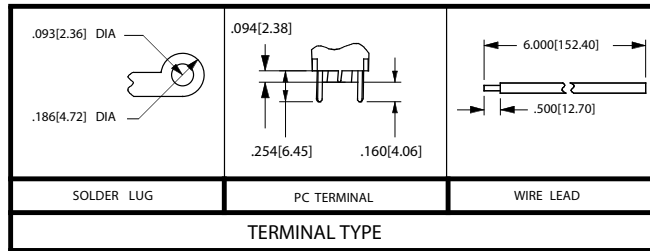
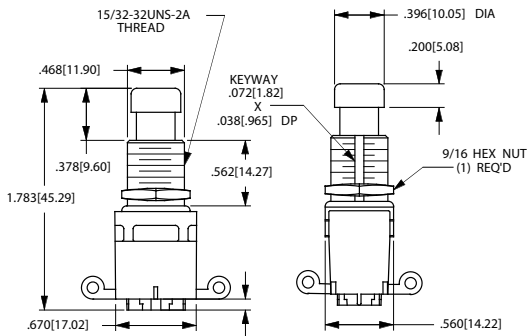
Three Pole

solder lug	PC term.	wire leads
64113210	64113212	64113215
64113220	64113222	64113225

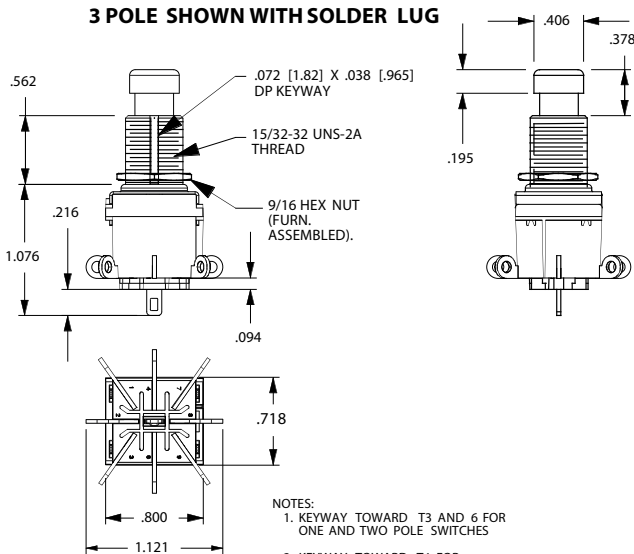
Notes:

1 For 1 and 2 pole only. 3 Pole switches use brass Pin

1 OR 2 POLE SHOWN WITH SOLDER LUG

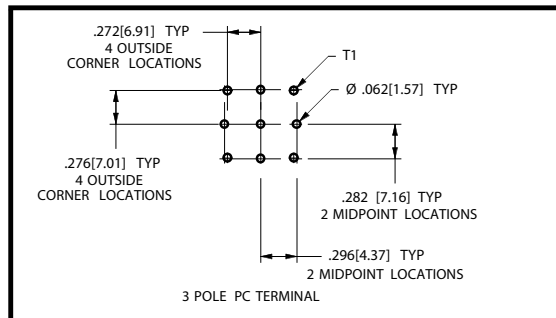
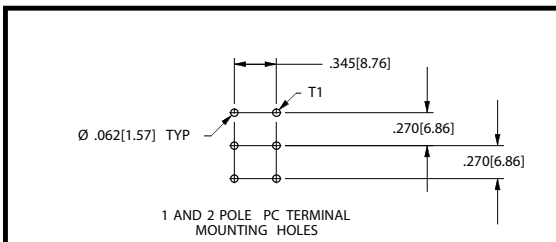
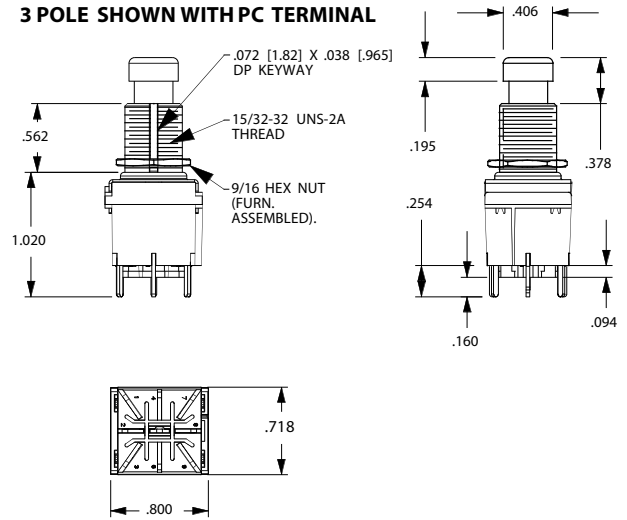


3 POLE SHOWN WITH SOLDER LUG



NOTES:
1. KEYWAY TOWARD T3 AND 6 FOR ONE AND TWO POLE SWITCHES
2. KEYWAY TOWARD T4 FOR THREE POLE SWITCHES.

