



UL 17

Underwriters Laboratories Inc. Standard for Safety

Vent or Chimney Connector Dampers for Oil-Fired Appliances



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UL Standard for Safety for Vent or Chimney Connector Dampers for Oil-Fired Appliances, UL 17

Fourth Edition, Dated April 30, 2008

Summary of Topics

This revision to UL 17 is being issued to address universal upkeep of UL Standards for Safety. These revisions are considered to be non-substantive.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin. Changes in requirements are marked with a vertical line in the margin and are followed by an effective date note indicating the date of publication or the date on which the changed requirement becomes effective.

A reference to UL 60730-1 and/or a Part 2 standard from that series has been added to this standard. The addition of this reference provides an alternate standard for investigating components currently covered by UL 873 until October 19, 2016. This added reference will facilitate the use of components that have been investigated to the UL 60730 series. Such components have been determined to fulfill the requirements of the legacy standards.

UL 60730-1 (4th Edition) becomes effective on October 19, 2016. All components that were previously investigated to the requirements in UL 873 will have to comply with the requirements in either UL 60730-1 and/or a Part 2 standard from that series in order to maintain UL Listing or Recognition, as appropriate. UL 873 legacy controls standards will be withdrawn on October 19, 2016.

This is intended to provide end product manufacturers with sufficient time to a) address the impact of the standards changes during normal design changes over the intervening years, b) submit any modified products for investigation, and c) implement any necessary changes in production.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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UL 17

Standard for Vent or Chimney Connector Dampers for Oil-Fired

Appliances

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April 30, 2008

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

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INTRODUCTION

1 Scope

1.1 These requirements cover electrically operated damper assemblies, that are intended for installation in the vent or chimney connector of automatically operated oil-fired appliances employing an atomizing type oil burner. The damper assembly is intended to restrict or block the connector opening when the burner is not firing.

1.2 These requirements cover automatic vent or chimney connector dampers for oil-fired appliances having a flue gas temperature not in excess of 538°C (1000°F), unless marked for a lower temperature. See 5.1.1, 20.5.1, and 33.1(d).

1.3 The vent or chimney connector dampers covered under these requirements are not for use on oil-fired appliances that employ vaporizing type oil burners.

1.4 Automatic vent or chimney connector dampers are intended for installation in accordance with the following standards of the National Fire Protection Association:

- a) Oil-Burning Equipment, NFPA 31.
- b) Chimneys, Fireplaces, and Vents, NFPA 211.
- c) National Electrical Code, ANSI/NFPA 70.

1.5 A product that contains features, characteristics, components, materials, or systems new or different from those covered by the requirements in this standard, and that involves a risk of fire or of electric shock or injury to persons shall be evaluated using appropriate additional component and end-product requirements to maintain the level of safety as originally anticipated by the intent of this standard. A product whose features, characteristics, components, materials, or systems conflict with specific requirements or provisions of this standard does not comply with this standard. Revision of requirements shall be proposed and adopted in conformance with the methods employed for development, revision, and implementation of this standard.

2 Glossary

2.1 For the purpose of this standard, the following definitions apply.

2.2 CHIMNEY CONNECTOR – The conduit that connects a heating appliance with a vertical flue.

2.3 COMBUSTIBLE MATERIAL, COMBUSTION PRODUCTS, NONCOMBUSTIBLE MATERIALS – These terms, as used in this standard, are defined in the Standard Glossary of Terms Relating to Chimneys, Vents, and Heat-Producing Appliances, ANSI/NFPA 97M-1988.

2.4 DIRECT VENT SYSTEM APPLIANCE – (Also called “sealed combustion system appliance.”) A self-contained appliance that by its inherent design, is constructed so that all air supplied for combustion, the combustion system of the appliance, and all products of combustion are completely isolated from the atmosphere of the space in which it is installed.

2.5 DRAFT REGULATOR – A device that functions to maintain a desired draft in an oil-fired appliance by automatically reducing the chimney draft to the desired value.

