

# 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 to IP68, Including Below the Panel
- Tri-Seal Design
- Connector with Twin Locking Tabs

### Typical Applications:

- Marine Equipment
- On/Off-Highway Equipment



# W-Series Switch

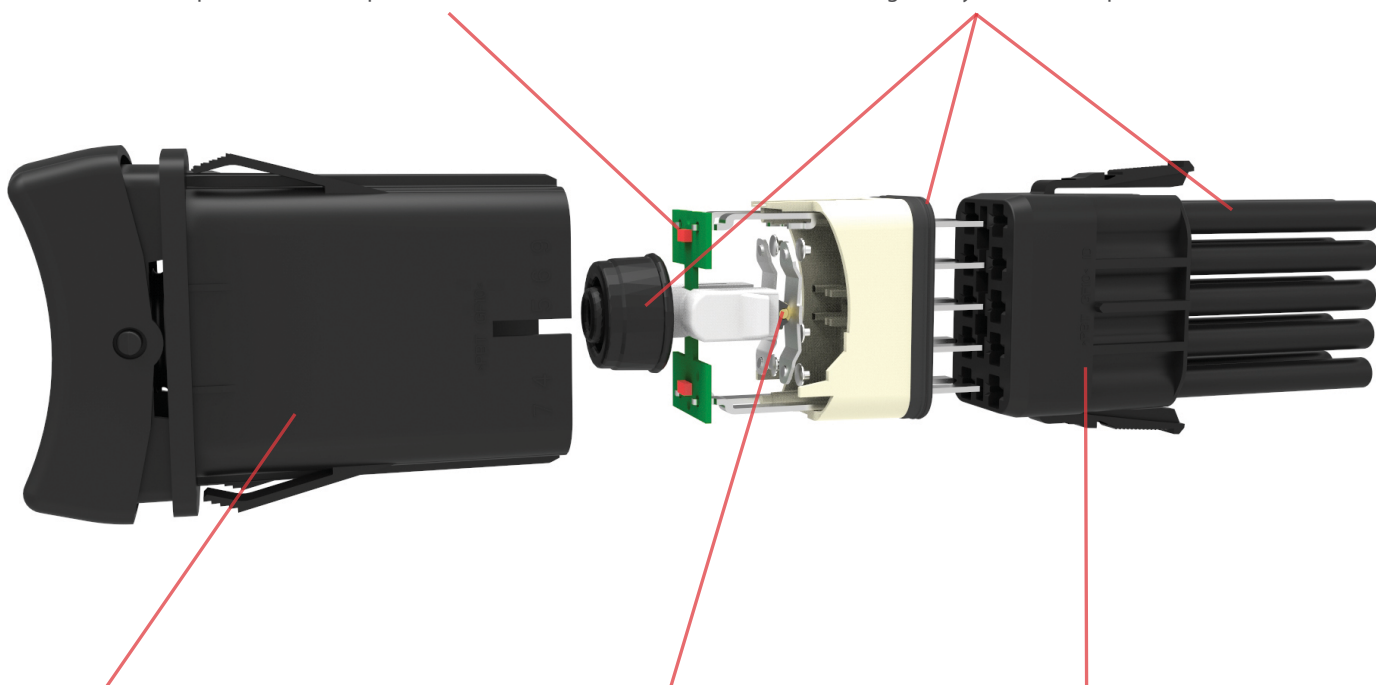
## DESIGN FEATURES

### 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	Up to 100,000 cycles circuit and load dependent
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

### 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

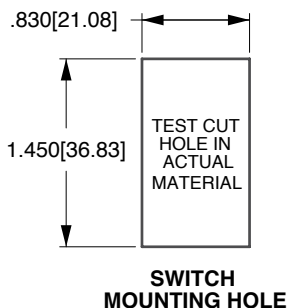
### Environmental

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

### Mounting Specifications

Panel Thickness Range .032 to .125

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



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

**W 11 D 2 B C 0 1 - A 7 Z 00 - 0 00**

1 Series    2 Circuit    3 Rating    4 Termination    5 Illumination    6 Lamp    7 Lamp    8 Bracket    9 Actuator    10 Lens    11 Lens    12 Legend    13 Legend Orientation    14 Actuator Lens Legend

