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:

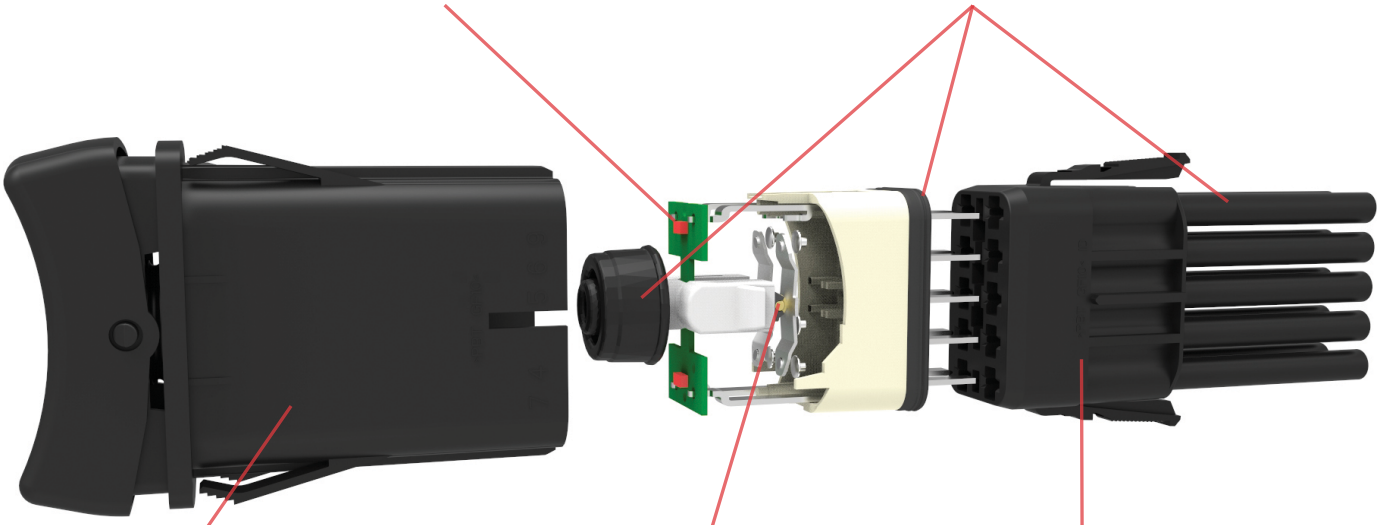
- Marine Equipment
- On/Off-Highway Equipment

Carling Technologies®
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 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 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

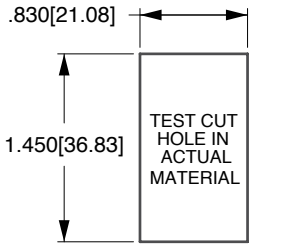
Environmental

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



SWITCH MOUNTING HOLE

*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-
	& # 2	Down	1+	7-
E	# 1	Up	1+	7-
	& # 2	Up	3+	7-
F	# 1	Independent	8+	7-
	& # 2	Up	3+	6-
G	# 1	Independent	8+	7-
	& # 2	Up	3+	7-
H	# 2	Independent	8+	7-
Selections for Single Pole Switches Only:				
J	# 1	Down	3+	8-
	& # 2	Independent	6+	7-
K	# 1	Independent	8+	7-
	& # 2	Independent	6+	7-
Selections for Double Pole Switches Only:				
L	# 1	Down	3+	6-
M	# 2	Up	3+	6-
N	# 1	Down	3+	6-
	& # 2	Down	1+	4-
P	# 1	Up	1+	4-
	& # 2	Up	3+	6-
R	# 1	Down	3+	7-
	& # 2	Up	6+	7-
S	# 1	Down	6+	7-
	& # 2	Independent	8+	7-
U	# 1	Independent	8+	7-
	& # 2	Independent	10+	9-
V	# 2	Independent	10+	9-
W	# 1	Independent	8+	7-
	& # 2	Independent	10+	7-
Y	# 1 & # 2	Independent in Series	8+	7-
Z	# 1 & # 2	Independent in Parallel	8+	7-

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

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

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

8 BRACKET COLOR [1]
1 Black

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

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

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

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

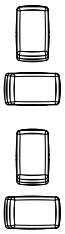
12 ACTUATOR LENS OR BODY LEGEND [2]
00 - No Legend this location/No actuator

