



ANSI/NEMA OS 1-2013 (R2020)

*Sheet-Steel Outlet Boxes, Device Boxes,
Covers, and Box Supports*

Published by

National Electrical Manufacturers Association

1300 North 17th Street, Suite 900

Rosslyn, VA 22209

www.nema.org

© 2020 National Electrical Manufacturers Association. All rights, including translation into other languages, reserved under the Universal Copyright Convention, the Berne Convention for the Protection of Literary and Artistic Works, and the International and Pan American copyright conventions.

NOTICE AND DISCLAIMER

The information in this publication was considered technically sound by a consensus among persons engaged in its development at the time it was approved. Consensus does not necessarily mean there was unanimous agreement among every person participating in the development process.

The National Electrical Manufacturers Association (NEMA) Standards and guideline publications, of which the document herein is one, are developed through a voluntary Standards development process. This process brings together volunteers and/or seeks out the views of persons who have an interest in the topic covered by this publication. Although NEMA administers the process and establishes rules to promote fairness in the development of consensus, it does not write the documents, nor does it independently test, evaluate, or verify the accuracy or completeness of any information or the soundness of any judgments contained in its Standards and guideline publications.

NEMA disclaims liability for any personal injury, property, or other damages of any nature, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, application, or reliance on this document. NEMA disclaims and makes no guaranty or warranty, express or implied, as to the accuracy or completeness of any information published herein, and disclaims and makes no warranty that the information in this document will fulfill any particular purpose(s) or need(s). NEMA does not undertake to guarantee the performance of any individual manufacturer's or seller's products or services by virtue of this Standard or guide.

In publishing and making this document available, NEMA is not undertaking to render professional or other services for or on behalf of any person or entity, nor is NEMA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstance. Information and other Standards on the topic covered by this publication may be available from other sources, which the user may wish to consult for additional views or information not covered by this publication.

NEMA has no power, nor does it undertake to police or enforce compliance with the contents of this document. NEMA does not certify, test, or inspect products, designs, or installations for safety or health purposes. Any certification or other statement of compliance with any health- or safety-related information in this document shall not be attributable to NEMA and is solely the responsibility of the certifier or maker of the statement.

CONTENTS

Foreword	vi
Section 1 General	1
1.1 Scope	1
1.2 References	1
1.3 Definitions	1
Section 2 Specifications	5
2.1 Material	5
2.2 Corrosion Protection	5
2.2.1 Outside Surfaces	5
2.2.2 Inside Surfaces	5
2.2.3 Screws	5
2.2.4 Spot Or Injection Welds	6
2.3 Openings	6
2.3.1 Conduit Knockouts	6
2.3.2 Cable-Size Knockouts	6
2.3.3 Diameters Of Knockouts	6
2.3.4 Open Holes	7
2.4 Supports	7
2.4.1 Supporting Ears	7
2.4.2 Stud Face Brackets	7
2.4.3 Stud Side Brackets	8
2.4.4 Bar Hangers (Adjustable Or Fixed)	8
2.4.5 Holes Provided For Mounting	8
2.5 Cover Screws	8
2.6 Boxes For Supporting Equipment Or Accessories	8
2.6.1 Boxes For Luminaire Support	8
2.6.2 Boxes For Ceiling-Suspended Fan Support	8
2.7 Device Boxes	8
2.8 Boxes And Mounts for Other Devices and Accessories	8
2.9 Boxes for High And Low Voltage Circuits	9
2.10 Markings	9
2.10.1 Boxes and Covers	9
2.10.2 Boxes for Supporting Equipment or Accessories	9
2.10.3 Clamps	9
2.11 Grounding	9
2.12 Dimensions	10
2.12.1 Trade Sizes	10
2.12.2 Dimensional Tolerances	10
2.13 Figures	10

Tables

Table 1 Diameter of Knockouts 6
Table 2 Openings in A Box 7
Table 3 Index of Figures 11
Table 4 Index of Design Configurations 14

