



UL 414

STANDARD FOR SAFETY

Meter Sockets

UL Standard for Safety for Meter Sockets, UL 414

Ninth Edition, Dated January 5, 2016

SUMMARY OF TOPICS

This revision of ANSI/UL 414 dated March 1, 2024 includes the following changes in requirements:

- Location of conductive parts of meter socket adapters; [SA2.1](#), [SA2.3](#), [SB2.2](#) and [SB2.4](#)***
- Supplements SA and SB heating test updates; [SA4.1.2](#), [SB4.1](#), [SB12.1.1](#) and [SB12.1.7](#)***
- New Moment Test requirements; [SA3.1](#), Section [SA5A](#), [SB11.1](#) and [SB15.11](#)***
- New Supplement [SC](#) or Meter Socket Adapters with Branch Circuit Connections***

Text that has been changed in any manner or impacted by ULSE's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated October 13, 2023 and January 19, 2024.

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The most recent designation of ANSI/UL 414 as an American National Standard (ANSI) occurred on March 1, 2024. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

The Department of Defense (DoD) has adopted UL 414 on November 20, 1987. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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INTRODUCTION

1 Scope

1.1 These requirements cover meter sockets for use with:

- a) Watthour and similar meters;
- b) Test switches;
- c) Metering transformer cabinets; and
- d) Metering transformer cabinet interiors

for installation in accordance with the National Electrical Code, NFPA 70.

1.2 Meter sockets are marked with a continuous duty ampere rating and may in addition have a maximum use (intermittent) ampere rating of 125 percent or less of the continuous duty ampere rating.

1.3 A meter socket, as covered by these requirements, is an assembly of wiring terminals and jaw type contacts for one or more plug-in watthour meters in an enclosure having provisions for securing the meter to the socket.

1.4 Some meter sockets may be housed in a metal pedestal enclosure intended for mounting on a concrete slab or in a metal post enclosure intended to be sunk in the ground with or without concrete poured around the post at ground level and either self-supported or intended for separate support. Such posts or pedestals are not intended to serve as the sole support of masts for overhead wiring.

1.5 Some meter sockets may be intended for mounting on a mounting post or pedestal for distribution equipment.

1.6 Except as indicated in [1.10](#), as covered by these requirements, a meter socket does not include:

- a) A meter,
- b) An overcurrent device,
- c) An instrument transformer,
- d) An arcing or switching part, or
- e) A similar component.

A meter socket does not have provision for installation of instrument transformers within the meter socket enclosure.

1.7 These requirements cover meter sockets rated:

- a) 300 volts alternating current or less, or 600 volts alternating current and
- b) 400 amperes maximum per meter position.

1.8 These requirements cover metering transformer cabinets and metering transformer cabinet interiors rated maximum 6000 amperes at maximum 600 volts.

1.9 As covered by these requirements, a metering transformer cabinet or metering transformer cabinet interior does not include the current transformers.

1.10 This Standard contains requirements in Supplement [SA](#) that cover meter socket adapters and Supplement [SB](#), that covers meter socket adapters with provisions for connection of distributed generation equipment, that may contain overcurrent protection.

2 General

2.1 Components

2.1.1 Except as indicated in [2.1.2](#), a component of a product covered by this standard shall comply with the requirements for that component. See Appendix [A](#) for a list of standards covering components generally used in the products covered by this standard.

2.1.2 A component is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or
- b) Is superseded by a requirement in this standard.

2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.2 Units of measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

2.2.2 Unless indicated otherwise, voltages and current values mentioned in this standard are root-mean-square (rms).

2.3 Undated references

2.3.1 Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition of that code or standard.

ALL METER SOCKETS AND METERING TRANSFORMER CABINETS

CONSTRUCTION

3 General

3.1 Unless otherwise noted specifically in this standard, all parts shall be assembled in place when the equipment is shipped from the factory. Internal connections between factory installed components shall be completed.

3.2 If a meter socket, metering transformer cabinet, or metering transformer is intended for use with or without an accessory assembly, the accessory assembly need not be shipped from the factory with the product if:

- a) The accessory assembly is shipped from the factory assembled as far as practicable, together with mounting screws, barriers, or the like, and installation instructions;
- b) The assembly itself is complete and needs no parts to make it ready for installation; and
- c) The accessory assembly is identified in accordance with [27.6.1](#) – [27.6.3](#).

3.3 For posts and pedestal type meter sockets, the requirements of Sections [29](#) – [40](#) apply in addition to the requirements for all meter sockets.

3.4 A meter socket provided with a circuit closer or disconnect shall be marked, as applicable, in accordance with [27.7.1](#) – [27.7.3](#).

4 Enclosure

4.1 An enclosure shall comply with the requirements of the Standard for Enclosures for Electrical Equipment, Non-Environmental Considerations, UL 50 and the Standard for Enclosures for Electrical Equipment, Environmental Considerations, UL 50E, unless modified by additional requirements as specifically described in this standard and shall be marked in accordance with [27.4.1](#).

4.2 In a cast metal enclosure intended for one meter, there may be an indication of location in the rear wall for an additional conduit connection. This indication may be in the form of a breakout with a reduced thickness to not less than 0.020 inch (0.51 mm), but shall not be a knockout nor shall it be for more than one size of conduit.

Exception: A concentric type breakout for a 1-1/4 inch trade size conduit and for one smaller trade size conduit may be provided in a cast metal enclosure.

4.3 Breakouts and knockouts shall be located so as not to result in interference with terminals or mounting screw holes or to cause reduction in minimum spacings when conduit fittings are in place.

4.4 In a single-meter sheet metal enclosure, a single non-concentric knockout may be located above the line of the lowest live part, provided the knockout, after formation is pushed back essentially flush with the wall.

4.5 In a single-meter enclosure a single concentric knockout may be located above the line of the lowest live part provided that such a knockout after formation is pushed back essentially flush with the wall. The concentric knockout shall also be subjected to the Concentric Knockout Rain Test, Section [18](#).

4.6 An external operating mechanism, such as for a disconnect, mounted on or through the enclosure shall withstand the environmental tests specified in the Standard for Enclosures for Electrical Equipment, Environmental Considerations, UL 50E, for the enclosure type marked in accordance with [27.4.1](#).

4.7 An enclosure not exceeding 185 square inches (1194 cm²) frontal area may be formed of 0.060 inch (1.52 mm) thick aluminum, if the aluminum hardness is grade H14, and if a meter socket is provided, the distance from the edge of the meter opening does not exceed 5 inches (127 mm) to an unflanged edge nor 10 inches (254 mm) to a flanged edge.

4.8 The cover over a socket for an individual meter shall be secured to the assembly by at least two fastenings. A latch or overlapping flange shall be considered as a fastening.

4.9 If required for a specific need, such as to provide for latching, the overlap between the cover and box may be less than 1/2 inch (12.7 mm) but not less than 1/4 inch (6.4 mm). The length of the reduced overlap shall not exceed 1-1/2 inches (38.1 mm).

4.10 The enclosure socket shall be tight, and shall have no opening other than:

- a) The opening necessary to accommodate a watt-hour meter.
- b) Openings for hubs, latches, drainage, mounting, ventilation and such, only as specifically described in this standard.
- c) If applicable, an open bottom to accommodate the entry of underground conductors as in a post or pedestal construction.
- d) A special opening intended for connection to other equipment if marked as specified in [27.4.3](#), and if the construction complies with [4.18](#).

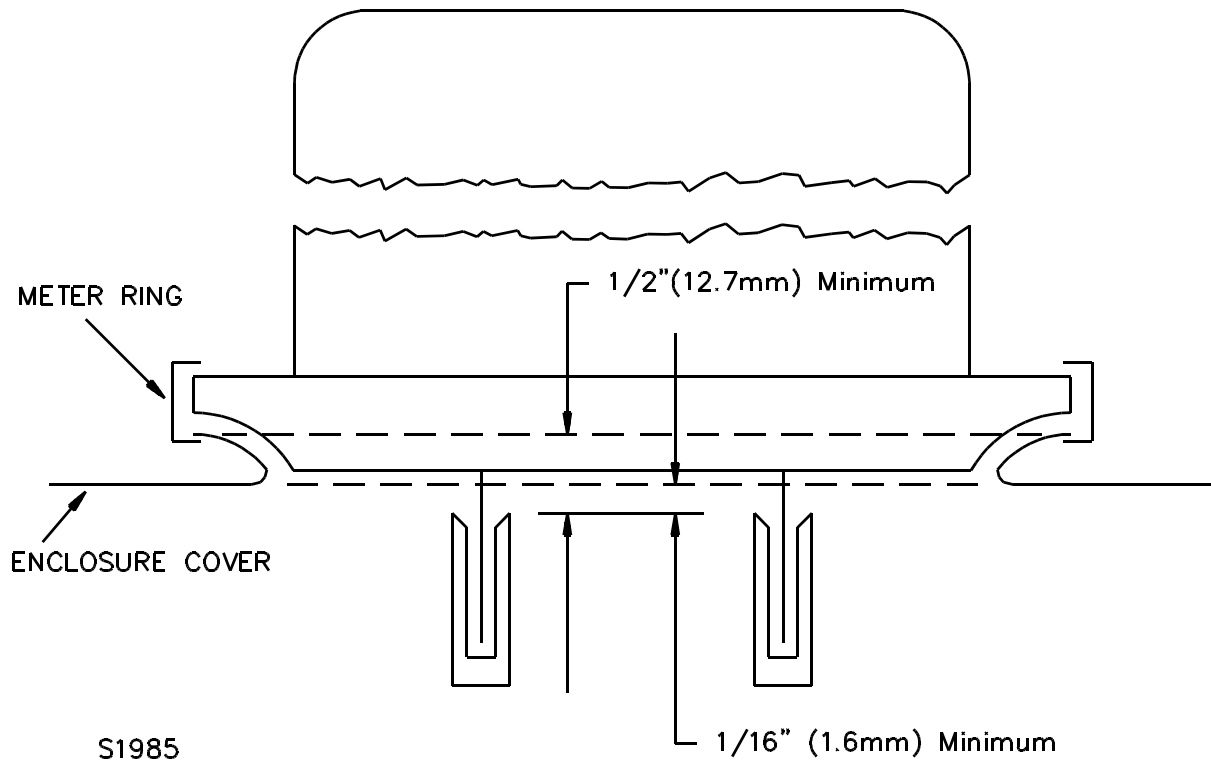
4.11 The enclosure of the equipment shall enclose all live parts.

