

SECTION

G



Technical Reference

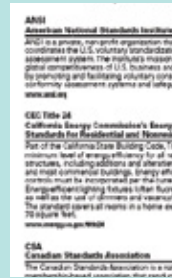
We've made it quick and easy to find the important industry and product data you are looking for, including NEMA configurations, electrical codes, industry standards, relevant definitions, general wiring device information, and wiring diagrams.



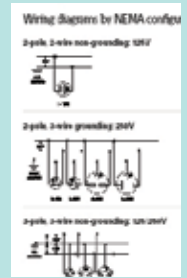
NEMA configuration chart
G-2



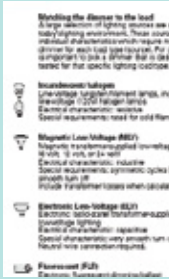
Power devices cross reference
G-3



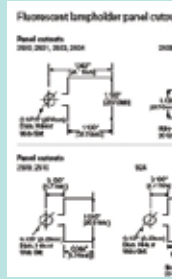
Common industry information
G-4



Wiring & coverage diagrams
G-10














Lighting control basics
G-18


















Panel cutout dimensional data
G-20



NAFTA compliance
G-21

Poles, wires	Rating	NEMA prefix	15A Straight blade		20A Straight blade						
			Receptacles, connectors & outlets	Plugs	Receptacles, connectors	Plugs					
2-pole, 2-wire	125V/AC	1	4882 ★ 86 ★● 2602 ● 2603 ● 2606 ● 2607 ● 2609 ●	6882 ★ SA155 ★	4862 ◆ 84 ◆ 183 ◆ 1912 ◆ 2600 ◆ 2601 ◆ 3123 ◆	SA540 ◆ SA940 ◆					
											
2-pole, 3-wire grounding	125V/AC	5	222 ★ 817 + 2887 ★ 4887 ★ AH5969 ★O TR817 +R TR6250 +DR TRCR15 ■R TRVGF15 ■GR TWRVGF15 ■GRW WRVGF15 ■GW VGF15 ■G 78 ■S 270 ■	298 ■ 1107 ■D 4270 ■ 5270 ■L 6887 ★ SA993 ★◆ TR270 +R TR775 +R TR780 ■R TR1107 ■DR TR5797 ■R	1709 ◆ 2867 ◆ 4867 ◆ AH5965 ◆O 6867 ◆ SA399 ◆	1877 + 2228 ★ 4228 ★ AH5369 ★O TR1877 +R TR6350 +DR TRCR20 ■R TRVGF20 ■GR TWRVGF20 ■GRW VGF20 ■G WRVGF20 ■GW	2809 ◆ 4409 ◆ AH5364 ◆O				
			250V/AC	6	2227 ★ 4227 ★ AH5669 ★O	74 ■S	2866 ◆ 4866 ◆ AH5666 ◆O	2229 ★ 4229 ★ AH5469 ★O	3809 ◆ 4509 ◆ AH5464 ◆O		
	277V/AC	7			5302 □	2839 ◆					
3-pole, 3-wire	125/250V/AC	10				805 +	2836 ◆				

Poles, wires	Rating	NEMA prefix	30A Straight blade		50A Straight blade		60A Straight blade	
			Receptacles	Plugs	Receptacles	Plugs	Receptacles	Plugs
2-pole, 3-wire grounding	125V/AC	5	1233 +■ 	S41 ◆A 	1253 + 	S41 ◆A 		
			250V/AC	6	1232 +S 1234 + 	S42 ◆A 	1252 +S 1254 + 	S42 ◆A 
3-pole, 3-wire	125/250V/AC	10			38B + 125 +S 	S80 ◆A 	32B + 112 +S 	S80 ◆A 
			3-pole, 4-wire grounding	125/250V/AC	14	1225 +S 1257 + 	S21 ◆A 	58 +P 1212 +S 1258 + 

Straight blade legend: How to use the chart

Core catalog number color indicates a device's grade:

BLACK = Heavy duty grade
BLUE = Standard grade

A suffix combining a **RED** shape and alpha letter indicates a device's body and type.

Device body:

- Duplex receptacle
- + Single receptacle
- ◆ Plug
- ★ Connector
- Outlet

Device type:

- A Angled
- D Decorator
- G GFCI
- L CO/ALR
- O Quick grip
- P Panel mount
- L CO/ALR
- O Quick grip
- P Panel mount

Power devices cross reference

Straight blade power devices – 20A, 30A, 50A & 60A



Rating: Amps V/AC	Receptacle/ Plug NEMA Configuration	Flush Receptacle	Wallplate	Surface Receptacle	Panel Mount Receptacle	Plugs	Adapters
2-pole, 3-wire grounding							
30A 125V	 5-30R	 5-30P	1233 (Brown)	Standard size: 2068, 2168, 93221, 93227 Mid-size: 5068, PJ703, PJ724		S41 (Black)	
30A 125V	 TT-30R	 TT-30P	1263 (Black)		U1263 (Black)	83 (Black)	1264 TT-30 Plug to NEMA 5-15R or 5-20R (Black)
30A 125V	 6-30R	 6-30P	1234 (Black)		1232 (Black)	S42 (Black)	
50A 125V	 5-50R	 5-50P	1253 (Brown)			S41 (Black)	
50A 125V	 6-50R	 6-50P	1254 (Black)		1252 (Black)	S42 (Black)	
3-pole, 3-wire non-grounding							
20A 125/250V	 10-20R	 10-20P	805 (Ivory)			2836 (Yellow)	
30A 125/250V Dryer	 10-30R	 10-30P	38B (Brown)	Standard size: 2068, 2168, 93221, 93227 Mid-size: 5068, PJ703, PJ724	125 (Black)	S80 (Black)	
50A 125/250V Range	 10-50R	 10-50P	32B (Brown)		112 (Black)	S80 (Black)	
3-pole, 4-wire grounding							
30A 125/250V Dryer	 14-30R	 14-30P	1257 (Black)	Standard size: 2068, 2168, 93221, 93227 Mid-size: 5068, PJ703, PJ724	1225 (Black)	S21 (Black)	
50A 125/250V Range	 14-50R	 14-50P	1258 (Black)		1212 (Black)	58 (Black)	S21 (Black)
60A 125/250V	 14-60R	 14-60P			60 (Black)	S20 (Black)	

Organization abbreviations glossary

Common abbreviations for organizations often referred to in the electrical industry and also noted throughout the residential catalog

ANSI

American National Standards Institute, Inc.

ANSI is a private, non-profit organization that administers and coordinates the U.S. voluntary standardization and conformity assessment system. The Institute's mission is to enhance both the global competitiveness of U.S. business and the U.S. quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems and safeguarding their integrity.

www.ansi.org

CEC Title 24

California Energy Commission's Energy Efficiency Standards for Residential and Nonresidential Buildings

Part of the California State Building Code, Title 24 requires a minimum level of energy efficiency for all new heated or cooled structures, including additions and alterations to existing homes and most commercial buildings. Energy efficient lighting and controls must be incorporated per the current standards. Energy-efficient lighting fixtures (often fluorescent) are required as well as the use of dimmers and vacancy/occupancy sensors. The standard covers all rooms in a home except closets under 70 square feet.

www.energy.ca.gov/title24

CSA

Canadian Standards Association

The Canadian Standards Association is a not-for-profit, membership-based association that conducts product safety testing, and issues certifications.

www.csa.org

GSA

General Services Administration Federal Supply Service

GSA's Federal Supply Service provides federal customers with a specific list of manufacturer's products that have been approved to meet stated requirements. The most frequently cited Federal Specifications regarding electrical wiring devices are those for Electrical Power Connector, Plug, Receptacle and Cable Outlet (Fed. Spec. W-C 596) and for Toggle and Lock, Flush Mounted Switches (Fed. Spec. W-S 896).

www.gsa.gov

NEC®

National Electrical Code®

Published by the NFPA (see listing) as NFPA 70, the National Electrical Code. This publication, renewed every 3 years under the auspices of ANSI, provides for the adequate protection of life and property from dangers associated with the use of electricity. It is now adopted and enforced in all 50 states in the United States and is also the basis for electrical codes in several other countries.

www.nfpa.org

NEMA

National Electrical Manufacturers Association

Comprised of electrical manufacturers, NEMA provides a forum for the standardization and testing of electrical equipment, enabling consumers to select from a range of safe, effective, and compatible electrical products. NEMA-standards of testing is frequently required by both government and third-party endorsees such as UL and CSA prior to their approval.

www.NEMA.org

NFPA

National Fire Protection Association

The mission of the international non-profit NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically based consensus codes and standards, research, training and education. The NFPA authors the NEC® and NPPA 70E electrical safety in the workplace.

www.nfpa.org

NOM

Normas Oficiales de México (Official Mexican Standards)

The Official Mexican Standards (referred to as Normas or NOMs) augment the Mexican Hazardous Materials Land Transportation Regulation and provide information relative to importing and exporting hazardous materials from and to Mexico.