2.6 ELECTRICAL CIRCUITS:

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- a) High-Voltage Circuit – A circuit involving a potential of not more than 600 volts and having circuit characteristics in excess of those of a low-voltage or an isolated limited secondary circuit.
- b) Low-Voltage Circuit – A circuit involving a potential of not more than 30 volts ac (42.4 volts peak or dc) and supplied by a primary battery or by a standard Class 2 transformer, or by a combination of transformer and fixed impedance that, as a unit, complies with all the performance requirements for a Class 2 transformer. (A circuit derived from a source of supply classified as a high-voltage circuit, using resistance in series with the supply circuit as a means of limiting the voltage and current, is not considered to be a low-voltage nor an isolated limited secondary circuit.)
- c) Safety Control Circuit – A circuit involving one or more safety controls that open the circuit in the event of grounding, opening, or shorting of any part of the circuit.
- d) Isolated Limited Secondary Circuit – A circuit of limited energy derived from an isolated secondary winding of a transformer having a maximum capacity of 100 volt-amperes and open-circuit secondary voltage not exceeding 1000 volts.

2.7 SEALED COMBUSTION SYSTEM APPLIANCE – See "direct vent system appliance," 2.4.

2.8 VENT CONNECTOR – The conduit that connects a heating appliance to a vertical vent.

3 Components

3.1 Except as indicated in 3.2, 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.

3.2 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.

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

3.4 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.

4 Units of Measurement

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

CONSTRUCTION

5 Assembly

5.1 General

5.1.1 A vent or chimney connector damper shall be constructed and assembled so that it will:

- a) Withstand a flue gas temperature of at least 538°C (1000°F), and
- b) Have the strength and rigidity necessary to resist the abuses to which it may be subjected, without total or partial collapse or without reduction of spacings, loosening or displacement of parts, or other serious defects,

when it is tested in accordance with the requirements of this standard.

Exception: A vent or chimney connector damper may be intended for a flue gas temperature less than 538°C but not less than 399°C (750°F) provided the assembly is marked in accordance with 33.1(d).

5.1.2 A joint in metal surfaces of a flue gas passageway shall be tight, as attained by being welded, lock-seamed, riveted, or bolted.

5.1.3 If a vent or chimney connector damper consists of two or more subassemblies that are to be joined in the application to form one assembly, each subassembly shall be constructed for ready attachment of one to the other without requiring alteration, drilling, welding or cutting or a similar task by the installer. The securement of subassemblies to each other shall be by use of conventional means such as screws or bolts and such securement means shall be provided as part of the subassemblies.

5.1.4 With respect to 5.1.3, the subassemblies that must bear a definite relationship to each other in order to operate as intended shall be arranged and constructed so as to permit them to be assembled only in the correct relationship with each other.

5.1.5 All operating parts of a vent or chimney connector assembly shall be secured against displacement and shall be constructed so as to maintain a fixed relationship between the parts under intended conditions of operation and handling.

5.1.6 The construction of the vent or chimney connector damper shall be such that it permits, after burner shutdown, the escape of the products of combustion and hot gases that may be present in the combustion chamber of the appliance. The means provided for this purpose shall comply with the requirements in 5.1.7.

5.1.7 To comply with the requirement in 5.1.6, the vent or chimney connector damper shall include a time-delay feature that delays the closing of the damper blade so that it does not attain a fully closed position until a minimum of 3 minutes after the burner shutdown.

Exception No. 1: Less than 3 minutes time-delay may be provided if the vent or chimney connector damper assembly is tested as described in 21.1 – 21.3.

Exception No. 2: No time-delay is required if the damper blade provides, in the fully closed position, some free venting area and the vent or chimney connector damper assembly is tested as described in 21.1 – 21.3.

5.1.8 A vent or chimney connector damper assembly shall interlock electrically with the oil burner primary safety control so that the burner can be fired only if the damper blade is in a fully open position.

5.1.9 A vent or chimney connector damper assembly intended for use with an oil-fired appliance that includes a constant burning gas pilot shall provide an internal free venting area of the vent gas passageway of not less than 5 percent of the total outlet free venting area.