Exception: This requirement does not apply to ventilating openings, an open bottom for underground conductors, and the like, or if an intended meter is not in place.

4.12 All live parts within a 3-inch (76.2-mm) radius of the center of the meter socket base shall be recessed not less than 1/2 inch (12.7 mm) behind the front plane of:

- a) The meter mounting rim of a ring type meter socket as shown in [Figure 4.1](#) or
- b) The meter support of a ringless type meter socket.

Figure 4.1
Ring type meter socket



4.13 The construction of a ring type meter socket shall be such that removal of the cover necessitates a procedure tending to guide the cover clear of any uninsulated live part.

Exception: The guide or insulation of a live part is not required if the jaws or other live part of the meter socket are recessed at least 1/16 inch (1.6 mm) behind the front plane of the meter socket cover as shown in [Figure 4.1](#).

4.14 In a meter socket intended to mount up to three meters and having up to three unit covers of flanged or flanged and offset overlap construction or other features intended to strengthen the assembly, the maximum length of an enclosure of 0.053 inch (1.35 mm) thick steel or 0.060 inch (1.52 mm) thick aluminum may exceed 24 inches (610 mm) but may not be greater than 30 inches (762 mm) provided that the width does not exceed 10 inches (254 mm) and the depth does not exceed 5 inches (127 mm).

4.15 If the performance of a meter socket depends on an operation applying clamping pressure to the jaws, it shall not be possible to complete the installation until the clamping pressure has been applied to the jaws. Completion of the installation is defined as follows:

- a) For ringless type meter sockets, installation of the cover and
- b) For ring type meter sockets, installation of the cover, meter, and sealing ring.

4.16 The diameter of the watt-hour meter opening in a ringless type meter socket shall not be less than 6.55 inches (166 mm).

4.17 An enclosure may be provided with removable ends or plates to facilitate ganging with other cooperating enclosures.

4.18 Equipment of the gangable type shall be provided with means to:

- a) Ensure bonding continuity between adjacent enclosures.
- b) Secure enclosures together by at least one fastening bolt for each joined edge not over 4 inches (102 mm) in length. For joints longer than 4 inches, fastenings shall be located not more than 1-1/2 inches (38.1 mm) from each end and not more than 6-1/2 inches (165 mm) apart.
- c) Close the gap at the joint between enclosures with metal of the same gauge as required for the enclosure. There shall be an overlap of 1/2 inch (12.7 mm) on each side of the gap.
- d) Close the end of an enclosure with an available fitting. Openings for fastenings shall be provided with upturned edges to retain the fitting when the screws are loosened.
- e) Identify gangable enclosures by marking.
- f) Ensure proper connection of live parts of ganged enclosures.

4.19 Each enclosure shall be provided with at least two mounting means not more than 5 feet (1.52 m) apart and not more than 12 inches (305 mm) from either end unless intended for mounting as a post or pedestal.

4.20 If internal mounting means are in the form of openings in the enclosure and are located above the level of any live part or terminal for a grounding connection, not more than two such openings shall be provided unless:

- a) All other openings are closed at the factory and
- b) The closing means when undisturbed excludes the beating rain in the test described in [17.1](#).

4.21 A ventilating opening in an enclosure shall comply with the requirements specified in Ventilation Openings, Section [31](#).

4.22 An enclosure of the semi-flush type shall be marked as an enclosure Type 3R and shall additionally be marked as specified in [27.4.2](#).

4.23 A meter socket not intended to be wired from either the top feed (overhead feed) or bottom feed (underground feed) shall be marked in accordance with [27.5.1](#).

5 Bases – Insulating Material

5.1 A base for the mounting of uninsulated live parts shall not be easily ignited, moisture resistant insulating material. The base shall be constructed so that it is able to withstand the most severe conditions likely to be met in service.

5.2 An insulating material shall have a Performance Level Category (PLC) that does not exceed the value specified in [Table 5.1](#). The specified values are derived from the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C. The Relative Thermal Index (RTI) of the material shall be at least 105°C (221°F).

Exception No. 1: A material may be accepted based on end-product testing as specified in UL 746C.

Exception No. 2: The RTI may be 90°C (194°F) for material that is spaced at least 1/2 inch (12.7 mm) from insulated or uninsulated live parts.

Table 5.1
Maximum performance level category (PLC) for insulating material

Test specified	Flammability rating of material ^{a,b}			
	V-0	V-1	V-2	HB
Comparative Tracking Index Under Moist Conditions (CTI) ^{c,d}	3 ^e	3 ^e	3 ^e	3 ^e
High Current Arc Resistance to Ignition (HAI) ^{b,c}	3	2	2	1
Hot Wire Ignition (HWI) ^{c,d}	4	4	4	4
NOTE – The additional parameters specified in Table 5.2 shall be considered. ^a As specified in the Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94. ^b If the material is used for indirect support and is spaced from uninsulated live parts by at least 1/2 inch (12.7 mm), the flammability rating may be HB if the PLC level for this test (HAI) is 4. ^c See the Standard for Polymeric Materials – Short Term Property Evaluations, UL 746A. ^d If the material is used for indirect support and is spaced from uninsulated live parts by at least 1/2 inch (12.7 mm), this test (CTI or HWI) is not required. ^e A material having a comparative tracking index PLC of 4 may be used if the voltage involved is 250 volts or less.				

Table 5.2
Additional parameters

Property	Test	Method	Units	Minimum levels related to flammability classification
Distortion under load and mold stress relief	Heat deflection temperature, or	UL 746A	Minimum °C	10°C greater than use temperature, but not less than 90°C, or
	Vicat softening point, or	UL 746A	Minimum °C	25°C greater than use temperature, but not less than 105°C, or
	Ball pressure temperature	UL 746A	Minimum °C	(40°C minus the ambient temperature) greater than the use temperature, but not less than 95°C

5.3 A base of insulating material shall be secured to its supporting surface so that it will comply with the conditions of the tests described in [19.1](#) and [23.1](#).

5.4 A live part, rivet, screw head or nut on the underside of a base designed for surface mounting shall be countersunk no less than 1/8 inch (3.2 mm) in the clear and covered to a depth of not less than 1/8 inch (3.2 mm) with a waterproof, insulating sealing compound that will not soften at a temperature of 15°C (27°F) higher than the temperature observed at the point where it is used but not lower than 65°C (149°F).

Exception: A sealing compound is not required for constructions complying with [5.5](#).

5.5 Live parts mentioned in [5.4](#), which are not covered with a sealing compound, shall comply with through air and over surface spacing requirements noted in [Table 8.1](#). Insulating materials used to provide the necessary spacings shall comply with:

- a) Requirements for Bases – Insulating Materials, Section [5](#) or
- b) Requirements for Insulating Barriers, Section [9.1](#) or

In addition to complying with these spacing requirements, threaded fasteners which are not covered with a sealing compound shall be reliably prevented from loosening by being staked or upset, by a lock washer, a spring washer, or by other means.

5.6 A determination of the softening point of a sealing compound shall be made by use of the ring and ball apparatus described in the requirements for Polymeric Materials – Short Term Property Evaluations, UL 746A.

5.7 The base of a meter socket having line or load terminals supported directly by the base shall be secured to its mounting surface so as to prevent rotation by means other than friction between surfaces.

5.8 The mounting or alignment of a wire connector or a jaw, the integrity of the base material of the equipment, the electrical or mechanical connection between a wire connector and a jaw of the equipment, or the spacings shall not be adversely affected by the application of the maximum tightening means.

