

# W-Series Switch

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 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.



#### Key Features:

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

#### Typical Applications:

- ♦ Marine equipment
- ♦ Transportation equipment



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Innovative Designs. Powerful Solutions.

# W-Series Switch

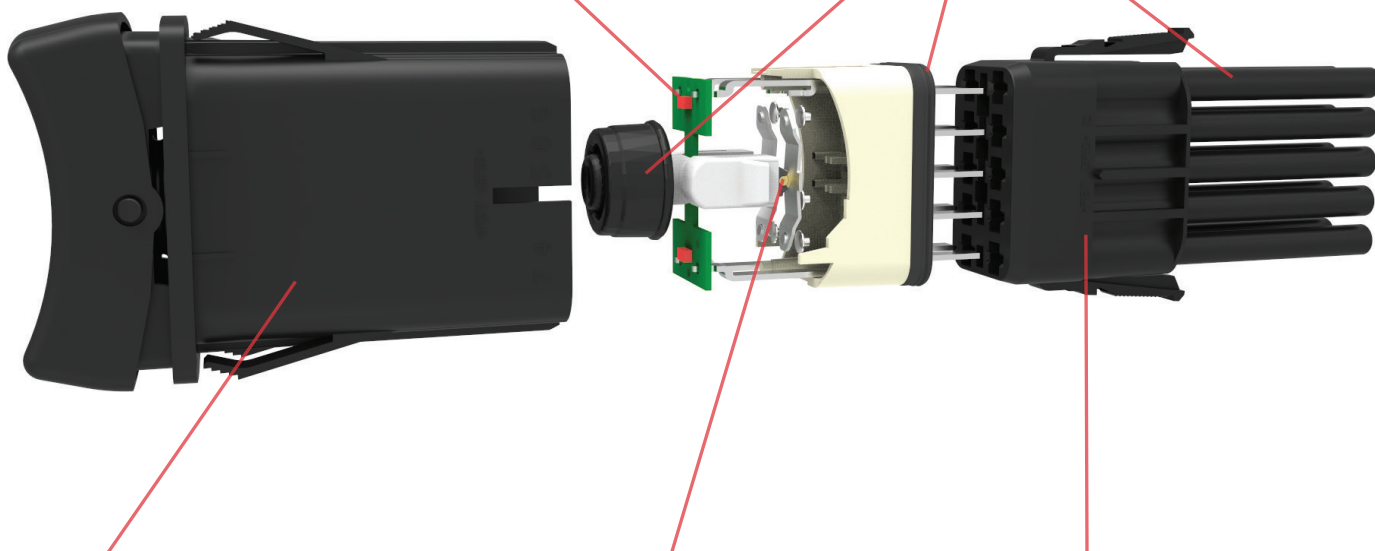
## DESIGN FEATURES

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

## Mechanical

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

## Physical

|           |                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------|
| Lighted   | LED - rated 100,000 hours 1/2 life<br>(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

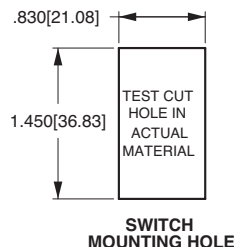
## Environmental

|                                  |                                                                                                                                                                                                       |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental                    | IP68, Fully sealed                                                                                                                                                                                    |
| Corrosion/<br>Chemical Splash    | Flowing Mixed Gas (FMG)<br>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<br>Test Condition A 0.06 DA or 10G's 10-500 Hz.                                                                                                                         |
| Vibration 2                      | Resonance search<br>24-50 Hz 0.40 DA<br>50-2000 ±10 G's peak<br>Results Horizontal Axis 3-5 G's max.<br>Random<br>24 Hz 0.06 PSD-Gsq/Hz<br>60 Hz 0.50<br>100 Hz 0.50<br>200 Hz 0.025<br>2000 Hz 0.025 |
| Handling/Drop<br>Salt Spray      | One meter onto concrete floor<br>Per Mil-Std 202F, Method 101D, Test Condition A, 48 Hrs.                                                                                                             |
| Dust<br>Thermal Shock            | IP6X<br>Per Mil-Std 202F, Method 107F, Test Condition A, -55°C to 85°C.<br>Test criteria - pre and post test contact resistance                                                                       |
| Moisture Resistance/<br>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<br>Series | 2<br>Circuit | 3<br>Rating | 4<br>Termination | 5<br>Illumination | 6<br>Lamp | 7<br>Lamp | 8<br>Bracket | 9<br>Actuator | 10<br>Lens | 11<br>Lens | 12<br>Legend | 13<br>Legend<br>Orientation | 14<br>Actuator<br>Lens Legend |   |    |