5.1.10 The inlet and outlet connections of a vent or chimney connector damper assembly shall be of the same nominal size and shall accommodate commercially available flue pipe sizes of integral inch diameter such as 4, 5, 6, 7, 8, 9, 10, and 12.

5.1.11 The inlet and outlet connections shall each provide at least a 1-1/4 inch (31.7 mm) insertion depth (lip) for the attachment of the vent or chimney connector pipe.

5.1.12 The vent or chimney connector vent damper assembly shall be constructed so that, with the damper blade in its intended fully open position, the internal free venting area of the vent or chimney connector on which the assembly is intended to be installed is not reduced by more than 5 percent.

5.1.13 The vent or chimney connector vent damper assembly shall include an indicator that is visible during operation of the vent damper to signify the position of the damper blade.

5.1.14 A pilot or signal light that is used to indicate the damper blade position shall be arranged so that impaired operation of the light (such as a burned out bulb) would not signify an open damper blade position.

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5.2 Electrical circuits

5.2.1 The primary input to a safety control circuit shall be a 2-wire, one-side-grounded system, having a voltage rating of a nominal 120 volts. A switch or protective device in the circuit shall be electrically connected to the ungrounded supply conductor.

6 Materials

6.1 The parts of a vent or chimney connector damper assembly that serve as a passageway for the flue gases or otherwise are in direct contact with the flue gases shall be made of stainless steel, cast iron, aluminum-coated or hot-rolled steel or other metals having equivalent durability and resistance to corrosion, fire, and heat. The maximum temperature ratings of materials are specified in Table 20.2.

6.2 With reference to 6.1, the thickness including coatings, of stainless steel shall not be less than 0.012 inch (0.3 mm), and neither aluminum-coated nor hot-rolled steel shall be less than 0.032 inch (0.81 mm).

6.3 Galvanized steel may be used in the same thickness and at the same temperature as hot-rolled steel, provided galvanizing is not required as a protective coating or for the reflectivity of the surface to reduce the risk of fire.

6.4 A part made of drawn brass or machined from brass rod shall withstand, without cracking, a 10-day moist ammonia air stress cracking test. See Section 28, 10-Day Moist Ammonia Air Stress Cracking Test.

7 Springs

7.1 A spring shall be of a material that is protected against corrosion.

7.2 If impaired operation of a spring may cause the damper blade to remain in the closed or partially closed position, the construction and application of the spring employed shall be such that corrosion, fatigue, overstress, wear, or abrasion is not likely to impair operation of the spring nor remove it from its intended position.

8 Enclosure

8.1 General

8.1.1 Uninsulated live high-voltage parts shall be enclosed or guarded to reduce the likelihood of unintentional contact by persons during intended use of the equipment. This requirement applies also to such parts located in a compartment into which access is required for intended care of the vent or chimney connector damper, such as resetting controls, lubricating, cleaning, or the like.

8.1.2 A polymeric material shall comply with the requirements applicable to fixed equipment in the Standard for Polymeric Materials – Use in Electrical Equipment Evaluations, UL 746C.

8.1.3 Sheet metal complying with Tables 8.1 or 8.2, whichever applies, is acceptable for the individual enclosure of electrical components.

Table 8.1
Minimum thickness of sheet metal for electrical enclosures carbon steel or stainless steel