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

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

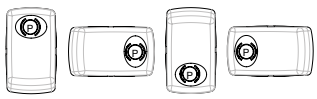
21 OFF **22** ON **23** O **24** I

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



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

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



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

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

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

1 SERIES
W

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

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

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

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

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

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

6 LOCK
W Lock Option

7 LAMP #2

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

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

8 BRACKET COLOR [1]
J Black

9 ACTUATOR [1]
P Black
R Red

10 LENS
Z - No Lens

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

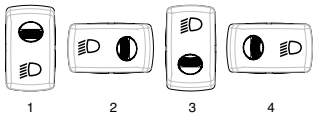
Lens color for LEDs must be clear, white, or match color of LED.

11 LOCK FUNCTION

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

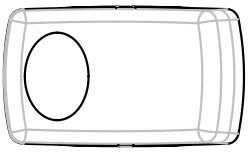
12 LASER ETCHED, LENS OR BODY LEGEND [1]
00 No legend this location / no actuator
For legend options & codes, visit us at carlingtech.com

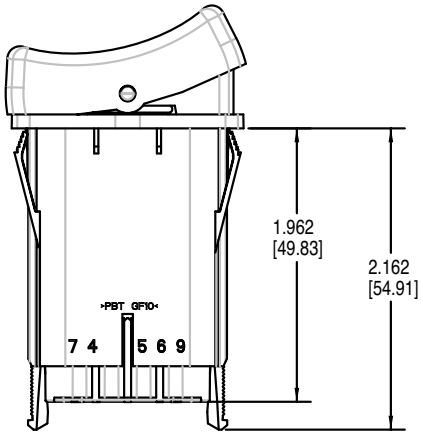
13 LEGEND ORIENTATION
0 No legend
1 Orientation 1
2 Orientation 2
3 Orientation 3
4 Orientation 4



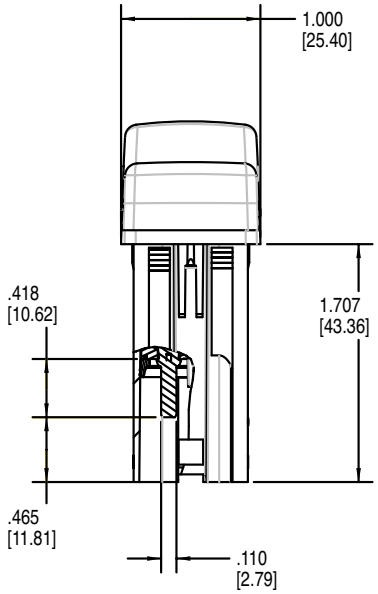
Notes:
1 White imprinting is standard on black actuators; Black imprinting is standard on white, red & gray actuators; Custom colors are available, consult factory.

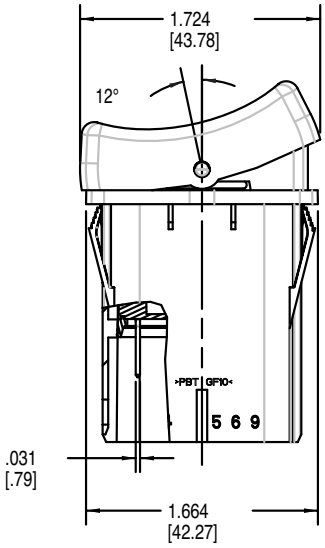
Dimensional Specifications: in. [mm]





SWITCH SHOWN WITH
CONNECTOR INSTALLED





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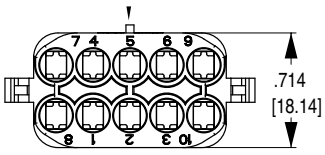
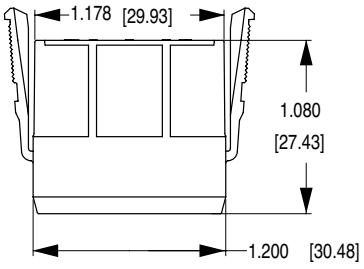
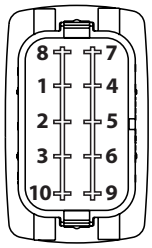