3 POLE SHOWN WITH PC TERMINAL



110-Series

110-Series PUSHBUTTON SWITCHES

The 110-Series provides a compact yet rugged solution to general purpose switch needs. Alternate action, metal construction and stiff (6-8 lb) actuation force have combined to make this switch a pillar in a variety of markets. This versatile switch is available in maintained and momentary circuits with a variety of termination and rating options.



Product Highlights:

- Ratings to 5A 250V, 10A 125V AC or DC
- Maintained or momentary circuitry
- On-Off, On-On and 2 circuit function options
- Choice of 4 different termination options

Typical Applications:

- Music Industry
- Audio/Visual
- Electronic Road Signs



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life

25,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

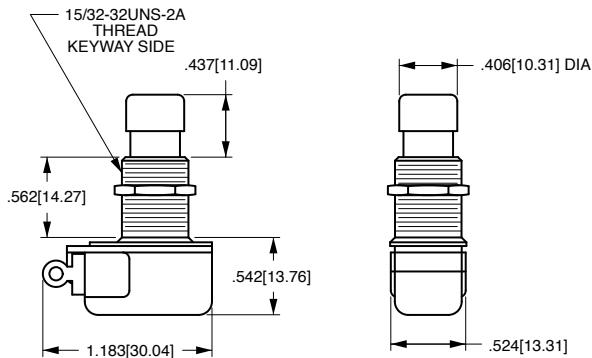
110-P

1
Part Number

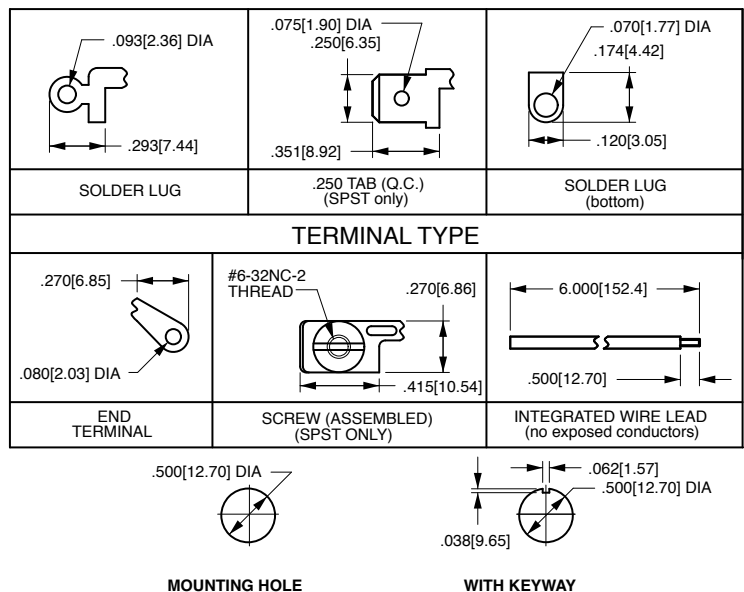
1 PART NUMBER: SERIES / ACTUATOR / CIRCUITRY / RATING / TERMINATION

	solder lug (end)	solder lug (bottom)	screw terminals	wire leads
Single Pole				
3A 250V, 6A 125V				
OFF-ON	110-P	110-BP	110-SP	111-16-P
OFF-(ON)	110-PM-OFF	110-PBM-OFF	110-SPM-OFF	111-PM-OFF
ON-(OFF)	110-PM-ON	110-PBM-ON	110-SPM-ON	111-PM-ON
5A 250V, 10A 125V, 1/4 HP 125V				
OFF-ON	160H-P	160H-BP	160H-SP	160H-AP
1A 250V, 3A 125V				
ON-ON	112-P	-	-	112-PA
ON-(ON)	112-PM	-	-	112-PAM
Double Pole				
1A 250V, 3A 125V				
OFF-ON	216-PP	-	-	216-PPA
OFF-(ON)	216-PM-OFF	-	-	216-PAM-OFF
ON-(OFF)	216-PM-ON	-	-	216-PAM-ON
ON-ON	316-PP	316-B-PP	-	316-PPA
ON-(ON)	316-PM	316-B-PM	-	316-PAM
1 ON - 1 OFF (2 circuit)	516-PP	-	-	516-PPA
1 (ON) - 1 (OFF) (2 circuit)	516-PM	-	-	516-PAM

Notes:
() Indicates momentary function.