5.9 With respect to the Test of Insertion and Withdrawal Force on Meter Base, Section [23](#), the mounting of the base of a meter socket shall withstand insertion and withdrawal forces without permanent deformation or damage to the insulating base. The rigidity of the assembly shall be such that after seating a typical watt-hour meter to the maximum depth permitted by the jaws or flange, the clearance between the meter and flange shall not exceed 1/16 inch (1.6 mm) and a sealing ring or cover can be installed.

5.10 A meter socket base shall not be solely dependent on the cover for support unless it is intended to be used with current transformers such that conductors no larger than 8 AWG (8.4 mm²) will be used.

Exception: The requirement does not apply to backwired devices mounted in switchboards or similar equipment.

6 Current-Carrying Parts

6.1 General

6.1.1 All current-carrying parts, including those associated with a potential jaw assembly shall be of:

- a) Silver;
- b) A silver alloy;
- c) Copper;
- d) A copper alloy;
- e) Aluminum; or
- f) Aluminum alloy.

Exception No. 1: A current-carrying part used only to bypass a meter may be plated steel if determined to be acceptable for the purpose in accordance with the Heating Test, Section [14](#).

Exception No. 2: A plated No. 10 (4.8 mm diameter) or larger wire-binding screw or nut and stud terminal may be fabricated of iron or steel.

6.1.2 The plating of steel wire-binding screws, nuts, and stud terminals, meter bypasses, and components of pressure wire connectors, shall be made of cadmium, nickel, zinc, tin, or silver.

6.1.3 A plated iron or steel member, if not depended upon to carry current, may be used with a pressure wire connector.

6.1.4 The surface of an aluminum bus bar shall be coated at a clamped joint with:

- a) Tin;
- b) Silver;
- c) Nickel; or
- d) Cadmium.

Exception: Other coatings may be used for aluminum bus bars if investigated for the application in accordance with the requirements in [14.2](#), [14.25](#), and [14.27](#).

6.1.5 Among the factors taken into consideration when the acceptability of coating as mentioned in the Exception to [6.1.4](#) is being determined are its adherence to aluminum and its resistance to corrosive environment. These factors are considered with respect to conductivity and thermal aging.

6.1.6 A multiple meter socket assembly shall be provided with all internal line conductors or busing or both.

Exception: The line conductors connecting not more than six sockets may be omitted where the main terminals are of the lay-in type.

6.1.7 Instructions or markings or both shall be provided to facilitate the proper interconnection of current carrying parts of gangable meter socket units. A link, jumper, or other hardware necessary to effect the connection shall be identified by part designation or other means. Instructions shall refer to the size of interconnecting conductors necessary to ensure compliance with [26.2](#) and [27.9.1](#) and [Table 26.1](#).

6.1.8 An insulated wire provided as a part of a meter socket is judged under the requirements for such material, considering its use in the particular application.

6.1.9 A current-carrying part shall be secured so that spacings shall not be reduced below the minimum required spacings specified in Spacings, Section [8](#).

6.1.10 Friction between surfaces may not be used as the sole means to restrict turning of an uninsulated live part.

6.1.11 If parts are held together by screws, a threaded part shall have not fewer than two full, clean cut threads engaged. If the screw does not extend all the way through a threaded part, the taper or lead thread and the first full thread are to be disregarded in a determination of a number of threads engaged.

6.1.12 A current-carrying part of a meter socket shall be constructed so that the part will not be permanently deformed by intended service.

6.1.13 If current-carrying conductors pass or may pass through an opening in a partition of magnetic material, all conductors of that circuit shall either be included in the same opening, or openings shall be joined by slotting or other means to break the magnetic path.

Exception: If one or more conductors of a circuit are separated by a complete path of magnetic material from the remainder of the circuit conductors, the construction shall be tested as required in [14.14](#) to determine that no adverse conditions result.

6.2 Washers

6.2.1 Each riveted connection involving current-carrying parts shall have a spring washer at one end and either a spring washer or a flat washer or equivalent at the other end.

Exception No. 1: The washers are not required in a riveted construction that has been tested in accordance with [14.25](#).

Exception No. 2: The washers are not required in a connection rated 225 amperes or less employing copper bus bars only.

6.2.2 A spring washer shall be used at one end of a bolt securing current-carrying parts together.

Exception No. 1: A spring washer is not necessary in a construction that has been tested in accordance with [14.25](#).

Exception No. 2: A spring washer may be replaced with a split ring lock washer and flat washer if each aluminum bus in the joint has a tensile yield strength of at least 20,000 pounds per square inch (138 MPa).

Exception No. 3: A flat washer, a split-ring lock washer, or a bolthead that complies with [6.2.4](#) may be used in place of a spring washer if the joint does not include any aluminum or if aluminum bolts are used with aluminum bus bars.

Exception No. 4: A type of fastening equivalent to that used for investigating the suitability of a wire connector used as a component in accordance with the requirements for wire connectors may be used.

Exception No. 5: A spring washer is not required at a bolted contact of an aluminum alloy conductor used in the grounding circuit for an application such as the service-grounding electrode, a neutral-bonding conductor, or an equipment-grounding conductor.

6.2.3 A spring washer as mentioned in [6.2.1](#) and [6.2.2](#) shall:

- a) Be a dished washer of stainless or hardened and tempered steel;
- b) Have an outer diameter not less than 150 percent of the bolt or rivet shank diameter and a thickness not less than 1/8 of the bolt diameter or rivet shank diameter; and
- c) Be dished not less than 3-1/2 percent of the bolt diameter.

6.2.4 A flat washer as mentioned in [6.2.1](#) and [6.2.2](#) shall have a thickness at least 1/6 the diameter of the rivet shank or bolt and an outer diameter at least 150 percent of that of the rivet shank or bolt, but not less than the outer diameter of the spring washer.

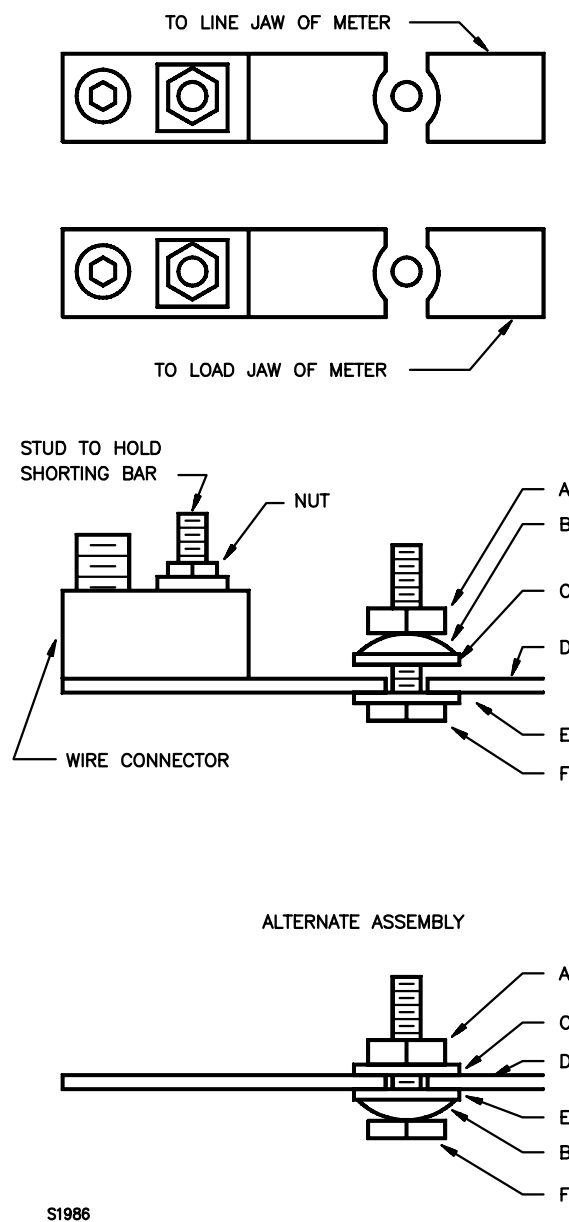
6.3 Test blocks

6.3.1 A test block disconnect assembly shall be provided with a spring washer of the type described in [6.2.3](#). A typical test block construction is shown in [Figure 6.1](#).

6.3.2 A stud for a test block disconnect nut assembly shall be restricted from rotating and shall be tested in accordance with the Test of Torque and Force on Test Block, Section [25](#).

6.3.3 A meter socket provided with a test block assembly shall be marked in accordance with [27.11.1](#).

Figure 6.1
Typical test block construction



NOTES

- A – Nut
- B – Dished Washer
- C – Shorting Washer
- D – Bus Bars
- E – Insulating Washer or Part of Base
- F – Stud Head

7 Wiring Terminals

7.1 A meter socket shall be provided with wiring terminals for the connection of insulated conductors having an ampacity for each rating of the device or circuit in accordance with [Table 7.1](#), based on the assumption that 75°C (167°F) rated wire will be used. A meter socket shall be marked, if applicable, in accordance with [27.10.1](#) – [27.10.17](#).

Exception No. 1: Wire terminals need not be provided as specified in [7.6](#).

Exception No. 2: Conductors as noted in [14.6](#) may be used.