Without supporting frame ^a		With supporting frame or equivalent reinforcing ^a		Minimum thickness in inches (mm)	
Maximum width ^b	Maximum length ^c	Maximum width ^b	Maximum length	Uncoated (MSG)	Metal coated (GSG)
Inches (cm)	Inches (cm)	Inches (cm)	Inches (mm)		
4.0 (10.2)	Not limited	6.25 (15.9)	Not limited	0.020 (0.51)	0.023 (0.58)
4.75 (12.1)	5.75 (14.6)	6.75 (17.1)	8.25 (21.0)	(24)	(24)
6.0 (15.2)	Not limited	9.5 (24.1)	Not limited	0.026 (0.66)	0.029 (0.74)
7.0 (17.8)	8.75 (22.2)	10.0 (25.4)	12.5 (31.8)	(22)	(22)
8.0 (20.3)	Not limited	12.0 (30.5)	Not limited	0.032 (0.81)	0.034 (0.86)
9.0 (22.9)	11.5 (29.2)	13.0 (33.0)	16.0 (40.6)	(20)	(20)
12.5 (31.8)	Not limited	19.5 (49.5)	Not limited	0.042 (1.07)	0.045 (1.14)
14.0 (35.6)	18.0 (45.7)	21.0 (53.3)	25.0 (63.5)	(18)	(18)
18.0 (45.7)	Not limited	27.0 (68.6)	Not limited	0.053 (1.35)	0.056 (1.42)
20.0 (50.8)	25.0 (63.5)	29.0 (73.7)	36.0 (91.4)	(16)	(16)
22.0 (55.9)	Not limited	33.0 (83.8)	Not limited	0.060 (1.52)	0.063 (1.60)
25.0 (63.5)	31.0 (78.7)	35.0 (88.9)	43.0 (109.2)	(15)	(15)

^a A supporting frame is a structure of angle or channel or a folded rigid section of sheet metal that is rigidly attached to and has essentially the same outside dimensions as the enclosure surface and that has sufficient torsional rigidity to resist the bending moments that may be applied via the enclosure surface when it is deflected. Construction that is considered to have equivalent reinforcing may be accomplished by designs that will produce a structure that is as rigid as one built with a frame of angles or channels. Construction considered to be without supporting frame includes:

- 1) A single sheet with single formed flanges (formed edges),
- 2) A single sheet that is corrugated or ribbed, and
- 3) An enclosure surface loosely attached to a frame, for example, with spring clips.

^b The width is the smaller dimension of a rectangular sheet metal piece that is part of an enclosure. Adjacent surfaces of an enclosure may have supports in common and be made of a single sheet.

^c For panels that are not supported along one side, such as side panels of boxes, the length of the unsupported side shall be limited to the dimensions specified unless the side in question is provided with a flange at least 1/2 inch (12.7 mm) wide.

Table 8.2
Minimum thickness of sheet metal for electrical enclosures aluminum, copper, or brass

Without supporting frame ^a		With supporting frame or equivalent reinforcing ^a		
Maximum width ^b	Maximum length ^c	Maximum width ^b	Maximum length	Minimum thickness, Inches (mm)
Inches (cm)	Inches (cm)	Inches (cm)	Inches (cm)	
3.0 (7.6)	Not limited	7.0 (17.8)	Not limited	0.023
3.5 (8.9)	4.0 (10.2)	8.5 (21.6)	9.5 (24.1)	(0.58)
4.0 (10.2)	Not limited	10.0 (25.4)	Not limited	0.029
5.0 (12.7)	6.0 (15.2)	10.5 (26.7)	13.5 (34.3)	(0.74)
6.0 (15.2)	Not limited	14.0 (35.6)	Not limited	0.036
6.5 (16.5)	8.0 (20.3)	15.0 (38.1)	18.0 (45.7)	(0.91)
8.0 (20.3)	Not limited	19.0 (48.3)	Not limited	0.045
9.5 (24.1)	11.5 (29.2)	21.0 (53.3)	25.0 (63.5)	(1.14)
12.0 (30.5)	Not limited	28.0 (71.1)	Not limited	0.058
14.0 (35.6)	16.0 (40.6)	30.0 (76.2)	37.0 (94.063.5)	(1.47)
18.0 (45.7)	Not limited	42.0 (106.7)	Not limited	0.075
20.0 (50.8)	25.0 (114.3)	45.0 (114.3)	55.0 (139.7)	(1.91)