NOTE:
KEYWAY
.072[1.82] X .038[.965] DP

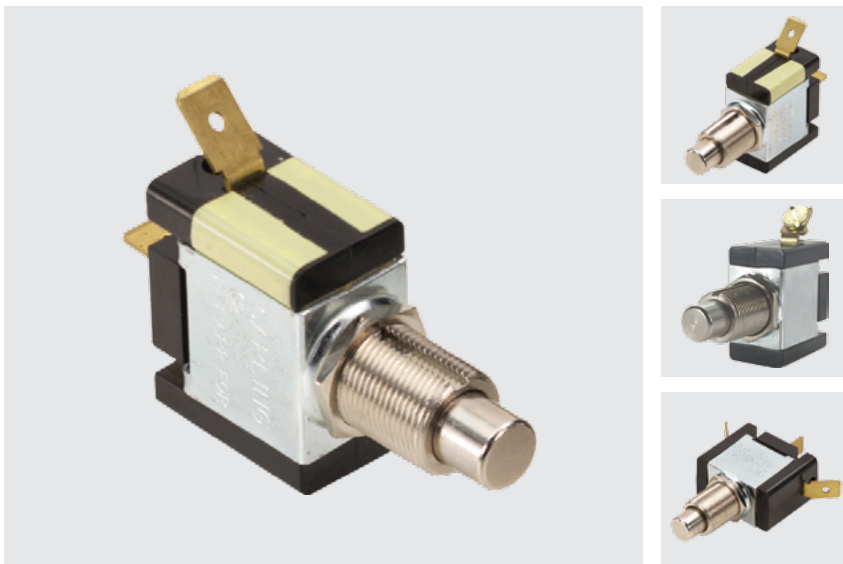


*Manufacturer reserves the right to change product specification without prior notice.

P-Series

PUSHBUTTON SWITCHES

These rugged pushbutton-type switches feature international approvals, ratings to 20A 125VAC and a heavy actuation force (3-5 lbs. typical) which makes this switch ideal for use as a “foot-pedal” switch. The metal bushing and plunger construction enables this alternate action switch to withstand the rigors of most any stringent pushbutton application.



Product Highlights:

- ♦ Rugged metal clad construction ideal for foot pedal applications
- ♦ Ratings to 20A 125VAC
- ♦ UL, CSA and TUV approvals
- ♦ Maintained On-Off or On-ON circuitry

Typical Applications:

- ♦ Vacuum Cleaners



Dielectric Strength

UL/CSA: 1000 - live to dead metal parts & opposite polarity
 TUV: 4000V - live to dead metal parts; 1250V - opposite polarity across open contacts

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

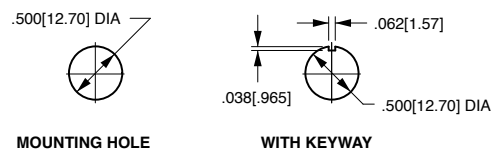
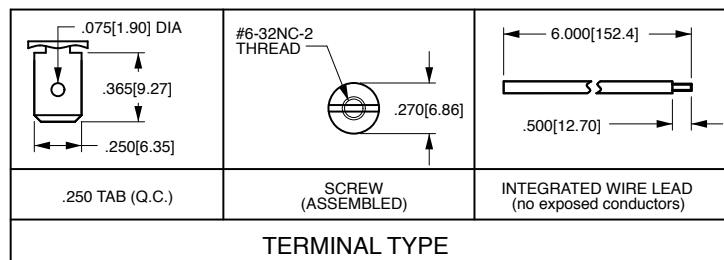
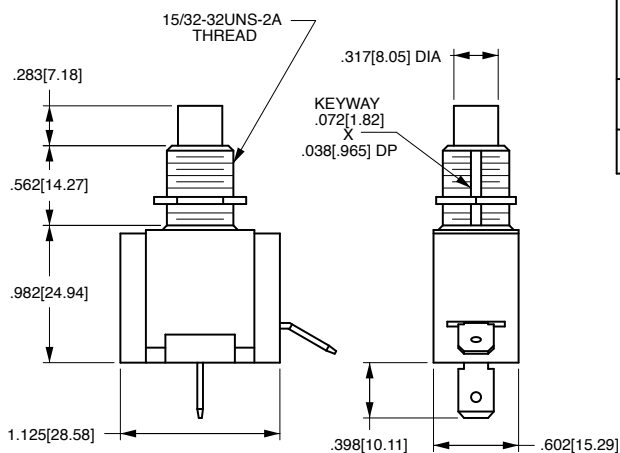
0°F to 85°F (32°C to 85°C)