### 1 SERIES W

### 2 CIRCUIT

Terminal Connections as viewed from bottom of switch:

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

( ) - momentary

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

### Position:

| SP | DP | 1            | 2                   | 3            |
|----|----|--------------|---------------------|--------------|
| 11 | 21 | 2 & 3, 6 & 8 | Connected Terminals | 1 & 2, 5 & 6 |
| 12 | 22 | ON           | NONE                | OFF          |
| 13 | 23 | ON (ON)      | NONE                | OFF          |
| 14 | 24 | ON           | NONE                | (OFF)        |
| 15 | 25 | ON           | NONE                | ON           |
| 16 | 26 | ON           | NONE                | (ON)         |
| 17 | 27 | ON           | OFF                 | ON           |
| 18 | 28 | ON (ON)      | OFF                 | (ON)         |
| -  | 49 | ON           | ON                  | ON           |

### 3 RATING

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

### 4 TERMINATION/BASE STYLE

2 .110 TAB (QC)

### 5 ILLUMINATION

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

|                                           | Lamps   | Actuator Lens Position Illumination Type | Lamp wired to Terminals |
|-------------------------------------------|---------|------------------------------------------|-------------------------|
| O                                         | NONE    |                                          |                         |
| A                                         | # 1     | Independent                              | 8+ 7-                   |
| B                                         | # 1     | Down                                     | 3+ 7-                   |
| C                                         | # 2     | Up                                       | 3+ 7-                   |
| D                                         | # 1     | Down                                     | 3+ 7-                   |
| 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     | Up                                       | 8+ 7-                   |
| Selections for Single Pole Switches Only: |         |                                          |                         |
| K                                         | # 1     | Down                                     | 3+ 8-                   |
| L                                         | & # 2   | Independent                              | 6+ 7-                   |
| M                                         | # 1     | Independent                              | 8+ 7-                   |
| N                                         | # 2     | Independent                              | 8+ 7-                   |
| Selections for Double Pole Switches Only: |         |                                          |                         |
| P                                         | # 1     | Down                                     | 3+ 6-                   |
| Q                                         | # 2     | Up                                       | 3+ 6-                   |
| R                                         | # 1     | Down                                     | 3+ 6-                   |
| S                                         | & # 2   | Down                                     | 1+ 4-                   |
| T                                         | # 1     | Up                                       | 1+ 4-                   |
| U                                         | & # 2   | Up                                       | 3+ 6-                   |
| V                                         | # 1     | Down                                     | 3+ 7-                   |
| W                                         | & # 2   | Up                                       | 6+ 7-                   |
| X                                         | # 1     | Down                                     | 6+ 7-                   |
| Y                                         | & # 2   | Independent                              | 8+ 7-                   |
| Z                                         | # 1     | Independent                              | 8+ 7-                   |
|                                           | & # 2   | Independent                              | 10+ 9-                  |
|                                           | # 1     | Independent                              | 10+ 9-                  |
|                                           | & # 2   | 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 | superbright 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<sup>1</sup>