Table 7.1
Ampacity of insulated conductors

Size, AWG or kcmil (mm ²)		Conduit trade size inches for ^a		Temperature rating of conductor			
				75°C (167°F)		90°C (194°F) ^b	
		3 Wires	4 Wires	Copper	Aluminum	Copper	Aluminum
14	2.1	1/2	1/2	15	—	20	—
12	3.3	1/2	1/2	20	15	20	15
10	5.3	1/2	3/4	30	25	30	25
8	8.4	3/4	3/4	50	40	55	45
6	13.3	3/4	1	65	50	75	60
4	21.2	1	1-1/4	85 ^c	65 ^c	95	75
3	26.7	1	1-1/4	100 ^c	75 ^c	110	85
2	33.6	1-1/4	1-1/4	115 ^c	90 ^c	130	100
1	42.4	1-1/4	1-1/2	130 ^c	100 ^c	150	115
1/0	53.5	1-1/2	2	150 ^c	120 ^c	170	135
2/0	67.4	1-1/2	2	175 ^c	135 ^c	195	150
3/0	85.0	2	2	200 ^c	155 ^c	225	175
4/0	107.0	2	2-1/2	230 ^c	180 ^c	260	205
kcmil							
250	127	2	2-1/2	255 ^c	205 ^c	290	230
300	152	2-1/2	3	285 ^c	230 ^c	320	255
350	177	2-1/2	3	310 ^c	250 ^c	350	280
400	203	2-1/2	3	335 ^c	270 ^c	380	305
500	253	3	3-1/2	380 ^c	310 ^c	430	350
600	304	3	3-1/2	420 ^c	340 ^c	475	385
700	355	3-1/2	4	460	375	520	420
750	380	3-1/2	4	475	385	535	435
800	405	3-1/2	4	490	395	555	450
900	456	3-1/2	4	520	425	585	480
1000	506	4	5	545	445	615	500
1250	633	5	5	590	485	665	545
1500	760	5	6	625	520	705	585

Table 7.1 Continued on Next Page

Table 7.1 Continued

Size, AWG or kcmil	(mm ²)	Conduit trade size inches for ^a		Temperature rating of conductor			
				75°C (167°F)		90°C (194°F) ^b	
		3 Wires	4 Wires	Copper	Aluminum	Copper	Aluminum
1750	887	5	6	650	545	735	615
2000	1013	5	6	665	560	750	630

NOTES

1 For a multiple-conductor connector at a terminal, the value is to be multiplied by the number of 1/0 AWG and larger conductors that the terminal will accommodate.

2 These values of ampacity apply only if no more than three conductors will be field-installed in the conduit. If four or more conductors, other than a neutral that carries the unbalanced current, will be installed in a conduit (as may occur because of the number of conduit hubs provided or because of the number of wires necessary in certain polyphase systems or for other reason), the ampacity of each of those conductors is reduced as shown in [Table 7.2](#).

^a Conduit size based on use of conductors having insulation thickness comparable to that of Type THW conductors and with conduit hubs or knockouts provided in the enclosure.

^b A meter socket may be rated for use with conductors on the line side having 90°C (194°F) ampacity under the following conditions:

- 1) Tested in accordance with Exception No. 1 to [14.6](#), with temperature rise limits as specified in [14.3](#).
- 2) Marked in accordance with [27.10.5](#).

^c With respect to Exception No. 2 to [14.6](#), equipment intended for use in a three-wire, single-phase dwelling service circuit with 75°C (167°F) rated conductors and marked in accordance with [27.3.7](#) may be investigated for ratings in accordance with the conductor ampacities specified in [Table 7.3](#).

Table 7.2
Ampacity of four or more conductors installed in a conduit

Numbers of conductors (diversity considered)	Percent of values in table
4 – 6	80
7 – 24	70
25 – 42	60
43 or more	50
Numbers of conductors (diversity not considered)	Percent of values in table
4 – 6	80
7 – 9	70
10 – 29	59
21 – 30	45
31 – 40	40
41 – 60	35

Table 7.3
Ampacity of conductors provided with meter sockets used in 3-wire, single-phase, dwelling service appliances

Ampacity, amperes	Conductor size, AWG or kcmil	
	Copper	Aluminum
100	4 AWG	2 AWG
110	3	1
125	2	1/0
150	1	2/0
175	1/0	3/0
200	2/0	4/0
225	3/0	250 kcmil
250	4/0	300
300	250 kcmil	350
350	350	500
400	400	600

7.2 A pressure wire connector intended to be used with a joint compound shall either have the compound in the barrel of the connector or, if in a separate package, instructions for use shall be provided on the package. Connectors to which the compound must be field applied shall be identified by a marking on the equipment.

7.3 A main terminal shall be rated for a minimum 8 AWG (8.4 mm²) copper or 6 AWG (13.3 mm²) aluminum conductor in a meter socket rated 40 amperes or less.

7.4 A pressure wire connector provided with or specified for use with a meter socket shall comply with the Standard for Wire Connectors, UL 486A-486B, when tested using the tightening torque specified in [7.5](#).

7.5 The tightening torque for a field-wiring terminal shall be as specified by the equipment manufacturer. The equipment shall be marked as specified in [27.10.3](#) to indicate the required torque value. The specified tightening torque shall not be more than 100 percent nor less than 90 percent of the value employed in the static heating test as specified in the Standard for Wire Connectors, UL 486A-486B, for that wire size corresponding to the ampere rating of the equipment.

Exception: The torque value may be less than 90 percent if the connector is investigated with the assigned torque value in accordance with UL 486A-486B.

7.6 With respect to Exception No. 1 to [7.1](#) and [27.10.15](#) and [27.10.16](#), pressure terminal connectors for field connection (line or load) need not be provided if the following conditions are met:

- a) Component terminal assemblies shall be available from the equipment manufacturer or one or more types of pressure terminal connectors shall be specified for field installation on the equipment.
- b) Fastening devices such as studs, nuts, bolts, spring or flat washers, or the like, as required for an effective installation, shall either be provided as part of the component terminal assembly or be mounted on or separately packaged with the equipment.

- c) The installation of the terminal assembly shall not involve the loosening or disassembly of parts other than a cover or other part giving access to the terminal location. The means for securing the terminal connector shall be accessible for tightening before and after installation of conductors.
- d) With respect to [27.10.2](#), if the pressure terminal connector provided in a component terminal assembly requires the use of a special tool for securing the conductor, any necessary instructions shall be included in the component assembly package or with the equipment.
- e) Installation of the pressure terminal connectors in the intended manner shall result in a product that complies with the requirements in this standard.
- f) If pressure terminal connectors are not provided on the equipment as shipped, the equipment shall be marked stating which pressure terminal connector or component terminal assemblies are for use with the equipment. The terminal assembly packages shall carry an identifying marking, wire size, and manufacturer's name or trademark.
- g) A wire connector of the type(s) mentioned in the marking may be installed on the equipment at the factory with instructions, if necessary, for proper connection of the conductor(s).

7.7 Equipment intended for the connection of a conductor larger than 10 AWG (5.3 mm²) shall be provided with a pressure wire connector or have provision for pressure wire connectors in accordance with [27.10.16](#).

7.8 A No. 10 (4.8 mm diameter) or larger wire-binding screw may be employed at a wiring terminal intended for the connection of a 10 AWG (5.3 mm²) or smaller solid conductor if an upturned lug or the equivalent is provided to retain the conductor under the head of the screw when the screw is loosened to permit shifting of the conductor.

7.9 A wire-binding screw terminal is one in which the conductor is intended to be formed around the terminal screw and can be so formed without disengaging the screw from the terminal plate.

7.10 A terminal plate for a wire-binding screw shall:

- a) Be of nonferrous metal;
- b) Provide not fewer than two full threads; and
- c) Provide physical strength to withstand a tightening torque of 20 pound-inches (2.3 N·m).

7.11 Attachment of a terminal for field wiring shall provide mechanical strength and incorporate a securing means to prevent reduction of required spacings during intended use of the terminal.

7.12 If a pressure wire connector for field connections will accommodate a conductor larger than 4 AWG (21.2 mm²) and is secured by the mounting of the socket jaws and a single screw, friction alone shall not be depended upon to prevent rotation of the jaw or wire connector.

7.13 A lock washer is not considered a positive means to prevent rotation.

7.14 Removable wire connectors provided with the meter socket equipment, must meet the requirements of Section [24](#) when replaced with the torque specified in [27.10.18](#).

8 Spacings

8.1 Electrical spacings shall be as indicated in [Table 8.1](#). Grounded metal includes the enclosure and any metal in permanent electrical connection with the enclosure.

Table 8.1
Minimum spacings

Voltage between parts involved	Minimum spacings from live parts to:							
	Parts of opposite polarity ^a				Grounded metal ^b			
	Over surface, ^c		Through air,		Over surface, ^c		Through air,	
	inches	(mm)	inch	(mm)	inch	(mm)	inch	(mm)
0 – 300 ^d	3/4	19.1	3/8	9.5	1/2	12.7	3/8	9.5
301 – 600	1-1/4	31.8	3/4	19.1	1	25.4	1/2	12.7

^a A through air or over surface spacing of 3/8 inch (9.5 mm) may be provided between parts of opposite polarity at other than wiring terminals if the construction complies with [20.1.2](#).