OSHA

Occupational Health and Safety Administration, U.S. Department of Labor

OSHA's mission is to assure safe and healthful working conditions for working men and women (having been authorized to enforce standards first created under the Occupational Health and Safety Act of 1970 and since evolved), by assisting and encouraging the States in their efforts to assure safe and healthful working conditions.

www.osha.gov

UL

Underwriters Laboratories

Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product safety testing and certification organization.

www.ul.com

NSF

National Sanitation Foundation

NSF International helps protect people by certifying products and writing standards for consumer goods. As an independent, not-for-profit organization, NSF works toward allowing everyone to live safer.

www.nsf.org

Organization acronyms

Standards development organizations

ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
BRC	British Retail Consortium
CANENA	Consejo de Armonización de Normas Electrotécnicas de Norte América (Council for Harmonization of Electrotechnical Standardization of North America)
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
ISA	Instrument Society of America
ISO	International Standards Organization
NFPA	National Fire Protection Agency
NSF	National Sanitation Foundation
SAE	Society of Automotive Engineers
SME	Society of Manufacturing Engineers

Certification agencies

ANCE	National Association of Normalization and Certification of the Electrical Sector (Mexico)
BSI	British Standards Institute
CCC	China Compulsory Certification
CE	European Compliance (This is not a certification agency, but CE is the European Compliance Mark)
CSA	Canadian Standards Association
cUL	Certified to CSA Standards by Underwriters Laboratories
cULus	Meets Canadian & US UL requirements
DESC	Defense Electronic Supply Center
ETL	Electrical Testing Laboratories
FCC	Federal Communications Commission
FM	Factory Mutual
IAPA	Independent Accident and Protection Association (Canada)
LEED	Leadership in Energy and Environmental Design
NRTL	National Recognized Testing Laboratories
OSHA	Occupational Safety and Health Administration
TUV	TUV Rheinland of N.A., Inc.
VDE	Verband Deutscher Elektrotechniker (Germany)
UL	Underwriters Laboratories

Common UL & CSA standards for wiring devices

UL standards pertaining to Eaton's Cooper Wiring Devices

UL20	General-use switches
UL50	Enclosures for electrical equipment
UL94	Flammability testing for materials, plastic
UL486E	Equipment and wiring terminals
UL496	Lampholders
UL498	Plugs, connectors, receptacles, inlets, outlets
UL498A	Taps and adapters
UL508	Industrial equipment (including motor control switches)
UL514A	Metallic boxes/covers/wallplates
UL514D	Nonmetallic boxes/covers/wallplates
UL817	Cord sets
UL943	GFCIs
UL1054	Special use switches
UL1363	Temporary power taps
UL1436	Outlet circuit testers
UL1449	Surge suppression devices
UL1472	Dimmers
UL1567	Switches and receptacles used with AL wire
UL1699	Arc fault circuit interrupters

Codes & standards

CEC	Canadian Electrical Code
CEE	European Electrotechnical Committee
NEC	National Electrical Code®
NMX	Normas Mexicanas
NOM	Normas Oficiales de México (Official Mexican Standard)

Industry associations

ABYC	American Boat and Yacht Council
ASHE	American Society of Healthcare Engineering
BICSI	Building Industry Consulting Services International
BOMA	Building Owners Management Association
CANAME	Cámara Nacional de Manufacturas Eléctricas (México)
CEMRA	Canadian Electrical Manufacturers Representatives Association
ECOC	Electrical Contractors of Canada
EFI	Electro-Federation Incorporated
EIA	Electronics Industry Association
EPRI	Electric Power Research Institute
IAEI	International Association of Electrical Inspectors
IBI	Intelligent Building Institute
IECA	Independent Electrical Contractors Association
IFMA	International Facilities Management Association
NAED	National Association of Electrical Distributors
NAW	National Association of Wholesalers
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NEMRA	National Electrical Manufacturers Representative Association
NMDA	National Marine Distributor Association
NMRA	National Marine Representative Association
SEMI	Semi-Conductor Equipment and Material International
TIA	Telecommunications Industry Association
USGBC	US Green Building Council

UL standards pertaining to Eaton's Cooper Wiring Devices

UL1786	Night-lights
UL1863	Communications circuit accessories
UL1917	Solid state fan speed control
FSWC596	Fed. Spec. receptacles
FSWS896	Fed. Spec. switches

CSA standards pertaining to Eaton's Cooper Wiring Devices

C22.2 No. 0.17	Polymeric materials
C22.2 No. 12	Night lights
C22.2 No. 42	General-use receptacles, attachment plugs
C22.2 No. 55	Special-use switches
C22.2 No. 111	General-use switches
C22.2 No. 144	GFCI
C22.2 No. 182.1	Industrial-type, special-use attachment plugs, receptacles and connectors. Pin and sleeve devices
C22.2 No. 182.2	Industrial locking type

General purpose wiring device definitions from NEMA Standard WD-1

NEMA standards pertaining to Arrow Hart Products
(in accordance with NEMA Standard WD-1)

WD 1-1.01 Cord connector

A portable receptacle with means for attachment to a flexible cord; the cord connector is not intended for permanent mounting.

NEMA Standard 7-13-1967

WD 1-1.02 Grounded conductor (system ground)

This is a usually current-carrying circuit conductor that's purposely connected to earth ground and is identified as the white conductor.

NEMA Standard 7-13-1967

WD 1-1.03 Grounding conductor (equipment ground)

Unlike the System Ground version, this conductor connects non-current-carrying metallic equipment parts to earth ground, providing a specific path for fault current to ground. It can be bare or covered, in which case it is identified as the green conductor, or green with yellow stripes.

NEMA Standard 7-13-1967

WD 1-1.04 Lampholder

Lampholders mechanically support an electric lamp and electrically connect it to a circuit.

NEMA Standard 7-13-1967

WD 1-1.05 Male base (inlet)

Designed for flush or surface mounting on an appliance or other equipment, male-based plugs serve to connect utilization equipment to a connector.

NEMA Standard 7-13-1967

WD 1-1.06 Outlet

An outlet is a point on the wiring system at which current is taken to supply utilization equipment.

NEMA Standard 7-13-1967

WD 1-1.07 Plug

The male blades of our plugs serve to connect the conductors of the attached, flexible cord with those of the female receptacle.

NEMA Standard 7-1-1967

WD 1-1.08 Polarization (plugs and receptacles)

Polarization assures the correct positioning for proper mating of plugs and receptacles of the same rating.

NEMA Standard 7-1-1967

WD 1-1.09 Pole

When used to designate plugs and receptacles, "pole" refers to a terminal that is connected to a regularly current-carrying circuit conductor. In switches, the number of poles indicates how many conductors are being controlled.

NEMA Standard 7-1-1967

WD 1-1.10 Receptacle

This device features female contacts, and is installed primarily at an outlet or on equipment meant to establish electrical connection with an inserted plug.

NEMA Standard 7-1-1967

WD 1-1.11 Slant symbol (/)

As it applies to wiring device ratings, the "slant" line (/) indicates that there's more than one voltage potential present between different terminals of a wiring device.

NEMA Standard 7-1-1967

WD 1-1.12 Switch

There are several different types of switches available for making, breaking or changing electrical circuit connections, including:

- A. Single-pole switch (single-pole, single-throw), which makes or breaks the connection of a single conductor.
- B. Double-pole switch (double-pole, single-throw), which makes or breaks the connection of two conductors on a single branch circuit.
- C. Three-way switch (single-pole, double-throw), which changes the connection of a single conductor and is most often utilized in tandem to better control one piece of equipment from two locations.
- D. Four-way switch (double-pole, double-throw reversing) is a double-pole switch used with two three-way switches to control a single piece of equipment from more than two locations.