PA341

¹
Part Number

1 PART NUMBER: SERIES / ACTUATOR / CIRCUITRY / RATING / TERMINATION	.250 Tab	Screw Terms.	Wire Leads
10A 250VAC, 15A 125VAC, 3/4 HP 120-240 VAC ¹ On-Off	PA341	PA344	PA345
On-On	PB341	PB344	PB345
10A 250VAC, 20A 125VAC, 1 1/2 HP 120-240 VAC ¹ On-Off	PA301	PA304	PA305
On-On	PB301	PB304	PB305
10A 250VAC, 15A 125VAC, 10(6)a 250 VACu, T85 ² On-Off	PA951	PA954	PA955

Notes:
 1 Additional ratings available. Consult factory.
 2 UL, CSA & TUV approved.

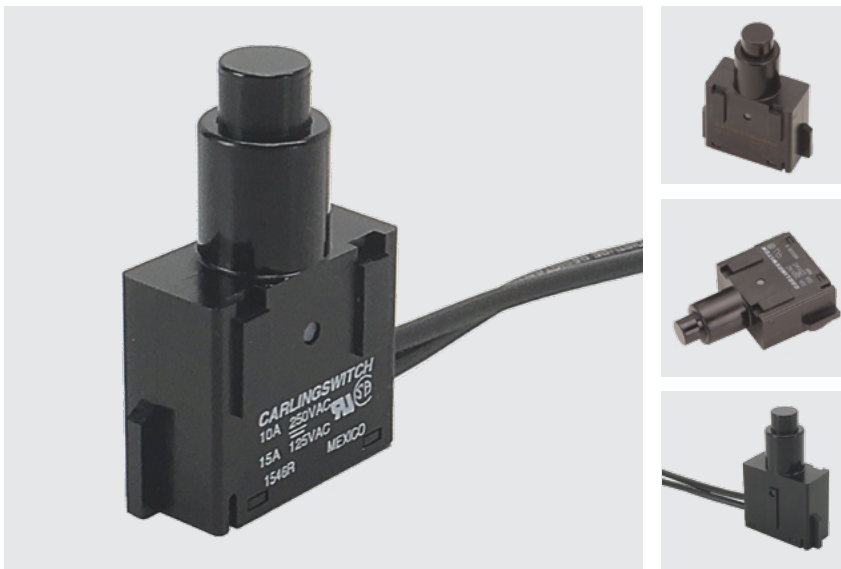


*Manufacturer reserves the right to change product specification without prior notice.

PP-Series

PUSHBUTTON SWITCHES

The PP-Series plastic pushbutton switches are heavy duty, single pole switches with wire leads. They are alternate action, available in single throw construction, with AC ratings up to 15 amps. Both bushing and bracket are made out of nylon. These high current switches are popular within the Appliance market.



Product Highlights:

- ♦ Ratings to 15A 125VAC
- ♦ All nylon construction
- ♦ Stiff actuation force suitable for foot pedal applications
- ♦ Integrated wire lead termination

Typical Applications:

