

Nonmetallic sheathed cable fittings

Specifications – Nonmetallic (NM) sheathed cable

Ref. CEC Rule 12-500

Canadian Electrical Code 2012 Part I, defines nonmetallic sheathed cable as, “A factory assembly of two or more insulated conductors having an outer sheath of moisture-resistant, flame-retardant, nonmetallic material.”

Nonmetallic sheathed cable is constructed of insulated conductors (14 to 2 AWG copper), and an outer nonmetallic sheath classified as Types NMD90, NMW and NMWU.

Nonmetallic sheathed cable is provided with bare bonding conductor. Nonmetallic sheathed cable is rated for 90 °C service with voltage limitation of 300 volts.

Type NMW and NMWU have a flame-retardant, moisture-resistant sheath.

Type NMD90, NMW and NMWU applications are described in Table 19 of CEC 2012 Part I.

Nonmetallic sheathed cable is permitted by code to be used exposed or concealed in one, two or multifamily dwellings or other structures not exceeding three floors. Use of Type NMD90 cable is restricted to dry locations.

Nonmetallic sheathed cables are not permitted to be used as a service conductor. Nonmetallic sheathed cables are also prohibited in hazardous locations.

NM cables need to be secured in place by suitable means so as not to injure the cable. Adequate protection for cable is also required when run is exposed, through joists or rafters, through floors, in unfinished basements and accessible attics.

NM cables shall be protected from physical damage when it passes through factory- or field-punched, cut or drilled holes in metal members. A bushing or grommet firmly secured in place is recommended (CEC Rule 12-516).

Please refer to the following for further details and complete information:

1. UL 719, ANSI C33.56 – Safety standards for nonmetallic sheathed cable
2. UL 514A and 514B – Safety standards for outlet boxes and fittings
3. NEMA FB-1 – Standards publication: Fittings, cast metal boxes and conduit bodies for conduit, electrical metallic tubing and cable
4. CEC Section 12-500 – Wiring methods (nonmetallic sheathed cable)
5. CSA C22.2 No. 48 – Safety standards for nonmetallic sheathed cable
6. CSA C22.2 No. 18.1 and 18.3 – Safety standards for outlet boxes, conduit boxes and fittings

Please note

The excerpts and other material herein, whether relating to the Canadian Electrical Code 2012 Part I, the Underwriters Laboratories, Inc. listing, to industry practice or otherwise, are not intended to provide all relevant information required for use and installation. Reference to original or primary source material and data is mandatory before any application or use is made of the product.

Nonmetallic sheathed cable fittings

Suggested specifications

—
01 Series 3300
nonmetallic sheathed
cable and flexible cord
fittings (all plastic)

—
02 Series 3302M
nonmetallic sheathed
cable and flexible
cord fittings (steel)

—
03 Series 3210
knockout bushings

—
04 Series 1942
insulated nipples

- Where nonmetallic sheathed cable or flexible cord terminates into a threaded or threadless opening, terminating fittings used shall be approved for the purpose by nationally recognized laboratory, inspection agency or product evaluation organization.
- Terminating fittings shall be of malleable iron, steel or thermoplastic construction designed to provide adequate strain relief and positively prevent damage to jacket or conductor insulation such as series 3300 or 3302M manufactured by ABB. Ferrous metal fittings shall be electro-zinc plated inside and outside including threads and bushed with a nylon-insulated throat. Thermoplastic material used for fitting construction shall be of high impact strength suitable for 105 °C/221 °F service with a UL flammability rating of 94V-1.
- Where nonmetallic sheathed cable passes through either factory or field-punched, cut or drilled holes in metallic members, the cable shall be protected by thermoplastic bushing such as series 3210 manufactured by ABB. Bushing shall be firmly secured in opening. Nylon-bushed metallic fittings such as series 1942 may be substituted as required.