NEMA Standard 7-13-1967

WD 1-1.13 Terminal (on a wiring device)

A terminal is a fixed location on a wiring device where a conductor is designated for connection.

NEMA Standard 7-13-1967

WD 1-1.14 Wire (plugs and receptacles)

As it applies in designating plugs and receptacles, the term "wire" stands for the number of either regularly current-carrying or equipment grounding connected conductors.

NEMA Standard 7-13-1967

For answers to technical questions or for more information on UL, CSA and NEMA standards pertaining to Eaton's Wiring Devices' products, please contact us at the following toll free number: 1-866-853-4293.
Website: www.eaton.com/wiringdevices

Selected articles, National Electric Code (NEC®) requirements for wiring devices from NFPA 70™, NEC® 2014 Edition

Article 210 — Branch circuits

210.8	Ground-fault circuit-interrupter protection for personnel
210.21	Branch circuit ratings, outlet devices
210.24	Branch circuit requirements - summary
210.50	Required outlets, general
210.60	Required outlets, guest rooms, guest suites, dormitories and similar occupancies
210.62	Required outlets, show windows
210.70	Lighting outlets required

Article 404 — Switches

404.2	Installation, switch connections
404.3	Installation, enclosure
404.4	Installation, damp or wet locations
404.9	Installation, provisions for general-use snap switches
404.14	Rating and use of snap switches
404.15	Construction specifications, marking

Article 406 — Receptacles, cord connectors & attachment plugs (caps)

406.3	Receptacle rating and type
406.4	General installation requirements
406.5	Receptacle mounting
406.6	Receptacle faceplates (cover plates)
406.7	Attachment plugs, cord connectors and flanged surface devices
406.8	Noninterchangeability
406.9	Receptacles in damp or wet locations
406.10	Grounding-type receptacles, adapters, cord connectors and attachment plugs
406.12	Tamper-resistant receptacles in dwelling units
406.13	Tamper-resistant receptacles in guest rooms and guest suites
406.14	Tamper-resistant receptacles in child care facilities

Article 430 — Motors, motor circuits & controllers

430.8	Marking on controllers
430.81	Motor controllers, general
430.82	Motor controllers, controller design
430.83	Motor controllers, ratings
430.90	Combination fuseholder and switch as controller
430.102	Disconnecting means, location
430.109	Disconnecting means, type

Article 517 — Health care facilities

517.2	Definitions
517.10	Wiring and protection, applicability
517.13	Grounding of receptacles and fixed electrical equipment in patient care areas
517.14	Panelboard bonding
517.16	Use of isolated ground receptacles
517.17	Ground-fault protection
517.18	Wiring and protection, general care areas
517.19	Wiring and protection, critical care areas
517.20	Wiring and protection, wet procedure locations
517.21	Ground-Fault-Circuit-Interrupter protection for personnel
517.30	Essential electrical systems for hospitals
517.31	Branches requiring automatic connection
517.35	Sources of power
517.40	Essential electrical systems for nursing homes and limited care facilities
517.41	Essential electrical systems (nursing homes, etc.)
517.45	Essential electrical systems for other health care facilities
517.61	Inhalation anesthetizing locations, wiring and equipment
517.62	Inhalation anesthetizing locations, grounding
517.63	Grounded power systems in anesthetizing locations
517.64	Inhalation anesthetizing locations, low-voltage equipment and instruments
517.71	X-ray installations connection to supply circuit
517.72	X-ray installations disconnecting means
517.160	Isolated power systems

Article 555 — Marinas & boatyards

555.1	Scope
555.13	Wiring methods and installations
555.15	Grounding
555.17	Disconnecting means for shore power connection(s)
555.19	Receptacles (including GFCI)

Article 590 — Temporary installations

590.4	General (including receptacles and GFCI)
590.6	Ground-fault protection for personnel

Article 604 — Manufactured wiring systems

604.2	Definition
604.6	Construction (including receptacles and connectors)

Article 630 — Electric welders

630.13	Arc welders, disconnecting means
630.33	Resistance welders, disconnecting means

Article 647 — Sensitive electronic equipment

647.7	Receptacles (including isolated ground receptacles)
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Article 660 — X-ray equipment

660.4	Connection to supply circuit
660.5	Disconnecting means

Article 700 — Emergency systems

700.26	Overcurrent protection, ground-fault protection of equipment
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Horsepower ratings for NEMA configurations
(plugs & receptacles only)

Straight blade configuration

NEMA	AC HP Rating	Rating
1-15	0.5	15A-125V
2-15	1.5*	15A-250V
2-20	2*	20A-250V
2-30	2*	30A-250V
5-15	0.5	15A-125V
5-20	1	20A-125V
5-30	2	30A-125V
5-50	2	50A-125V
6-15	1.5*	15A-250V
6-20	2*	20A-250V
6-30	2*	30A-250V
6-50	3*	50A-250V
7-15	2	15A-277V/AC Only
7-20	2	20A-277V/AC Only
7-30	3	30A-277V/AC Only
7-50	5	50A-277V/AC Only
10-20	2L-L*/1 L-N	20A-125/250V
10-30	2 L-L*/2 L-N	30A-125/250V
10-50	3 L-L*/2 L-N	50A-125/250V
11-15	2	15A-3Ø 250V
11-20	3	20A-3Ø 250V
11-30	3	30A-3Ø 250V
11-50	7.5	50A-3Ø 250V
14-15	1.5 L-L*/0.5 L-N	15A-125/250V
14-20	2 L-L*/1 L-N	20A-125/250V
14-30	2 L-L*/2 L-N	30A-125/250V
14-50	3 L-L*/2 L-N	50A-125/250V
14-60	3 L-L*/2 L-N	60A-125/250V
15-15	2	15A-3Ø 250V
15-20	3	20A-3Ø 250V
15-30	3	30A-3Ø 250V
15-50	7.5	50A-3Ø 250V
15-60	10	60A-3Ø 250V
18-15	2	15A-3ØY 120/208V
18-20	2	20A-3ØY 120/208V
18-30	3	30A-3ØY 120/208V
18-50	7.5	50A-3ØY 120/208V
18-60	7.5	60A-3ØY 120/208V

L-L denotes phase-to-phase HP rating
L-N denotes phase-to-neutral HP rating
*Suitable for 208V motor applications at HP rating



Wire & cable type abbreviations

Key

S Service	W Weather approved
J Junior	P Parallel
T Thermoplastic/Vinyl	

Examples

SJT	Hard usage thermoplastic rubber-insulated conductors and overall thermoplastic jacket. 300V up to 105°C.	SPT-3	Same as SPT-2, but heavier construction (18-10 gauge).
SJTW	Hard usage thermoplastic or rubber-insulated conductors and overall thermoplastic jacket. 300V up to 105°C. Weather resistant for outdoor use.	SRDT	Portable range or dryer cable, 3-conductor parallel type or 4 insulated conductors, jacketed. All thermoplastic construction. 300V, maximum temperature of 60°C.
SPT-1	All thermoplastic construction, parallel jacketed. 300V up to 105°C, 2 or 3-conductor (18 gauge).	HPN	Two-conductor, neoprene-insulated heater cord. Parallel construction. For use in damp locations. 300V, 90°C.
SPT-2	Same as SPT-1, but heavier construction (18-16 gauge).		