- ♦ Vacuum Cleaners



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts & opposite polarity

Electrical Life

50,000 cycles

Mechanical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

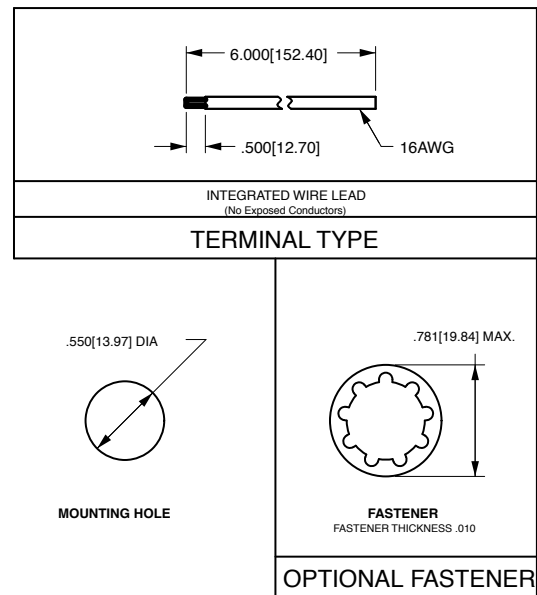
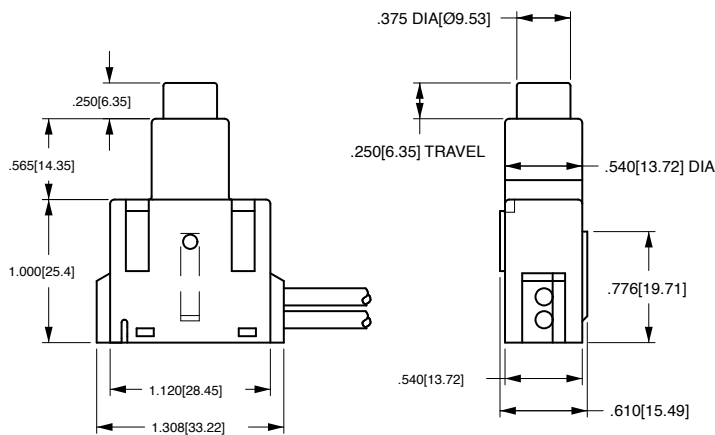
PPA525-AC

¹
Part Number

1 PART NUMBER: SERIES / ACTUATOR / CIRCUITRY / RATING / TERMINATION

10A 250VAC, 15A 125VAC, 3/4HP 125-250VAC
On-Off
10A 250VAC, 15A 125VAC
On-Off

Wire Leads
PPA525-AC
PAA515-AC



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

R135-Series

ROTARY SWITCHES

The R135 and R135A-Series rotary switches are single pole, single throw “L” rated up to 3A, feature an ON-OFF repeating action, and are available with a nylon actuating knob; nylon snap-in bracket or nickel-plated brass bushing. These switches are typically used to control lighting functions.



Product Highlights:

- ◆ 3A 125VAC “L” rating to control lighting
- ◆ Off-On repeating action circuitry
- ◆ Integrated wire lead termination
- ◆ Bushing or snap in mounting styles

Typical Applications:

- ◆ Appliance
- ◆ HVAC



Dielectric Strength

UL/CSA: 1000V - live to dead metal parts

Mechanical Life

100,000 cycles

Electrical Life

100,000 cycles

Operating Temperature

32°F to 185°F (0°C to 85°C)

R135-A - BL

¹
Base Part Number

²
Knob Color

1 BASE PART NUMBER: SERIES / CIRCUITRY / RATING / TERMINATION

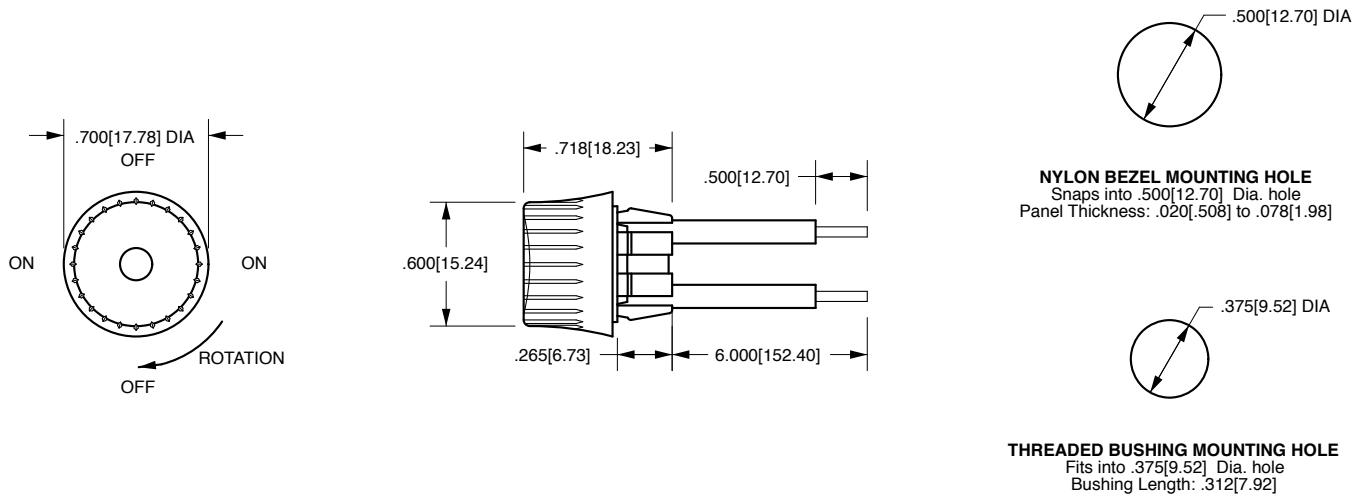
1.5A 250 VAC; 3A 125 VAC L; 5A 12 VDC	Wire Leads
OFF-ON repeating	.375 threaded bushing R135
OFF-ON repeating	nylon snap-in bezel R135-A

2 KNOB COLOR ¹

BL	Black
WH	White

Notes:
Standard Wire Leads are 6" long, stripped 1/2" black. If different length required, please specify at the end of the part number. ex. R135-A-BL/20". Panel Cut-Out Recommendations: For sheet metal panels, switch must enter panel in same direction as the punch. Burr on bottom. Test cut hole in actual material.