Figures

Figure 1 Device Box.....	15
Figure 2 Outlet Box.....	15
Figure 3 Minimum Box/Cover Face Opening.....	16
Figure 4 Clearance Between Device Box Plaster Ear Mounting Screws.....	17
Figure 5 Alternate Knockout Configurations.....	18
Figure 6 Alternate Cover Mounting Hole(S)/Slot(S) Configurations.....	19
Figure 7 Alternate Device Mounting Configurations For Covers.....	20
Figure 8 Alternative Pryout Configurations.....	21
Figure 9 Alternate Exposed Work Cover Configurations.....	22
Figure 70 3-1/4" Round Cable Box.....	23
Figure 80 3-1/2" Octagon Box, 1-1/2" And 2-1/8" Deep.....	24
Figure 81 3-1/2" Octagon Cable Box, 1-1/2" Deep.....	25
Figure 90 4" Round Box, 1/2 [16] Knockouts.....	26
Figure 91 4" Round Box (Pan) With Cable Clamps.....	27
Figure 100 4" Octagon Box, 1-1/2" And 2-1/8" Deep, 1/2 [16], 3/4 [21], Or 1 [27] Knockouts.....	28
Figure 101 4" Octagon Cable Box, 1-1/2" And 2-1/8" Deep.....	29
Figure 110 4" Square Box, 1-1/4", 1-1/2", And 2-1/8" Deep, 1/2 [16] Knockouts.....	30
Figure 111 4" Square Box, 1-1/2" And 2-1/8" Deep, 3/4 [21] And 1 [27] Knockouts.....	31
Figure 112 4" Square Box, 1-1/2" And 2-1/8" Deep, Combination 1/2 [16] And 3/4 [21] Knockouts.....	32
Figure 113 4" Square Cable Box, 1-1/2" And 2-1/8" Deep.....	33
Figure 120 4-11/16" Square Cable Box, 1-1/2" And 2-1/8" Deep, 1/2 [16] Knockouts.....	34
Figure 121 4-11/16" Square Cable Box, 1-1/2" And 2-1/8" Deep, 3/4 [21] And 1 [27] Knockouts.....	35
Figure 122 4-11/16" Square Box, 1-1/2" And 2-1/8" Deep, Combination 1/2 [16] And 3/4 [21] Knockouts.....	36
Figure 125 3-1/2" Octagon Box Extension, 1-1/2" Deep, 1/2 [16] Knockouts.....	37
Figure 130 4" Octagon Box Extension, 1-1/2" And 2-1/8" Deep, 1/2 [16], 3/4 [21], And 1 [27] Knockouts.....	38
Figure 140 4" Square Box Extension, 1-1/2 And 2-1/8" Deep, 1/2 [16] Knockouts.....	39
Figure 141 4" Square Thru-Wall Box, 1-1/2" And 1-1/2" Deep, 1/2 [16] Knockouts.....	40
Figure 142 4" Square Box Extension, 1-1/2" And 2-1/8" Deep, 3/4 [21] And 1 [27] Knockouts.....	41
Figure 143 4" Square Thru-Wall Box, 1-1/2" Deep, 3/4 [21] Knockouts.....	42
Figure 144 4" Square Box Extension, 1-1/2" And 2-1/8" Deep, Combination 1/2 [16] And 3/4 [21] Knockouts.....	43
Figure 145 4" Square Thru-Wall Box, 1-1/2" Deep, Combination 1/2 [16] And 3/4 [21] Knockouts.....	44
Figure 150 4-11/16" Square Box Extension, 1-1/2" And 2-1/8" Deep, 1/2 [16] Knockouts.....	45
Figure 151 4-11/16" Square Box Extension, 1-1/2" And 2-1/8" Deep, 3/4 [21] And 1 [27] Knockouts.....	46
Figure 152 4-11/16" Square Box Extension, 1-1/2" And 2-1/8" Deep, 3/4 [21] And 1 [27] Knockouts.....	47
Figure 160 Concrete Ring, 1/2 [16], 3/4 [21], And 1 [27] Knockouts.....	48
Figure 161 Hung Ceiling Box, 1/2 [16] And 3/4 [21] Knockouts.....	49
Figure 170 Gang Boxes, 1-5/8" And 2-1/2" Deep, 1/2 [16], 3/4 [21] And 1 [27] Knockouts.....	50
Figure 200 Non-Gangable Device Boxes, 1/2 [16] Knockouts.....	51
Figure 201 Non-Gangable Device Boxes, 3/4 [21] Knockouts.....	52
Figure 202 Flush Device Box Extender (Goof Ring).....	53
Figure 210 4" Square Box For Two Devices, 1/2 [16] Knockouts.....	54
Figure 211 4" Square Box For Two Devices, 3/4 [21] Knockouts.....	55
Figure 220 Single Device Box For 1/2 [16] Or 3/4 [21] Knockouts.....	56
Figure 221 Gangable Device Box For Cable, 2-1/4" Deep, With Bevel Corner.....	57
Figure 222 Single Device Box For Cable.....	58
Figure 240 Tile Wall Boxes, 1/2 [16] Knockouts, Single And Multigang.....	59
Figure 241 Masonry Thru-Wall Boxes, 1/2 [16] And 3/4 [21] Knockouts, Single Gang.....	60
Figure 280 Flat Cover For 3-1/2" Octagon Box, With Or Without 1/2 [16] Knockout.....	61
Figure 281 Flat Cover For Single Convenience Outlet For 3-1/2" Octagon Box.....	62
Figure 300 Flat Cover For 4" Octagon Box, With Or Without 1/2 [16] Knockouts.....	63
Figure 301 Flat Cover For Single Convenience Outlet For 4" Octagon Box.....	64
Figure 302 Flat Cover For Duplex Convenience Outlet For 4" Octagon Box.....	65