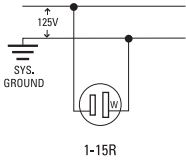
Diameter ranges of jacketed cord in accordance with standard UL62

Acceptable range for overall diameter of jacketed cord

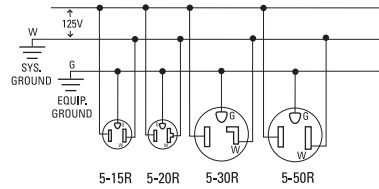
Type of cord	Avg. size	2-Conductor	3-Conductor	4-Conductor	5-Conductor
SV, SVO, SVT, SVTO	18	0.22"-0.26" (5.6mm-6.6mm)	0.23"-0.27" (5.8mm-6.9mm)	—	—
SJ, SJO, SJT, SJTO	18	0.28"-0.32" (7.1mm-8.1mm)	0.30"-0.34" (7.6mm-8.6mm)	0.33"-0.37" (8.4mm-9.4mm)	—
	16	0.31"-0.34" (7.9mm-8.6mm)	0.33"-0.36" (8.4mm-9.1mm)	0.35"-0.40" (8.9mm-10.2mm)	—
	14	0.34"-0.38" (8.6mm-9.7mm)	0.36"-0.40" (9.1mm-10.2mm)	0.39"-0.44" (9.9mm-11.2mm)	—
	12	0.41"-0.46" (10.4mm-11.7mm)	0.43"-0.48" (10.9mm-12.2mm)	0.47"-0.52" (11.9mm-13.2mm)	—
	10	0.54"-0.61" (13.7mm-15.5mm)	0.57"-0.64" (14.5mm-16.3mm)	0.63"-0.70" (16.0mm-17.8mm)	—
S, SO, ST, STO	18	0.34"-0.39" (8.6mm-9.9mm)	0.36"-0.40" (9.1mm-10.2mm)	0.39"-0.43" (9.9mm-10.9mm)	0.46"-0.51" (11.7mm-13.0mm)
	16	0.37"-0.41" (9.4mm-10.4mm)	0.39"-0.43" (9.9mm-10.9mm)	0.41"-0.46" (10.4mm-11.7mm)	0.49"-0.55" (12.4mm-14.0mm)
	14	0.50"-0.55" (12.7mm-14.0mm)	0.52"-0.58" (13.2mm-14.7mm)	0.56"-0.62" (14.2mm-15.7mm)	0.63"-0.71" (16.0mm-18.0mm)
	12	0.57"-0.63" (14.5mm-16.0mm)	0.59"-0.66" (15.0mm-16.8mm)	0.64"-0.71" (16.3mm-18.0mm)	0.70"-0.77" (17.8mm-19.6mm)
	10	0.62"-0.69" (15.7mm-17.5mm)	0.65"-0.72" (16.5mm-18.3mm)	0.70"-0.78" (17.8mm-19.8mm)	0.76"-0.84" (19.3mm-21.3mm)
	8	0.78"-0.88" (19.8mm-22.4mm)	0.83"-0.93" (21.1mm-23.6mm)	0.93"-1.05" (23.6mm-26.7mm)	1.00"-1.15" (25.4mm-29.2mm)
	6	0.92"-1.05" (23.4mm-26.7mm)	0.97"-1.10" (24.6mm-27.9mm)	1.05"-1.20" (26.7mm-30.5mm)	1.18"-1.33" (30.0mm-33.8mm)
	4	1.06"-1.21" (26.9mm-30.7mm)	1.13"-1.28" (28.7mm-32.5mm)	1.25"-1.45" (31.8mm-36.8mm)	—
2	1.21"-1.40" (30.7mm-35.6mm)	1.30"-1.50" (33.0mm-38.1mm)	1.45"-1.65" (36.8mm-41.9mm)	—	

Wiring diagrams by NEMA configurations

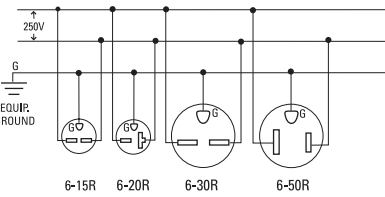
2-pole, 2-wire non-grounding: 125V



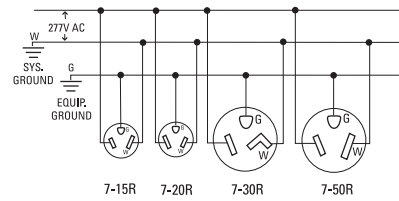
2-pole, 3-wire grounding: 125V



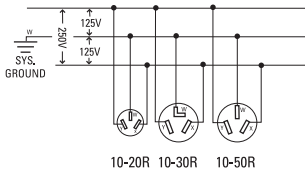
2-pole, 3-wire grounding: 250V



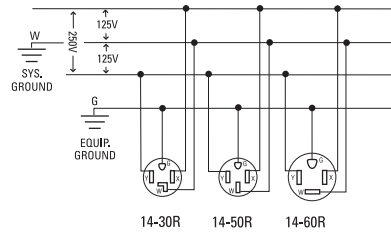
2-pole, 3-wire grounding: 277V AC



3-pole, 3-wire non-grounding: 125/250V

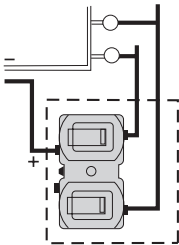


3-pole, 4-wire grounding: 125/250V

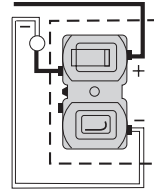


Combination devices

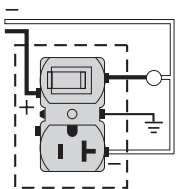
2 Single-pole switches



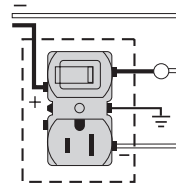
Single-pole switch and neon pilot light



Single-pole switch and 2-pole, 3-wire 20A U grounding receptacle



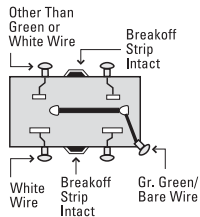
Single-pole switch and 2-pole, 3-wire U grounding receptacle



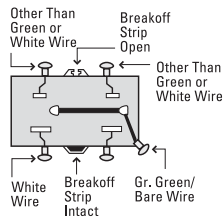
Receptacles

15A-125V

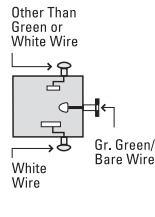
1 Circuit Duplex Receptacle



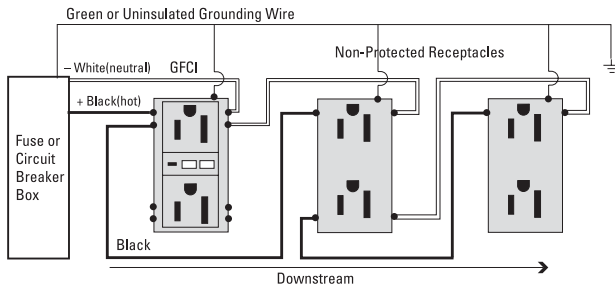
Split Circuit Duplex Receptacle



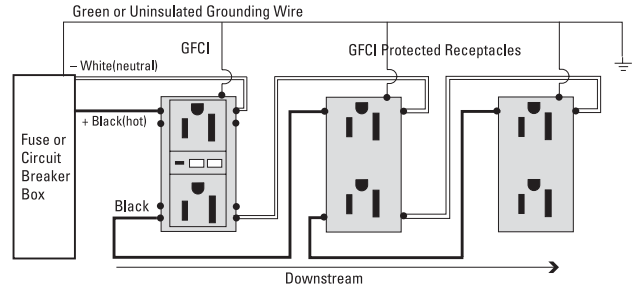
1 Circuit Single Receptacle



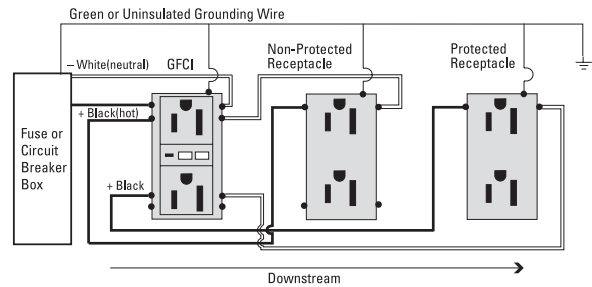
GFCI: feed-through installation with non-protected receptacles downstream



GFCI: feed-through installation with protection provided downstream

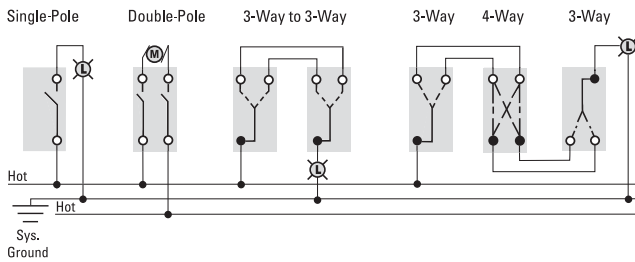


GFCI: feed-through installation with both protected and non-protected receptacles downstream