¹ Custom colors available. Consult factory.



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

700/800-Series

ROTARY SWITCHES

The 700 and 800-Series are single pole multi-position, general purpose rotary switches. These switches feature a nylon actuator in a metal clad construction along with a self-cleaning silver plated contact design. The 700 and 800-Series are typically used in applications requiring multi-position speed controls, such as electric fans.



Product Highlights:

- ◆ Ratings to 3A 250VAC, 6A 125VAC
- ◆ Up to 8 available detent positions
- ◆ Double “D” bushing mount
- ◆ Sturdy metal clad construction

Typical Applications:

- ◆ Small Appliance
- ◆ Industrial Control
- ◆ Marine



Dielectric Strength

UL/CSA: 1000V (minimum)

Base Material

Steel/Zinc Plate

Insulation Resistance

100 Megohms (minimum)

Actuator Material

Brass/Nickel Plate

700-1A - BL

¹
Base Part Number

²
Knob Color

1 BASE PART NUMBER: SERIES / POLES / CIRCUITRY ¹ / RATING / TERMINATION ²

2A 250VAC; 4A 125VAC; 1A 125V

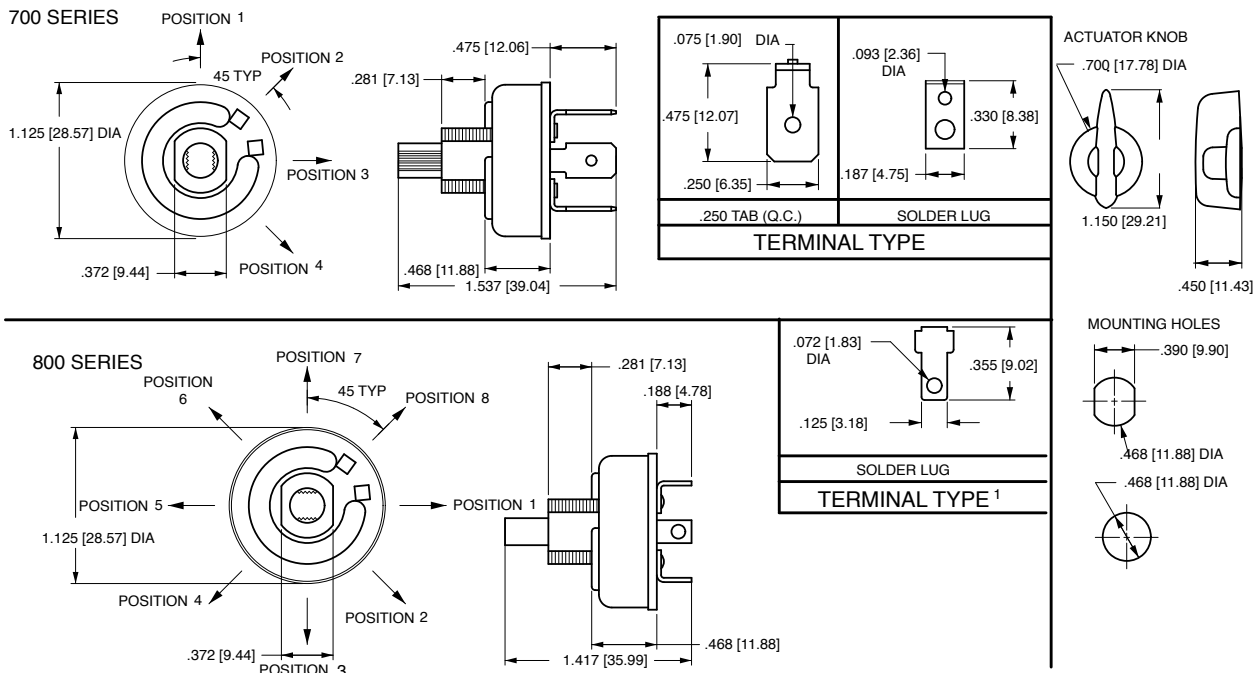
Solder Lugs	.250 Tabs	Position 1	Position 2	Position 3	Position 4	
-	700-A	OFF	ON	ON	ON	
700-1	700-1A	OFF	ON	-	-	
700-2	700-2A	OFF	ON	ON	ON	repeating 8 positions
700-3	700-3A	OFF	ON	ON	OFF	
700-4	700-4A	OFF	ON	ON	-	
700-5	700-5A	OFF	ON	OFF	-	
700-6	700-6A	-	ON	OFF	ON	
700-7	700-7A	-	ON	ON	-	
700-8	700-8A	-	ON	ON	ON	
700-9	700-9A	OFF	ON	OFF	ON	