^b A through air or over surface spacing of 3/8 inch may be provided at other than wiring terminals in a cast-metal enclosure or to grounded metal where indentation or deformation of the overall enclosure will not affect the spacing if the construction complies with [20.1.2](#).

^c In measuring an over surface spacing, any slot, groove, or the like 0.013 inch (0.33 mm) wide or less in the contour of insulating material is to be disregarded.

^d If a meter socket base is intended for use as a component in equipment having a maximum voltage rating of 300 volts, 300-volt spacings may be applied between the neutral and:

- 1) Phase potential parts and
- 2) Grounded dead-metal parts.

8.2 A terminal and any other part intended to be connected to the grounded circuit conductor is considered to be an uninsulated live part unless such a part is in permanent electrical connection with the enclosure. A separate screw, strap, or other means to bond an enclosure to the grounded circuit conductor may be considered to provide permanent electrical connection for the purpose of this requirement only if such connection is not likely to be broken other than for test purposes.

8.3 In measuring spacings between an uninsulated live part and conduit bushings, it is to be assumed that a bushing, having the dimensions indicated in [Table 8.2](#), is in place inside the enclosure in conjunction with a single locknut on the outside of the enclosure.

Table 8.2
Bushing dimensions

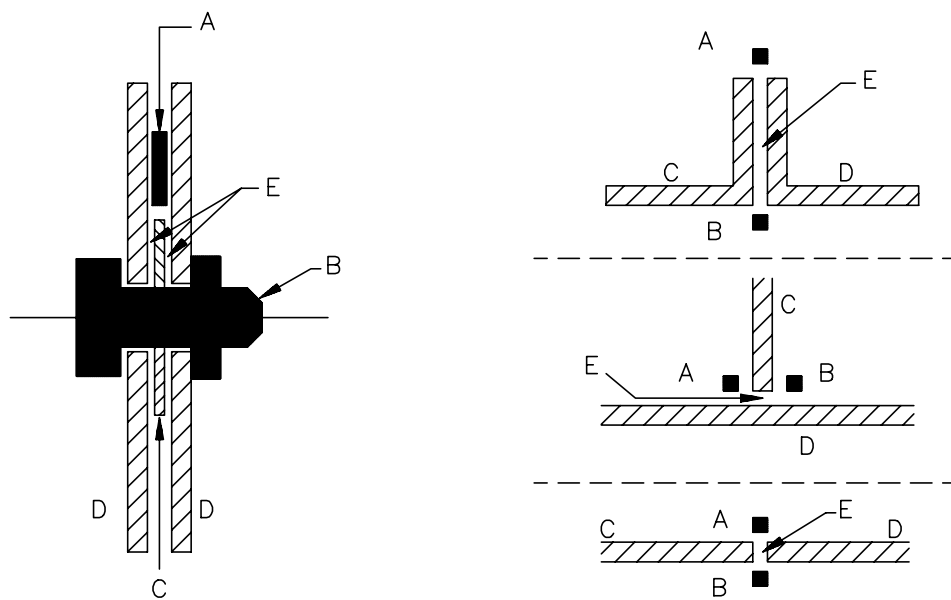
Trade size of conduit, inches	Overall diameter,		Height,	
	inches	(mm)	inch	(mm)
1/2	1	25.4	3/8	9.5
3/4	1-15/64	31.4	27/64	10.7
1	1-19/32	40.5	33/64	13.1
1-1/4	1-15/16	49.2	9/16	14.3
1-1/2	2-13/64	56.0	19/32	15.1
2	2-45/64	68.7	5/8	15.9
2-1/2	3-7/32	81.8	3/4	19.1
3	3-7/8	98.4	13/16	20.6
3-1/2	4-7/16	112.7	15/16	23.8
4	4-31/32	126.2	1	25.4

8.4 Spacings involving field wiring terminals are to be measured with the terminals wired in the intended manner.

8.5 An isolated dead metal part (such as a screw head or washer) interposed between uninsulated live parts of opposite polarity, or between an uninsulated live part and grounded dead metal, is considered to reduce the spacing by an amount equal to the dimensions of the interposed part along the path of measurement.

8.6 Spacings are to be measured through cracks unless a clamped joint has been tested in accordance with the Clamped Insulating Joint Test, Section 21, with acceptable results. A clamped joint is a joint between two pieces of insulating material that are under pressure as shown in Figure 8.1. Adhesives, cements, or the like, if used to effect a seal in lieu of a tightly mated joint, shall comply with the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

Figure 8.1
Clamped insulating joint



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NOTES

Parts A, B – Live parts of opposite polarity, or a live part and grounded metal part with spacing through the crack between C and D less than required in Table 8.1.

Parts C, D – Insulating barriers clamped tightly together so that the dielectric withstand strength between A and B is greater than the equivalent air spacing.

Part E – The clamped joint.

8.7 Spacings (though air and over surface) shall not be less than 1/8 inch (3.2 mm) between uninsulated live parts of the same polarity between the line and load of a meter socket. This spacing shall be maintained with the meter inserted and removed and, if equipped with bypasses, with the bypass in the fully open position.

9 Barriers

9.1 Insulating barriers

9.1.1 In [9.1.2](#) – [9.1.6](#), the liner or barrier that is referenced is insulating material that separates uninsulated live parts of opposite polarity, or separates uninsulated live parts and a grounded dead metal part (including the enclosure) where the through air spacing between the parts would otherwise be less than the required value. Over surface spacings are measured across air gaps of less than 1/32 inch (0.8 mm).

9.1.2 Fiber shall not be used as a liner or barrier.

9.1.3 A barrier that comprises the sole separation or is used in conjunction with an air space of less than 0.013 inch (0.33 mm) shall comply with (a) and (b). The barrier shall:

- a) Be insulating material as covered in [5.2](#). However, with regard to the flammability rating in [Table 5.1](#), the rating may be VTM-0 rather than V-0, VTM-1 rather than V-1, or VTM-2 rather than V-2.

Exception: A barrier may be acceptable based on the end-product tests specified in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

- b) Have a minimum thickness of 0.028 inch (0.71 mm).

Exception: A barrier of insulating material may have a thickness less than 0.028 inch if it withstands a 60-hertz dielectric-withstand voltage of 5000 volts applied in accordance with [20.2.1](#).

9.1.4 A barrier used in conjunction with a minimum air space of 0.013 inch (0.33 mm) shall comply with (a) – (e). The barrier shall be:

- a) Material that has insulating properties as covered in [9.1.3](#) or complies with the requirements for internal barriers as specified in [Table 9.1](#). The relative thermal index shall be at least 90°C (194°F).

Exception: A barrier may be acceptable based on the end-product tests specified in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

- b) Of such strength to withstand exposure to mechanical damage.
- c) Secured in place.
- d) Located so that it will not be adversely affected by operation of the equipment in service.
- e) Of a minimum thickness of 0.028 inch (0.71 mm).

Exception No. 1: The material may have a thickness less than 0.028 inch if it withstands a 60-hertz dielectric-withstand voltage of 5000 volts applied in accordance with [20.2.1](#).

Exception No. 2: Material used in conjunction with an air space of 1/2 or more of the required through-air spacing may have a thickness not less than 0.013 inch, or less than 0.013 inch if it withstands a 60-hertz dielectric-withstand voltage of 2500 volts applied in accordance with [20.2.1](#).

Table 9.1
Maximum performance level category (PLC) for barrier used in place of spacing in conjunction with minimum air space of 0.013 inch (0.33 mm)

Test specified	Flammability rating of material ^a			
	V-0 or VTM-0	V-1 or VTM-1	V-2 or VTM-2	HB
Comparative Tracking Index Under Moist Conditions (CTI) ^b	4	4	4	4
High Current Arc Resistance to Ignition (HAI) ^b	3	2	2	1
Hot Wire Ignition (HWI) ^b	4	4	4	4
NOTE – The additional parameters specified in Table 9.2 shall be considered.				
^a Refer to the Standard Tests For Flammability of Plastic Materials for Parts in Devices and Appliances, UL 94.				
^b The Standard for Polymeric Materials – Short Term Property Evaluations, UL 746A.				

Table 9.2
Additional parameters

Property	Test	Method	Units	Minimum levels related to flammability classification
Distortion under load and mold stress relief	Heat deflection temperature, or	UL 746A	Minimum °C	10°C greater than use temperature, but not less than 90°C, or
	Vicat softening point, or	UL 746A	Minimum °C	25°C greater than use temperature, but not less than 105°C, or
	Ball pressure temperature	UL 746A	Minimum °C	(40°C minus the ambient temperature) greater than the use temperature, but not less than 95°C

9.1.5 A wrap of thermoplastic tape, rated for use as sole insulation, may be employed if:

- At a point where the spacing prior to the application of the tape is not less than half the required through-air spacing shown in [Table 8.1](#) the wrap is not less than 0.013 inch (0.33 mm) thick and is applied in two or more layers.
- At a point where the spacing prior to the application of the tape is less than half the required through-air spacing shown in [Table 8.1](#), the wrap is not less than 0.028 inch (0.71 mm) thick.
- The tape is not subject to compression.
- The tape is not wrapped over a sharp edge.
- The tape is not subjected to temperatures in excess of 80°C (176°F).