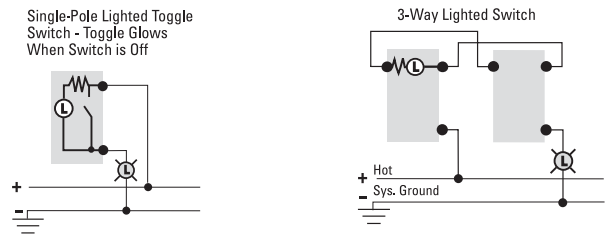


Switches

AC Switches & standard switches



Lighted switch, single-pole and 3-way



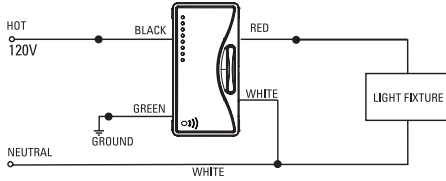
Dimmers & fan speed controls

Z-Wave wireless collection

Dimmer with neutral

RF9536-N, RF9537-N (also FLR), RF9540-N (also LED, CFL, FLR)

INC, MLV, ELV
Single-pole

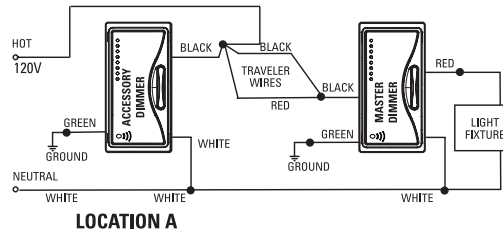


Z-Wave wireless collection

Dimmer with neutral

RF9536-N, RF9537-N (also FLR), RF9542-Z, RF9540-N (also LED, CFL, FLR)

INC, MLV, ELV
Multi-location

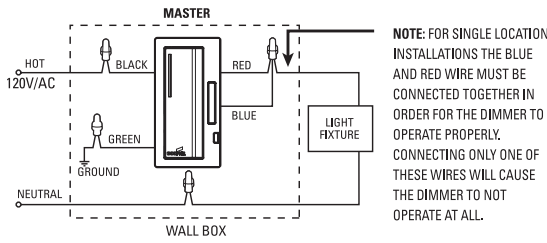


Z-Wave wireless collection, Aspire, Electronic

Dimmer without neutral

RF9534, RF9536, 9534, 9536, 9537, AIM10

INC, MLV, ELV
Single-pole

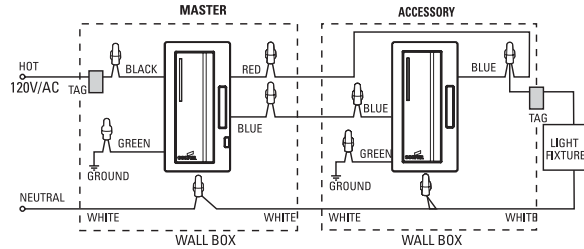


Z-Wave wireless collection, Aspire, Electronic

Dimmer without neutral

RF9534, RF9536, RF9542, 9534, 9536, 9537, 9542, AIM10, ARD

INC, MLV, ELV
Multi-location

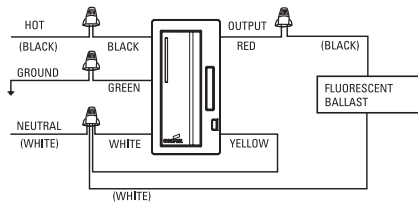


Electronic

Dimmer with neutral

AF10

FLR
Single-pole

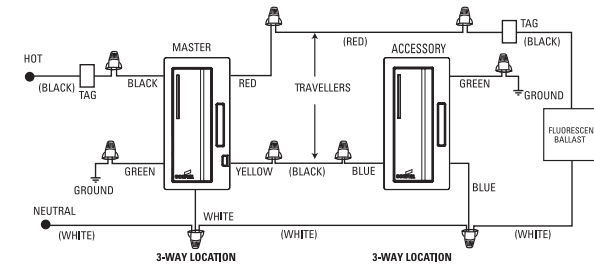


Electronic

Dimmer with neutral

AF10, ARD

FLR
Multi-location

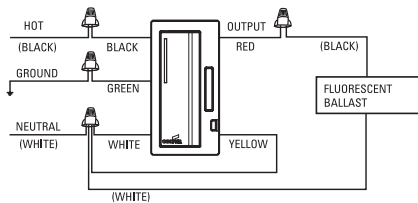


Electronic

Dimmer with neutral

AAL06

INC, MLV, ELV, FLR, LED, CFL
Single-pole

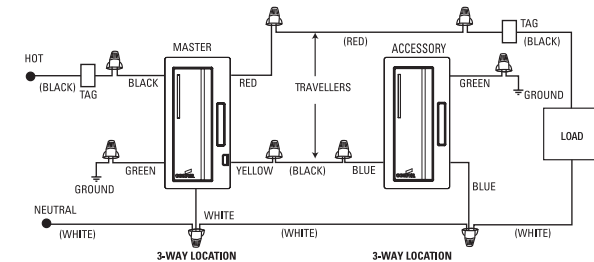


Electronic

Dimmer with neutral

AAL06, ARD

INC, MLV, ELV, FLR, LED, CFL
Multi-location

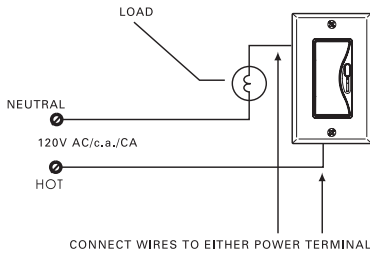


Dimmers & fan speed controls

Aspire

Slide dimmer
9530, 9531, 9532, 9533

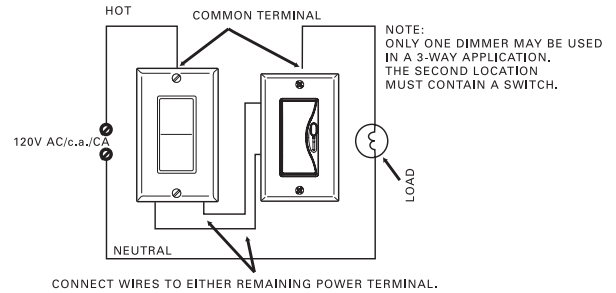
INC, MLV, ELV
Single-pole



Aspire

Slide dimmer
9530, 9531, 9532, 9533

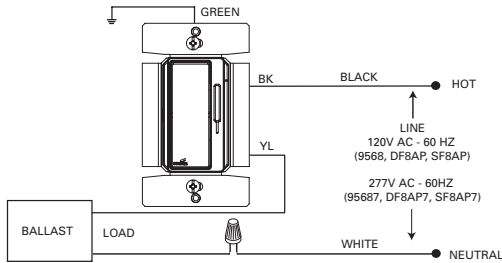
INC, MLV, ELV
3-way



Aspire, Decorator, Slide

Slide dimmer
9568, 95687, DF8AP, DF8AP7, SF8AP7

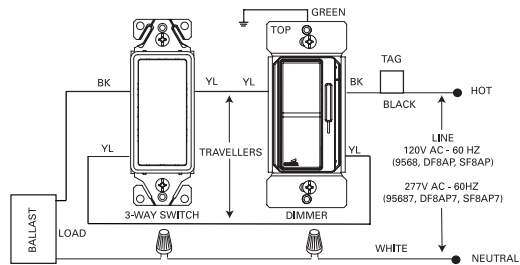
FLR
Single-pole



Aspire, Decorator, Slide

Slide dimmer
9568, 95687, DF8AP, DF8AP7, SF8AP7

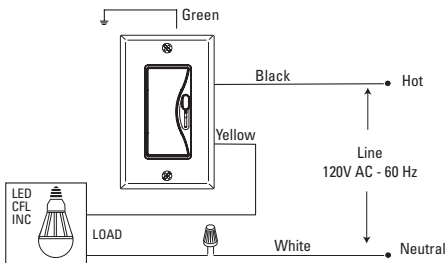
FLR
3-way



Aspire

Slide dimmer
9573

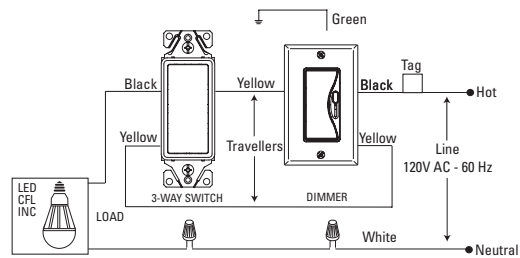
LED, CFL, INC
Single-pole



Aspire

Slide dimmer
9573

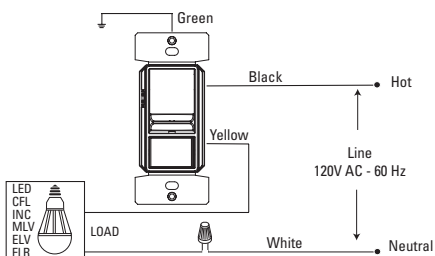
LED, CFL, INC
3-way



Decorator, Slide

Slide dimmer
DAL06P, SAL06P

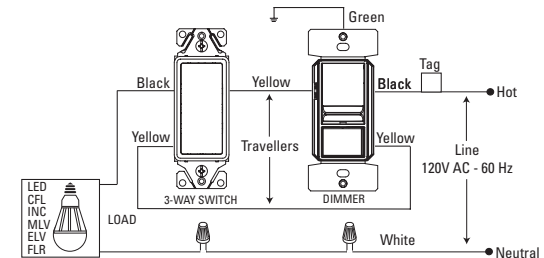
INC, MLV, ELV, FLR, LED, CFL
Single-pole