Figure 303 Raised Cover With One 1/2 [16] Knockout For 4" Octagon Box	66
Figure 304 Raised Cover With Center Blanked Out For 4" Octagon Box	67
Figure 305 Raised Cover For Drop Cord For 4" Octagon Box	68
Figure 310 Flat Cover For 4-11/16" Square Box, With Or Without 1/2 [16] Knockouts	69
Figure 311 Raised Cover For 4-11/16" Square Box, With Or 1/2 [16] Knockout	70
Figure 312 Raised Cover With Center Blanked Out For 4" And 4-11/16" Square Box	71
Figure 313 One-Device Cover For 4" Square Box	72
Figure 314 Two-Device Cover For 4" Square Box	73
Figure 315 One-Device Tile Cover For 4" Square Box	74
Figure 316 Two-Device Tile Cover For 4" Square Box	75
Figure 317 Surface Cover For One Gfci Receptacle For 4" Square Box	76
Figure 318 Surface Cover For One Gfci Receptacle For 4" Square Box	77
Figure 319 Surface Cover For One Toggle Switch And One Gfci Receptacle For 4" Square Box	78
Figure 320 Surface Cover For Single Receptacle For 4" Square Box	79
Figure 321 Surface Cover For One Toggle Switch And One Single Receptacle For 4" Square Box	80
Figure 322 Surface Cover For One Toggle Switch For 4" Square Box	81
Figure 323 Surface Cover For Two Toggle Switches For 4" Square Box	82
Figure 324 Surface Cover For One Duplex Receptacle For 4" Square Box	83
Figure 325 Surface Cover For One Toggle Switch And One Duplex Receptacle For 4" Square Box	84
Figure 326 Surface Cover For Two Duplex Receptacles For 4" Square Box	85
Figure 327 Surface Cover For 30-50-60 Ampere And 3-Wire Receptacle For 4" Square Box	86
Figure 328 Surface Cover For Two Single Receptacles For 4" Square Box	87
Figure 329 Surface Cover For One Toggle Switch And One Gfci Receptacle For 4" Square Box	88
Figure 330 One-Device Cover For 4-11/16" Square Box	89
Figure 332 One-Device Tile Cover For 4-11/16" Square Box	90
Figure 333 Two-Device Tile Cover For 4-11/16" Square Box	91
Figure 340 Surface Cover For Single Receptacles For 4-11/16" Square Box	92
Figure 341 Surface Cover For One Toggle Switch And One Single Receptacle For 4-11/16" Square Box	93
Figure 342 Surface Cover For One Toggle Switch For 4-11/16" Square Box	94
Figure 343 Surface Cover For Two Toggle Switches For 4-11/16" Square Box	95
Figure 344 Surface Cover For Single Receptacles For 4-11/16" Square Box	96
Figure 345 Surface Cover For One Toggle Switch And One Duplex Receptacle For 4-11/16" Square Box	97
Figure 346 Surface Cover For Two Duplex Receptacles For 4-11/16" Square Box	98
Figure 347 Surface Cover For 30-50-60 Ampere And 3-Wire Receptacle For 4-11/16" Square Box	99
Figure 348 Surface Cover For Two Single Receptacles For 4-11/16" Square Box	100
Figure 350 Flat Blank Covers For Gang Boxes	101
Figure 351 Toggle Switch Covers	102
Figure 352 Raised Covers For Gang Boxes	103
Figure 360 Concrete Backplate Combination 1/2 [16] And 3/4 [21] Knockouts (Optional)	104
Figure 361 Concrete Backplate With Stud, 1/2 [16] And 3/4 [21] Knockouts (Optional)	105
Figure 400 Box And Conduit Support	106