Table 8.2 Continued

Without supporting frame ^a		With supporting frame or equivalent reinforcing ^a		
Maximum width ^b	Maximum length ^c	Maximum width ^b	Maximum length	Minimum thickness,
Inches (cm)	Inches (cm)	Inches (cm)	Inches (cm)	Inches (mm)
^a A supporting frame is a structure of angle or channel or a folded rigid section of sheet metal that is rigidly attached to and has essentially the same outside dimensions as the enclosure surface and that has sufficient torsional rigidity to resist the bending moments that may be applied via the enclosure surface when it is deflected. Construction that is considered to have equivalent reinforcing may be accomplished by designs that will produce a structure that is as rigid as one built with a frame of angles or channels. Construction considered to be without supporting frame includes: 1) A single sheet with single formed flanges (formed edges), 2) A single sheet that is corrugated or ribbed, and 3) An enclosure surface loosely attached to a frame, such as with spring clips. ^b The width is the smaller dimension of a rectangular sheet metal piece that is part of an enclosure. Adjacent surfaces of an enclosure may have supports in common and be made of a single sheet. ^c For panels that are not supported along one side, such as side panels of boxes, the length of the unsupported side shall be limited to the dimensions specified unless the side in question is provided with a flange at least 1/2 inch (12.7 mm) wide.				

8.1.4 If the design and location of components and the strength and rigidity of the outer cabinet warrant, an individual enclosure thinner than that specified in Table 8.1 or 8.2, whichever applies, may be employed.

8.1.5 A steel enclosure shall be protected against corrosion by painting, plating, or other equivalent means.

8.1.6 The enclosure shall prevent the emission through its openings of molten metal, burning insulation, flaming particles, or the like, that may occur inside.

8.1.7 If insulating material other than electrical insulation is provided within the enclosure, consideration shall be given to the burning characteristics and combustibility of the material and the proximity of an ignition source.

8.1.8 All intended mounting positions of the vent or chimney connector damper shall be considered when determining if it complies with the requirements in 8.1.6 and 8.1.7.

8.2 Doors and covers

8.2.1 A cover or access panel of an enclosure for uninsulated live parts shall be provided with means for securing it in place.

8.2.2 A hinged or pivoted panel or cover shall be positioned or arranged in such a manner that, due to gravity or vibration, it is not subject to falling or swinging that may cause injury to persons by exposing moving parts or uninsulated live parts.

8.2.3 The assembly shall be arranged so that an overload protective device such as a fuse, the intended functioning of which requires renewal, can be replaced, and a manual-reset device can be reset without removing parts other than a service cover or panel and a cover or door. See 8.2.6.

8.2.4 A required protective device shall be wholly inaccessible from outside the vent or chimney connector damper without opening a door or cover.

Exception: The operating handle of a circuit breaker, the operating button of a manually operable motor protector, and similar parts may project outside the vent or chimney connector damper enclosure.

8.2.5 A fuseholder shall be constructed, installed, or protected so that adjacent uninsulated high-voltage live parts within 4 inches (102 mm), other than the screw shell of a plug fuseholder, cartridge fuse clip, or wiring terminal to the fuseholder, will not be exposed to contact by persons removing or replacing fuses. An insulating barrier or vulcanized fiber or similar material employed for this purpose shall not be less than 0.028 inch (0.71 mm) in thickness.

8.2.6 Except as indicated in 8.2.7, a door or cover of an enclosure that provides access to any overload-protective device that requires resetting or renewal shall be hinged or otherwise attached in an equivalent manner.

8.2.7 A hinged cover is not required for a device in which the only fuses enclosed are:

- a) Control-circuit fuses of 2 amperes or less, provided the fuses and control-circuit loads, other than a fixed control-circuit load, such as a pilot lamp, are within the same enclosure,
- b) Extractor-type fuses, each with its own enclosure, or
- c) Fuses in low-voltage circuits.

8.2.8 A hinged cover, where required, shall not depend solely upon screws or other similar means requiring the use of tools to hold it closed, but shall be provided with a catch or spring latch.

8.2.9 A spring latch, a magnetic latch, a dimple, or any other mechanical arrangement that will hold the door in place and would require some effort on the user's part to open is considered to be an acceptable means for holding the door as required by 8.2.8.