Decorator, Slide

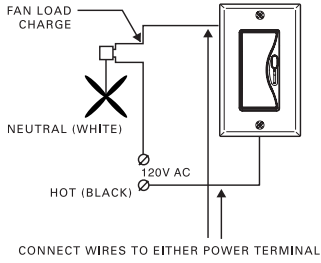
Slide dimmer
DAL06P, SAL06P

INC, MLV, ELV, FLR, LED, CFL
3-way

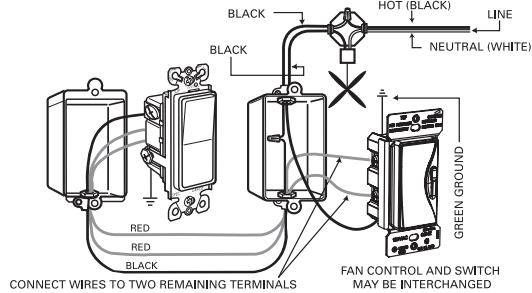


Dimmers & fan speed controls

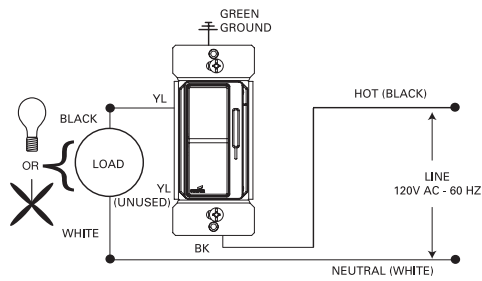
Aspire 3 speed & fully variable
Slide fan Single-pole
9544, 9543



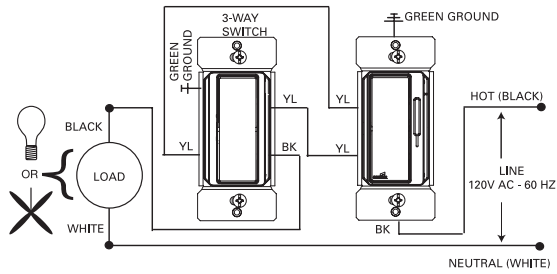
Aspire 3 speed & fully variable
Slide fan 3-way
9544, 9543



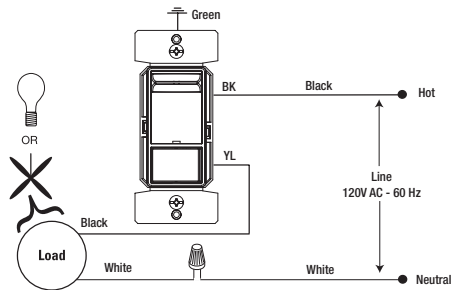
Decorator INC, MLV
Dimmer & fan Single-pole
DI10P, DFS15P



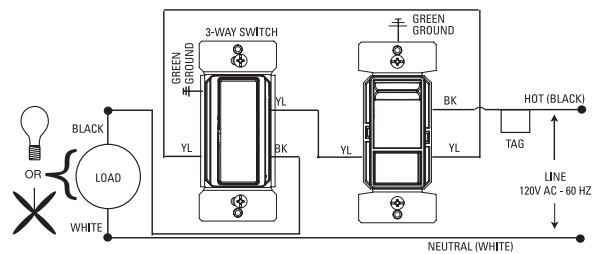
Decorator INC, MLV
Dimmer & fan 3-way
DI10P, DFS15P



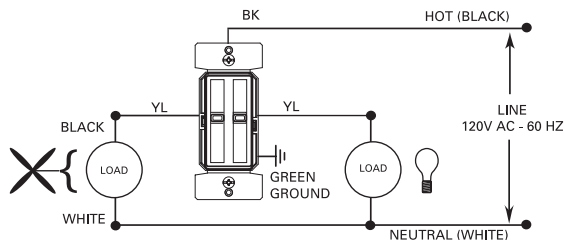
Slide INC, MLV
Dimmer & fan Single-pole
SI061, SI10P, SFS15P, SFS5P, SFS5



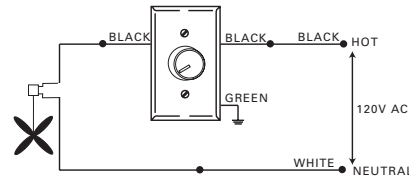
Slide INC, MLV
Dimmer & fan 3-way
SI10P, SFS15P, SFS5P, SFS5