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Nonmetallic sheathed cable fittings

Nonmetallic sheathed cable and flexible cord fittings (steel)

—
01 3302M Series
nonmetallic sheathed
cable fitting
—

02 Typical installation
—

03 Typical installation
(flexible cord)
—

04 Typical installation
(NM-sheathed cable)
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Application

- To connect nonmetallic sheathed cable and flexible cord to a box or an enclosure

Features

- Rugged all steel/malleable iron construction (A)
- Rounded cable clamp grip provides superior mechanical holding power without damaging conductor insulation or outer jacket (B)
- Clamp designed to cover body opening for a neat and safe installation
- Screws thread into clamp and not body; screw heads are snug with body and ends of screws do not project beyond the body (C)
- Insulator firmly secured in place protects conductors and reduces wire pulling effort; protects threads from damage during handling (D)
- Locknut designed to secure fitting to a box or enclosure; will not vibrate loose

Standard material

- Body: ½ in. through 1 in. steel;
1¼ in. through 2 in. malleable iron
- Clamp: ½ in. through 1¼ in. steel;
1¼ in. through 2 in. malleable iron
- Locknut: All steel
- Insulator: Thermoplastic

Standard finish

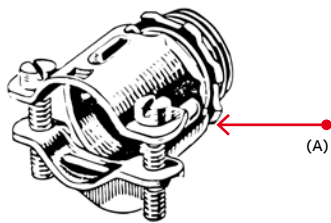
- All steel and malleable iron parts: Electro zinc plated and chromate coated

Range

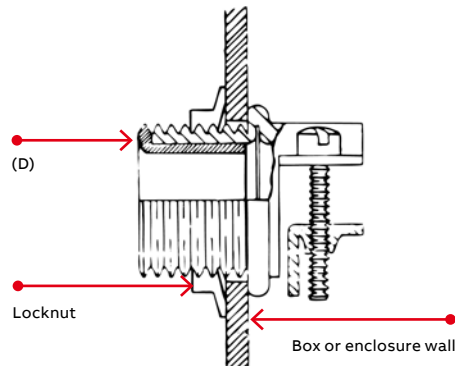
- Hub size: ½ in. through 2 in. Hubs provided with straight pipe threads (NPS)
- Cable: 2 #14 through 4 #4 Type NM
- Cable outside: 0.250 in. to 1.150 in diameter

Conformity

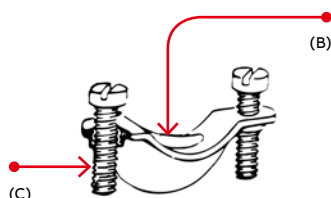
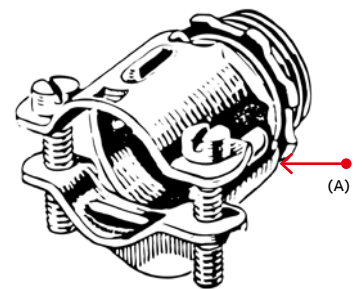
- UL 514B
- CSA C22.2 No. 18.3
- NFPA 70-2008 (ANSI)
- NEMA FB-1
- Federal Standard H-28 (threads)



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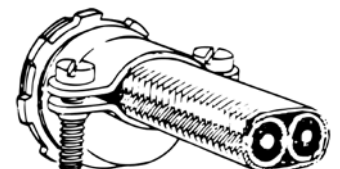
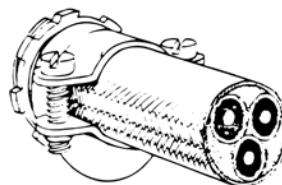


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(C)

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Nonmetallic sheathed cable fittings

Two-screw fittings

Steel or malleable iron.

Rounded cable grip and smooth bushing protect the cable sheath and wire insulation. Since saddle threaded, screws do not travel or extend beyond the fitting body as it is clamped to the cable.

An extra lip on the saddle closes the unused part of the fitting opening.