**1 SERIES**  
W

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

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

**3 RATING 3**

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

**4 TERMINATION / BASE STYLE**

2	.110 TAB (QC)
---	---------------

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

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

**6,7 LAMP (SAME CODING FOR BOTH SELECTIONS)**

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

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

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

**8 BRACKET COLOR 1**

1 Black

**9 ACTUATOR 1**

3 Black with Laser Etched  
A Black

**10 LENS COLOR / STYLE - ABOVE LAMP #1 TERMINALS 1 AND 4**  
**11 LENS COLOR / STYLE - ABOVE LAMP #2 TERMINALS 3 AND 6**

Z - No Lens

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

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

**12 ACTUATOR LENS OR BODY LEGEND 2**

00 - No Legend this location/No actuator

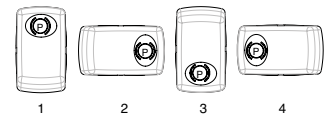
11	ON	12	OFF	13	I	14	O
	OFF		ON		O		I
15	O O	16	O O	17	O I	18	I O
	F N		N F				
	F		F				
21		22	ON	23	O	24	I
	OFF		ON		O		I
25	O	26	O	27	O	28	I
	F		N				
	F						



For additional legend options & codes, visit us at [carlingtech.com](http://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](http://carlingtech.com)

Notes:

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

**W 11 D 2 0 W 0 J - P 7 B 00 - 0**

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

**1 SERIES**  
W

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

**Position:**

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

**3 RATING**

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

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

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

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

**6 LOCK**  
W Lock Option

**7 LAMP #2**

No lamp	0	Red	Amber	Green	White
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**<sup>1</sup>  
J Black

**9 ACTUATOR**<sup>1</sup>  
P Black  
R Red

**10 LENS**

Z - No Lens

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

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

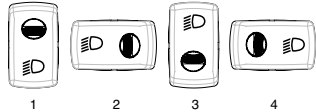
**11 LOCK FUNCTION**

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

**12 LASER ETCHED, LENS OR BODY LEGEND**<sup>1</sup>  
00 No legend this location / no actuator  
For legend options & codes, visit us at [carlingtech.com](http://carlingtech.com)

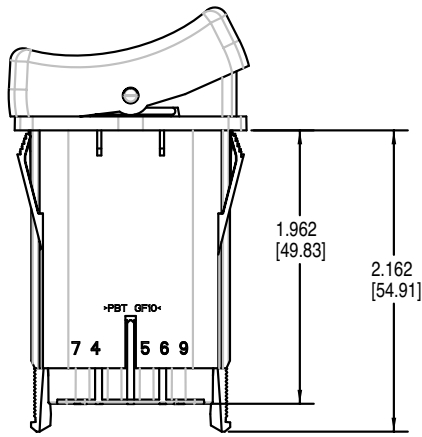
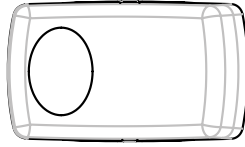
**13 LEGEND ORIENTATION**

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

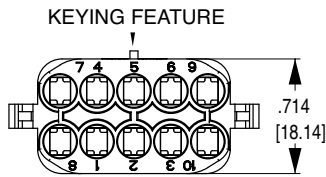
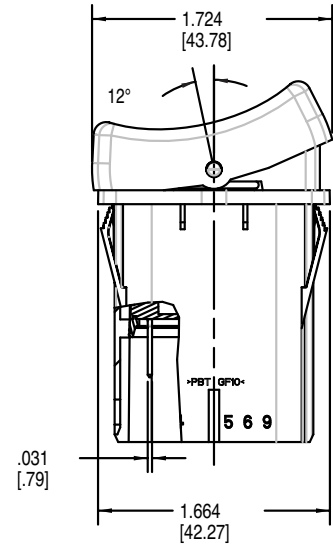
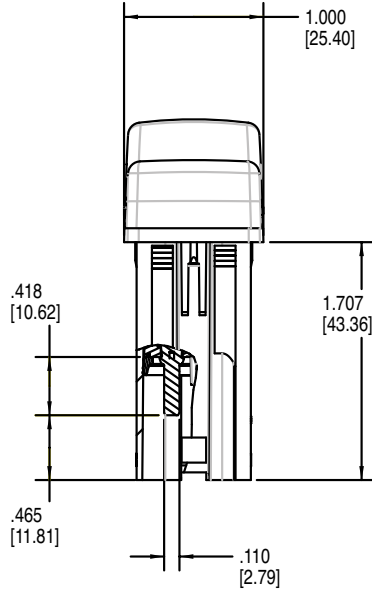