WCH CONNECTOR
(190-31214-001)

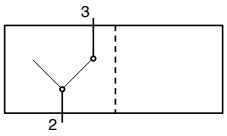
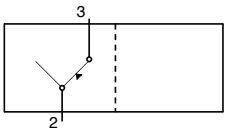
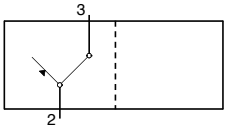
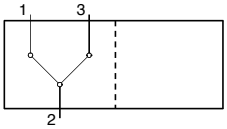
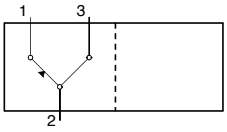
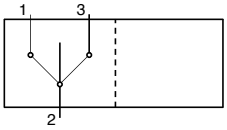
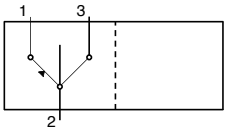
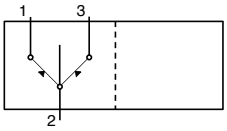
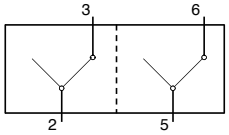
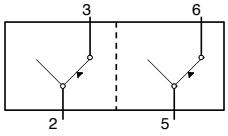


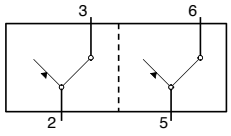
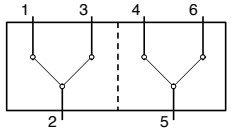
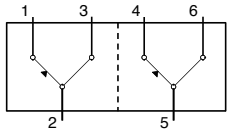
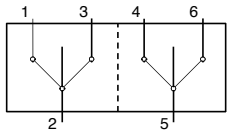
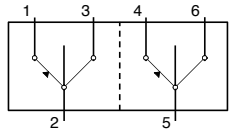
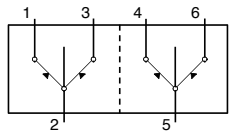
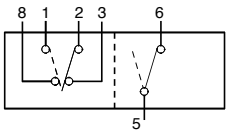
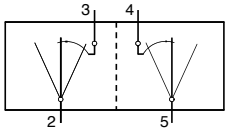
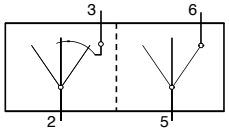
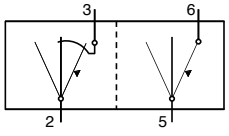
TERMINAL ARRANGMENT

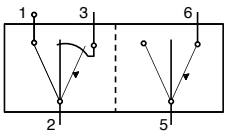
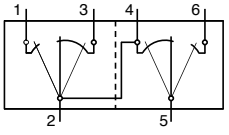
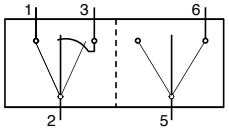
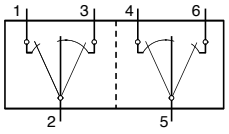
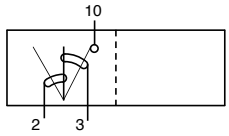
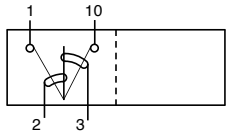
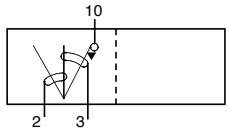
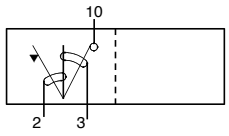
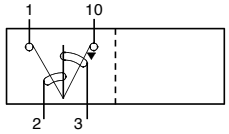
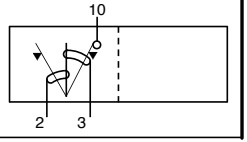