Cat. no.	Non-insulated	Insulated	KO size (in.)	UL Listed & CSA certified for the following single (1) and pairs of (2) NM and NMC cable	UL Listed & CSA certified for the following service entrance cables	Dimensions (in.)			Cable opening (in.)	
						A	B	C	max.	min.
3302-C*		3302M-C	½	(1) 2#14, 2#12, 2#10, 3#14,	2#12 thru 2#4, 3#12, 3#10	¾ ₃₂	1 ³ / ₈	1	0.590	0.250
3302-C*		3302M-C	½	3#12, 3#10, (2) 2#14, 2#12	2#12 thru 2#4, 3#12, 3#10	¾ ₃₂	1 ³ / ₈	1	0.590	0.250
3303-C		3303M	¾	(1) 2#8, 2#6, 3#8	2#8 thru 2#1/0, 3#8, 3#6,	1 ¹ / ₄	1 ⁵ / ₈	1 ³ / ₁₆	0.750	0.530
3303-C		3303M	¾	(2) 2#12, 2#10, 2#8, 3#14	2#6 + #8 GND	1 ¹ / ₄	1 ⁵ / ₈	1 ³ / ₁₆	0.750	0.530
3303-C		3303M	¾	(1) 3#8, 3#6, 3#4	2#1, 2#1/0, 3#6 thru 3#2,	1 ¹ / ₄	1 ⁵ / ₈	1 ³ / ₁₆	0.750	0.530
3304		3304M	1	(2) 2#8, 3#10	2#4 + #6 GND, 2#3 + #5	1 ¹⁵ / ₃₂	1 ⁷ / ₈	1 ¹ / ₄	0.990	0.690
3304		3304M	1	(2) 2#8, 3#10	GND, 2#2 + #4 GND	1 ¹⁵ / ₃₂	1 ⁷ / ₈	1 ¹ / ₄	0.990	0.690
3304		3304M	1	(1) 3#8, 3#6, 3#4	3#2 thru 3#2/0, 2#1 + #3	1 ¹⁵ / ₃₂	1 ⁷ / ₈	1 ¹ / ₄	0.990	0.690
3305		3305M	1 ¹ / ₄	(2) 2#8, 2#6, 2#4, 3#8	GND, 2#1/0 + #2 GND,	1 ¹⁵ / ₁₆	2 ⁷ / ₃₂	1 ⁹ / ₃₂	1.320	0.850
3305		3305M	1 ¹ / ₄	(2) 2#8, 2#6, 2#4, 3#8	2#2/0 + #1 GND	1 ¹⁵ / ₁₆	2 ⁷ / ₃₂	1 ⁹ / ₃₂	1.320	0.850
3306		3306M	1 ¹ / ₂	(1) 3#4	3#3/0, 3#4/0, 2#3/0 + #1/0	2 ⁵ / ₃₂	2 ²¹ / ₃₂	1 ⁵ / ₈	1.515	0.930
3306		3306M	1 ¹ / ₂	(1) 3#4	GND, 2#4/0 + #2/0 GND	2 ⁵ / ₃₂	2 ²¹ / ₃₂	1 ⁵ / ₈	1.515	0.930
3307		3307M	2	Max. 1.98 po, min. 1.15 po	GND, 2#4/0 + #2/0 GND	2 ⁵ / ₃₂	2 ²¹ / ₃₂	1 ⁵ / ₈	1.515	0.930
3308†		—	2 ¹ / ₂	Max. 2.38 po, min. 1.5 po	GND, 2#4/0 + #2/0 GND	2 ⁵ / ₃₂	2 ²¹ / ₃₂	1 ⁵ / ₈	1.515	0.930
3309†		—	3	Max. 2.88 po, min. 1.75 po	—	2 ²⁵ / ₃₂	3 ⁵ / ₁₆	1 ²⁹ / ₃₂	1.980	1.150
3310†		—	3 ¹ / ₂	Max. 3.38 po, min. 2.25 po	GND, 2#4/0 + #2/0 GND	2 ²⁵ / ₃₂	3 ⁵ / ₁₆	1 ²⁹ / ₃₂	1.980	1.150
3311†		—	4	Max. 3.88 po, min. 2.5 po	GND, 2#4/0 + #2/0 GND	2 ²⁵ / ₃₂	3 ⁵ / ₁₆	1 ²⁹ / ₃₂	1.980	1.150

* UL Listed for use with rubber and thermoplastic flexible cords (both single and multiple cords and 2 oval cables)