Note: This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at NEMA or ANSI.

FOREWORD

The purpose of this standards publication is to provide a guide to the types and sizes of metal outlet boxes, and supports for general use or suggested for future design or both. The standards present dimensional data needed for the safety and convenience of interchangeability with associated equipment. All items when properly installed and properly used contribute to safety.

Properly manufactured boxes and covers are, however, only one factor in minimizing the hazards, which may be associated with the use of electricity. The reduction of hazard involves the joint efforts of the various equipment manufacturers, the system designer, the installer, and user. Information is provided herein to assist users and others in the proper selection of boxes and covers.

The manufacturer has limited or no control over the following factors which are vital to a safe installation:

- a. Environmental conditions
- b. System design
- c. Equipment selection and application
- d. Installation
- e. Operating practices
- f. Maintenance

This publication is not intended to instruct the user of the boxes and covers with regard to these factors except insofar as suitable equipment to meet needs can be recognized in this publication.

These standards are necessarily limited to defining the construction requirements for the products covered herein. The publication has been promulgated with a view towards reducing the hazard to persons and property when boxes and covers conforming to these standards are properly selected and installed in accordance with the *National Electrical Code*[®].

NFPA 70[®], National Electrical Code[®], and NEC are registered trademarks of the National Fire Protection Association, Quincy, MA.

This standards publication has been reviewed with input obtained from independent testing laboratories and major consumer representatives.

This is a reaffirmation of NEMA OS 1 - 2013. OS 1-2013 revises and supersedes OS 1-2008 and its revision OS 1-2008 (R2010).

User needs have been considered throughout the development of this publication. The standard is reviewed periodically by NEMA Outlet and Switch Box Section so that it will be kept up to date with advancing technology. Proposed or recommended revisions should be submitted to.

Technical Director, Operations
National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, Virginia 22209

This Standards publication was developed by the NEMA Outlet and Switch Box Section. Section approval of the Standard does not necessarily imply that all section members voted for its approval or participated in its development. At the time it was approved, the Outlet and Switch Box Section was composed of the following members:

ABB, Inc.	Memphis, TN
Allied Moulded Products, Inc.	Bryan, OH
Arlington Industries, Inc.	Scranton, PA
Eaton	Cleveland, OH
Emerson	Saint Louis, MO
Hotwire, LLC	Virginia Beach, VA
Hubbell Incorporated	Shelton, CT
IPEX USA, LLC	Pineville, NC
Legrand, North America	West Hartford, CT
Madison Electric Products	Bedford Heights, OH
nVent	St. Louis Park, MN
Sigma Electric Manufacturing Corporation	Garner, NC
Titan3 Technology LLC	Tempe, AZ

< This Page is Intentionally Left Blank. >

Section 1

GENERAL

1.1 SCOPE

This standards publication covers those general-purpose metal outlet boxes, device boxes, covers, and supports that are widely used by the consumer. These items (covered by UL 514A) are designed to facilitate the pulling of wires, to protect and facilitate wiring splices and taps, to provide a means of mounting and protecting wiring devices, and to provide a connection for rigid conduit, electrical metallic tubing, armored cable, metal clad cable, nonmetallic sheathed cable, flexible metallic conduit and knob- and-tube wiring systems.

This standard provides useful guidance for design and performance of certain aspects of metallic floor boxes.

Excluded from this standards publication are the following: “conduit bodies” and similar types of boxes; cabinets or cutout boxes; pull boxes; floor boxes; flush device plates; boxes, plates and covers designed for use with surface metal raceway systems only; and boxes larger than 1650 cubic cm (100 cubic in.) in volume except multiple gang device boxes.