Slide 3 speed, INC
Slide fan/dimmer Single-pole
SDC15



Toggle, Rotary Fully variable
Toggle & rotary fan Single-pole
TFS5, RFS5, RFS15

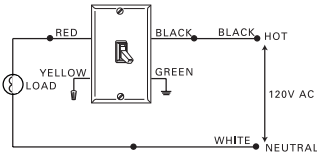


Dimmers & fan speed controls

Toggle

Toggle dimmer
TI061, TI061L, TI3101, TI3101L

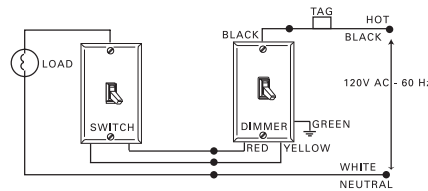
INC
Single-pole



Toggle

Toggle dimmer
TI061, TI061L, TI3101, TI3101L

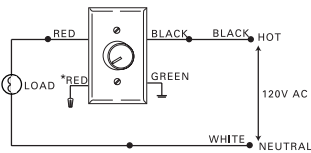
INC
3-way



Rotary

Rotary dimmer
RI061, RI101, RI06P, RI06PL

INC
Single-pole

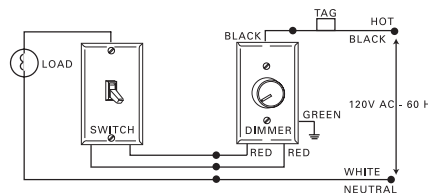


*Not required for RI061, RI101

Rotary

Rotary dimmer
RI06P, RI06PL

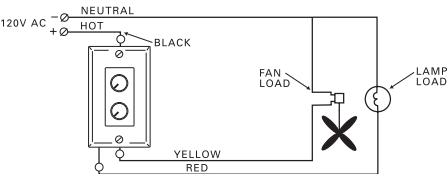
INC
3-way



Rotary

Rotary fan/dimmer
RDC15, RDC25

4 Speed/INC & Fully Variable/INC
Single-pole

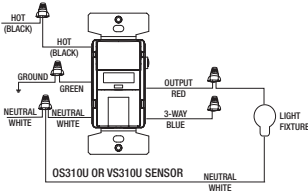


Occupancy & vacancy sensors

Sensor switch

OS310U, VS310U

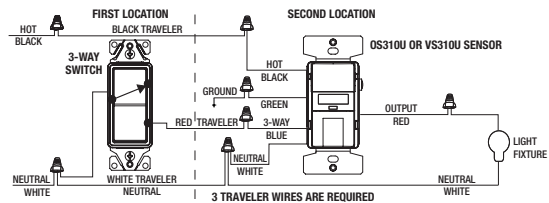
All load types
Single-pole



Sensor switch

OS310U, VS310U

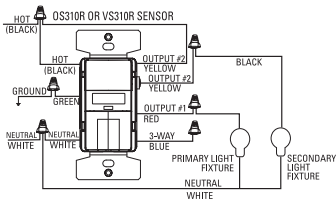
All load types
3-way



Dual switch

OS310R, VS310R

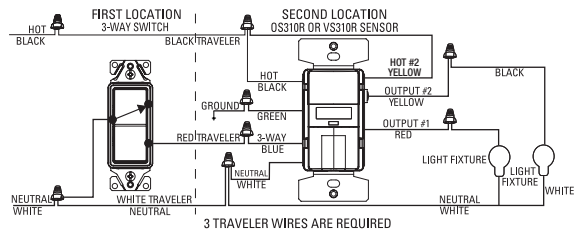
All load types
Single-pole



Dual switch

OS310R, VS310R

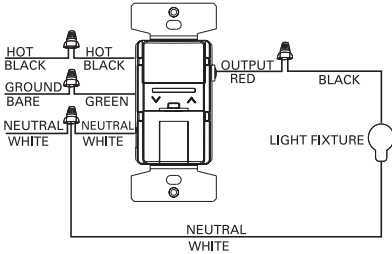
All load types
3-way



Occupancy & vacancy sensors

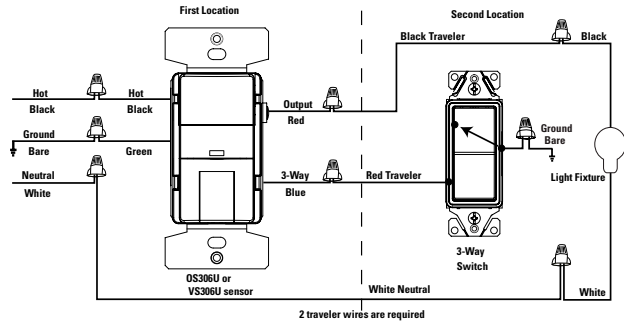
Sensor dimmer
OS106D1, VS106D1

INC, MLV
Single-pole



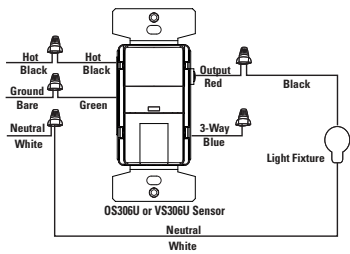
Standard sensor
OS306U, VS306U

INC, MLV, ELV, FLR, LED, CFL
3-Way with sensor in location with hot wire



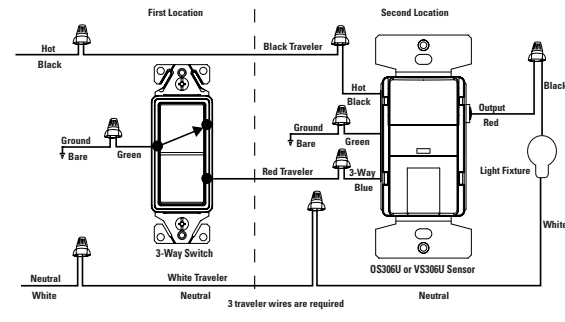
Standard sensor
OS306U, VS306U

INC, MLV, ELV, FLR, LED, CFL
Single-pole



Standard sensor
OS306U, VS306U

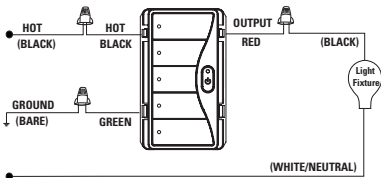
INC, MLV, ELV, FLR, LED, CFL
3-Way with switch in location with hot wire



Timers

Aspire, Electronic
Timers
9590, 9591, PT18M, PT18H

INC, MLV, ELV, FLR, LED, CFL
Single-pole

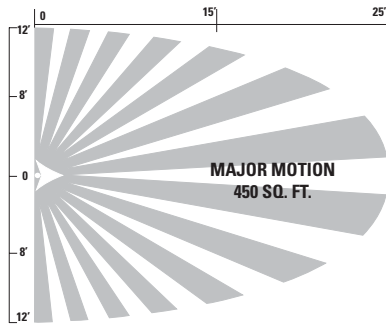


Occupancy & vacancy sensor coverage areas

Standard series

Sensor: OS306U, VS306U

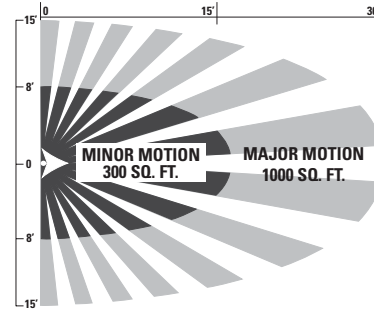
All load types



Sensor switch

OS310U, VS310U, OS310R, VS310R, OS106D1, VS106D1

All load types



Matching the dimmer to the load

A large selection of lighting sources are available in today's lighting environment. These sources have specific individual characteristics which require mating a particular dimmer for each load type (source). For proper use it is important to pick a dimmer that is designed and UL tested for that specific lighting load type.



Incandescent/halogen

Line-voltage tungsten filament lamps, including line-voltage (120V) halogen lamps
Electrical characteristic: resistive
Special requirements: rated for cold filament inrush.



Magnetic Low-Voltage (MLV)

Magnetic transformer-supplied low-voltage lighting (6 volt, 12 volt, or 24 volt)
Electrical characteristic: inductive
Special requirements: symmetric cycles ($VDC \leq 2$), smooth turn off
Include transformer losses when calculating the load.



Electronic Low-Voltage (ELV)

Electronic (solid-state) transformer-supplied low-voltage lighting
Electrical characteristic: capacitive
Special characteristic: very smooth turn on.
Neutral wire connection required.



Fluorescent (FLR)

Electronic fluorescent dimming ballast
Special dimmers are designed and UL listed to send power and control signals to each type of electronic fluorescent dimming ballast.



Light Emitting Diode (LED)

Electronic LED driver special dimmers are designed to send power and control signals to each type of electronic LED drive.
Special requirements: LED light source must be properly matched to LED driver, and LED driver must meet control spec for control type.



Fan controls

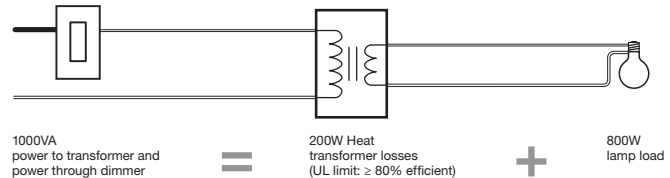
There are two styles of fan control. Select the one that is right for your application:

- | | |
|---|---|
| Fully variable | Quiet 3-speed |
| • Fully variable fan speed | • Three speeds plus off |
| • Used for controlling one or more ceiling fan(s) or exhaust fan(s) | • Will not cause fan motor hum |
| | • Used for controlling one ceiling fan only |

Consult with Eaton's Wiring Devices for driver compatibility: www.eaton.com/wiringdevices.

Magnetic low-voltage dimmer ratings

The stated VA (volt-ampere) rating is the rated capacity of the dimmer which includes the magnetic transformer heat losses and the lamp load. A CORE™ SAVANT dimmer UL listed for 1000VA can be loaded with a full 1000VA of lamp load. A transformer dissipates up to 20% of the connected load as heat. Better transformers dissipate less than 10% as heat. Added together, the lamp load and the transformer loss determine the dimmer capacity required. See the example below.



Electronic low-voltage dimmer ratings

Electronic Low-Voltage transformers do dissipate some heat. These inefficiencies are small enough to be accounted for in the dimmer rating. A CORE dimmer UL listed for 600W can be loaded with a full 600W of lamp load. If ganged with other dimmers, standard derating rules apply.

Heat dissipation

During normal operation, dimmers will get warm to the touch. Wallbox dimmer efficiency is typically around 99%; the remaining 1% is dissipated as heat. Therefore, a 600W load on a 600W dimmer would produce around 6 watts of heat. Operating on its rated load, CORE dimmers will stay below the UL limits of 140°F (60° C). Use screwless wallplates to avoid contact with metal screws that may feel warm to the touch.

Single-Pole



Single-pole dimmers provide control from one location.

3-way/4-way



3-Way dimmers adjust the light level from one location. When used with 3-way and 4-way switches, the lights can be turned on to the dimmer level or off from many locations.