Notes:  
1 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.

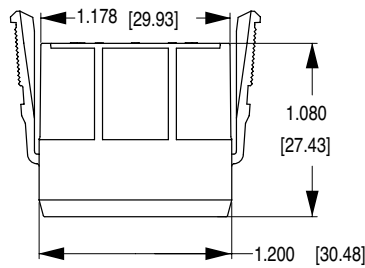
Dimensional Specifications: in. [mm]



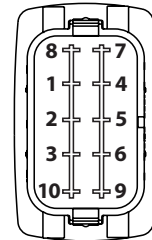
SWITCH SHOWN WITH CONNECTOR INSTALLED



WCH CONNECTOR  
(190-31214-001)



TERMINAL ARRANGMENT



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

Circuit Diagrams:

CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM	CIRCUIT CODE	CIRCUIT DIAGRAM
11		23		46		57	
12		24		47		58	
13		25		48		61	
14		26		49		62	
15		27		51		63	
16		28		52		64	
17		42		53		65	
18		43		54		66	
21		44		55		67	
22		45		56		68	

Lamp Circuit Diagrams:

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

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

LAMP CIRCUIT CODE	CIRCUIT DIAGRAM
U	
V	
W	
Y	
Z	



## Authorized Sales Representatives and Distributors

Click on a region of the map below to find your local representatives and distributors or visit [www.carlingtech.com/findarep](http://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 ISO9001 and IATF16949 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](http://www.carlingtech.com/company-profile).

To view all of Carling's environmental, quality, health & safety certifications please visit [www.carlingtech.com/environmental-certifications](http://www.carlingtech.com/environmental-certifications)

## **Worldwide Headquarters**

Carling Technologies, Inc.  
60 Johnson Avenue, Plainville, CT 06062  
**Phone:** 860.793.9281 **Fax:** 860.793.9231  
**Email:** sales@carlingtech.com

**Northern Region Sales Office:** nrsm@carlingtech.com  
**Southeast Region Sales Office:** sersm@carlingtech.com  
**Midwest Region Sales Office:** mrsm@carlingtech.com  
**West Region Sales Office:** wrsm@carlingtech.com  
**Latin America Sales Office:** larsm@carlingtech.com

## **Asia-Pacific Headquarters**

Carling Technologies, Asia-Pacific Ltd.,  
Suite 1607, 16/F Tower 2, The Gateway,  
Harbour City, 25 Canton Road,  
Tsimshatsui, Kowloon, Hong Kong  
**Phone:** Int + 852-2737-2277 **Fax:** Int + 852-2736-9332  
**Email:** sales@carlingtech.com.hk

**Shenzhen, China:** shenzhen@carlingtech.com  
**Shanghai, China:** shanghai@carlingtech.com  
**Pune, India:** india@carlingtech.com  
**Kaohsiung, Taiwan:** taiwan@carlingtech.com  
**Yokohama, Japan:** japan@carlingtech.com

## **Europe | Middle East | Africa Headquarters**

Carling Technologies LTD  
4 Airport Business Park, Exeter Airport,  
Clyst Honiton, Exeter, Devon, EX5 2UL, UK  
**Phone:** Int + 44 1392.364422 **Fax:** Int + 44 1392.364477  
**Email:** ltd.sales@carlingtech.com

**Germany:** gmbh@carlingtech.com  
**France:** sas@carlingtech.com



**Carling Technologies®**

Innovative Designs. Powerful Solutions.