8.2.10 A door or cover giving direct access to fuses in other than low-voltage circuits shall shut closely against a 1/4-inch (6.4-mm) rabbet or the equivalent, or shall have either turned flanges for the full length of four edges or angle strips fastened to it. Flanges or angle strips shall fit closely with the outside of the wall of the box proper and shall overlap the edges of the box not less than 1/2 inch (12.7 mm). A construction which affords equivalent protection, such as a fuse enclosure within an outer enclosure or a combination of flange and rabbet is acceptable.

8.2.11 A strip used to provide a rabbet, or an angle strip fastened to the edge of a door, shall be secured at no fewer than two points, not more than 1-1/2 inches (38.1 mm) from each end of each strip and at points between these end fastenings not more than 6 inches (152 mm) apart.

8.3 Openings

8.3.1 An opening in an enclosure to provide clearance around a dial, knob, lever, or handle shall not allow the entrance of a rod having a diameter of 9/64 inch (3.6 mm) at any setting or position of the dial, knob, or the like.

8.3.2 Ventilating openings in an enclosure shall be judged on the basis of the necessity for their existence, their size and location, and the aggregate area of all the openings involved, in accordance with the following:

- a) A ventilating opening shall be necessary to prevent the attainment of excessive temperatures on parts of the control, as demonstrated by a temperature test with such an opening blocked.
- b) Openings other than those necessary for mounting the assembly shall not be located in the bottom or in the mounting surface of the enclosure.
- c) The nearest portion of a ventilating opening shall be above the bottom of the enclosure and away from the wall mounting surface by a distance equal to one-quarter of the enclosure height and depth, respectively, or 1 inch (25.4 mm), whichever is less.
- d) If an enclosure houses fuses or any portion of a circuit breaker other than the operating handle, a ventilating opening shall not be provided unless the construction affords containment of electrical fault disturbances equivalent to that provided by the requirements in 8.2.10 and 8.2.11.
- e) The compartment or that part of an enclosure that contains field-wiring splices in the high-voltage circuit shall not be provided with ventilating openings.
- f) There shall be no emission of flame or molten material from an opening, or other evidence of fire, during tests such as transformer burnout and burnout of relays with blocked armature.
- g) An opening shall not permit entrance of a 3/4-inch (19.1-mm) diameter rod.
- h) An opening shall be arranged so that a probe, as illustrated in Figure 8.1, cannot be made to touch any uninsulated live part when inserted through the opening.
- i) An opening shall be so arranged that a probe, as illustrated in Figure 8.2 cannot be made to touch film-coated wire when inserted through the opening.

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Figure 8.1
Probe for uninsulated live parts