9.1.6 When the spacings are less than the required values, thermoplastic tubing may be used when:

- It is not subjected to a temperature higher than that for which the tubing is acceptable;
- It is not subjected to compression, repeated flexure, or creasing at a point where the tubing is required to satisfy spacing requirements;
- All edges of the conductor covered with the tubing are well rounded and free from sharp edges;

- d) For chemically dilated tubing, a solvent recommended by the tubing manufacturer is used; and
- e) The wall thickness (after assembly) of the tubing is not less than 0.022 inch (0.56 mm) for tubing 1/2 inch (12.7 mm) or less in diameter, not less than 0.027 inch (0.69 mm) for 9/16 and 5/8 inch (14.3 and 15.9 mm) diameter tubing, and not less than 0.028 inch (0.71 mm) for larger tubing.

9.2 Restricting barriers

9.2.1 Restricting barriers are used to:

- a) Define a wireway or wiring space;
- b) Prevent the entry of rain;
- c) Provide separation between circuits as defined in [9.3.1](#); or
- d) Prevent direct access to live parts through ventilation openings in the enclosure.

9.2.2 A sheet steel barrier shall not be less than 0.053 inch (1.35 mm) thick if uncoated and not less than 0.056 inch (1.42 mm) thick if galvanized.

9.2.3 A metal barrier may be thinner than indicated in [9.2.2](#) provided that its strength and rigidity are not less than that of a flat sheet of steel having the same dimensions as the barrier and of the specified thickness.

9.2.4 A nonmetallic barrier shall:

- a) Not be less than 1/16 inch (1.6 mm) thick and
- b) Not contact any live part unless the barrier is of the type described in [9.1.3](#).

9.3 Isolating barriers

9.3.1 Space inside the enclosure marked for use with:

- a) Telephone or other communication circuits;
- b) Class 2 or Class 3 wiring; or
- c) Community antenna television cable, as marked in accordance with [27.13.1](#).

shall be separated by barriers from space containing power circuit components or wiring. The barrier shall be provided in accordance with [9.2.2](#) or [9.2.4](#).

Exception: A barrier is not required if the wiring connects to the meter.

10 Wire-Bending Distance

10.1 The wire-bending distance provided in equipment for conductors to be installed in the field shall be as specified in:

- a) [Table 10.1](#) for the largest conductor, as specified by the marking in [27.10.4](#), entering or exiting the enclosure through the wall opposite the opening for wire in the connector or
- b) [Table 10.2](#) for the largest conductor, as specified by the marking, if the conductor does not enter or exit the enclosure through the wall opposite the opening for wire in the connector.

Exception No. 1: For a meter socket not installed in a metering transformer cabinet or interior, the wire-bending distance may be as specified in [Table 10.2](#) for a conductor not larger than 350 kcmil (177 mm²) that enters or exits the enclosure opposite the opening for wire in the connector provided:

- a) The connector is of the lay-in type or removable wire connector with integral mounting tang, and directly faces the enclosure wall through which the conductor enters or exits or is angled toward the conductor exit in the wall and*
- b) The offset, if any, (measured between the center line of the opening for wire in the connector and the center line of the opening in the enclosure) as shown in [Figure 10.1](#) is not greater than 50 percent of the wire-bending distance provided.*

The center line of the opening for wire in a connector angled toward the exit in the wall shall intersect the center line of the exit opening at the enclosure wall or external to the enclosure as illustrated by wire terminal G in [Figure 10.2](#).

Exception No. 2: For a meter socket not installed in a metering transformer cabinet or interior, the wire-bending distance may be as specified in [Table 10.2](#) for a conductor not larger than 350 kcmil (177 mm²) that enters or exits the enclosure opposite the opening for wire in the connector provided the terminal is of the lay-in type or removable wire connector with integral mounting tang, and complies with the limitations specified in [Figure 10.2](#).

Table 10.1
Minimum wire-bending distance at connectors in inches

Wire size,		Wires per terminal (pole) ^a							
AWG or kcmil	(mm ²)	1		2		3		4 or more	
14 – 10	2.1 – 5.3	Not specified		—		—		—	
8	8.4	1-1/2		—		—		—	
6 ^b	13.3	2		—		—		—	
4 ^b	21.2	3		—		—		—	
3 ^b	26.7	3		—		—		—	
2 ^b	33.6	3-1/2		—		—		—	
1 ^b	42.4	4-1/2		—		—		—	
1/0 ^b	53.5	5-1/2		5-1/2		7		—	
2/0 ^b	67.4	6		6		7-1/2		—	
3/0 ^b	85.0	6-1/2	(1/2)	6-1/2	(1/2)	8		—	
4/0 ^b	107	7	(1)	7-1/2	(1-1/2)	8-1/2	(1/2)	—	
250 ^b	127	8-1/2	(2)	8-1/2	(2)	9	(1)	10	
300 ^b	152	10	(3)	10	(2)	11	(1)	12	
350 ^b	177	12	(3)	12	(3)	13	(3)	14	(2)
400	203	13	(3)	13	(3)	14	(3)	15	(3)
500	253	14	(3)	14	(3)	15	(3)	16	(3)
600	304	15	(3)	16	(3)	18	(3)	19	(3)
700	355	16	(3)	18	(3)	20	(3)	22	(3)
750	380	17	(3)	19	(3)	22	(3)	24	(3)

Table 10.1 Continued on Next Page

Table 10.1 Continued

Wire size,		Wires per terminal (pole) ^a			
AWG or kcmil	(mm ²)	1	2	3	4 or more
800	405	18	20	22	24
900	456	19	22	24	24
1000	506	20	—	—	—
1250	633	22	—	—	—
1500	760	24	—	—	—
1750	887	24	—	—	—
2000	1013	24	—	—	—

^a The wire-bending distance may be reduced by the number of inches shown in parentheses under the following conditions:

- 1) Lay-in or removable wire connectors receiving one wire each are used (there may be more than one removable wire per terminal) and
- 2) The removable wire connectors can be removed from their intended location without disturbing structural or electrical parts other than a cover, and can be reinstalled with the conductor in place.

^b See Exception Nos. 1 and 2 to [10.1](#) for conditions in which lay-in type or removable wire connectors may be used in accordance with [Table 10.2](#) in meter sockets.

For SI units one inch = 25.4 mm.

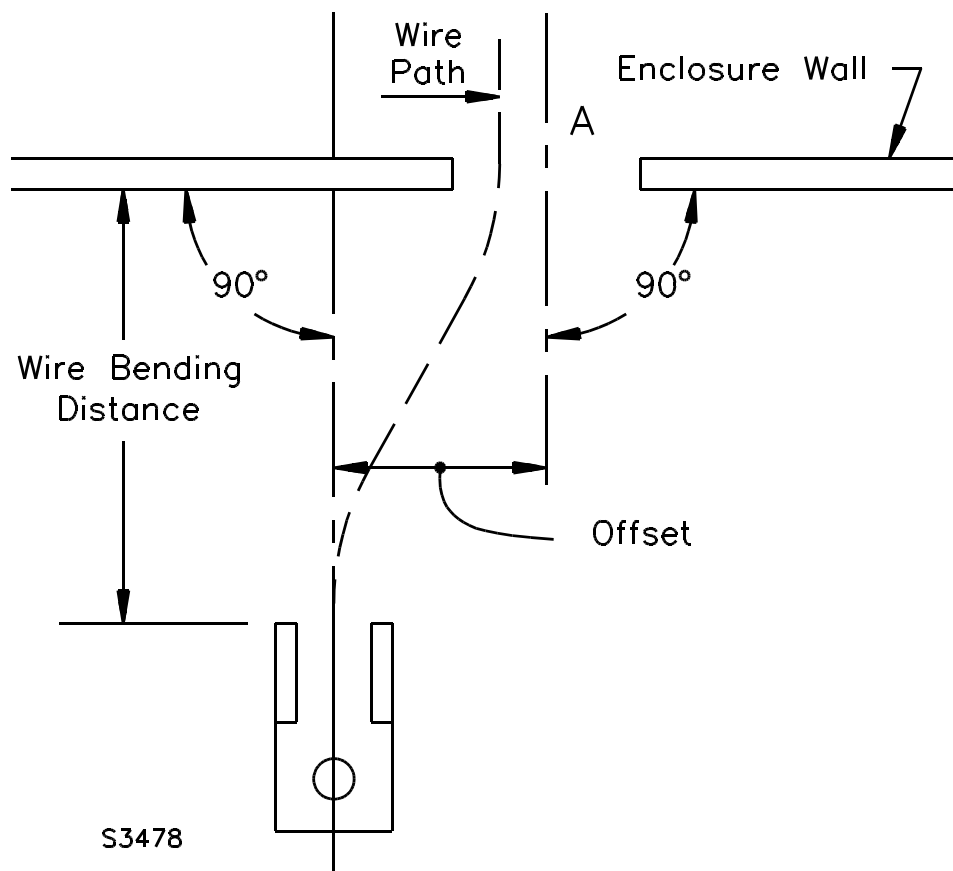
Table 10.2
Minimum width of gutter and wire-bending distance in inches (mm) for wires not entering or exiting enclosure opposite connectors