Multi-location

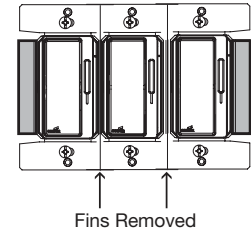


Multi-location dimmers can be used with dimmers for full dimming control of the lights from two or more locations.

Ganging and Derating Dimmers

A typical dimmer is wider than a switch. This increased size helps the dimmer dissipate internal heat which is normal to operation.

Dimmers can be ganged together such that the space is the same as for switches. A portion of the fins (heat sink) must be removed. The fins are grooved to make the removal of fins easy with a pair of pliers. The removal of these fins reduces the wattage capacity (load) the dimmer can control. Derating information is provided in the "CORE Derating Chart". The dimmer can be loaded with the full derated capacity indicated.



Dimmer derating chart

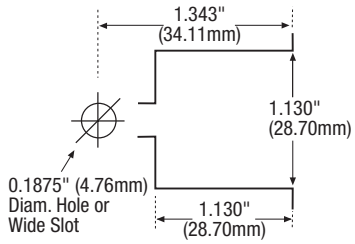
Dimmers	Single-gang	Double-gang	Triple-gang or more
Toggle			
Incandescent	600W	600W	600W
Incandescent	1000W	900W	800W
Fully variable fan	5A	5A	5A
Rotary			
Incandescent	600W	600W	600W
Incandescent	1000W	900W	800W
Dual 4-speed/dimmer	2.5A / 300W	2.5A / 300W	2.5A / 300W
Dual 4-speed/dimmer	1.5A / 300W	1.5A / 300W	1.5A / 300W
3-Speed fan	1.5A	1.5A	1.5A
Fully variable fan	5A	5A	5A
Toggle w/preset			
Incandescent	600W	600W	600W
Magnetic low-voltage	600VA	600VA	600VA
Fluorescent	Refer to Spec sheet for more information		
Electronic low-voltage	600W	600W	600W
LED/CFL	300W	300W	300W
Slide			
Incandescent	600W	500W	500W
Incandescent	1000W	850W	650W
Magnetic low-voltage	600VA	500VA	500VA
Magnetic low-voltage	1000VA	850VA	650VA
Fluorescent	8.3A	6.6A	5.4A
Dual 3-speed/dimmer	1.5A / 300W	1.5A / 300W	1.5A / 300W
3-Speed fan	1.5A	1.5A	1.5A
Fully variable fan	5A	5A	5A
LED/CFL	300W	300W	300W
Decorator			
Incandescent	600W	500W	500W
Incandescent	1000W	800W	650W
Magnetic low-voltage	600VA	500VA	500VA
Magnetic low-voltage	1000VA	800VA	650VA
Electronic low-voltage	600VA	600VA	600VA
Fluorescent	8.3A	6.6A	5.4A
3-Speed fan	1.5A	1.5A	1.5A
LED/CFL	300W	300W	300W

Dimmers	Single-gang	Double-gang	Triple-gang or more
Electronic			
Incandescent	1000W	800W	800W
Magnetic low-voltage	1000VA	800VA	800VA
Fluorescent	8.3A	6.6A	6.6A
Electronic			
Incandescent	600W	550W	500W
Magnetic low-voltage	600W	550W	500W
Fluorescent	Refer to Spec sheet for more information		
LED/CFL	300W	300W	300W
Aspire slide			
Incandescent	600W	600W	600W
Incandescent	1000W	900W	800W
Magnetic low-voltage	600VA	600VA	600VA
Magnetic low-voltage	1000VA	900VA	800VA
Electronic low-voltage	600VA	600VA	600VA
Electronic low-voltage	1000VA	900VA	800VA
Fluorescent	8.3A	6.6A	5.4A
3-Speed fan	1.5A	1.5A	1.5A
Fully variable fan	5A	5A	5A
Aspire			
Incandescent	600W	600W	500W
Incandescent	1000W	800W	700W
Magnetic low-voltage	600VA	600VA	500VA
Magnetic low-voltage	1000VA	800VA	700VA
Electronic low-voltage	600VA	600VA	500VA
Electronic low-voltage	1000VA	800VA	700VA
Fluorescent	8.3A	6.6A	6.6A
Z-Wave wireless collection			
Incandescent	600W	600W	600W
Incandescent	1000W	800W	800W
Incandescent (no neutral)	600W	600W	600W
Incandescent (no neutral)	1000W	800W	800W
Magnetic low-voltage	600VA	600VA	600VA
Magnetic low-voltage	1000VA	800VA	800VA
Electronic low-voltage	600VA	600VA	600VA
Electronic low-voltage	1000VA	800VA	800VA
Fluorescent	1000VA	800VA	800VA
LED/CFL	300W	300W	300W
Dimming sensors			
Incandescent	600W	600W	600W
Magnetic low-voltage	600VA	600VA	600VA

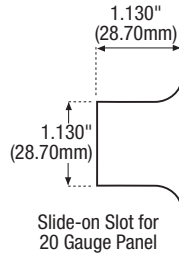
Fluorescent lampholder panel cutout dimensional data

Panel cutouts

2500, 2501, 2503, 2504

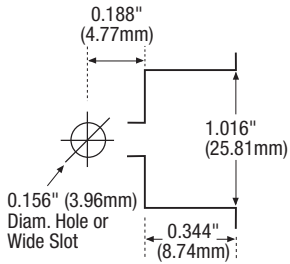


2505, 2506

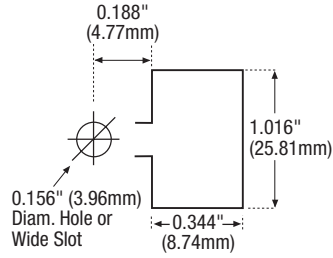


Panel cutouts

2509, 2510



924



Slide on Slot for
20 Gauge Panel



NAFTA compliant products meet specifications at time of print. Product listing subject to change.

For specific product details, visit www.arrowhart.com or email cwdmarketing@eaton.com.



Buy American Provision, American Recovery and Reinvestment Act (ARRA) (Section 1605)

ARRA Section 1605 establishes requirements for federal government projects funded with stimulus monies: "None of the funds appropriated or otherwise made available by [the ARRA] may be used for a project for the construction, alteration, maintenance, or repair of a public building or public work unless all of the iron, steel, and manufactured goods used in the project are produced in the United States." Iron and steel used as components or subcomponents of other manufactured construction materials do not need to be produced in the United States. There is no requirement that components and subcomponents be U.S.-origin provided the manufactured construction material is "produced in the United States." (FAR 25.001(c)(4)) Section 1605 does not contain a domestic cost requirement. However, the government has not defined "produced" for purposes of the ARRA Buy American provision. Many commentators have adopted the "substantial transformation" test to determine whether a manufactured article is "produced" in the United States for purposes of Section 1605. Section 1605 contains a requirement that the Buy American provision be applied in a manner consistent with U.S. obligations under international agreements. As a result, national treatment is extended to products from countries with which the United States has entered a free trade agreement (e.g., Canada, Mexico, Bahrain, Chile, etc.) and to products from countries that have signed the WTO Government Procurement Agreement. National treatment is also extended to least developed countries (LDCs) (e.g., Bhutan, Mali, Zambia, etc.) but not to Caribbean basin countries (e.g., Belize, Haiti, Bahamas, etc.). Products that are identified as NAFTA compliant may qualify under the Buy American Act or ARRA program guidelines. Consult specific project guidelines and compliance requirements to assure suitability for your project needs.

Buy American Act (US Code, Title 41, Section 10 (a-d))

The Buy American Act (often BAA, not to be confused with the Buy America (no "n") Act) applies to all U.S. federal government agency purchases of goods over certain contract thresholds. The BAA restricts purchases of supplies and construction materials to domestic products, unless an exception or waiver applies. Unmanufactured products must be mined or produced in the United States. There is a two-part test for manufactured articles: (1) article must be manufactured in the United States, and (2) cost of U.S. components must exceed 50% of the cost of all components in the item. Note: this calculation does not include labor and overhead for final assembly in the United States. The component cost test is waived for commercial-off-the-shelf (COTS) items. (FAR 25.001(c)(1)). BAA waivers may be available, often at the discretion of the contracting officer.



Restriction of the use of certain hazardous substances (RoHS)

Parts are manufactured and designed in accordance with article 4 of the European Union's RoHS2 directive 2011/65/EU