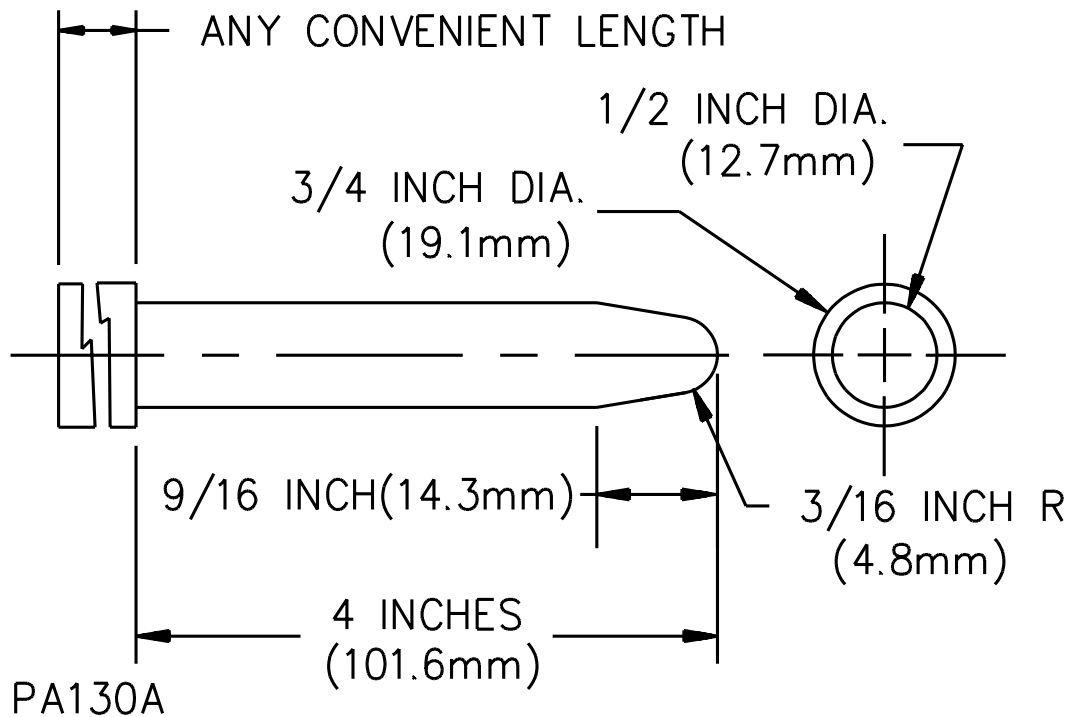
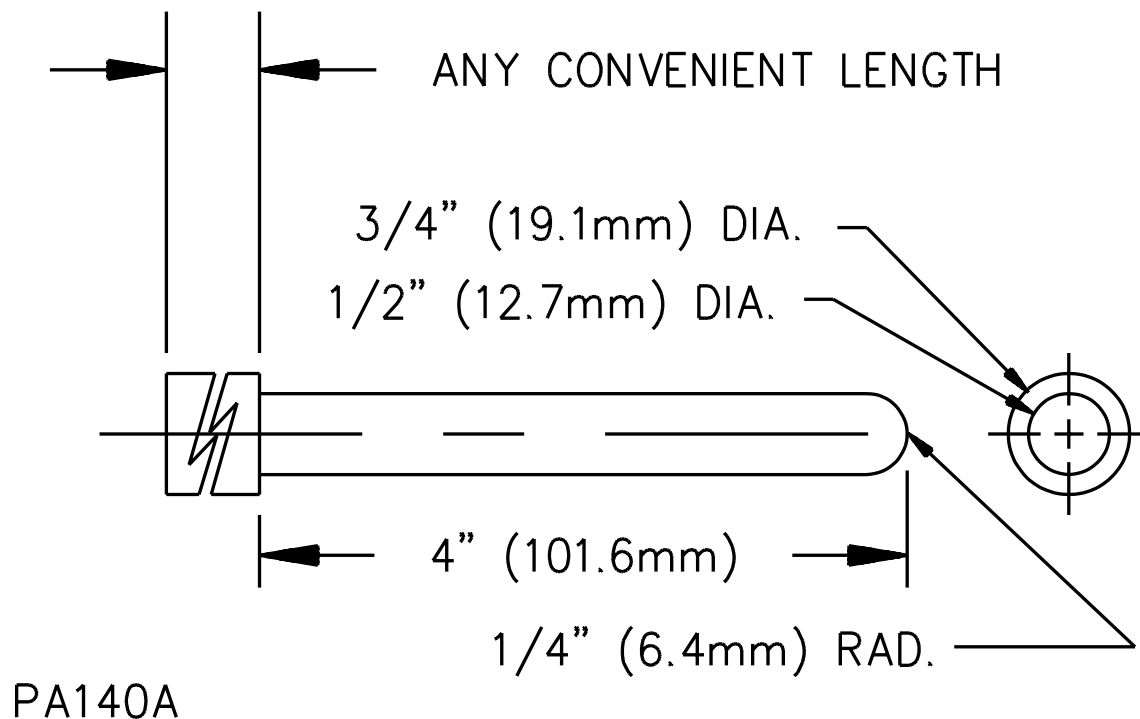


Figure 8.2
Probe for film-coated wire



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