3A 250VAC; 6A 125VAC

Switch Positions		OFF Position	
800-2	2 positions	800-A	1st position
800-3	3 positions	800-A2	2nd position
800-4	4 positions	800-A3	3rd position
800-5	5 positions	800-A4	4th position
800-6	6 positions	800-A5	5th position
800-7	7 positions	800-A6	6th position
800-8	8 positions	800-A7	7th position
		800-A8	8th position

2 ACTUATOR COLOR
BL Black

- Notes:
 1 700-2 and 700-2A feature 8 detent positions.
 2 800-Series terminal is a combination solder lug and quick connect.



- Notes:
 1. Terminal is combination solder lug and quick connect.


















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

Terminology

Agency data	UL File #E7560 CSA File # LR9280
Single Pole (SP)	A switch device that opens, closes or changes connection of a single conductor in an electrical circuit.
Double Pole (DP)	A switch device that opens, closes or changes connection of two conductors in an electrical circuit.
Single Throw (ST)	A switch that opens, closes or completes a circuit at only one of the extreme positions of its actuator.
Double Throw (DT)	A switch that opens, closes or completes a circuit at both extreme positions of its actuator.
Normally Open (NO)	A momentary switch where one or more circuits are open when the switch actuator is at rest (the normal position.)
Normally Closed (NC)	A momentary switch where one or more circuits are closed when the switch actuator is at rest (the normal position.)
Power Rating	A switches current handling capability measured in amperes, horsepower, lamp loads or combinations thereof, in conjunction with applicable voltage levels.
L Rating	Denotes the ability of a switch to handle the initial high inrush of a Tungsten Filament Lamp on AC voltage only.
T Rating	Denotes the ability of a switch to handle the initial high inrush of a tungsten filament lamp on AC or DC voltage.
Typical European Rating	16 resistive load amperage (4) motor load amperage A amperage 250V voltage ~ AC T85 max. operating temp. in centigrade μ micro-gap (<3mm) approved
Microgap (μ)	European marking required for contact separation of less than 3mm. Switches with microgap (μ) approval are not acceptable as the safety disconnect of equipment from the main power source. The equipment requires an additional means for safe disconnection from the main power source such as a cord and plug.
Bulb Life	Neon 25,000 hours Incandescent 25,000+ hours LED 100,000 hours
Lamp Characteristics	Neon (120-240V) .002A Current Draw Incandescent 6V .20A Current Draw 12-14V .08A Current Draw 18V .04A Current Draw 24-28V .04A Current Draw

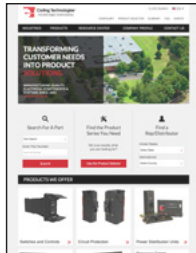
Agency Approvals

These marks are granted by national certification bodies for use on products which comply with their specifications.

Agency	Country	Mark
UL	USA	
UL	Canada	
UL	USA & Canada	
BEAB	United Kingdom	
CSA	Canada	
VDE	Germany	
TUV	Germany	
SEMKO	Sweden	
NEMKO	Norway	
KEMA	Netherlands	
DEMKO	Denmark	
UTE(USE)	France	
SEV	Switzerland	
OVE	Austria	
IMQ	Italy	
CCC	China	
FIMKO	Finland	

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.