† Not UL Listed or CSA Certified

UL Listed for multiple cords and cables



Nonmetallic sheathed cable fittings

Nonmetallic sheathed cable and flexible cord fittings (all plastic)

01 3300 Series

Application

- To connect nonmetallic sheathed cable and flexible cord to a box or an enclosure

Features

- Provides strain relief by partially deflecting cable (A); therefore:
 - (1) Fitting will not damage outer covering or jacket of cable, or conductor insulation; designed to give safe trouble-free installation
 - (2) Holding power and cable strain relief are not effected by surface finish of outer covering or cable jacket
 - (3) Fitting provides superior holding power far in excess of listing agency requirements
- Snap-in one-piece design; accommodates variation in knockout dimensions, saves installation time (B)
- All high impact thermoplastic construction provides:
 - (1) Insulated throat; conductors are protected from abrasion
 - (2) Improved dielectric strength, and elimination of potential shorts
 - (3) Corrosion resistance
- Wide range—reduces inventories
- Fitting may be pre-installed in box KO or on cable

Standard material

- All high impact thermoplastic – UL 94V-1, suitable for 105 °C application.

Standard finish

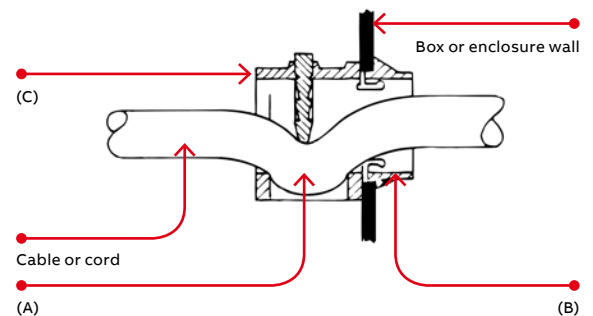
- As molded

Listing/certification

- Cat. no. 3201, 3350 for factory installation

Conformity

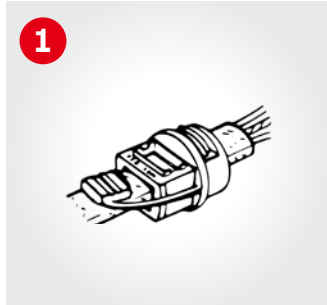
- UL 514B
- CSA C22.2 No.18.3
- NFPA 70-2008 (ANSI)



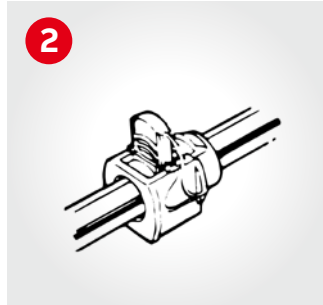
Nonmetallic sheathed cable fittings

Nonmetallic sheathed cable and flexible cord fittings (all plastic)

Typical Installation



1. Remove sheath from end of cable (4 in. or more as required). Insert cable through fitting as shown (cable under button).

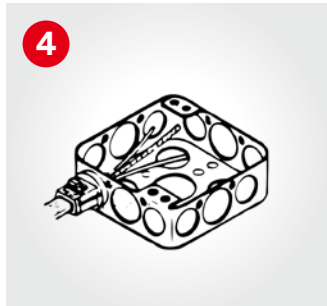


2. Insert button into cavity.



3. With grooved pliers, or parallel jaw type pliers (commercially available), squeeze button into cord or wires as far into fitting body as possible.

Note: It may be necessary to re-adjust pliers to ensure button is properly installed.



4. Snap fitting into knockout box. If desired this step can be done prior to Step 1.



5. To remove from knockout box, depress ears.



6. To remove from cable, cut fitting as shown.



Cat. no.	Knockout size (in.)	Cable/ cord range
Range		
3300	½	10-2, 12-2 and 14-2 type NM cable 0.125 in. to 0.300 in. outside diameter cord
3201-TB & 3350	½	10-3, 12-3, 14-3, 10-2, 12-2, 14-2 type NM cable; also multiple (2) 12-2 and 14-2 type NM cable; 0.300 in. to 0.600 in. outside diameter cord 8-3 and 6-3 type
3202	¾	NM cables; also multiple (2) 14-3 and 10-2 type NM cable; 0.500 in. to 0.850 in. outside diameter cord

Nonmetallic sheathed cable fittings

All plastic fittings for NM cable and flexible cord



High impact thermoplastic, UL 94V-1.