Wire size,		Wires per terminal (pole)									
AWG or kcmil	(mm ²)	1		2		3		4		5	
14 – 10	2.1 – 5.3	Not specified		—		—		—		—	
8 – 6	8.4 – 13.3	1-1/2	38.1	—		—		—		—	
4 – 3	21.1 – 26.7	2	50.8	—		—		—		—	
2	33.6	2-1/2	63.5	—		—		—		—	
1	42.4	3	76.2	—		—		—		—	
1/0 – 2/0	53.5 – 67.4	3-1/2	88.9	5	127	7	178	—		—	
3/0 – 4/0	85.0 – 107	4	102	6	152	8	203	—		—	
250	127	4-1/2	114	6	152	8	203	10	254	—	
300 – 350	152 – 177	5	127	8	203	10	254	12	305	—	
400 – 500	203 – 253	6	152	8	203	10	254	12	305	14	356
600 – 700	304 – 355	8	203	10	254	12	305	14	356	16	406
750 – 900	380 – 456	8	203	12	305	14	356	16	406	18	457
1000 – 1250	507 – 633	10	254	—		—		—		—	
1500 – 2000	760 – 1013	12	305	—		—		—		—	

NOTES

- 1 The table includes only those combinations that are likely to be used. Combinations not mentioned may be given further consideration.
- 2 The wire-bending distance is to be determined as specified in [10.2](#).
- 3 See Exception Nos. 1 and 2 to [10.1](#) for conditions in which lay-in type or removable wire connectors may be used in accordance with this table in meter sockets.

Figure 10.1
Maximum connector offset

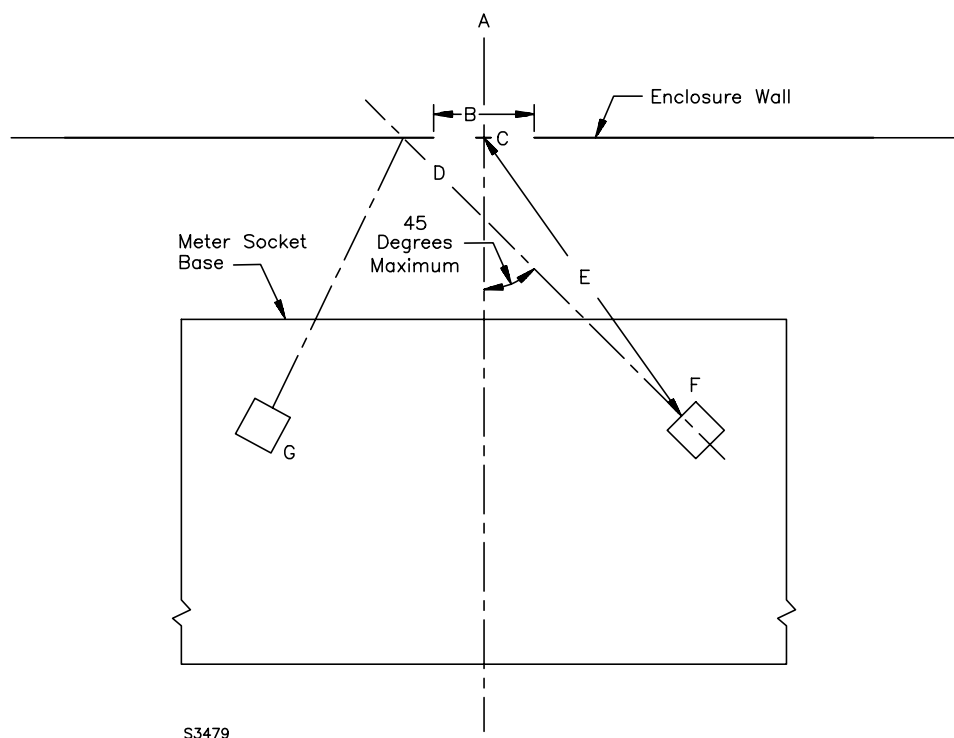


NOTES

A – Center line of opening that is assumed to be:

- 1) Located symmetrically about the center line of the meter socket base,
- 2) Indicated by a marking as specified in [27.4.4](#), or
- 3) Defined by a factory mounted conduit hub or a factory provided provision for a conduit hub.

Figure 10.2
Wire connector axis directed toward opening in enclosure



NOTES

A – Center line of opening that is:

- 1) Located symmetrically about the center line of the meter socket base;
- 2) Indicated by a marking as specified in [27.4.4](#); or
- 3) Defined by a factory mounted conduit hub or a factory provided provision for a conduit hub.

B – Opening in the enclosure with a radius as specified in [Table 10.3](#) centered about center line A.

C – Center point of opening B in the enclosure wall.

D – Center line of the opening for wire in connector F that may intersect the opening B in the enclosure and that is within a 45 degree angle of directly facing the enclosure wall. The center line D of the opening for wire in connector F need not intersect the opening B if it intersects the center line A within the enclosure and is still within a 45 degree angle of directly facing the enclosure wall.

E – The wire-bending distance that is measured from the center point of the opening in the enclosure to the center point of the opening for wire in connector F. Wire-bending distance shall be determined as specified in Exception No. 2 to [10.1](#).

F – Wire terminal properly mounted that complies with D.

G – Wire terminal mounted such that the wire-bending distance shall comply with [Table 10.1](#) and [10.2\(a\)](#) since the center line of the opening for wire in the connector does not intersect opening B or line A within the enclosure as specified in D.

Table 10.3
Assumed radius of opening in enclosure

Maximum ampere rating of meter socket, amperes	Radius, ^a	
	inches	(mm)
125 (100 Continuous)	7/8	22.2
250 (200 Continuous)	1-1/4	31.8

^a See note B of [Figure 10.2](#).

10.2 The wire-bending distance shall be measured as follows:

a) With regard to:

1) [Table 10.1](#) or

2) [Figure 10.1](#) and [Table 10.2](#) based on application of Exception No. 1 to [10.1](#),

the wire-bending distance shall be measured perpendicular to the wall of the enclosure through which the wire enters or exits from the wall to the nearest part of the wire connector.

b) With regard to [Table 10.2](#), the wire-bending distance shall be measured as shown in [Figure 10.2](#) in the application of Exception No. 2 to [10.1](#).

c) With regard to [Table 10.2](#), if the wire does not exit or enter the enclosure opposite the connector, the wire-bending distance shall be measured along the center line of the opening for wire in the terminal from the center of the wire opening in the connector to the enclosure wall, barrier, or obstruction. A barrier, shoulder, or the like is to be disregarded when the measurement is being made if it does not reduce the radius to which the wire must be bent.

10.3 If uninsulated live parts are located within a wiring space, the construction shall be such that the conductor can be routed to the proper terminal without contacting a live part of opposite polarity.

10.4 The size and location of a knockout, wire-bending space, wireway, barrier, terminal, or the like, with respect to the marked rating will be considered if equipment is marked for top (overhead) feed only. If direct entrance to the terminal is not practical, consideration can be given to other conductor routing.

11 Wiring Space

11.1 For the purpose of these requirements, a wiring space is the cross sectional area through which conductors are routed, but not terminated.

11.2 No wiring system shall enter or exit the enclosure in a wiring space.

11.3 There shall be sufficient wiring space within the enclosure of a meter socket for the installation of conductors likely to be used in connecting the line and load terminals. Unless intended to be installed for either top or bottom feed only as allowed in [4.23](#), and marked in accordance with [27.5.1](#), it is to be assumed that conductors can enter or exit at either end of the enclosure.

11.4 The clear wiring space, independent of all projections, obstructions, or interference from a moving part, shall:

a) Not be smaller in width and depth than the values specified in [Table 11.1](#); and

b) Not be smaller in total area than 250 percent of the total cross-sectional area of the maximum number of conductors that may be used in the space. See [Table 11.1](#).

11.5 In determining whether a wiring space complies with the requirements in [11.4](#) consideration is to be given to the actual size of conductors that will be used in the space; but it is to be assumed that conductors smaller than 12 AWG (3.3 mm²) will not be used. In computing the area of a wiring space, consideration is to be given to all the available space that may be used for the more common multiple wire connections as specified in [Table 10.1](#).