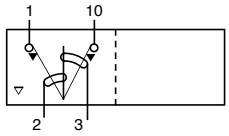
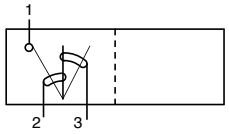
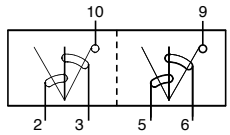
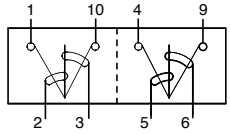
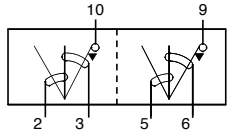
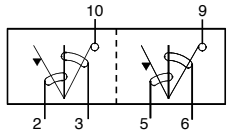
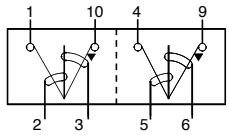
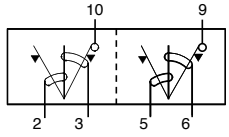
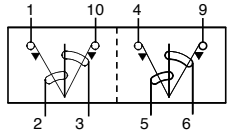
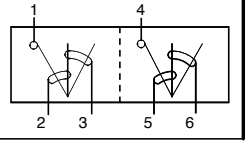
Notes:
WCH connector is intended for use with Tyco/Amp .110 Junior Power Timer, female contacts, and wire seals.
For 14-16 awg wire, specify Tyco/Amp P/N 927766-3
For 16-20 awg wire, specify Tyco/Amp P/N 927770-3
Tyco/Amp cable seal P/N 828904-1 (20-18 awg wire) or P/N 828905-1 (16-14 awg wire) is required 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:

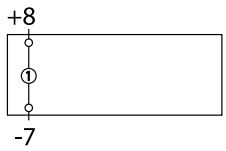
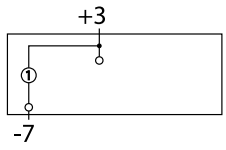
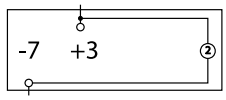
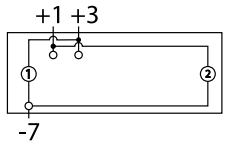
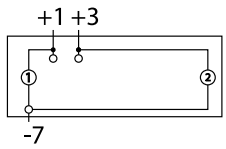
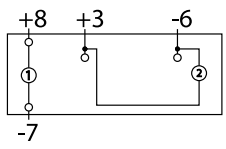
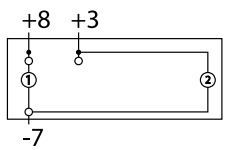
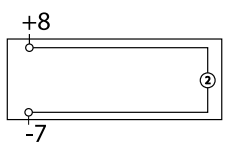
CIRCUIT CODE	CIRCUIT DIAGRAM
11	
12	
13	
14	
15	
16	
17	
18	
21	
22	

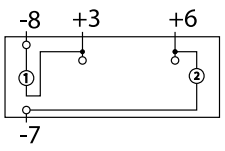
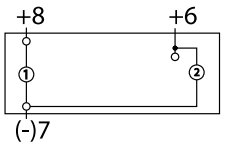
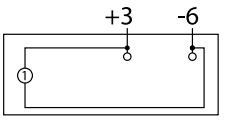
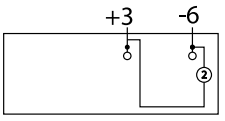
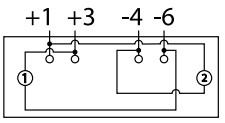
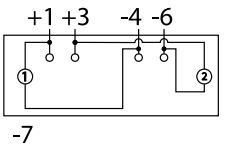
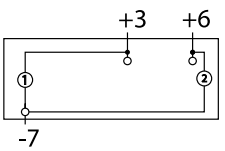
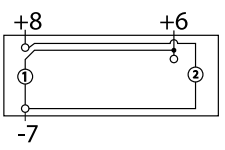
CIRCUIT CODE	CIRCUIT DIAGRAM
23	
24	
25	
26	
27	
28	
42	
43	
44	
45	

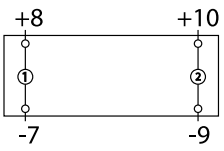
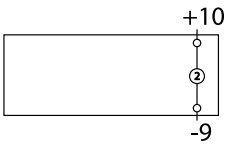
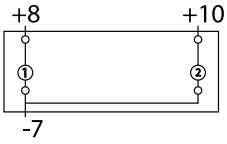
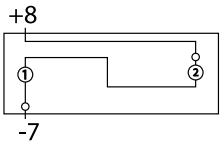
CIRCUIT CODE	CIRCUIT DIAGRAM
46	
47	
48	
49	
51	
52	
53	
54	
55	
56	

CIRCUIT CODE	CIRCUIT DIAGRAM
57	
58	
61	
62	
63	
64	
65	
66	
67	
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	
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