Features push-in design. Captive locking wedge secures cable with single squeeze of standard electrician's pliers. Provides excellent insulation, strain relief and high pull-out value.



Cat. no.	Size range	KO size (in.)	Fig.	Dimensions (in.)						F max. thk. enclosure (in.)	H (in.)
				A	B	C	D	E			
3300	For use with 10-2, 12-2 and 14-2 NM cables; 18-2 and 18-3 SJ and SJO cords and 18-2 SV, SVO, SJT and SJTO cords, single or multiple; cord capacity 0.125 in. to 0.300 in. diameter	1/2	2	1 1/32	1 5/16	3/8	0.880	0.795	0.080	5/16 X 3/16	
3350	For use with 10-3, 12-3, 14-3, 10-2, 12-2, 4-2 NM cables; multiple (2) 12-2 and 14-2 N multiple flexible cords in wire range 0.300 in. to 0.600 in.	1/2	1	1 11/32	1	7/16	0.880	0.795	0.080	2 1/2 dia.	
3202	For use with 8-3 and 6-3 NM cables; (2) 14-3, 14-2, 12-2 and 10-2 NM cables; single and multiple flexible cords in wire range 0.500 in. to 0.850 in.	3/4	1	1 1/2	1 5/16	7/16	1.100	1.005	0.090	7/8 dia.	

Temperature rating: 105 °C

01 Figure 1

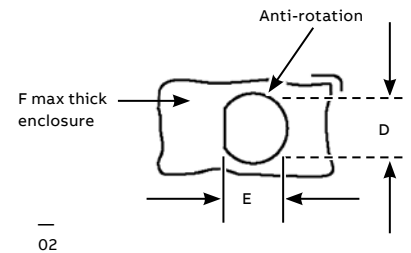
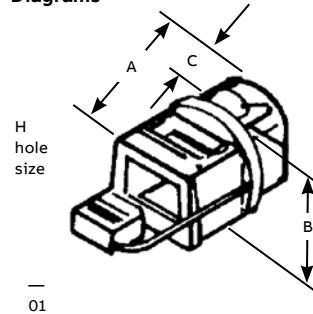
02 Figure 2

03 Snap captive locking wedge into fitting's cavity

04 Press locking wedge into cavity, which locks onto cable

05 Cat. no. 3201 is ideal for multiple flexible cords and cable

Diagrams



Note: If rotation in hole is to be avoided, use connector in a hole dimensions per column D and E.



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Nonmetallic sheathed cable fittings

Snap-in fittings and clamps



No locknut required. No special tools required.
High impact thermoplastic with steel insert.

Snap-in fittings for flexible metal conduit



Diagram	Cat. no.	Conduit size (in.)	KO size (in.)	Dimensions (in.)		
				A	B	C
	100TB	3/8	1/2	27/32	1 13/32	1 31/32
	100BP	3/8	1/2	27/32	1 13/32	1 31/32

Temperature rating: 105 °C. UL 94V-1



Swivel tray clamps



Cat. no.	Conduit size (in.)
6209	1/2-3/4
6211	1-1 1/4
6214	1 1/2-2
6216	2 1/2-3
6218	3 1/2-4



Swivel cable tray clamps for aluminum and steel trays with regular or reinforced flanges.

- Serrations and biting teeth on clamping saddle provides a high quality bond between conduit and clamp
- 1/2 in. to 6 in. sizes that can be clamped to any position in a 90° arc

- Hardened steel screws bite into tray and provide positive bond
- Malleable iron hub and steel U-bolt accept conduit from any angle

Cable tray clamps



Cat. no.	Conduit size (in.)
6210	1/2-3/4
6212	1-1 1/4