Table 11.1
Wire space

Maximum size of wire or cable,		Minimum width and depth of wiring space,		Minimum area required for multiple wires based on factor of 2.5											
				Two wires,		Three wires,		Four wires,		Five wires,		Six wires,		Seven wires,	
AWG or kcmil	(mm ²)	in	(mm)	in ²	(cm ²)	in ²	(cm ²)	in ²	(cm ²)	in ²	(cm ²)	in ²	(cm ²)	in ²	(cm ²)
12	3.3	3/8	9.5	0.14	0.9	0.21	1.4	0.28	1.8	0.35	2.3	0.42	2.7	0.49	3.2
10	5.3	3/8	9.5	0.23	1.5	0.34	2.2	0.46	3.0	0.57	3.7	0.68	4.4	0.80	5.2
8	8.4	1/2	12.7	0.43	2.8	0.64	4.1	0.85	5.5	1.07	6.9	1.28	8.3	1.50	9.7
6	13.3	5/8	15.9	0.62	4.0	0.93	6.0	1.24	8.0	1.55	10.0	1.86	12.0	2.17	14.0
4	21.2	3/4	19.1	0.80	5.2	1.20	7.7	1.60	10.3	2.00	12.9	2.40	15.5	2.80	18.1
3	26.7	3/4	19.1	0.91	5.9	1.36	8.8	1.82	11.7	2.27	14.6	2.72	17.6	3.18	20.5
2	33.6	7/8	22.2	1.03	6.6	1.55	10.0	2.06	13.3	2.58	16.6	3.10	20.0	3.61	23.3
1	42.4	1	25.4	1.36	8.8	2.04	13.2	2.72	17.6	3.40	21.9	4.08	26.3	4.76	30.7
1/0	53.5	1	25.4	1.55	10.0	2.33	15.0	3.10	20.0	3.88	25.0	4.66	30.1	5.43	35.0
2/0	67.4	1	25.4	1.79	11.6	2.68	17.3	3.58	23.1	4.47	28.8	5.36	34.6	6.26	40.4
3/0	85.0	1-1/8	28.6	2.08	13.4	3.11	20.1	4.16	26.8	5.19	33.5	6.22	40.1	7.27	46.9
4/0	107.2	1-1/4	31.8	2.42	15.6	3.63	23.4	4.84	31.2	6.05	39.0	7.26	46.8	8.47	54.6
250	127	1-3/8	34.9	2.96	19.1	4.44	28.6	5.92	38.2	7.40	47.7	8.88	57.3	10.36	66.8
300	152	1-1/2	38.1	3.42	22.1	5.13	33.1	6.84	44.1	8.55	55.2	10.26	66.2	11.96	77.2
350	177	1-1/2	38.1	3.81	24.6	5.72	36.9	7.62	49.2	9.53	61.5	11.44	73.8	13.34	86.1
400	203	1-5/8	41.3	4.18	27.0	6.27	40.5	8.36	53.9	10.45	67.4	12.54	80.9	14.63	94.4
500	253	1-3/4	44.5	4.92	31.7	7.38	47.6	9.84	63.5	12.30	79.4	14.76	95.2	17.22	111.1
600	304	1-7/8	47.6	5.97	38.5	8.96	57.8	11.94	77.0	14.93	96.3	17.92	115.6	20.90	134.8
700	355	2	50.8	6.68	43.1	10.02	64.6	13.36	86.2	16.70	107.7	20.04	129.3	23.38	150.8
750	380	2	50.8	7.04	45.4	10.56	68.1	14.08	90.8	17.60	113.5	21.12	136.3	24.64	159.0
800	405	2-1/8	54.0	7.39	47.7	11.09	71.6	14.78	95.4	18.48	119.2	22.18	143.1	25.87	166.9
900	456	2-1/4	57.2	8.09	52.2	12.13	78.3	16.18	104.4	20.22	130.5	24.26	156.5	28.31	182.6
1000	507	2-1/4	57.2	8.77	56.6	13.15	84.8	17.54	113.2	21.92	141.4	26.30	169.7	30.69	198.0
1250	633	2-1/2	63.5	11.03	71.2	16.55	106.8	22.06	142.3	27.58	177.9	33.10	213.5	38.61	249.1
1500	760	2-3/4	69.8	12.74	82.2	19.11	123.3	25.48	164.4	31.85	205.5	38.22	246.6	44.59	287.7
1750	887	2-7/8	73.0	14.45	93.2	21.67	139.8	28.90	186.5	36.12	233.0	43.34	279.6	50.57	326.3
2000	1010	3-1/8	79.4	16.04	103.5	24.06	155.2	32.08	207.0	40.10	258.7	48.12	310.5	56.14	362.2

12 Provisions for Bonding and Grounding

12.1 If provided, a bonding jumper in the form of a separate screw, strap, or other means, for bonding the enclosure to the grounded (neutral) conductor of an alternating current system shall be of copper or aluminum and shall have a cross-sectional area as specified in [Table 12.1](#). If applicable, the meter socket shall be marked in accordance with [27.8.1](#).

Exception: A steel or brass screw, as specified in the footnotes to [Table 12.1](#), may be used as the bonding means.

Table 12.1
Size of bonding jumper and grounded service conductor

Ampere rating not exceeding	Size of main bonding jumper (minimum) ^{a,b,c}		Cross section of main bonding jumper in square inches (minimum) ^{a,b,c}		Grounded service conductor (minimum)	
	Copper	Aluminum	Copper	Aluminum	Copper	Aluminum
90	8 AWG	6 AWG	0.013 ^d	0.021 ^d	8 AWG	6 AWG
100	6	4	0.021 ^d	0.033 ^d	6	4
125	6	4	0.021 ^d	0.033 ^d	6	4
150	6	4	0.021 ^e	0.033 ^e	6	4
200	4	2	0.033 ^e	0.052 ^e	4	2
300	2	1/0	0.052 ^{f,g}	0.083 ^{f,g}	2	1/0
400	1/0 ^h	3/0 ^h	0.083 ^{g,h}	0.132 ^{g,h}	1/0	3/0 ^h
500	1/0	3/0	0.083	0.132	1/0	3/0
600	2/0	4/0	0.105	0.166	2/0	4/0
800	2/0	4/0	0.105	0.166	2/0	4/0
1000	3/0	250 kcmil	0.132	0.196	3/0	250 kcmil
1200	250 kcmil	250	0.196	0.196	250 kcmil	250
1600	300	400	0.236	0.314	300	400
2000	400	500	0.314	0.393	400	500
2500	500	700	0.393	0.550	500	700
3000	600	750	0.471	0.589	600	750
4000	750	1000	0.589	0.785	750	1000
5000	900	1250	0.713	0.981	900	1250
6000	1250	1500	0.981	1.178	1250	1500

^a The cross section may be reduced to 12.5 percent of the total cross section of the largest main service conductor(s) of the same material (copper or aluminum) for any phase on equipment rated 1200 amperes and above.

^b For equipment rated 1200 amperes or more and that has wiring terminals intended to connect service conductor wires sized larger than 600 kcmil copper or 750 kcmil aluminum, the cross section of the main bonding jumper shall be at least 12.5 percent of the total cross section of the largest main service conductor(s) of the same material (copper or aluminum) for any phase.

^c See [Table 12.2](#) for SI equivalents.

^d A No. 8 (4.2 mm diameter) or larger brass or No. 10 (4.8 mm diameter) or larger steel screw may be used.

^e A No. 10 or larger brass or steel screw may be used.

^f A No. 10 or larger brass screw may be used.

^g A 1/4 inch (6.4 mm) diameter or larger brass or steel screw may be used.

^h When the ampere rating is 400 and the wire terminal connectors for the main service conductors are rated for two 3/0 AWG copper or two No. 250 kcmil aluminum conductor, but will not accept a 600 kcmil conductor, these values may be reduced to 2 AWG (0.052 square-inch) copper or 0 AWG (0.083 square-inch) aluminum.

Table 12.2
SI equivalents

Wire size, AWG	Minimum cross section, (mm ²)	Wire size, AWG or kcmil	Minimum cross section, (mm ²)
8	8.4	4/0 AWG	107
6	13.3	250 kcmil	126
4	21.2	300	152
2	33.6	400	203
1/0	53.5	500	253
2/0	67.4	600	304
3/0	85.0	750	380

12.2 If the bonding means is not used, the minimum spacings specified in [Table 8.1](#) shall be maintained.

12.3 A meter socket with up to six meter positions and without a provision for load conductors to be connected to the grounded service conductor shall be provided with a wiring terminal bonded to the enclosure for connection of a grounded service conductor sized in accordance with [Table 12.1](#).

Exception: The connector need not be provided in a single position meter socket.

12.4 Unless the intended use and method of installation of the bonding means are obvious, installation instructions shall be provided.

12.5 The neutral terminal or terminals of meter sockets having provisions for mounting not more than six meters may be mounted directly on or otherwise in permanent electrical connection with the enclosure, provided a secure and effective bond is made. The neutral terminal or terminals of meter sockets for seven or more meters shall be insulated but may have provision for bonding to the enclosure.

12.6 The cover of an enclosure shall be bonded to the enclosure as specified in [4.8](#) and [22.1](#).

PERFORMANCE

13 General

13.1 A representative sample of each rating, construction, and type of meter socket shall be subjected to tests for:

- a) Heating;
- b) Dielectric voltage-withstand;
- c) Insertion-withdrawal;
- d) Strength of insulating base and support;
- e) Rotation prevention;
- f) Bonding continuity; and
- g) Other tests deemed appropriate.