1 Black

### 9 ACTUATOR<sup>1,3</sup>

3 Black with Laser Etch  
A Black

### 10 LENS - ABOVE LAMP #1 TERMINALS<sup>1,4</sup>

### 11 LENS - ABOVE LAMP #2 TERMINALS<sup>3,6</sup>

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 -   | 7     | B     | G     | M   | T    |
| 2 -   | 8     | C     | H     | N   | U    |
| 3 -   | 9     | D     | J     | P   | V    |
| 4 -   | 0     | E     | K     | R   | W    |
| 5     | A     | -     | -     | -   | -    |

Laser Etch background color

### 12 ACTUATOR LENS OR BODY LEGEND<sup>2</sup>

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      |        |
| 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](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<sup>2</sup>

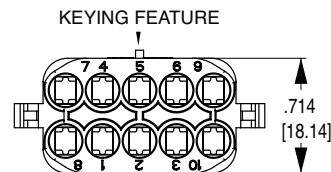
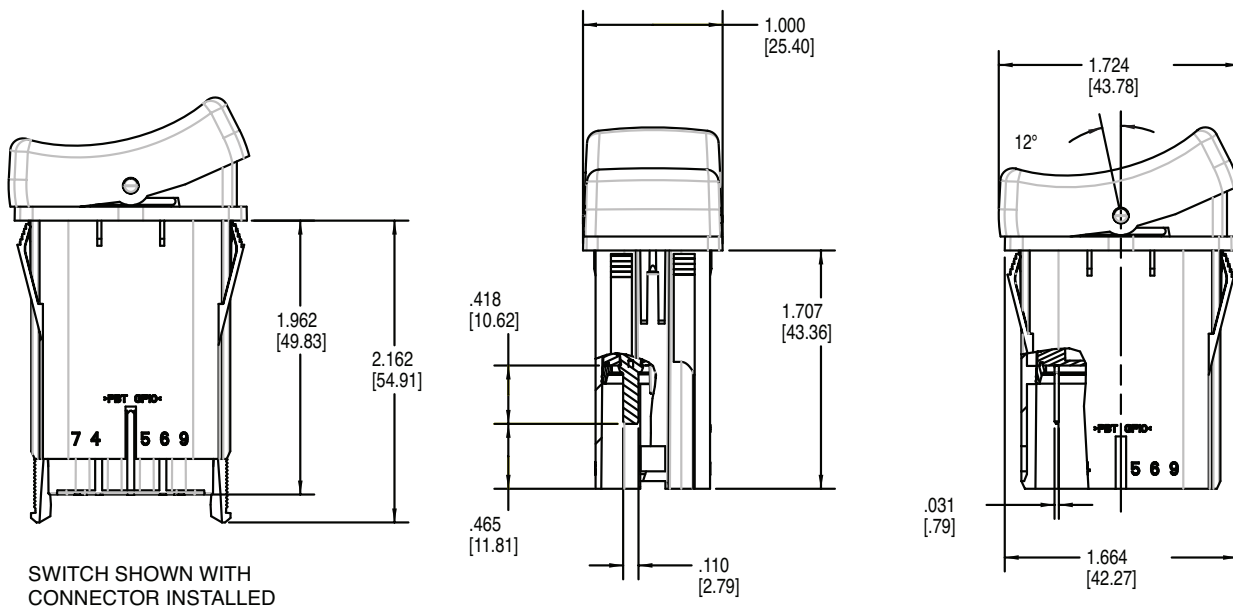
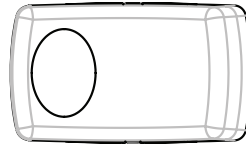
00 No legend this location/no actuator (used with codes 11-18 in selection 12)

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)

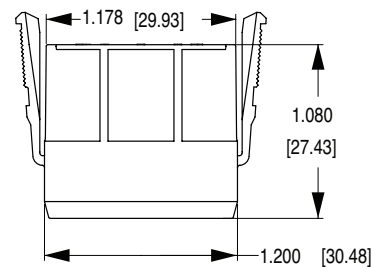
#### Notes:

- 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.
- 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.

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