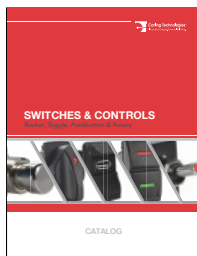
www.carlingtech.com



Watch Company Profile Video



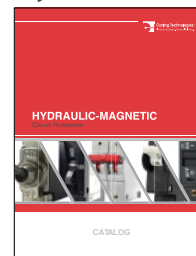
Switches & Controls



catalog

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

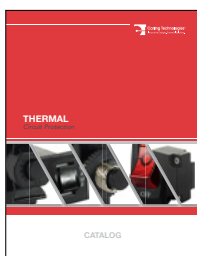
Hydraulic-Magnetic



catalog

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

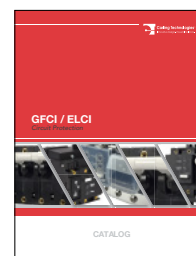
Thermal



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



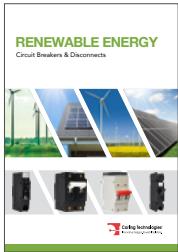
catalog



brochure

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

Renewable Energy



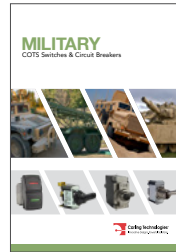
catalog



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



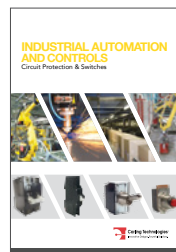
catalog



brochure

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

Industrial Automation

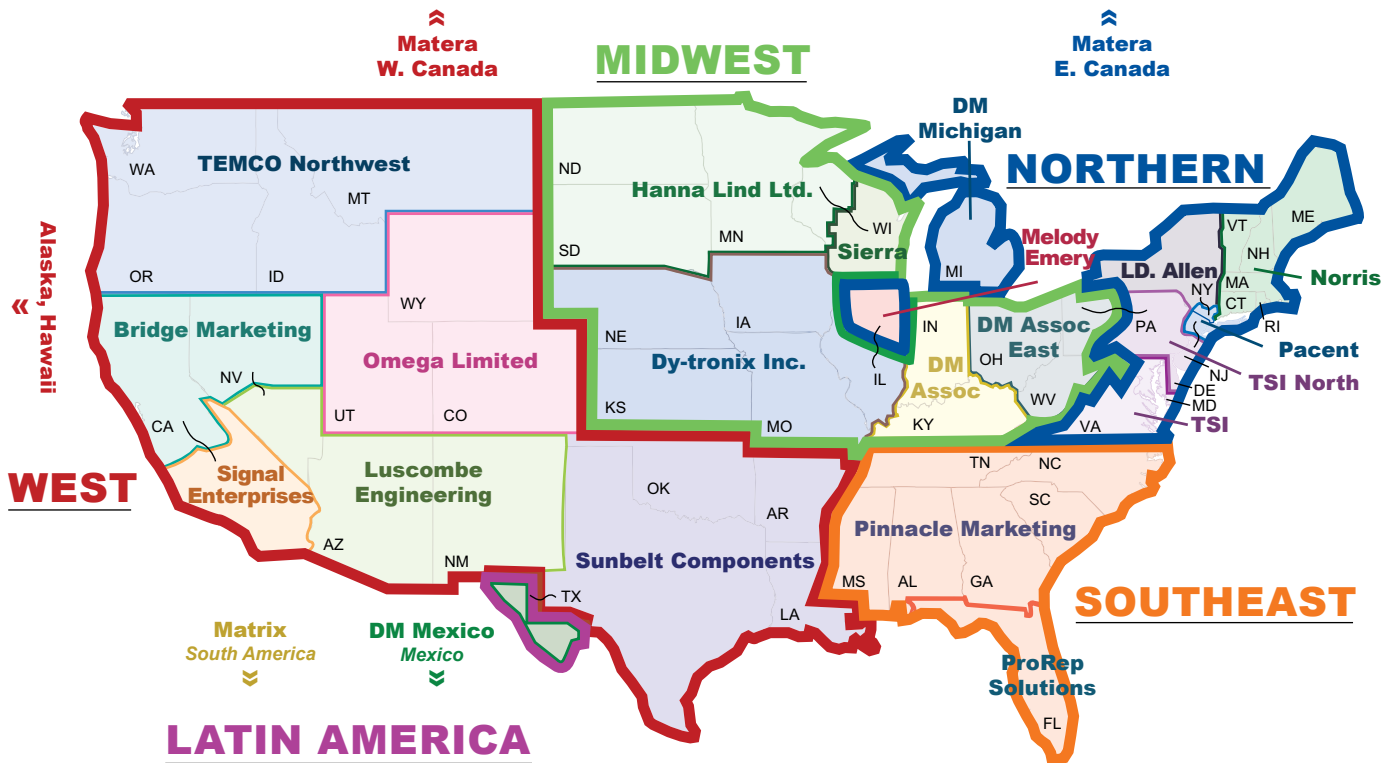


brochure

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.



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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